

How Do We Construct Worlds With Words?

A Study of Metaphors and Conceptions of Outer Space in Parisian French

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Résumé

Comment construisons-nous les mondes avec les mots?

Une étude des métaphores et des conceptions de l'espace dans le français parisien

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Université Concordia, 2019

Dans cette thèse, j'emploie l'analyse critique de discours (Van Dijk 1997) et la théorie de la métaphore conceptuelle (Charteris-Black 2004) afin d'examiner les données que j'ai collectionnées dans quarante entretiens dans le but de documenter le processus métaphorique utilisé par 40 parisiens lorsqu'ils imaginent et parlent de l'inconnu au-delà de la Terre. Ma recherche va au-delà des frontières traditionnelles de CMT afin d'analyser le processus métaphorique mis en oeuvre lorsque les interviewées imaginent et décrivent l'inconnu. Quel rôle le langage a-t-il, surtout la métaphore, dans le processus de compréhension de l'inconnu et comment il influence comment nous concevons et 'construisons' des nouveaux mondes?

Des recherches précédentes indiquent que l'analogie et la métaphore sont fondamentales au langage et à la cognition humains (Kövecses 2002, Hofstadter and Sander 2010). Une métaphore se compose d'un domaine source et d'un domaine cible, tous les deux 'connus' de l'individu grâce à son expérience précédente ou sa connaissance culturelle généralisée. Toutefois, la fonction de la métaphore dans le discours concernant l'imaginaire ou l'inconnu est moins étudiée que la fonction des métaphores dans des schémas métaphoriques traditionnels. Comprendre comment la métaphore rend l'inconnu connu est la clef de notre compréhension de la façon dont le langage fonctionne dans le 'wor(l)d-building' (ou la construction mutuelle des mondes et des mots) (Black 2018) car elle facilite les processus cognitifs qui font le pont entre l'imagination humaine et la réalité émergente.

Basée sur l'analyse de 40 entrevues faites à Paris, et sur une année d'observation participante, la thèse se développe en 11 chapitres. En mettant l'accent sur le langage et la construction des mondes par la parole, je participe à un débat classique en anthropologie du

langage et qui concerne la création du sens. Si nos métaphores sont motivées par notre connaissance et notre expérience précédente, comment pouvons-nous réussir à connaître quelque chose de vraiment nouveau, à innover, ou à inciter des changements sociaux profonds?

Mots-clés : métaphore, l'espace, l'inconnu, le langage incarnée, la cognition incarnée, l'imagination, les effets d'encadrement du langage, la France.

Abstract

How Do We Construct Worlds With Words?

A Study of Metaphors and Conceptions of Outer Space in Parisian French

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In this thesis, I employ Critical Discourse Analysis (Van Dijk 1997) and Conceptual Metaphor Theory (CMT) (Charteris-Black 2004) in order to examine data I collected in forty interviewees with the goal of documenting the metaphoric process used by 40 Parisians when they imagined and spoke about the unknown beyond the Earth. My research extends the traditional boundaries of CMT in order to analyse the metaphoric process at work when interviewees imagine and describe the unknown. What role does language, especially metaphor, play in the process of understanding the unknown and how does it influence how we conceive of and ‘build’ new worlds?

Past research indicates that analogy and metaphor are fundamental to human language and cognition (Kövecses 2002, Hofstadter and Sander 2010). A metaphor is composed of a source domain and a target domain, both ‘known’ to a speaker through her previous experience or generalized cultural knowledge. However, the function of metaphor in discourse concerning the imaginary or unknown is less studied than the function of metaphors in traditional metaphorical schemas. Understanding how metaphor makes the unknown known is key to our understanding of how language functions in ‘wor(l)d-building’ (or the mutual construction of worlds and words) (Black 2018) by facilitating cognitive processes that bridge human imagination and emergent reality.

Based on the analysis of 40 interviews conducted in Paris, and a year of participant observation, my thesis will be developed in 11 chapters. By focusing on language and the construction of worlds through words, I participate in a classic debate in linguistic anthropology concerning the creation of meaning. If our metaphors are motivated by our previous knowledge

and experience, how do we come to know something truly new, to innovate, or to incite profound social change?

Key words: Metaphor, Outer space, The unknown, Embodied language, Embodied cognition, Imagination, Framing effects of language, France.

Acknowledgements

I have learned and grown considerably from the experience of conducting and writing up this research. One of the things that previous research has demonstrated, and that I found true in my own data, is that there is no such thing as pure imagination or creation. We are creatures of patterns, imitation and repetition; creatures of the precedent, the past, the what has come before. A.A. Milne reminds us that *all this has happened before, and it will all happen again*. This cycle of my work and my imagination and conceptions of the world would not have been possible in its current form without a number of other human beings.

Two of them are my parents, Todd and Angel Black, who raised me quietly in that western frontier so many of my participants mythologized, and who now have migrated even further where they live on the edge of the world at the base of a mountain from which they listen to me with an infinite patience. Their gumption, perseverance and bravery repeatedly call me to steel my own. They did much to create and do much to sustain the person who has written the following pages.

Another is my thesis supervisor, Christine Jourdan, without whom my life for the past six years would not have been possible in the same way, much less my research. My respect and esteem for Christine are without bounds and I owe, in part, the accomplishment of this project to her support, creativity, input and personality. Blessed are those who have a thesis supervisor as I have had, and that they be blessed those who do as Christine has done for me.

This research would also not have found its current form without the valuable input of my thesis committee, Valérie de Courville-Nicol and Jean-Philippe Warren, as well as my external committee members John Leavitt and Paul Bandia. I am also grateful to David Valentine and Bertrand Masquelier for their input on my work over the course of my doctoral program.

I extend my gratitude ‘as high as the sky’ to my research participants and my friends, neighbors and all the people who shared and share their imaginations, their worlds and the microverses that are themselves with me. I appreciate the patience of those I have neglected, the advice of those who have been generous enough to read and comment on my work, and all the hours that I have passed in this village and the city attached to it, distant in almost every imaginable way from that first environment that shaped my ways of seeing the world.

Finally, I thank those who not only want us to imagine survival as a species, but who want to imagine the most wonderful things possible for all of us. I know that this is worthwhile; that it is, in fact, one of the most important things we can do.

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List of Acronyms

CMA - Conceptual Metaphor Analysis

CMT - Conceptual Metaphor Theory

ESA - European Space Agency

FE - Female Expert Participant

FNE - Female Non-Expert Participant

ISS - International Space Station

ME - Male Expert Participant

MNE - Male Non-Expert Participant

NASA - National Aeronautics and Space Administration

PI - Primary Investigator (the author)

SAE - Standard American English

STEM - Science Technology Engineering and Mathematics

List of Conventions

All conceptual metaphors in the thesis are in **COPPERPLATE** font to distinguish them from the rest of the text.

All quotes in the original French in the text have been placed in *italics*.

All research participants have been assigned pseudonyms. I reference them using these pseudonyms, without quotation marks, throughout the text.

The twelve vignettes have been formatted apart from the main body of the thesis text and are in **American Typewriter** font to set them apart from the rest of the text.

I use American English and Standard French (France) spelling in my writing.

“...there is no unknown, only things temporarily hidden, temporarily not understood.”

Captain Kirk, “The Corbomite Maneuver” (1966).

Vignette 1: “J’ai bien compris la question, mais je pense aux clefs quand même.”

(Male, Expert, 71 years old)

It was finally cooling down after a muggy August day outside of Gradignan, at a camp site and recreational area where the National Science Fiction Convention was being held. Gradignan is located in the countryside just outside of Bordeaux. That part of the country can get awfully swampy in the summer, complete with mosquitoes buzzing in the high nighttime temperatures. The contact at whose apartment I was staying had actually advised me to bring a few items, including a mosquito net (as he kept the windows open all night). It was hot, it had been hot and it was going to be hot.

We had come to the final evening of the convention; three days of conferences, booksellers and art exhibits, hydrated liberally with bottle after bottle of cold water, pastis and beer. The ‘gala’ dinner had taken place on a patio outside of the main building, where tables had been set up with plastic table clothes and silverware. The conference goers went through a buffet and ate family style; authors and fans, scientists and geeks, artists and other geeks.

Now, the memorabilia auction was going strong in one of the large, un-air conditioned buildings, and I was still sitting outside on the patio with Jules, a science fiction author, his wife, and the eventual addition of Simon, a graphic artist I had interviewed the previous day. The buffet and dinner ware had been cleared away. All that remained were our paper coffee cups and a few emptying bottles of water and red wine. It would be one of the most pleasant and fluid interviews of the project as my two principal interlocutors had shared the better part of their lives together and complemented each other’s answers, supplementing information, questioning each other’s accuracy and grinning all the while. Everyone was comfortable in the coming cool of the evening, away from the noise of the other people and the boisterous auction, content after dinner and coffee.

I was unsurprised when, as an author, Jules’ first response to the question “what would you take in your one kilo of personal effects” was books.

“Ben, peut-être un iBook quand même là, du coup. Parce que j’ai des iBooks, je m’en sers pas. J’aime bien les livres. Mais un kilo là, les iBooks, avec 6,000 bouquins à l’intérieur, oui pas mal...sans aucun doute, un iBook. Donc, déjà ça fait 100 grammes. J’ai encore le choix de prendre autre chose.”

His wife intervened, “Music, right?”

“Mais la musique c’est pareil. Je mets ça en numérique. Tu sais la clef USB sur notre voiture, on a 25 heures de musique sur notre petite clef de 12 gigas, donc. Donc, voilà, franchement. Avec 100 grammes je me débrouille.”

I noted his analogy between ‘their USB key’ in the car and the format he would choose to take to travel through space. He continued his response, beginning to cite things that he could not digitally dematerialize.

“Bon, j’aime bien les stylos et le papier, mais là c’est pas la peine. Non, je m’en passe. Mes lunettes. Pour voir de loin. Quand même, oui. Il y a quand même des étoiles, j’aimerais bien les voir.”

He paused for a moment, returning to his glasses. “Faut pas oublier mes lunettes.” And then he said something which surprised me:

“Les clefs de la maison parce qu’on sait pas, je pourrais peut-être revenir....”

In my surprise, I interjected, in a manner that I would learn to curb as my interviews progressed. “But sir, we stipulated already that you would not be coming back.”

“Oui, justement, c’est bien qu’on a précisé que je ne reviens plus que je prends encore les clefs de la maison. J’ai bien compris la question, mais je pense aux clefs quand même.”

Chapter 1: Introduction

“We are enraptured prose beings...” Walter Benjamin, 1928 (2006)

1.1 Talking Into Being

During the month of August, the French have a common practice of taking three or four weeks of vacation. As an American graduate student, I had never experienced such a thing. In the summer of 2016 I made friends with a group that was going down to stay at a family house in the south of France. The house was set out in the vines of Ramatuelle, just far enough away from the lights, noise and hubbub of the Côte d’Azur. Sometimes we went to the beach, the market or into town for the evening, but mostly we stayed at the house, enjoying the calm, the lack of motion and the absence of masses of people that we lived with daily in the city.

Over the weeks, little habits formed within our impromptu household. One of my favorites became the evening ritual of preparing a late dinner together after a long apéritif in the warm evening air. As the sun set, birds would flit across the surface of the pool to drink water and the landscape inverted. The gleaming green of the vines, the heat reflecting off of the tile roofs - all of the energy and activity on the ground went dark and the sky, that had remained a cloudless blue for hours, became a spectacle. After dinner, coffee and talking, when night would fall truly, darkly onto the rolling hills and ordered rows of vines, we spread out on deck chairs or on thick towels under the sky. *La grande ourse. La petite ourse. Orion. But, what are those? Isn’t that the Cygne?*

Possibly a bottle or an iPhone are interchangeably passed around in a 21st century manifestation of a human activity that has gone on for thousands of years. In English we call it stargazing. In French we “*regarder les étoiles.*” But we do not stop at the gaze. We bring these distant points of light into our worlds. On the August evenings in question this was done in part through contemporary scientific data (the distance of a star from Earth, its size and luminosity), but also through narrative. As we lay, our backs pulled to the ground by gravity and our eyes drawn far beyond the Earth in both space and time, we repeated the individual scientific names of the stars and placed them in constellations according to greco-roman narratives. Gods, royalty,

heroes and monsters; the sky on those clear nights was transformed into a mythological arena. It was a place of sense where we could find a sense of place.

We found this sense of place together, by talking, pointing with an index finger and tracing imaginary lines in the blackness of space between points of light vastly distant from one another. Together, we spoke into being a world informed by empirical scientific data as well as cultural knowledge (the wonders of a wifi connection and a star map application), but a world that remained delineated by our embodied experience of it (and previous embodied experiences like it). The boundaries of the new world we mapped in language were based on our location on the Earth and the stars visible to us at any given hour, as well as a host of other environmental conditions. As the hours would pass and the Earth slowly rotated into day, the cast of celestial characters changed, narratives shifted, and the stargazers were lulled from their imagination of the heavens into the imagery of their dreams.

For millennia humans have anthropomorphized the natural backdrop of the sky, “talking...into meaningfulness” (Shore 1996, 58) the distant unknown. How people construct knowledge about worlds beyond our own, or about the unknown, as well as the relationship between humans and ‘reality’ are central to much anthropological research and a fundamental problematic in sub-disciplines such as archaeoastronomy and ethnoastronomy (Vertesi 2015; Messeri 2017). George Gumerman and Miranda Warburton (2005) argue that “to truly comprehend a culture we must have some sense of its cosmology - the group’s conception of themselves in relation to the heavens” (cited in Campion 2017, 5). A society’s understanding of the cosmos has a direct impact on the sociopolitical organization of that society. “The intellectual horizon of the human race at any time has always been inextricably bound up with the scale of the universe...there can be little doubt that a people’s perceived scale of the universe must play a fundamental role in its culture and consciousness” (Rowan-Robinson 1984, 1).

In the western world we can trace the advent of political systems according to the evolution of social conceptions of cosmology. For example, Plato’s conception of the material universe as an imperfect representation of a world of Ideas that is governed by time and regulated by mathematics underpins his conception of a perfect society - in which philosophers rule in order to harmonise society with a perfect cosmos. Scholars like Campion (2017) argue

that this conception of the universe, and humanity's place within it continues to provide the foundation for utopianism.

Similarly, the Copernican revolution, in which the Sun was identified as the center of the universe rather than the Earth, provided an opportunity to create a parallel between rulers (associated with the Sun since ancient times) and the Sun. The solar analogy of absolute monarchy, which reached its height during the reign of French king ("*le roi soleil*" or "Sun King") Louis XIV, claimed that, like the planets orbit the sun, a society orbits around its king (Hutchinson 1987). Newtonian conceptions, in which the universe was governed by one system of natural law, would later be extended to conceptions of social organization on Earth and serve as a justification for disbanding monarchies. Theoretically, if everything in the universe is governed by the same law, all of human society would be governed by the same law, rendering all peoples equal and monarchy redundant. This political Newtonianism was adopted widely by French (1789) and American (1776) revolutionaries (Becker 1958; Campion 2009) as they imagined the societies they wanted to create.

Human realities are profoundly informed by a group's conception of that which is distant and unknown. Extensive anthropological research on cosmologies (e.g. Mary Douglas's 1966 *Purity and Danger*. Also see, Abramson and Holbraad 2014 for an overview of recent research concerning cosmology and the anthropology of worlds), the afterlife (Samovar, Porter, McDaniel 2010) and other unknown or unclear phenomena work towards an understanding of how humans understand and build their reality. Within the worlds anthropologists encounter, they must always work in and through languages. Anthropological currents stemming largely from the work of Edward Sapir have demonstrated how people use languages to construct worlds. Linguistic practices mediate between thought and perception of the real. Whether it be incantations, mantras, prayers or daily conversation, words are generative, not only descriptive tools. Because language is one, if not the fundamental characteristic of the human (Chomsky 1968), questions concerning the relationship between thought, language, practice and reality are primary across anthropology.

How people understand phenomena beyond their individual experiences demonstrates a key function of culture, namely culture's role as a shared set of ideas and categorizations within a

group. “Ideas about the cosmos are an integral part of human cultural and social systems” (Campion 2017). Many anthropologists, including archeologist Timothy Darvill (2008, 111) defines ‘cosmology’ as “the world view and belief system of a community based upon their understanding of order in the universe.” For example, in the 5th B.C.E., Aristotle developed a conception of the cosmos as being composed of concentric spheres. This conception, refined further by Ptolemy, would become the ‘universe’ for the Christian, Jewish and Muslim world (Primack N.D.). A person in Medieval France would have looked into the night sky and seen nesting, transparent spheres, rather than the vast distances and separate celestial objects that my French interlocutors spoke about in the early 21st century. People’s knowledge about the unknown demonstrates how humans appropriate reality beyond them and in their lives, and allows us to observe cultural influences and determinants in this process. Language, after all, gives us an insight into the categories of knowledge that represent speakers’ places in the world, as well as their conception of this world.

Intrigued as I was by the star-gazing experiences of my time in Provence, and by the narratives I collected at that time about what space meant for the stargazers, I proposed to turn this experience into a research project: to study what language can reveal of people’s conception of the unknown, here the unknown of space, with the further goal to inquire into the role of language in the process of imagining and forming conceptions of that unknown (i.e. for my project, space and people’s conception of space, rather than a religious or metaphysical unknown). The research project developed into a way to examine the cognitive linguistic process of what I call wor(l)d-building (Black 2018), or the mutual creation, revision or deployment of words and worlds. It is commonly accepted that the way we speak reinforces and influences our daily lives and present reality. To better understand how speaking can influence potential worlds and emergent reality, I developed three central research questions: How does language, particularly analogy and metaphor, shape our perceptions, imaginations and categorizations of (im)possibilities? How do analogical and metaphorical processes, especially their dependence on prototypes and cultural models, interact with the way we imagine and talk about these imaginations? And, finally, how can a better comprehension of these cognitive linguistic processes be employed in the service of creating the worlds we wish to live in, through

innovation, invention and social change? To answer these questions, I carried out field research in Paris, working with interlocutors who had different understandings of space: some were scientists, others were French citizens with no particular scientific training, yet others were interested in science fiction.

The objectives of the research are threefold: 1) to analyze the source domains in the primary metaphors used by speakers to discuss extra-planetary existence, 2) to provide an explanation for the motivation of dominant metaphors and 3) to reach conclusions concerning the influence of these metaphors on comprehension, intellectual construction, and perception of extra-planetary human existence.




 Ruef @denisruef · Jul 30
#StarTrekSansLimites @LeGrandRex c'est maintenant

Figure 1.1: Crowd outside of the Grand Rex theatre at the premier of *Star Trek Sans Limites* (I'm at the back); Paris, July 2016. Photo by @denisruef.

I expected, when beginning this project concerning peoples' imagination and discourse about space, that interviewees would not have extensive embodied experience of space, whether in the form of stargazing, or traveling to outer space. This would not be problematic as most of my interviewees had experiences with a night sky and, as past humans have taught us, it is unnecessary to possess significant knowledge about the stars and space to create representations and

understandings of them. We can talk about the stars, name them and attribute traits to them without 'knowing' them, and subsequently we know them, in part, according to the ways we name them (and whether or not we learn their names!) and talk about them. The terms we use to describe the world "help to constitute what [they] describe" (Giddens 1991, 33).

I know people can talk about the unknown of outer space because I observed it over and again during the course of thirty-three hours of individual interviews talking about space and the unknown beyond the Earth and numerous discussions about the topic outside of the interviews. When I use the term “unknown,” I do so in acknowledging Donald Rumsfeld’s (Department of Defense [DoD] 2002) argument concerning military strategy and preparing for the unknown. Rumsfeld posited that there are different kinds of unknowns: known or familiar unknowns and unknown unknowns (See Chapter 4). Space is a domain of knowledge that contains all forms of unknowns. There are varying levels to which different people know the things they do not know about space, as well as things that all people do not know that we do not know (despite our efforts to do so) about what exists beyond our planet. How do we constitute knowledge about these different kinds of unknowns and about our capacity to know them?

1.2 Context: Embodied, Situated Talk and Imaginations

My data collection took place from May 2016 to December 2018 and my focus was on individual interviews and participant observation in the city of Paris and a handful of other locations in France (i.e. *Les Utopiales* in Nantes; *La Convention Nationale de la Science Fiction* in Gradignan). I chose Paris for two reasons, reasons that simultaneously extend the conceptual content available to the people I speak with and minimize the linguistic variation they may potentially use to express their conceptions.

First of all, Paris and conceptual content: I wanted to know how embodied experience and cultural knowledge informs imagination. I use Jeffrey Alexander’s (2004, 9) definition of imagination, an approach inspired by Durkheim’s concept of the ‘religious imagination’: “Imagination is intrinsic to the very process of representation. It seizes upon an inchoate experience...and forms it, through association, condensation, and aesthetic creation, into some specific shape.” Similarly, Illouz (2012, 199) argues that “Imagination is viewed...as consisting of the very stuff through which we organize thought and experience or anticipate the world.” I concur with Illouz’s analysis and have chosen this definition because of its emphasis on imagination not as inventing new constructs, but as making use of pre-established ones, particularly through association.

In this project I look at how being French and the experience of living in France has particular influences on the way people speak about and perceive the world (and possible worlds). Paris provided me the opportunity of studying both the French cultural narrative in one of its most highly distilled contexts (i.e. *the* city that symbolizes France) and of studying how people who live in this context talk about space and imagine it. Paris is perceived by many as one of the bright centers of the universe. The French, and Parisians in particular, are proud of this “beautiful” city and the culture and political power it represents. The normalization of the cultural narrative of “Frenchness” is highly distilled in Paris and talking about this narrative and providing proofs of it are a part of daily life in the city (e.g. how one is a *vrai parisien*). When discussing the cultural capital of the city, people speak of the Louvre, the Sorbonne, le Musée d’Orsay and le Musée de l’Homme, as well as what they perceive as a high concentration of Michelin-starred restaurants and high-end boutiques. These are a few of the abundant manifestations of the high culture narrative that the French maintain and to which they ascribe significant importance. The Elysée, swarms of embassies, martial monuments and military parades are manifestations of political and military power that one is hard-pressed to find outside of the city. If one is to see fighter planes flying in French skies, it is likely to be in Paris on the Champs Elysée - the 14th of July, when *Les Bleus* won the World Cup in 2018 or for the centennial of Armistice Day. Paris is the center-piece in the cultural narrative of what it is to be French and is the nerve center for the normalization of this narrative. The *roman d’initiation* (or coming of age novel) is a French literary genre with a sub-genre that is exclusively constructed around the narrative of a “*campagnard*” (rural dweller) coming to Paris and being transformed (*Le Paysan parvenu* [1734], Marivaux; *Bel Ami* [1885], Guy de Maupassant; *Le Rouge et le noir* [1830] Stendhal). This genre is in many ways an allegory for how the French conceive of France being molded through Paris.

In everyday conversation Parisians continue to reinforce the division between Paris and the rest of the nation. “*Les banlieuzards*,” or suburbanites on the outskirts of Paris; “*les provinciaux*” or “*campagnards*” living in the countryside are often scorned. Parisians also have a social geography of the city itself. This geography is so entrenched in Parisian and popular culture that the “*rive gauche*” and “*rive droite*” divisions of the city are familiar to people

thousands of kilometers away who have never visited. Beyond the cleave of the Seine, Parisians, like any other urbanites, have complex divisions of the city based on ethnicity, social class, sociopolitical stances and stereotypes. Each of these divisions is based off of a manner of understanding what it is to be French: from the high culture of the upper class, to the pastis and zinc bars of the working class. Though increased immigration is changing this landscape, France maintains a national discourse that insists that there is such a thing as being “French,” and that this thing has very particular characteristics (for example, being secular and speaking Standardized French). This ideology pervades social discourse at all levels - from television advertisements¹ to national politics. The presidential elections in 2016 demonstrated to what extent being “French” and keeping France “French” is important to French voters. To foreigners, and many French people, Paris, more than any other site in the francophone world, embodies the ideal French state and its citizens. For French citizens living outside of the capital, this is not at all the case. The saying “*Paris n’est pas la France*” (“Paris is not France”) says it all. The tension between Paris and the provinces is palpable on an everyday basis through news reports and popular culture, and particularly in light of the cuts to services that have affected the livelihood of many people in rural France. The “*gilets jaunes*” movement that continues at the time of this writing is a manifestation of these tensions and the negative consequences of an increasing desertification of the countryside and concentration of wealth and opportunity in urban areas (e.g. Paris and Bordeaux).



Figure 1.2: Movie poster in the Paris metro for a docu-film about Pesquet’s time in the ISS. 2018. Photo by author.

¹ For an excellent recent example of this, I invite readers to watch Toyota’s Yaris advertisement entitled “C’est très français” (<https://youtu.be/uXjEZf6rGiU>).

The solidarity demonstrated after traumatic events, such as the November 2015 terrorist attacks across Paris, that resulted in 137 deaths and over 400 injuries, attests to the fact that a national narrative about being French and what France is exists. After these attacks, Paris was metonymically used to represent French ideals and the French way of life. Though there have been attacks in other European cities (e.g. Nice and Brussels), the Paris attacks remain the most deadly terrorist event in Europe to date. Parisians, French citizens across the Hexagon, and people around the world not only sympathized, but directly identified themselves with the city of Paris after the attack on the *Charlie Hebdo* newspaper. “*Je suis Charlie*” was a battle cry in response to the attacks. Paris, and Parisian institutions such as *Charlie Hebdo*, so symbolize liberal values that people responded with an ontological metaphor, a statement about their conception of their very being, as being “Charlie,” or an integral part of Paris. Paris is not just a city, it is a symbol with broadly reaching global meanings.

The French know this and Parisians take pride in this. The middle-class population generally perceives itself as well-informed, cosmopolitan and largely liberal and secular. I believed that in Paris, people’s self-perception of being generally informed and educated may be more prevalent than in rural settings. Whether it is true or not, the denizens of the capital have a tendency to consider themselves more sophisticated and enlightened than their rural counterparts (and, in some cases, more than most people anywhere in the world). The constant exposure to media of all sorts (e.g. television, street advertising, digital media) and the variety of social exchange made me hypothesize that Parisians may be less likely to tell me they “didn’t know” what I was talking about or had no opinion about it. Already, I knew from previous experience living in France, and subsequently comparing this to life in the Czech Republic, England, Morocco and Canada, that the French were not shy about their opinions, and not uneasy at the prospect of verbal disagreement. On the contrary, the French self-report that they love to debate and this has certainly been my experience. In Paris, my research project on the narrative of space was frequently criticized, my questionnaire questioned and my interpretations debated. No one I spoke with told me they had never heard of the European Space Program (ESA), or projects for human futures in space. On the contrary, women in their 70s and 80s in a community sewing group would inform me about French space projects and other interviewees would interpret my

results based on the cultural context of French involvement in space exploration. Over a coffee near Place du Caire, Étienne² explained that he thought more people knew about space now because of the unprecedented amount of news coverage surrounding Thomas Pesquet's 2017 trip

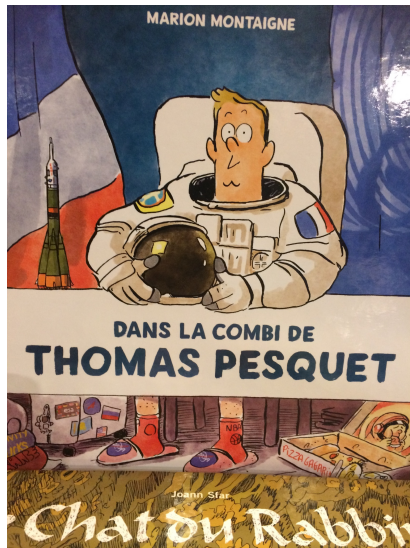


Figure 1.3: Photo of cover art for the bande dessinée *In the Spacesuit of Thomas Pesquet*, 2018. Photo by author.

to the International Space Station (ISS). Pesquet's presence in national scientific and popular culture is evident (See Figures 1.2 and 1.3), but interest in space in France has been drummed up by a series of events in the past few decades, including collaboration in the European Space Agency, the launch pad constructed in French Guyana and the Cité de l'Espace that opened in 1997 in Toulouse. As over 400 pages of interview transcriptions demonstrate, Parisians had no problems talking to me about the unknown of space and had a range of resources to draw upon when doing so.

Though they did not all come from Paris, 35 of the 40 interviewees lived in Paris at the time of my study. We met each other for interviews using public transport or walking through crowded streets. We shared the same experiences of a fast-paced quotidien, a constant human mass surrounding us, of being approached daily by homeless people or tourists, of being confronted incessantly by extreme poverty and extreme luxury. Paris, beautiful as it is, is a place of ambient hostility. The sirens, the noise, people crammed into subway cars, stuck in interminable traffic, people barking at each other in the streets. *Ils s'engueulent. Ils râlent. Ce n'est pas tous les jours fête*³. It may be unsurprising that the people who live in these daily conditions would subsequently talk to me about the constraint of space, about being 'squeezed like a sardine,' 'stuffed into a box' or going insane being 'trapped' with a small group of people.

Secondly, linguistic production: If Paris is the distillation of French culture, it is also the site of the distillation and normalization of the French language. The second reason I chose Paris

² All participants have been given pseudonyms.

³ They fight. They complain. Everyday is not a holiday.

as a field site is because it is the center of the standardization of the French language; for example, Paris is the site of the Académie française, the government institution that has ensured for almost 400 years that French is the most normalized world language (Armstrong and Pooley 2010). The French national language possesses a unique history of intensive linguistic homogenization and cultural and political policing, based on an ideology of the superiority of French and an intrinsic link between *being* a French citizen and *speaking* standardized French (this to the continuing detriment of other regional French languages and immigrant languages, Harrison and Joubert 2019). This extreme normalization, and its effects upon the expressive and cognitive tendencies of francophones, is one of the reasons the French language has always interested me. Harrison and Joubert (2019, 7) argue that this standardization goes beyond government policy and has become “part of the implicit knowledge shared amongst French citizens...[an] extremely powerful cultural construct that encapsulates the core characteristics of the French national imagined community.” They cite a similar argument from Schiffman (1996), who also calls attention to how French citizens *imagine* the French language:

“French language policy, believed by some...to be the most explicit and restrictive in the world, is more of a cultural construct than an explicit policy. *Its power rests in what people imagine it to consist of*, rather than on actual statuses or rigid codes. In other words, policy is not as explicit as French people think it is—but it is every bit as restrictive as they believe it is as long as they think it is” (Schiffman 1996, 123, emphasis added).

I will further discuss the political history and ideological machinery that set in motion and continues to maintain these legal and cultural codes in Chapter Seven, but here I find it important to note scholars’ insistence on the fact that linguistic normalization in France occurs through government institutions and legislation (e.g. the French Constitution, “*La langue de la République est le français*” [“The language of the Republic is French”]), and, as any other language, by the habitual patterns of communication, speech and linguistic socialization of its speakers. My data support this argument about individual practice and *imagination* of the French language, as people expressed their linguistic ideologies (e.g. talking to me about how French is ‘difficult’ or ‘logical’) and engaged in self and other correction during the interviews (see

Bourdieu and Boltanski's [1975, 20] discussion of practices of "distinction" and "correction" being the "*propriétés de la langue légitime*" ["the properties of legitimate language"]. I place emphasis on Schiffman's use of the word "imagine" as his argument about the power of imagination in reality constructs resonates with my own arguments in this thesis.

To start, French francophones in Paris (as opposed to foreign francophones, like myself) operate within a linguistic ideology that typically possesses a few common and well-documented characteristics. 1) That French is "superior to and clearer than any other" language (Harrison and Joubert 2019; Lodge 1993). The primary evidence of this is the belief that French is a language of logic - clear, precise, well-ordered. This is an inheritance from the *Siècle des lumières* (literally the "century of light," referring to the Enlightenment period) and the emphasis on grammar that characterized it. I have been told on numerous occasions that these reasons are why French continues to be pervasive as a language of global diplomacy (e.g. one of the official languages of the United Nations). A UNESCO employee who lives in my neighborhood explained to me over coffee one day that the precision allowed by the French language means that international governing bodies translate texts into French to render them more clear. Whether or not this is true is not important here. What is important is the fact that he had integrated this ideology about the French language.

2) The French language is a difficult language to master (much more so than languages like English, for example). This second characteristic is one of the most prevalent. French linguistic ideology idealizes French as being so complicated that it is often beyond the linguistic capacities of its own speakers, let alone foreigners. The standard, legitimate variety of French, or "*l'étalon unique de la langue commune*" as Bourdieu and Boltanski (1975, 4) describe it, against which all linguistic production is compared, is perceived to be difficult to produce. This provides an excuse for the mistakes of native speakers and reinforces the idea of French as an intricately constructed product of French ('high') culture. French speakers do not conceive of their language as being formed by their practice, nor as conforming to their ideals, but as possessing an ideal form outside of the community of linguistic practice, to which speakers aspire. Bourdieu and Boltanski (1975, 14) discuss this citing Balzac's claim that only he, Hugo and Gauthier 'possessed the French language;' they argue that "*Ce qui est rare, ce n'est pas la capacité de*

parler, qui...est universelle, donc essentiellement non-distinctive, mais la compétence nécessaire pour parler la langue légitime qui, appartenant au patrimoine social, dépend étroitement de la condition sociale” (“What is rare is not the ability to talk, which...is universal and therefore essentially non-distinctive, but the necessary competence to speak legitimate language which, belonging to the social patrimony, depends closely on social condition”). Language, in this ideology, is not viewed as practice, but as an (un)attainable object, the possession of which marks speakers’ cultural and material capital and positions them within a market of exchange.

3) Connected to this conception of the French language as a complex object that speakers can ‘fall short’ of using legitimately, is the idea that French can (and/or should be) ‘pure.’ Again, the idea (and practice) of avoiding anglicisms and other foreign words and, contrarily, reinforcing a conception of French as a unified language descended from Latin, feeds back upon ideas about French as an object, rather than a practice. An ideal form of French exists (in previous research my interlocuteurs situated this idealized form in the Ile-de-France region of the Hexagon, i.e. Paris [Black 2009], results that line-up with other data concerning the ‘ideal’ French accent [Dryef 2011]). As an English speaker, I have no conceptual problem with the idea that there are many acceptable and equally valuable forms of the English language (e.g. British English and American English) that may vary so considerably as to be unintelligible to speakers from different regions. Yes, the conception of an ideal, correct English exists (and is frequently associated with ‘BBC English’ or Ivy League speech). Nonetheless, there seems to be less value placed on this conception in everyday anglophone contexts than in everyday francophone contexts.

My hypothesis is that the hyper-standardization of contemporary French, both in legal and social life, results in more uniform linguistic production among its speakers (particularly those speakers who are residents of the Île-de-France, where the French argue that ‘ideal’ Standard French is situated, Black 2009; Dryef 2011). As speakers police their speech and that of others, novel conceptions, neologisms, and other non-standard forms of speech can be expected to be less frequently deployed, and more frequently challenged. The ways people speak on an everyday basis differ in various ways from the official norm, nonetheless, people’s everyday conception of a norm is strong and impacts everyday linguistic practice in formal and informal

settings. I made allowances in my research for social, regional and vernacular variations, however, in the interviews I conducted these elements were scarce in people's speech. I do not think this is necessarily a reflection of a lack of these aspects in French language use in Paris, but, again, more likely reflects the language ideologies of speakers, and their ideas about how they *should* speak to someone in an interview.

There is a final characteristic about Paris that made it an appropriate field site for research concerning the imagination of outer space. Science fiction narratives, or those narratives in which the imagination of outer space and humanity in outer space are most prevalent, appear in the highest concentration in comic books and graphic novels (Booker 2010). France is one of the three largest comic book markets in the world (with the United States and Japan) and possesses the most varied production of these markets (Macdonald 2015). Diverse imaginations of space should therefore be more readily available for Parisians (and they should be more frequently exposed to them) than they would be, for

example, to people in my hometown of Norman, Oklahoma. French children born in the 20th and 21st centuries are socialized with comic strips. They grow up with *Tintin*, *Astérix and Obélix* or *Titeuf*, and other series that many people continue to peruse into adulthood. Many interviewees in the 40>59 and 60+ years of age categories grew up with *Tintin: Objectif Lune* (*Tintin On the Moon*) and *On a marché sur la lune* (*Explorers On the Moon*), as well as novels such as Jules Verne's (1867) *De la Terre à la Lune* (*From the Earth to the Moon*). Figures 1.2 and 1.4 are contemporary examples of science fiction narratives in mass-distributed graphic novels for children. This concentration of generalized cultural knowledge concerning space (whether it be from comic books or ESA reports), should ensure that I will have rich interviews with people and



Figure 1.4: Photo of the cover of the children's *bande dessinée*, *Un goûter sur la Lune* BY Dorothée de Monfreid; Paris, July 2017. Photo by author.

minimize cases where people say they “don’t know” or “have never heard of” the scenarios I ask them to imagine.

My pre-fieldwork research into the sites for narratives concerning outer space in French publishing, scientific research, science fiction and comic book production confirmed the widespread presence of these narratives created for a range of different kinds of people (e.g. experts, non-experts, children). However, upon arrival to the field, I realized that the diversity of cultural knowledge concerning space in Paris was more concentrated than I had imagined and that sites of distribution of these narratives were more diverse than I had previously thought. I was surprised by how much discourse concerning the unknown beyond the Earth permeates daily life in this global metropolis. I was

immersed in the nebulae of representations of beyond this world that appeared within the city. Advertisements, literature for children and adults, movie posters, toys, games, art and science exhibitions and street art were all sites where I would find the imagination of humanity beyond the Earth manifested.

Standing for hours in line at film premieres for science fiction movies, attending gallery and museum exhibits about space, realms beyond the Earth,

and popular science fiction characters, as well as walking everyday in the city and seeing how space informed various forms of media, all attested that the influence of discourse concerning space exceeded the boundaries of science fiction, comic books and scientific discourse. For example, in the late summer participants spoke to me about the Raeliens and several months later, exiting a metro station, I accepted a flyer for an upcoming Raelien event. 2019 marked the 50th anniversary of the first successful human Moon mission and supermarket chains in France capitalized upon this by offering themed house linens and other decorative objects embossed



Figure 1.5: Ad campaign for Tintin space-themed products. Copyright Carrefour 2019.

with images from the *Tintin* comic books about the moon - Tintin's spaceship on bedsheets, Tintin in his spacesuit embroidered into bath towels, Hergé's representations of the moon and stars on dishes and throw pillows. A number of people talked about the Bogdanov brothers⁴ and their discourse on outer space (and whether or not, some questioned jokingly, they were *from* outer space).



Figure 1.6: Book release poster in the Paris metro; Paris, October 2017. Photo by author.

Space was present at every level of popular and scientific discourse and icons associated with outer space peppered the city on posters and in person. Space was active in people's individual imaginations and the ambient sociopolitical discourse in the city. A slew of science fiction films taking place in space came out during my fieldwork, including *Star Wars The Last Jedi*, *Star Trek Sans Limites* (premiere pictured in Figure 1.1), *Guardians of the Galaxy 2*, *Alien*

Covenant, *Blade Runner 2049* and *Valerian City of a Thousand Planets*. The release of *Star Wars* caused an explosion of advertising from subway stations, to toy stores, bus stops and train stations, featuring full-color images of aliens, space ships and the principal characters of the new *Star Wars* universe. I would attend a number of these films with project participants, including *Star Wars The Last Jedi* with Christian, an astrophysicist, and *Alien Covenant* with my neighbor Éric, on a hot summer evening when the air conditioning happened to be out at the theatre, leaving most patrons complaining about the film and the heat.

⁴ "Igor and Grichka Osten-Sacken-Bogdanoff (or Bogdanov) are French twin brothers who are television presenters, producers and scientific essayists who, since the 1970s, have presented various subjects in science fiction, popular science and cosmology. They were involved in a number of controversies, most notably the Bogdanov affair, in which it was alleged the brothers wrote nonsensical advanced physics papers that were nonetheless published in reputable scientific journals. They have also been notable because of their personality, family origins and physical appearances." (Wikipedia 2018)

Space and human existence beyond the Earth were not only a subject of popular discussion, summer blockbuster releases, scientific literature and science fiction. Space was a topic within ‘real’ world discourse, including the 2017 presidential elections in France. Jacques Cheminade, a presidential candidate for the “*Solidarité et progrès*” party, advocated strongly during the 2017 presidential campaign for the colonization of the Moon in order to facilitate future exploration of Mars. News outlets such as *Marianne* (Mathoux 2017) and *Europe 1* (Commandeur 2017) were among the many sources that chided his monumental ambitions and his puny numbers in the polls. As much as it may have provided critics with easy fodder, space was a serious part of Cheminade’s political platform and brought discussions of lunar and martian colonization into national political discourse.

The primary task of my fieldwork was to conduct unstructured individual interviews with forty people, equally distributed by age and gender. I elicited discussions concerning outer space, humans in outer space and how they imagined existence beyond the Earth. I realized after a few interviews what a wonderful experience it was to ask a question and to watch people look up into the sky, close their eyes to picture things and search for words to describe to me what they were experiencing in their minds. They were calling into being, if only for an instant, potential possibilities and impossibilities and reacting to them - categorizing, evaluating and emoting according to them. Participants laughed, exhibited disgust and displeasure, anger or excitement, sentimentality or frustration. There was extensive affect in these interviews that I consider important because of my focus on embodied experience. I have included vignettes, such as the one preceding this chapter, that present different kinds of data and details my account of



Figure 1.7: Space in the street; television advertising, Paris, February 2018. Photo by author.

interviewees' emotional responses. However, because my focus is on linguistic production, particularly analogies and metaphors, I do not concentrate on emotions, though I do incorporate them into my analysis where appropriate (e.g. risks and risk containment strategies in outer space [Lupton 2013; Reddy 1996]; how embodied emotions and desires inform people's imaginations of being in space [Barrett and Lindquist 2008]). The affective content of the interviews is a potential site for rich research, as are other aspects of participants' expression, notably their gestures and body movement while describing their imaginations.

In these interviews, we were talking about things my interlocutors had never known for themselves, or that no one knows or has experienced. Nonetheless, though imaginary, these potential realities and the narratives participants built around them created real reactions, judgements and affective responses. Their conceptions of these unknown (im)possibilities were not static, nor sterile, but influenced their conceptions of the present and their behaviors, judgements and opinions in the 'real' world.

1.3 Wor(l)d-Building: Language and Constructing Knowledge

I chose to talk to people about space so that I could observe a particular discursive process: how do people imagine the unknown and what role does language play in this process? My research is part of a large body of work, both in linguistics and anthropology, that seeks to understand the relationship between human language, thought, experience and conceptions of reality (Gibbs 2008; Lakoff 1987), especially the conceptual frames and perceptual primes that inform our construction of reality metaphorically (Gentner and Bowdle 2002). Linguistic relativity and its implication that language predisposes its speakers to certain interpretations of the world (Sapir 1929) is a foundational and still unresolved issue in linguistic anthropology. My project is situated within this debate and extends it beyond interpretations of the 'real world' to imaginations of the unknown 'off-world.' It builds on theories of embodied and metaphorical language and cognition as developed by George Lakoff (1993, 2009), Lakoff and Mark Johnson (1999) and Zoltán Kövecses (2006) and concentrates on pushing these theories further to apply them to linguistic production specifically concerning the unknown and the (im)possible. I intend

to further this theory by examining the metaphoric process (Corradi Fiumari 1995) as it operates in this kind of discourse.

Linguistic metaphors are moments where the analogical processes of cognition are apparent to those outside of the mind of the speaker and can be documented and analyzed. Language permits an external demonstration of what source domains of knowledge an individual uses to conceptualize a phenomena or event (a target domain of knowledge). The entailments and implications of the source domains people use, influence their comprehension of the target domain. Talking gives us traces of how a conceptual framework is being constructed, while simultaneously contributing to the construction of that conception.

Theories of metaphorical cognition posit that people build their conceptual worlds by using metaphorical schemas that operate as a best-match, patterning system (Ramachandran 2011) to apply previous knowledge to novel or abstract input. These theories suggest that humans do not apprehend things-in-the-world by themselves, but frame sensory input according to previous experiences. Following the publication of Lakoff and Johnson's (1980) *Metaphors We Live By*, extensive research in conceptual metaphor theory (Gibbs 2008) and metaphorical cognition has productively analyzed common metaphorical schemas (e.g. TIME IS MONEY, Mueller 2016) and explored how surface metaphors reinforce perceptions of target domains (the quality or experience described by the source domain) in terms of source domains (the domain of experience to be mapped on the target domain) with which they are associated. However, the majority of these studies document metaphorical constructions in which both the source and target domains refer to lived experience.

Decades of research across diverse disciplines provide evidence of the intimate links between language and perception (for an overview of this topic see Carruthers 2012). As I will discuss further in Chapter Two, over the past several decades researchers have revisited Whorfianism to explore the "structuring effects" of language on cognition and how the absence of certain lexical units corresponds to an absence of certain cognitive processes (Hunt and Agnoli 1991; Lucy 1992a, 1992b; Gumperz and Levinson 1996; Rosch 1973, 1975, 1977). Regier and Kay (2009, 1) explored the Whorfian hypothesis as applied to the perception of color categories, observing that:

“...the yes-or-no framing of the very question ‘does language affect perception?’ - obscure[s] an interesting possibility: that language might affect half of perception. Specifically, language might be expected to shape perception primarily in the right visual field (RVF), and much less if at all in the left visual field (LVF). This expectation follows from the observations that the left hemisphere (LH) of the brain is dominant for language, and that the visual fields project contralaterally to the brain. On this view, half of our perceptual world might be viewed through the lens of our native language, and half viewed without such a linguistic filter.”

Rather than studying the absence of certain processes, research like that conducted by Boulenger, Hauk, and Pulvermüller (2009) investigates how cognitive processes are activated by language use, notably the activation of the motor cortex when a subject hears words or phrases related to bodily action. Lacey, Stilla, and Sathian (2012) conducted similar experiments focusing on activation of the texture-selective somatosensory cortex in the parietal operculum during the processing of sentences containing textural metaphors and compared these to a lack of activation found when processing literal sentences with the same meaning. Recent research concerning brain areas involved in language and cognitive mechanisms (e.g. Binder et al. 2009; Binder et al. 2005; Price 2012; Sakai 2005), particularly mirror neurons, enriches this data demonstrating that whether we perform an action, see someone performing an action or hear (or read) the term for an action, the same perceptual cognitive brain areas are activated. Perlovsky and Ilin (2013, 17) use these findings to argue for a joint model of language and cognition “in which these two abilities are closely related yet distinct. This model... leads to a hypothesis that only in combination could these human abilities have evolved.”

Research like this has significantly advanced our understanding of language, cognition and human evolution. Nevertheless, these studies predominantly address basic-level, online processing within actual, present contexts. How we understand what we experience is a crucial process to document, but I argue that it is equally important to examine how we imagine what we have yet to experience; how we project into the future; how we construct new worlds in our words. Unlike studies that concentrate on basic sensory experiences and their influence on language and thought, my research focuses on how people accomplish this process when there is no sensory input for a target domain. Hofstadter and Sander (2010) explain that analogy and

metaphor are not simply linguistic phenomena, but foundational processes in human cognition. This is demonstrated in anthropological and cognitive studies that demonstrate how language is influenced by culturally oriented experiences and how these experiences structure a range of perceptions and behaviors within a group. Perlovsky and Ilin (2013, 19) argue that “Embodiment of abstract representations relies to a significant extent on embodiment of language in the surrounding culture.” Communities of linguistic practice are reality-construction groups. As Ochs (1988) and Ochs and Schieffelin (1984) have demonstrated in various contexts (e.g. Samoan villages and middle class households in California) speakers of a language are socialized in and through that language. A linguistic system (and therefore community of linguistic practice) is structured by environment, the bodies and lives of speakers, and changes within them, as well as their sociocultural and historic context.

Following these arguments, I posit that analogy and metaphor should be equally prevalent in talk about both real and imagined experiences and I seek to understand their particularities when deployed in this kind of talk (if any exist). My research examines how humans function cognitively in what Fauconnier and Turner (2002) call a “metaphorical blend” by applying knowledge of their past sensorimotor experience to novel stimuli, or in this case to unknown stimuli. Understanding how people function using this blend is key not only to understanding our practices of categorization and reaction to input, but also our larger conceptualization of reality and possible realities. Metaphorical analysis allows us to pinpoint instances of this cognitive linguistic (and greater social) process and tease out specific elements in this conceptualization and wor(l)d-building. The fieldwork and analysis I conducted for this project allow me to address the process of conceiving of a(n) (im)possible reality by understanding it through various forms of past experience and knowledge.

Metaphors not only function as conceptual bridges between potentially disparate associations, they “transform the way we perceive situations and thus relate to them” (Corradi Fiumari 1995, 31). The specific domains referenced by metaphors shape the kinds of interpretations and perceptions speakers will be inclined to experience. The source and target domains of a metaphor promote idealization, or “highlighting,” (a process in which a referent

entity is idealized in terms of a schema) and abstractedness, or “hiding,” (the process through which all aspects of an object that do not correspond to a particular schema are ignored) among potential alternative conceptions (Lakoff and Johnson 1980; Talmy 2000).

Through these processes of idealization and abstractedness, how do the metaphors people use shape their understanding and perception of space, and more specifically of humanity beyond the Earth? What does this influence demonstrate about the role of language in the human construction of the 'real' and further innovation beyond the known? Because only a few humans have experience of existence beyond the Earth, this topic allows me to examine the relationship between metaphor, experience and the 'imaginable' or potentially 'real.' Because I examine projected or imaginary realities, my research is appropriately poised to contribute to understanding how metaphor functions to “creat[e]...a new reality” (Koch 1979,142).

It is my conjecture that analogy and metaphors are central to this process cognitively and culturally and that an examination of how people use metaphors to imagine and understand unknown phenomena will shed light on our ways of constructing knowledge. How we categorize and create realities linguistically is a reflection of how this process operates cognitively. Our linguistic categories not only help us communicate a version of reality, they also contribute to its creation and reinforcement. These categories are therefore of utmost importance to the way we understand our world.

1.4 Unpacking Imagination

To inquire into how language frames perception, particularly imagination, I analyze metaphorical production in discourse concerning space and human existence in outer space. On couches, at picnic tables, on patios, at corner tables in noisy cafés and in quiet dining rooms, forty people talked to me about their imagination of known unknowns and unknown unknowns in this world and beyond it. They also talked to me about their own lives, interests and hobbies, their families, the first time they ever saw a television or recognized the traces of an exo-planet. In short, they allowed me into their worlds and generously joked, laughed, criticized and questioned me, sometimes for thirty minutes, sometimes for hours.

The people I interviewed came from various walks of life, social classes, educational, ethnic and religious backgrounds. The majority of participants were caucasian lower to upper middle class of European descent, with a few exceptions of working class participants. Being “French” for the purposes of this study is defined as 1) having been educated in France, 2) speaking French and 3) living in France. Because of this, several of my interlocutors were the first generation of their family to be born and educated in France. For example, Madeleine and Antony were born in Lebanon, but moved to France with their parents before starting school. Though the majority of participants lived in Paris at the time of the interviews, they were from all over the country - Burgundy, Alsace-Lorraine, Les Vosges, the Gironde, the Charente-Maritime - and had varied experiences of living in rural and urban settings in France. Many also had lived in other countries, including Jean (Colombia, the Czech Republic), Olivier (Canada), Madeleine and Nayla (England), Camille, Bernard and Joseph (the United States).

It is important to note that all of these people had ideas about the knowns and unknowns I asked them about. My interviewees were not blank slates of imagination, nor ignorant about the subject at hand (I learned a lot from them!) They all know about human life, they know about imagining things, they know more or less about space and about projections for human existence in space. For example, they were all familiar, to some extent, with NASA (National Aeronautics and Space Administration), ESA (European Space Agency), the space race of the 1960s and different works of science fiction. All of the interviewees had a BAC-level (high school level) education and were familiar with basic scientific theories in astronomy and physics. Many of the foundations that they use to construct representations of life in space are shared and this knowledge was largely rooted in class and gender-based 19th and 20th century knowledge. For example, by and large, people ascribed to Enlightenment conceptions of science as ‘progress’ and of exploration as a legitimate way of extending human knowledge.

It was my privilege to be privy to the imaginations of these people and to witness their processes of imagining. I was clued in to their ideas, hopes, fears and fantasies about future worlds and a future humanity beyond the Earth. They let me into their imaginations through language and they built these imaginations, in part, through the linguistic and cognitive processes of analogy and metaphor. Language was never the topic of our conversations; it was not an

element in the project questionnaire and I did not discuss my linguistic interests in their discourse until prodded to do so (in a handful of cases) following the project interviews. However, our imagining, and our communication of those imaginations, was done largely in and through language. The people I interviewed created and destroyed possible and present worlds, species, space and time. They dealt with issues concerning that which is profoundly unknown and distant (e.g. possible forms of non-carbon based life, alternate universes and the nature of spacetime) not by understanding it in itself (an almost impossible feat for any of us, as none of us has been beyond the Earth), but by comprehending it through their own lives, through the proximal and intimate.

The analysis I propose (i.e. of the dominant domains of experience people use in metaphors when talking about the target domain of space), allows my study to document how analogy and metaphor, cognitive processes based on precedent experience and knowledge, function to construct knowledge of an unknown experience. If analogy and metaphor are fundamental to human cognition (Boroditsky 2000; Feldman 2006) and subsequent perception and reaction (Boulenger, Hauk and Pulvermüller 2009; Corradi Fiumari 1995; Geary 2012; Gibbs and Ferreira 2011), how do we come to know the unknown and how do we innovate towards new, emergent realities? My research uses the techniques of linguistic metaphor identification (Steen et al. 2010) and Critical Metaphor Analysis (CMA, Charteris-Black 2004) in order to examine what domains of knowledge are dominant and to hypothesize about why this is so.

I have chosen to use the methods of metaphor identification (i.e. MIPVU) developed by Steen and his team (2010) (the “Pragglejaz Group”) because their methodology is unique in the study of metaphor in its comprehensiveness and rigor. For the purposes of my project metaphor is defined as a ‘mapping across distinct conceptual domains’ (Steen et al. 2010,12) and metaphorical meanings are identified based on a contrast between a contextual meaning and a more basic meaning (ibid., 37). The Pragglejaz Group defines a “basic meaning” as those meanings that “tend to be concrete, related to bodily action, more precise or older” (ibid., 5-6). These contrasts are determined through dictionary-based comparison that I will explain further in Chapter Three.

Steen et al. (2010, 6) argue that the MIPVU approach provides “an operational way of finding all metaphor in actual usage” and references Jonathan Charteris-Black and his Critical Metaphor Analysis (CMA), stating that Charteris-Black essentially makes use of a MIPVU style approach, albeit in an unformalized and untested fashion. Therefore, in addition to being a unique methodology for metaphor identification, this perspective pairs with the work of Charteris-Black (2004) and that of Critical Metaphor Analysis, the second methodological framework that informs my research.

CMA is a particularly apt theoretical framework to use for my study as CMA uses a cognitive semantic approach in which metaphor is understood as a pragmatic process (or rhetorical practice) as well as a semantic process of stretching linguistic resources to accommodate conceptual change. Charteris-Black (2004) conceives of metaphors as methods for enforcing established norms or creating new ways of understanding. This perspective gives priority to the “exploratory role of metaphor,” and, citing Boyd (1993:551), he argues that metaphors, “provide a way to introduce terminology for features of the world whose existence seems probable, but many of whose fundamental properties have yet to be discovered” (Charteris-Black 2004, 23). This exploratory function of metaphor is key to my project, as is CMA’s insistence on the conceptual importance of metaphor in human thought.

But this project also requires an extension of CMA in order to allow a novel exploration of the motivation of complex metaphors by investigating how cultural and experiential frames operate when forced to compensate for the unknown. Extending CMA beyond human experience is an important innovation proposed by this project, as previous studies focus on the conceptualization of emotional and physical experiences that, though often highly abstract, remain within the realm of (potential) experience for the speaker (e.g. love, Kövecses 1988). The present study applies CMA to examine how language influences human imagination and innovation by testing a case where language is forced to the edge of the real, often with the goal of extending our known reality beyond its present boundaries.

My thesis will be presented as follows:

Chapter Two provides a presentation of the anthropological context of this study, in particular its position within classic anthropological discussions concerning language, mind and social worlds. I will outline the influence of metaphor theory, theories of embodied language and cognition, findings in cognitive science and discussions in cultural theory concerning the creation of “worlds” upon the study and my analysis. Finally, I will discuss the project field site and situate my research within the social and historical context in which the data was collected.

After discussing the theory motivating my study and my field site, in *Chapter Three* I will present the research guidelines and methodology, including a description of data collection methods, study participants, the study questionnaire and methods of analysis. I will discuss the particularities of this study, for example how I define ‘expert’ and ‘non-expert’ participants and my reasoning behind collecting data from these two categories of interlocutors. I will also discuss the importance of the production and dissemination of narratives about outer space in France, notably the comic book and graphic novel market in France, and the widespread readership of comic books (and other forms of print literature) among the French. I argue that the presence of these narratives, in fictional form and in ‘fact’ form (e.g. Thomas Pesquet’s stay at the International Space Station) influence the ways people imagine (im)possible realities. However, my data suggest that though these narratives inform imagination, they are not prioritized by people over their everyday, embodied experiences when describing outer space.

In *Chapter Four* I will discuss the target domain of the study: outer space. Here I will define “outer space” for the purposes of my project and discuss human imaginations of space and manifestations of these imaginations (e.g. myths/constellations, popular fiction, scientific study, government and private space exploration projects). I will then go on to discuss how this target domain is constructed and informed. Here I will also discuss the major concepts and ideologies people associated with space (e.g. utopian/dystopian visions). This chapter will close with an analysis of the influences on this target domain people discussed, including personal interest in the topic, experiences, and intertextuality.

Chapter Five describes and analyzes the kinds of source domains that participants use in the conceptual metaphors they deploy (e.g. of small and vast spaces in their personal experience). Here I will discuss how these source domains structure the metaphors people

deploy, subsequently structuring people's comprehension of the target domain (space). Though people possess diverse information about the target domain, as I outline in Chapter Four, the source domains I survey in Chapter Five can often be in contradiction with people's literal knowledge of the target domain. I will analyze specific examples of these contrasts in subsequent chapters.

In the next five chapters, I analyze the specific types of metaphors deployed by participants as they speak of space and their conception of life on other planets. The kinds of metaphors people deployed in my study coincide well with the three major categories of metaphor identified by Lakoff and Johnson (1980): orientational metaphors, structural metaphors and ontological metaphors. This categorization of metaphors is foundational in approaches to metaphor study and I wanted to see if metaphorical production when discussing the unknown aligned with this categorization of metaphorical production concerning the known. I have been able to productively apply these categories to my data, and I believe that, in large part, this is so because these categories reflect basic cognitive principles for knowing the world: *Where* or *When* something is (orientational conceptualization); *What* something is (structural conceptualization) and *How* or *Who* something is (ontological conceptualization).

Albeit methodologically useful, it was my experience that, when using MIPVU, I encountered metaphorical phenomena that did not enter into these explicit categories. These categories of metaphor concern underlying conceptual metaphors: complete schema for understanding phenomena. Using MIPVU, I found that certain lexical units were implicitly metaphorical, though not necessarily complete conceptual metaphors. For this reason, I have expanded Lakoff and Johnson's three category model to account for what I call proto-metaphors, or grammatical preferences within a language that predispose speakers to certain conceptions. My position resonates with Whorfian perspectives on language as Whorf himself concentrated strongly on grammatical elements of languages as shapers of conceptions (Schultz 1990). Contemporary reviews of Whorfian approaches (Leavitt 2010) emphasize the continued relevance of Whorf's arguments and the importance of contextualizing them historically, insisting particularly that "linguistic diversity need not entail incommensurability" (Darnell 2012). Leavitt (2010, 116) foregrounds Boas's conception of a "decentered linguistic and cultural

world, not a chaos of relativism...but a world where social order had to be ‘worked out from within a given perspective.’” Additionally, he connects this linguistic and cultural world to Bourdieu’s concept of habitus “to think of habitual thought, like the habitual production of speech sounds, as a kind of habitus’, thereby restoring to linguistic relativity the wholeness and relationality of languages” (ibid., 210).

This perspective of linguistic relativity, in which habitual speech and thought are culturally variable “classification schemes” that not only describe stimuli, but “make distinctions between what is good and bad, between what is right and what is wrong, between what is distinguished and what is vulgar, and so forth” is pertinent to my arguments about the way metaphoric language informs people’s speech; not only describing or expressing ideas, but conferring judgements and perceptions (im)possibility (Bourdieu 1996, 8). In my analysis, I confirm arguments about metaphors informing conceptions, but also extend these arguments to apply to other forms of metaphoric language, namely proto-metaphors.

The metaphors and proto-metaphors I chose to analyze were those that appeared most frequently within interviewees’ discussions and across interviewee discourse. There is a wealth of other metaphorical data within the corpus (e.g. colloquial expressions such as “*il a le charisme d’une huitre*” [“he has the charisma of an oyster”]; the use of metaphor and analogy when describing childhood experiences or family members), but because of the purview of my study, I concentrate on patterns in metaphorical language and ways of imagining outer space.

Quantitatively, in my data set people generally used structural and orientational metaphors more frequently than ontological metaphors in their discussions of space. For example, there is a wealth of container metaphors (which are structural metaphors) present in the data. Because of this, I have chosen to discuss structural and orientational metaphors in two chapters each. I will first provide an overview of the dominant structural and orientational metaphors in the corpus in Chapters Six and Seven. Then in Chapters Eight and Nine, I will provide a more in-depth analysis of the most frequent orientational and structural metaphors in the corpus (e.g. the orientational metaphor of the Horizon and the structural metaphor of the Box or Bubble). This permits me to more widely discuss the metaphorical production in the corpus and to unpack the more statistically important conceptions people used when discussing space.

The purview of my research prevents me from providing an in-depth review of all of the metaphors people used to talk about space. I have chosen to provide further analysis on the metaphors that were used 1) frequently and 2) globally across the participant pool (making these dominant conceptions within this data set).

Therefore, *Chapter Six* will provide an overview of structural conceptions and metaphors in the corpus, particularly those related to containers, as container metaphors were important to the ways people articulated their imagination of outer space. I will analyze the three dominant container conceptions and their accompanying metaphors in the corpus. Following conventions, metaphors will be written in capital letters: **SPACE IS A CONTAINER**, **EARTH IS A CONTAINER** and **TIME IS A CONTAINER** and demonstrate how these source domains not only attest to the influence of previous embodied experience in people's ways of talking, but especially attest to the influence of prototypical experiences and objects.

Chapter Seven will provide an overview of orientational conceptions and metaphors in the corpus, which are the second most prevalent type of conception deployed by participants. The analysis will focus on the three dominant orientational conceptions in the corpus: On Earth, On the Moon and The Beyond and will discuss their implications. These orientational conceptions, particularly that of "the beyond" in my corpus, reinforce a number of metaphors interviewees deployed that I will analyze, such as **SELF IS A TERRITORY OR A BOUNDED ENTITY** and **KNOWLEDGE IS TERRITORY**. Because many metaphors in the corpus are constructed using locative prepositions, this chapter on orientational conceptions (all of which use these prepositions) provides an opportunity to further discuss the influence of proto-metaphors on how people talk about and imagine outer space.

In *Chapter Eight* I will concentrate my analysis on the source domain of the horizon, which operates within the orientational metaphors people use for conceptualizing time, knowledge and domains of experience and discovery. Unpacking this metaphor further allows me to analyze the motivations of this metaphor and its influences on people's imagination of (im)possibilities. I will argue that this is a fixed, or generalized cultural metaphor, but that it continues to be motivated by interviewees' embodied experiences (e.g. their individual experiences of horizons as distant, out of reach, or as delineating visual space in particular ways).

Similarly, in *Chapter Nine* I will concentrate my analysis on the most frequent structural metaphor people use to talk about space in the corpus⁵, the structural metaphor **LIFE IN SPACE IS LIFE IN A CONTAINER**. People's predominant notion concerning space was that of constraint and this constraint is manifested in a series of container metaphors participants deploy using prototypical source domains of experience, especially those of boxes, bubbles and cans. I will unpack these examples and discuss their motivations and different influences on people's conceptions of space (e.g. How is thinking about being inside a bubble different from being inside of a box or a can?)

In *Chapter Ten* I will turn my discussion towards the last category of conceptual metaphor, and the least deployed by participants in my study: ontological metaphors. The most recurrent example of ontological metaphor that people used when they spoke about space is **HUMANITY IS MADE FOR EARTH**. I will focus on this metaphor and the ontologies that it describes and reinforces. The surface metaphors people used are situated within larger conceptual structures concerning humanity (e.g. its 'purpose,' its 'home,' its necessities and minimum requirements) and this chapter will explore these ideas. An interesting epiphenomena of this study was the extent to which participants engaged with enduring debates concerning what is human and what is basic to humanity. In Chapter Ten I will engage these aspects of the data and analyze how these ideas interact with dominant conceptual metaphors in the corpus.

Chapter Eleven will conclude the study with a summary of results and the implications of these results, as well as suggestions for future research. In this chapter I will further discuss prototype theory and delve deeper into the precedent analysis by engaging specifically with the presence of prototypes in the data. I argue that the less information/stimuli a participant possesses the more prototypical their metaphors will tend to be. I will also make a number of arguments for applications of my research and its methods as well as the importance of research that inquires into how people imagine new worlds.

A complete bibliography for the study and an Appendices section will follow the thesis chapters. The Appendices include the project questionnaire in French and English, an English

⁵ This metaphor is also the most frequently used of ALL conceptual metaphors concerning space in the corpus (orientational, structural, ontological and proto-metaphor).

translation of Charles Baudelaire's poem "Elevation" (cited in French in Chapter 8), a spreadsheet with a breakdown of project participants, a spreadsheet of the primary sources of intertextuality cited by participants, a number of tables I will make reference to in my analysis in the text, as well as the full translations of the twelve vignettes.

On the page preceding this chapter, I inserted an excerpt I composed from my field notes and the recorded corpus of interviews. Using these documents, as well as my memory and imagination (to imagine an "*imaginé non-imaginaire*" ['non-imaginary imagined'] as Godelier [2015, 33] would call it), I recreated an exchange from my interview with Jules and his wife, describing context, gestures and movements and my subjective impressions and interpretations. This vignette, as is the case for the vignettes that precede each chapter of my thesis, focuses on each person's response to Question #7 of the project questionnaire: "Currently, astronauts on the International Space Station are allowed 1 kilogram of personal effects. If you had to leave Earth tomorrow, what would you bring in your kilogram?"

I chose to include these ethnographic "images" as such - formatted differently and self-contained - to delineate them from other kinds of material I present in my thesis. These are snapshots of the imaginaries people described to me; nuggets of information and experience that were salient to each of them as they imagined a world beyond their own. Adèle, a sixty-eight year-old science fiction author I interviewed had this exact reflection. "*Parce que,*" she said in an almost conspiratorial tone, "*c'est pas pour rien que 'l'image' et 'l'imaginaire' c'est quand même de la même famille cette affaire-là*" ("Because it's not for no reason 'image' and 'imaginary' it's all from the same family that business.")

These vignettes are not intended to be an introduction to the topic I discuss in each chapter, but are meant to give the reader an idea of what my data are like. I encourage readers to read all of the vignettes before beginning the full thesis, to be better informed on the data. (Complete English translations of the vignettes can be found in Appendix X.) Each vignette not only contains data, but information about the interviews, the interviewees and my interactions with them. These images better acquaint us, albeit briefly, with twelve of the project participants. They attest to the metaphorical density of interviewees' discourse and the conceptual power of their everyday experiences.

**Vignette 2: “Qu’est-ce que j’ai amené à Cuba quand je suis partie?”
(Female, non-expert, 38 years old)**

It was too loud on the patio with the late afternoon traffic passing by, so Charlotte and I found a table at the back of her favorite brasserie in the 20th arrondissement. She settled in with her beer and electronic cigarette and we immediately began the questionnaire. Having studied social sciences herself, she was familiar with the interview process and was generous with her responses, even though she considered human spaceflight to be waste of resources.

Charlotte is an avid traveler and has spent months away from home in distant places. When we met for the interview she had recently returned from spending several weeks in Cuba. When I asked what she would bring with her to space, she immediately made connections between her past voyages, and baggage, and her imagined baggage to leave the Earth.

“Ce à quoi je réfléchissais c’est ce que j’ai apporté quand je suis partie pendant 5 mois aux îles Salomon.”

“J’ai pris quelques livres, si possible longs et que je pouvais relire avec plaisir. Je me souviens qu’il y avait *Zadig* de Voltaire, entre autres, dedans, mais malheureusement les livres, effectivement ça pèse et on est forcément très limité sur ce qu’on peut prendre. Alors, je sais que maintenant, probablement à l’époque actuelle j’opterais pour un Kindle avec plein de livres chargés dedans, à condition d’avoir une source d’énergie dont je sois sûre qu’elle soit disponible une fois sur place, sinon je préfère encore les livres en papier, mais en prendre moins.”

Her choice of literature made, she paused and asked, “What else would I take with me?”

“Une poignée de vêtements préférés...ce t-shirt fait partie de mes t-shirts préférés, donc celui-ci, probablement un jean et je dirais, genre deux, trois pantalons et 4-5 t-shirts. En fait, je m’attache aux vêtements et j’en prends soin, donc je les fais réparer quand ils sont... J’essayerais de prendre soin de mes vêtements pour qu’ils me durent longtemps.”

She interrupted her train of thought with her memories of what she had taken on her trip to Cuba. She discussed how she disliked checking luggage, so she took the absolute minimum (“Quelques affaires de toilette indispensables, évidemment, sachant que je sais que je ne pourrai pas forcément les retrouver là-bas”) and filled the rest of her sack with gifts for people she would meet in the Cuban countryside.

“Et quoi d’autre? Je prendrais probablement une cigarette électronique ou des cigarettes. Ça aussi c’est question de ce que je peux trouver sur place. Qui puisse remplacer ça. S’il n’y a pas d’électricité aussi c’est un problème, puisqu’on ne peut pas recharger dans ce cas-là.”

“So,” I asked, “in that case you would take a normal pack of cigarettes?”

“Probablement, genre 4-5 au moins...Bah ça serait un peu difficile parce qu'en gros ça nécessiterait de toute façon d'arrêter de fumer parce qu'il y aurait plus sur place, il n'y en aurait plus de cette ressource-là.”

She then returned to the question of books, as it seemed to be the most difficult decision. “Forcément je serais limitée à trois ou quatre livres. À moins que ce soit un Kindle. Je ne prendrais pas Zadig, justement parce que je l'ai pris pour les îles Salomon. J'irais chercher dans ma bibliothèque des livres que j'ai relu avec plaisir puisque je sais que probablement je serais obligée de les relire plusieurs fois, donc il faut que ce soit des livres que je relise avec plaisir. Ah, il y a Le vieil homme et la mer, par exemple, que je peux lire avec plaisir de temps en temps...”

“Probablement je prendrais un livre dans chaque langue que je parle. Malheureusement, Le vieil homme et la mer, pour moi la logique c'est de le lire en espagnol, mais il n'a pas été écrit en espagnol. Donc c'est un peu perturbant, je l'ai en espagnol chez moi, mais c'est pas forcément le livre que je prendrais en espagnol. Je prendrais un livre en allemand, un livre en espagnol, un livre en anglais, et c'est tout parce que les autres langues je lis pas vraiment dans les autres langues. C'est les trois langues dans lesquelles je peux lire.”

As Charlotte's imagination of her kilogram progressed, it became clear that the purpose of books in her baggage was not simply a pastime, but as a way to keep her life experiences in other languages alive. Her choices were more motivated by bringing linguistic samples, than specific stories. Whether she would be able to speak these languages with other people was not a question. The importance for her was not to lose the abilities she had gained, whether they were useful in context or not.

Chapter 2: Theoretical Contexts

“The fact of the matter is that the ‘real world’ is to a large extent unconsciously built up on the language habits of the group... We see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation”
(Sapir 1929, 209-210).

As discussed in the preceding chapter, my research is motivated by inquiries concerning how language, particularly metaphor and analogy, contributes to our cognitive organization, and therefore experience of reality. This is an inquiry into how humans use language and is therefore not a purely linguistic question, but an anthropological one. I approach language as a crucial tool in the way humans exist within the world and create new worlds of all kinds. My focus here is to examine language's contribution to the construction of these latter worlds; those potential, imagined and projected. The axes of human language use, thought and imagination, situate my research within theoretical contexts issuing from anthropology, linguistics and the cognitive sciences. This project is primarily informed by linguistic anthropology and debates within this sub-discipline concerning the relationship of language and thought. However, as I seek to understand how the metaphorical process operates and influences conceptions of the unknown, cognitive perspectives are also vital to my research.

Because I want to examine the process of wor(l)d-building and how speaking can influence potential worlds and emergent reality, I developed three central research questions: How does language, particularly analogy and metaphor, shape our perceptions, imaginations and categorizations of (im)possibilities? How do analogical and metaphorical processes, especially their dependence on prototypes and cultural models, interact with the way we imagine and talk about these imaginations? And, finally, how can a better comprehension of these cognitive linguistic processes be employed in the service of creating the worlds we wish to live in, through innovation, invention and social change?

To answer these questions, I use complementary theoretical frameworks so that I can address questions of linguistic relativity, cultural models, language, cognition and perception. I

think that these questions can be best answered by using literature concerning linguistic relativity, particularly the role of metaphor in cognition and the influence of culture on linguistic production. It is for this reason that I have chosen to employ Whorfian perspectives, Critical Metaphor Theory and cognitive anthropological literature concerning culture, language and cognition. I will discuss these frameworks, and research in these domains that has influenced my own approach, in greater detail in this chapter.

2.1 Wor(l)d-Building : Metaphor and the Unknown

According to scholars like Donald Schon (1993) (e.g. Migliore 1993; Nerlich, Hamilton and Rowe 2002; Semino, Demjén and Demmen 2016; Thibodeau and Boroditsky 2011), metaphors are excellent methods for seeing things ‘in a new light’ by re-framing our experience, however, these scholars rarely propose how metaphor functions without experience. This leads us to two important questions: 1) How do we make use of the known to understand the unknown? and 2) How do we go beyond the known and the real in order to extend the real further?

Beginning primarily with the work of Franz Boas in the 20th century, scholars began to assert that language is more than a product of culture, but that it is a product of the human mind and a factor in cultural (re)production (Boas 1911; Sapir 1933; Hymes 1963). Anthropologists and other social scientists began to demonstrate that language’s influence in human culture was more profound than simply as a strategy of communication or artistic expression. Within anthropology (e.g. Basso 1988) and sociology (e.g. Bourdieu and Passeron 1990), it became increasingly clear with cross-cultural research that language did more than allow people to describe their experiences within the world (Goodenough 1973; Kramsch 1998). Language does not only function to describe culture or the world around us but is a mechanism for making culture happen and for (re)constructing human realities (Bakhtin 1940; Ochs 1988; Ochs and Schieffelin 1984).

The depth and expansiveness of research concerning the constructive nature of language in human life and society attests to the significance of this question in the sciences and the

continuing importance of this problematic in how we understand human minds and lives. A few of the major themes in this research include: the transmission of language and culture (Jordan and Shennan 2003; Kirby, Dowman and Griffiths 2007; Miller and Hoogstra 1992); language and social differentiation and assimilation (Boas 1940; Fillmore 1996; Irvine and Gal 2009; Silverstein 2003); language ideology and language control (Bourdieu and Boltanski 1975; Irvine 1989; Kroskrity 1998; Silverstein 1979; Woolard and Schieffelin 1994); translation (Cronin 2006; Leavitt 2014); multilingualism (Edwards 1994; Gorter 2006); pidgin and creole languages (Hymes 1971; Jourdan and Keesing 1997; Romaine 1988); linguistic taboo (Allan and Burridge 2009; Mead 1937; Keesing and Fifi'i 1969); and magical language (Malinowski 1935; Tambiah 1968; Todorov 1973).

My research is greatly informed by anthropological perspectives that attribute a constructive role of language in human lives and social structures. Narratives, like that of the “Conquest of the New World⁶” found in my corpus, operate as linguistically coded cultural models⁷ that reflect foundational schemas (or that, at certain levels of discourse and analysis can be understood as foundational schemas themselves) (Shore 1996). Foundational schemas may lack in “specific sensory reference” (as we see in the use of basic-level experiences to frame unknown experiences that share little sensory content) but are efficient methods for the organization of a spectrum of diverse cultural models, “underwrit[ing] the possibility of meaning construction in a variety of contexts” (Shore 1996, 53). Anthropology’s attention to human world-building necessitates a perspective in which language is recognized as a fundamental tool in the construction of human reality on a micro and macro level. The role of language and thought in this process has been well-documented (Boas 1940, Whorf 1941) and though the extent and specifics of this relationship are still debated, the existence of this relationship is indisputable (Geertz 1973; Shore 1996). So crucial is the interaction between societies, symbolic systems and thought that many scholars uphold the position that “[t]here is no human society that does not depend on, is not shaped by, and does not itself shape language” (Chaika 1989, 2).

⁶ See Zubrin and Wagner (1996) extension of the conception of manifest destiny on the North American continent to the galaxy; a romantic narrative of expansion that almost entirely obscures the destructive elements of the events of European colonization and its continuing legacy (e.g. elimination of indigenous populations, slavery, epidemics).

⁷ “Cultural models are symbolic representations of reality” (Shore 1996:61)

Shore (1996, 57-58) argues that human societies function within cultural models that can be both linguistic and non-linguistic. He establishes a working taxonomy of these models, most pertinent to my arguments here are what he calls lexical models (which use “sets of related terms to mould experience”) and narrative, both as the process of “adjusting and creating reality by talking it out” and the product(s) of this process. “Through narrative the strange and the familiar achieve a working relationship” (Shore 1996, 58). This is precisely the process occurring in the metaphorical production in this data set. In my research, it also appears that the more “strange” or unfamiliar a target domain is, the more familiar, or basic source domains participants deploy. Interviewees talk the unknown experience of outer space “into meaningfulness” (ibid.) by conceptually framing it through domains of knowledge for which they have deeply ingrained experience.

My purpose here is to demonstrate how metaphor can function as a process of wor(l)d-building. We know that this system of embodied cognition and language is not simply a passive machine of perception and interpretation. These interpretations subsequently affect our reactions, behaviors and the kinds of relationships and realities we build. It is in this way that these theories connect intimately to anthropological perspectives concerning human culture and world-building. What is the role of language, in particular metaphor, in the imagination and construction of worlds and what are the implications of this role for the present and for possible futures?

I use the term wor(l)d-building to refer to the mutual construction of linguistic, social and physical realities (Black 2018). The term world-building or world-making has existed within the social sciences for several decades, and language has often been understood as an essential tool for the construction of worlds of all kinds (e.g. political, cultural, virtual, literary; Goodman 1978). Goodman (1978) argued that we cannot know the world as it exists, but that we can only know descriptions and documentations of the world and its workings, all of which are expressed in symbolic systems (e.g. music, dance, visual art) that are commonly recognized by a social group (Clark, Finlay and Kelly 2017). Different (symbolic) languages categorize worlds in different ways and Halbermayer (2004, 40) argues that the distinctions in categories used by different groups “are not just categories of the mind and cognition but operate distinctions

producing in their application different sociocosmological fields, specific forms of social relatedness and a baseline for different sociocultural styles of worldmaking.” Human worlds in this perspective are moldable constructs, rather than empirical states, and worldmaking “depends heavily on the symbolic system in which it is conducted” (Bruner 1991a, 77).

I extend these arguments further in examining the function of language in imagination and in the comprehension of the unknown and emergent realities. Language, as it is essential to wor(l)d-building, seems to also be an essential tool in imagination and comprehension of the unknown and of emergent realities. Scientific theory is a realm of imagination and subsequent innovation in which metaphor has been well-documented (Baake 2003; Corradi Fiumari 1995). Metaphor allows speakers to “introduce terminology for features of the world whose existence... ha[s] yet to be discovered” (Boyd 1993, 551). Charteris-Black (2004) argues that this is because of the “exploratory function” of metaphor and the ways in which metaphors invite us to focus on relationships between objects, rather than on objects themselves. The exploratory function of metaphor allows speakers to create new associations between features and is crucial in influencing the ways in which conceptualization of problems and potential solutions takes place. This functioning is germane to human knowledge acquisition through the process of building relationships between things we know and things we do not know.

The elegance and efficiency that metaphors accord comprehension of the observable world is well-documented in the social sciences (Black 1962; Arbib and Hesse 1986; Lakoff and Johnson 1999; Brown 2008; Giles 2008), and scrutinized, as any metaphor a scientist uses to make sense of reality has value in bringing that “reality to light” (Baake 2003, 56). These studies argue that we compare what we know with what we do not know, and that the only way to find out about the latter is to compare it to the former through analogy and metaphor (Geary 2012). Metaphor is not a process of recognizing patterns, but of creating them. This constructivist perspective of metaphor, in which metaphor is “an essential characteristic of the creativity of language” (Ortony 1993, 2), suggests that metaphor is not a way of interpreting reality but of fashioning it in some form and, in the most extreme constructivist positions, creating it entirely.

However, as demonstrated in my research, it is not only our bodies and present worlds that inform these realities and their alternatives. Battaglia, Valentine and Olson (2015, 246) argue

that, since Émile Durkheim (1912), anthropology has recognized that people build worlds by incorporating not only their physical experience, but “entire universes” of “cosmic figure(s)” (e.g. celestial gods, beings who exist on astral or supernatural planes). Our ways of being and ways of speaking are informed by our perception of physical experience, as well as our imaginations and speculations about worlds beyond our own. “It is perception *molded by imagination* that gives us the outward world that we know” (Langer 1953, 372, my emphasis).

In my research, I interviewed forty adults between the ages of 24 and 80 years old. My participants and I engaged in an imagination of “epistemic things,” or those scientific objects with which scientists engage that “incarnate what we do not yet know” (Rheinberger 1997, 28, cited in Messeri 2016, 22). In the present study, I propose not only an investigation of epistemic things with scientists and experts, but also with individuals possessing no expertise whatsoever. Thirty interviewees had no professional experience in the imaginary of outer space, while the remaining ten were what I considered as “expert participants,” or those individuals with professional experience in the imagination of outer space (e.g. science fiction writers or astrophysicists).

Due to current inaccessibility and the physical resources required for human space travel, at this point we comprehend this potential reality, and prepare for its challenges, primarily through analogy. Because we cannot respond to the question 'How is it?' we return incessantly to interrogations of 'What would it *be like*?' I argue that how individuals use metaphors to mobilize past experience to create frames of perception and (re)action for novel artifacts, practices, and concepts is fundamental groundwork for the imagination and innovation of possible realities. Studies addressing metaphorical production for expressing the imaginary remain underrepresented, however, I argue that this niche of metaphorical production is a particularly rich site for examining metaphor as a process by which “new perspectives come into being” (Schon 1993). This project addresses metaphorical production at a site on the cusp of the real, where language operates not only to describe the unknown (or make it more understandable through analogy), but to incorporate the unknown into a wider human reality in-the-making.

2.2 Language Habits and the ‘Real’ World

It makes sense that language is the primary tool humans use to build social worlds (Sapir 1933) and to socialize themselves within these worlds (Ochs and Schieffelin 1984), as language seems to be a principal cognitive tool in apprehending, comprehending and building upon the world (Feldman 2006). At the same time, languages are not independently existing entities, but, as Bakhtin (1940) reminds us, they are always already the products and property of social actors in human societies. “Speaking,” Frantz Fanon (1967, 2) insists, “means, above all, assuming a culture and carrying the weight of a civilization.” Language is a product both of human cognition and physiology as well as cultures, social groups and individuals. Speakers of languages are not free to conceive of the world and socialize themselves within it at their whim, but to use the expression of poet Charles Bukowski (1992), are “born into” their languages - with their syntax and vocabulary as well as history, world view and ideologies.

Benjamin Lee Whorf famously proposed a relationship between language and thought in which language functions not as a “weight” (as Fanon suggests), but as an interpretative frame. In his collection of writings, *Language, Thought and Reality*, Whorf (1940) cites his mentor Edward Sapir, arguing that:

“Human beings do not live in the objective world alone, nor alone in the world of social activity as ordinarily understood, but are very much at the mercy of the particular language which has become the medium of expression for their society. It is quite an illusion to imagine that one adjusts to reality essentially without the use of language and that language is merely an incidental means of solving specific problems of communication or reflection. The fact of the matter is that the ‘real world’ is to a large extent unconsciously built up on the language habits of the group... We see and hear and otherwise experience very largely as we do because the language habits of our community predispose certain choices of interpretation” (Sapir 1929, 209-10).

Whorf developed Sapir’s arguments into a conception of language as a method for “dissect[ing] nature according to the categories and types” that different languages, through their

grammatical structures, preferences and cultural forms, isolate, emphasize or obscure (1940, 213). In a passage reminiscent of many current cognitive linguistic positions, he states:

“The world is presented in a kaleidoscopic flux of impressions which has to be organized by our minds - and this means largely by the linguistic systems in our minds. We cut nature up, organize it into concepts, and ascribe significances as we do, largely because we are parties to an agreement to organize it in this way - an agreement that holds throughout our speech community and is codified in the patterns of our language” (Whorf 1940, 214).

I think it is important to keep in mind the restraint in both Whorf and Sapir’s positions. Whorf speaks about how language “largely” organizes sensorimotor input from the surrounding world, while Sapir declares that language forces an “adjust[ment]” to reality and interpretation of information. Neither asserts an ultimate linguistic determinism, but rather they observe language’s orienting role in human reality. To demonstrate this we can call to mind Whorf’s (1939) example of the gasoline drums. The drums were empty of gasoline but remained full of combustible vapor. Yet, it was the word “empty” that organized reality in particular ways for the people in that context. The factory employees smoked around the drums (causing the building to explode) something they never would have done had they perceived, or categorized, the drums as being “full.” Whorf’s observation is not that some thoughts and realities were impossible for these people to imagine or perceive, but that language framed their experience in particular ways by placing emphasis on some elements of experience while obscuring others.

I go to some lengths to explain my interpretation of Sapir and Whorf’s arguments as there have been a range of interpretations of their work over the past seventy years, with certain scholars using the Sapir-Whorf hypothesis to propose strong constructivism and linguistic determinism (e.g. “mould” theories of language in which language functions as a mould “in

terms of which thought categories are cast,” Bruner et al. 1956, 11)⁸. Research claiming strong versions of the Sapir-Whorf hypothesis have been roundly refuted and I believe rightly so, as I do not think complete conceptual dominance of language in any domain is what Sapir and Whorf were arguing for in the first place. The results of this study do not attest to linguistic determinism, but rather the strong priming and framing effects language encourages. Sapir spoke of language as providing predispositions for the interpretation of what we would now call sensorimotor input. Experiences and emotions are possible without language. But, it is in large part linguistic habits that define the field of possibility, shaping our possible interpretation of experiences, emotions and thought.

Scholars have vacillated between overzealous application and complete rejection of the Sapir-Whorf hypothesis; this rejection reaching a peak with the development of Chomsky’s (1957) nativist theory of language. However, a number of researchers have revisited the linguistic relativity hypothesis (Lucy 1992a, 1992b) and now propose the existence of “Whorfian tendencies” or “Whorfian effects” in human cognition. Whorfian effects refer to cases where it appears that linguistic differences do influence cognition, notably in the domains of perceiving colors, objects, emotions, time and space (e.g. Regier and Kay 2009). Many scholars in the cognitive sciences speak today about a “shallow” or “weak Whorfianism” (where language provides short-term cues during perceptual processes, otherwise known as the “language as meddler effect,” Wolff and Holmes 2011; Winawer et al. 2007) or a “habitual” or “deep Whorfianism” (when language establishes perceptual habits that are stable over the long-term) (Lalumera 2014). In these theories language has a structuring effect on thought and does not sharply define reality based on linguistic categories, but rather makes certain concepts more accessible or more ‘likely’ for speakers. My data supports theories of Whorfian tendencies, particularly in the identification of what I call proto-metaphors, or the grammatical preferences

⁸ For example, Daniel Everett, in his work among the Pirahã people in Brazil, argued that the Pirahã were lacking in counting abilities, concluding that this was because their language did not have specific numerical terms beyond “1” and “2” (Bower 2005). Everett’s arguments were later refuted and refined by additional fieldwork providing evidence of numerical cognition among the Pirahã, even without numerical terminology (e.g. the Pirahã do conceive of and count numbers and quantities beyond ‘two,’ but do so using other expressions such as “small,” “larger,” “many,” Frank et al. 2008). However, continuing research among this tribe has produced evidence of linguistic determinism in the “unelaborated” distinctions between numbers in groups that are lacking in specific numerical terms (Gordon 2004).

of languages that prime speakers to think about the world in certain ways (e.g. locative prepositions. For further discussion see Chapter Six).

Though these guarded Whorfian perspectives continue to be critiqued (Schultz 1990), especially by the cognitive sciences⁹ (Papafragou et al. 2002; Li and Gleitman 2002), there is consensus among cognitive scientists that there *is* a relationship between language and cognition (Perlovsky 2013), and that higher level cognition, such as that seen in human beings, is *impossible* without language (Perlovsky and Ilin 2013). Perlovsky and Ilin (2013, 19) explain this in the following way:

“At lower levels of perception and cognition, embodied perception plays a significant role in every mental representation. At higher levels of abstract thoughts, embodied representations grounded in direct sensory–motor perception have a limited role. A larger role is assumed by language. This shift from embodied representations to language increases at higher levels of more abstract thoughts.”

Research in the cognitive sciences over the past four decades, like that of Perlosky and Ilin (2013), demonstrates that both embodied experience and language are fundamental to human cognition. Varela, Thompson and Rosch’s (1991, 173) definition of embodiment is widely accepted and states that embodied cognition means that cognition depends on our experiences within a particular kind of body and that the sensorimotor capacities of our bodies are themselves “embedded in a more encompassing biological, psychological and cultural context.” This contextualization of human cognition situates cognitive processes within bodies and these bodies within external environments. I will discuss issues of embodiment in Section 2.4 below, but directly relevant to my statements concerning Whorf, is the role of embodied language in cognition.

A rich and diverse range of data exists demonstrating the relationship between linguistic cognitive processes and other cognitive processes. A few recent examples include Perlovsky’s (2013) results concerning the joint acquisition, dual hierarchy and emotional prosody of language and cognition; Perry and Lupan’s (2013) research on online language processing and

⁹ The primary criticism of existing research is the almost random design of most experiments that test for the force and frequency of linguistic interference in cognitive tasks (See Carruthers 2012).

the divergent, but strongly interactive processes of language and thought; Vicario and Riuminati's (2013) work on how left and right processing affects the use of verbs. Studies like these demonstrate what Perlovsky and Sakai (2014) identify as the recursive nature of the relationship between language and cognition. They explain, "information is exchanged between language and each of perception, memory, and consciousness in both directions. Namely, language is involved in both reciprocal and recursive information exchange with each element of the mind. Since language is tightly linked to the mind, it would be more natural to assume that language is a part of the mind than to think it is an entity which exists outside the mind. The study of language is, in essence, to understand a part of the 'human' mind. The more we study the language used by humans, the more we will understand the structure of the mind" (Ibid., 1).

The recursive role of language is fundamental, but not deterministic. When people think and talk, their minds switch between embodied cognitive models and linguistic cognitive models, making use of whichever model is more 'crisp,' less vague and more "available" (Perlovsky and Ilin 2013). Linguistic representations are often crisper and are especially useful for dealing with highly abstract information. These cognitive arguments are directly in line with Whorf's argument about the gasoline drums and how language interacts with our categorization of sensory information.

Humans, "like most biological organisms, do not think and act optimally at all times" (see Levine and Perlovsky 2008; Moukheiber 2019). Humans have a strong tendency towards heuristic thinking, rather than using all available knowledge to inform their judgements and behaviors. Human perceptual systems perceive and categorize a vast spectrum of sensory input in such a way as to maximize similarity, not 'accuracy,' with a goal of satisfying their instinctual needs of food, survival and procreation. However, "humans and other higher animals engage in exploratory behavior even when basic bodily needs, like eating, are satisfied" (Perlovsky 2007, 73). This behavior has intrigued biologists and psychologists, leading to research demonstrating that both monkeys and humans seek positive stimulation, whether or not these correspond to the satisfaction of a basic drive. Berlyne (1960, 1973) proposes that curiosity stimulates the acquisition of new knowledge; Festinger (1957) argues that humans possess a drive to reduce cognitive dissonance. However, it was difficult to prove the existence

of a curiosity drive until recent advances in mathematical modelling (Perlovsky 2007; Gudwin 2007).

Mathematical models have permitted researchers such as Perlovsky and Ilin (2010, 71) to map the processing of what they call the “knowledge instinct” or “an inborn drive to fit [maximize similarity] between top- down and bottom-up signals.” This knowledge instinct is connected to maintenance of vital parameters of human biology and is linked to emotional responses (Gudwin 2007; Perlovsky 2001, 2006; Perlovsky and McManus, 1991). Like many drives in other animals, the human knowledge instinct operates on the basis of minimal effort for pattern recognition. Human senses organize input so as to rapidly match it to pre-existing patterns by concentrating on important elements within a situation and ignoring irrelevant elements (Perlovsky and Ilin 2013).

Perlovsky (2007, 74) illustrates this by discussing the workings of the mind during visual perception:

“Our knowledge always has to be modified to fit the current situations. We don’t usually see exactly the same objects as in the past: angles, illumination and surrounding contexts are usually different. Therefore, our internal representations that store past experiences have to be modified; adaption-learning is required. For example, visual perception (in a simplified way) works as follows (Grossberg 1988, Zeki 1993, Ganis and Kosslyn 2007). Images of the surroundings are projected from the retina onto the visual cortex, while at the same time memories-representations of expected objects are projected on the same area of cortex. Perception occurs when actual and expected images coincide. This process of matching representations to sensory data requires modifications-improvement of representations”

This simplified discussion of visual perception allows us to ‘see’ how sensorimotor input is treated through an adaptive process of perception. This process works to match our memories-representations to stimuli; perceiving the world based on our expectations of it, rather than purely on its empirical qualities. As noted above, these memories-representations can be linguistic, and are increasingly so at higher levels of abstraction (Perlovsky and Ilin 2013).

Some scholars view language as so central to human processes of representation and categorization they argue for the existence of a “language instinct” that, like the knowledge instinct, “indicates to our mind the basic need to understand and use language” (Gudwin 2007, 130). Gudwin (Ibid.) describes the language instinct as “not encompass[ing] specific mechanisms postulated by Chomsky (1972, 1981), Pinker (1994), Jackendoff (2002), or Tomasello (2001, 2003). These specific mechanisms have yet to be elucidated...” This view of the cognitive mechanisms of language presents evidence that language functions by ‘bootstrapping’ other fundamental cognitive processes, such as memory, pattern recognition and spreading activation (Dick et al. 1979; Saygin et al. 2003). Neurologically speaking, many cognitive scientists argue that “language [can] be viewed as a new machine constructed entirely out of old parts” (Bates and MacWhinney 1989, 10, cited in Ahearn 2012, 53). These scholars argue that generalized cognitive processes operate in language as they do in other advanced cognitive tasks, such as visual perception (Perlovsky and Ilin 2013). For example, Beilock et al. (2008) demonstrate that specialized motor training like that associated with sports enhances language understanding through the recruitment of the left dorsal lateral premotor cortex. Mattson (2014, 5) argues that results like these provide evidence that cognitive linguistic processes are connected to motor skill-related areas outside of the core language networks, “suggest[ing] that the language SPP [superior pattern processing] capabilities of the human brain co-evolved with development of organized ‘teamwork,’ which may have bolstered functional interactions between brain regions involved in language and those responsible for specialized sensory-motor skills”

This research has prompted the creation of new fields of study, notably that of embodied linguistics which focuses on the connections between language and sensorimotor cognition (Carruthers and Boucher 1998; Steels, De Beule and Wellens 2012; Tuci 2009). Results demonstrating the dynamic interactions between language and other basic cognitive processes are echoed by linguists such as Fauconnier and Turner (2002, 147) who remark that “language is not separated from other cognitive functions such as interpretation and reasoning.” Language is not an isolated, autonomous cognitive capacity, as posited by many foundational hypotheses in

the nativist tradition (i.e. the separation of syntax from the environment, Chomsky 1957; or the separation of syntax from communicative functions, Chomsky 1975). Rather, human language is a cognitive capacity linked to and reinforced by the form and function of other basic cognitive processes.

2.3 Categorizing the World to Know the World

Language plays a crucial role in people's organization of their experience, as attested to by decades of rich ethnography (e.g. Boas' work concerning tribal categories of perception, 1911; Conklin's research of folk taxonomies in the Philippines, 1955, 1962; Goodenough [1956, 1964, 1969] and Frake's [1969] respective research on kinship terminologies) and for this reason is often given an important place in cognitive studies. My research corresponds with the cognitive anthropological emphasis on the relationship between cultural schemas and action (e.g. questions of emotion, behavior, motivation and socialization) (D'Andrade 1995, 248).

Particularly, I mobilize theories of categorization, and the crucial role of language in this cognitive process (Lakoff 1987) as well as prototype theory (Rosch 1973). These frameworks allow me to analyze interviewee discourse in terms of categories and domains of knowledge, from which I can determine the elements that are more salient, or more important in people's conceptions and subsequent self-reported actions.

The work of George Lakoff and Elenor Rosch, central to my research, represents a porous boundary between cognitive anthropology and cognitive linguistics. Though Lakoff's work is originally based in linguistics, especially cognitive approaches, his theories of categorization have been adopted in a number of disciplines, including psychology, cognitive science and anthropology. Similarly, Rosch's work concerning prototypes originally issued from behavioral and cognitive psychology but is utilized extensively in cognitive linguistics and anthropology. Cognitive linguistics, like cognitive anthropology is strongly linked to psychology. However, rather than focusing on how people organize cultural information, cognitive linguistics focuses on the interaction and relationship between language and cognition and how language predisposes individuals to certain thoughts, perceptions and behaviors (Robinson 2008).

As my project is primarily based on interviews and discursive analysis, the focus on cognitive linguistics provides an appropriate theoretical and methodological approach. Cognitive linguistic methods and frameworks of analysis are relevant tools for concentrating on conceptions in participant discourse and people's metaphorical production as they allow me to analyze natural language with a focus on conceptual and metaphorical elements of discourse. These methods also permit me to concentrate on the various source domains employed by interviewees and tease out the experiential and cultural motivations of these domains. Cognitive linguistics encourages a focus on conceptual phenomena and is informed by a comprehension of embodied cognition. This allows me to concentrate my analysis on people's conceptual worlds, especially how language reflects and reinforces these conceptual worlds. Many key concepts in cognitive linguistics are shared with cognitive anthropology, such as embodiment and prototypicality. The theoretical influence of both cognitive linguistics and cognitive anthropology on my work is unmistakable as concepts such as prototypes, schemata and embodiment remain key to my analysis and interpretation of results.

Additionally, my focus on metaphor necessitates the use of cognitive linguistic theories related to embodied language and cognition and metaphorical cognition. As discussed above, cognitive linguistics engages specifically with issues of analogy and metaphor in human cognition, whereas these sites of interest are predominantly absent from the foci of cognitive anthropological research. My project shares many interests with cognitive anthropology, notably that of the connection between thought and sensory perception. However, it is cognitive linguistics, especially the past four decades of metaphor theory, that provides the necessary tools to engage with my research questions concerning how the metaphorical process works in the imagination of the unknown.

2.4 Embodied Cognition and Language: Thought and Speech as Human-Like

Foundational to theories of metaphorical language and cognition as I deploy them in this study, is the thesis of the embodied mind based in the phenomenological tradition, especially the work of Maurice Merleau-Ponty (1945). Instead of a cartesian dichotomy of mind and 'reason' being separate from the body, phenomenology posits the fundamental role of sensory-motor

perception in human understanding of reality. In this paradigm, the form and function of our bodies greatly influences our perception, reasoning and subsequent reaction to the world.

The theory of embodied mind states that human thought is “deeply shaped by its interconnection with the body and by the inherent nature of human sensory and motor processes” (Ramachandran 2011, 143). I use the term embodied as defined by Varela, Thompson and Rosch (1991, 172-173), “to highlight two points: first that cognition depends upon the kinds of experience that come from having a body with various sensorimotor capacities, and second, that these individual sensorimotor capacities are themselves embedded in a more encompassing biological, psychological and cultural context.” This modern embodiment view, in abandoning the cartesian separation of body and mind, abandons the “machine metaphor” that has pervaded comprehensions of the mind and body for centuries (Barrett and Lindquist 2008). The machine metaphor approaches psychological phenomena as machines, with interacting but separate parts that have no causal relation to one another. Embodied approaches to the mind and emotions view knowledge as the concretization of modality specific sensory-motor (rather than abstract propositional) representations of prior events (called perceptual symbols, Barsalou 1999) (Gallese 2005). Barrett and Lindquist (2008) explain that “neurons in different modalities (e.g., vision, audition, interoception, motor behavior) capture different sensory and motor elements of a perceptual event, and neural representations accumulate to produce a “simulator” which is a kind of a toolbox for creating any future conceptual representation of a category.”

The thesis of the embodied mind relocalizes mental processes from the neural domain to the body. This profoundly transforms the way we can conceptualize our relationship to perception, reality and imagination. The interactions between our bodies, their environments and our conceptions, categorizations and (affective) responses to the world around us are much more dynamic, intersecting and interrelated than we had imagined. Theories of embodied mind have benefited immensely from an effervescence in neuroscience research, for example, the extensive research being conducted on the enteric nervous system (or the “second brain,” Dorland 2012; Pocock and Richards 2006, 63) and the expansion of neurogastroenterology (Hansen 2003). Scientific evidence of the presence of neurons in the human gastrointestinal tract is compelling proof of an embodied mind.

Similarly, recent research in emotions fails to find evidence of the biological distinctiveness of emotional responses. We perceive sensory-motor stimulus based on the universal human capacity of experiencing pleasure and displeasure (Mesquita 2003; Russell 1983; Scherer 1997) and based on cultural models that categorize these forms of (dis)pleasure and associate them with specific reactions and emotions. Again, research demonstrates that the body and mind are not separate, independently functioning entities, but that they operate through constant feedback that is stimulated by physical sensation and categorized according to cultural knowledge and practice. According to Barrett and Lindquist (2008, 22-23), language and linguistic socialization drive “the acquisition of conceptual knowledge about emotion, and may therefore be a crucial element in any conceptualization of emotion. It is possible that people learn to represent emotion in the way that they learn about other abstract concepts for which there are no biological bases. Children acquire emotion categories that conform to their culture, not because there is some natural, biological reality to anger (or fear or sadness, etc.), but because this level of categorization is socially functional.” Emotions are not biologically programmed responses, but the result of an interaction between the sensory-motor input perceived by an embodied mind in a particular context and conceptual system.

Barrett and Lindquist’s (2008) arguments are congruent with my own concerning the role of language in wor(l)d-building. My research corpus contains a wealth of data concerning participant affect, particularly their emotions of fear, joy and pride when imagining human life in outer space. This affective content, and the conceptual system of emotions that my interviewees employ (Barrett 2006), influences how people conceive of the (im)possibility and (un)desireability of human futures in space. Though I have not chosen to explore this aspect of the data set, part of the reason I have included twelve vignettes from my interviewees is to attest to the conceptual richness of people’s imagining and how their experience, emotions and desires inform the ways they imagine distant unknowns.

I have chosen to focus my analysis on the role of embodied language in people’s construction of worlds. Embodied language is the theoretical branch of linguistics informed by embodied cognition that holds that the nature of language is greatly determined by the form of the human body, its neural framework, and the physical environment. In an explanation of his

embodied, or neural theory of language, Jerome Feldman (2006, 8) justifies the theoretical position of embodied language, arguing that “thought and language are inherently embodied. They reflect the structure of human bodies and have the inherent properties of neural systems as well as the external physical and social environment.” Thought, experience, and language in this paradigm are inextricable from one another. In this framework metaphor and analogy are in no way a pure question of language, but are cognitive processes through which we perceive and process experience. Metaphors in language are a manifestation of the underlying nature of cognition.

According to Hofstadter and Sander (2010), cognition is primarily a process of categorizing input and analogy is the mechanism that drives this categorization. We do not know the world anew each time we encounter a stimulus, rather our comprehension of each stimulus is processed based on comprehension of, or analogy to, prior experience. We recall that an analogy is a comparison between one thing and another; a correspondence, or similitude. Analogies can be created in two ways, through comparison (or simile, e.g. this is *like* that) or by metaphor. Metaphors take analogies further in establishing not only a correspondence, but in declaring that one thing *is* another.

Many metaphorical theories of language and cognition posit that this analogy-making is a process in which “source domains of knowledge” that stem from experience and generalized cultural knowledge are deployed in order to understand “target domains” (Ortony 1993; Gibbs 2008). According to these frameworks, understandings of the world and subsequent perceptions and reactions are built on metaphorical schemas (or “conceptual metaphors” Kövecses 2010). It is for this reason that scholars such as Gilles Fauconnier and Mark Turner (2002) argue that human beings live and function in what they call a ‘metaphorical blend’ that informs our perception and conceptualization of reality and possible realities.

Metaphors We Live By, the now classic text by George Lakoff and Mark Johnson (1980), presents a systematic deconstruction of a host of conventional expressions in English that are commonly considered literal rather than metaphorical. By dissecting everyday figurative language, Lakoff and Johnson argue about the depth of the influence of metaphors and their link to physical reality: “The conceptual systems of various cultures partly depend on the physical

environments they have developed in....since much of our social reality is understood in metaphorical terms, and since our conception of the physical world is partly metaphorical, metaphor plays a very significant role in determining what is real for us” (Lakoff and Johnson 1980, 146).

Informed by Lakoff and Johnson’s classifications of common metaphors, other scholars have compiled surveys of metaphorical language in numerous languages and genres. One such overview, *Metaphor* by Kövecses (2010), surveys a number of studies of metaphorical cognition manifested in dozens of world languages. Kövecses explains that linguistic expressions, such as metaphors and analogies, are “manifestations” of the conceptual metaphors at work in human thought (2010, 7). Conceptual metaphors are “ways of thinking” and these ways of thinking are rendered explicit in our “ways of talking” (Kövecses 2010, 7). Metaphors in speech are symptomatic of our ways of categorizing and conceiving of the world and are motivated by our basic experiences.

For example, he analyzes the conceptual metaphor **ANGER IS A HOT FLUID IN A CONTAINER** in both English and Hungarian and demonstrates that there is very little difference between the conceptual systems that structure container metaphors for anger in both languages. He then compares his data concerning English and Hungarian with similar studies of container metaphors for anger in Japanese (Matsuki 1995), Chinese (King 1989), Zulu (Mbense 1998), Polish (Mikolajczuk 1998), Wolof (Munro 1991), and Tahitian (Levy 1973) (Kövecses 2010, 198-202). Kövecses notes a number of dissimilarities but maintains that the common factor for all of these closely related metaphors is the human experience of living in a body (a container) and observing other containers of heated or pressurized fluids or forces. In other words, he argues for the universality of some conceptual metaphors based on universal characteristics of the human body, whereas other conceptual metaphors are based in the particularities of embodied experience in different cultures, contexts and environments.

The mappings of conceptual metaphors are thought to be largely motivated by schemata, recurring structures in cognition that establish patterns of reasoning based on our experiences within a human body, an historical context and a linguistic and cultural group or groups (Lakoff 1987). Cognitive schemata "are conceptual abstractions that mediate between stimuli received by

the sense organs and behavioural responses...that serve as the basis for all human information processing . . .” (Casson 1983, 430). The “conceptual abstractions” furnished by cognitive schemata serve as organizational principles through which our experiences of space, time, movement and other core elements of embodied experience can be deployed to understand more complex and abstract concepts and experience.

Many excellent analyses of conceptual metaphors and the cognitive schemata that motivate their mappings exist, such as **LOVE IS A VOYAGE** (Kovecses 2006), or **ARGUMENT IS STRUGGLE** (Lakoff and Turner 1989). These studies analyze different surface metaphors used to reinforce the perception and experience of a target domain (the quality or experience described by the source domain) in terms of source domains (the domain of experience to be mapped on the target domain) with which they are associated. Though extensive research of metaphor exists, the majority of this scholarship documents metaphorical constructions in which both the source and target domains refer to lived experience. My study seeks to expand existing scholarship in cognitive linguistics and anthropology by testing how conceptual metaphors operate when the target domain (i.e. extra-planetary human existence) is unknown, or pertaining to a realm of zero experience for humanity.

**Vignette 3: “Je vais juste passer dans mon appartement...”
(Male, non-expert, 36 years old)**

Charlie was a quiet, pensive guy. A yoga instructor and contortion student, he had heard about my study from a mutual friend and contacted me about doing an interview. We met one afternoon in a café in his neighborhood, where he talked about his work and family and responded thoughtfully to the questionnaire. When I asked him what he would bring with him to space in his kilogram, he paused to reflect.

“Plutôt des choses qui durent. Plutôt des livres, maintenant les choix pour les livres vont être très difficiles. J’essaierais de prendre des livres que j’arriverais à relire. Une liseuse c’est quelque chose qui peut tomber en panne.”

“Après, effectivement je prendrais des objets technologiques, peut-être, mais j’évitais parce que si jamais je n’ai droit qu’à un kilo, je veux des choses qui puissent me durer dans le temps, jusqu’à la fin de ma vie.”

He went on to discuss what kind of literature he would bring, maybe adventure novels. certainly books of ancient wisdom. He specified that he would not bring the Bible, and referenced his Catholic upbringing and how much he felt the Bible had been transformed and had become “dishonest” However, he expressed a desire to bring texts of “ancient wisdom,” citing Confucius, Socrates, and Plato.

“Je pense que je prendrais un pavé, un truc de 300 pages, au moins je mettrais du temps pour le relire. Quelque chose d’assez complet, je ne sais pas. Il y a un livre qui s’appelle Melmoth (“l’homme errant”) et c’est une histoire à tiroir, donc une histoire dans une histoire dans une histoire, etc.. Ça dit pas trop de choses, ça reste un petit peu, pas subjectif mais ça donne une impression, c’est plutôt un livre on va dire gothique. Il n’y a pas trop de descriptions, c’est quelque chose qui traverse plutôt bien le temps donc je prendrais un livre comme celui là. Peut-être pas celui-là, mais un pavé. Plein de petites histoires, mais c’est intemporel.”

Then he decided he would like to have a gaming console, but realized how quickly a kilo adds up. He decided to bring a small console “grande comme ça, c’est comme une liseuse” as well as video games, saying “les jeux c’est très petit en fait, c’est la taille d’un ongle.” He also wanted paper and pencils for drawing, admitting he didn’t draw well, but would “[s]y mettre.” He commented that the paper wouldn’t last long, but he could probably bring enough to use for a few years.

He stopped speaking, looked away for a moment and closed his eyes. Keeping them closed he started to talk again,

“Je vais juste passer à — mon appartement. Mon appartement en fait est très épuré parce que comme il est pas très grand, j’épure beaucoup donc

j'essaie de garder presque l'essentiel. C'est pour ça tout à l'heure quand je t'ai parlé des livres, j'ai ma bibliothèque en tête et je sais que ce sont des livres que j'aime particulièrement. Ceux que je n'aime pas je les vire au fur et au mesure. Donc j'essaie de réfléchir à ce que j'ai dans mon appartement un petit peu léger que je prendrais."

I watched him create a virtual reality in his mind, imagining his most intimate everyday space, his home. Behind his closed eyes he was walking through his apartment, all while sitting with me at a café table several blocks away. "I can see my bookshelves," he says, thinking about what books he has and imaging them organized within a physical space. When imagining his existence in space, he did not close his eyes and project himself into a virtual reality of a space ship, or extra-terrestrial habitat; he went home, and used his embodied senses to inform his perceptions and decisions.

I sat quietly as he continued to 'walk around his apartment.' He chose a few more items, articles of clothing that he "felt good in." Then he opened his eyes and returned to the café to sip his tea.

Chapter 3: Methodology

I found that Charlie, in the preceding vignette, was an excellent example of how people draw on their everyday experiences, and their representations of these experiences, to imagine. It seems evident that when choosing what he wants to take to space, Charlie imagines his possessions and where they are located. However, his imagination demonstrates more than a simple correspondence between packing a bag and looking into one's closet. Already, the choice to take physical possessions was, though common, not universal in my interviews. The choice of reading material was the most common factor in interviewees' discussions, but they did not all articulate their choices like Charlie. Charlie imagined the titles of the books he wanted to take and positioned them in a corporeal space. He used memories of his body and interactions with these books to help him think about his preferences. He went through the same process when choosing clothing "he felt good in" (this choice was entirely motivated by physical sensation, i.e. "fe[eling] good"). To imagine taking his body and a kilo of stuff to outer space, he imagined manipulating his body and objects in past experiences.

Charlie also projected his needs and desires in a future reality, based on his needs and desires in his past and the attachments and emotions he has for objects (e.g. clothing and books). Charlotte (1FNE) similarly discussed her emotional attachments to clothing, as Jean (1MNE) and Louis (1MNE) described their attachment to paper books. Several people described bringing the small, sentimental objects one might imagine when leaving one's home: Adèle (3FE) and François (3MNE) talked about bringing photographs of loved ones, Margot (1FE) talked about jewellery. and Simon (2ME) mentioned locks of hair. But sentimental items were not the most frequently cited objects. People more often talked about things they would use/need in daily life (e.g. toothbrushes, socks, house keys, wine) than 'memory boxes' (Franck, 1MNE). Again, this seems self-evident, but is important to note. When projecting themselves into an unknown reality, participants largely patterned their projected existence based on their current one. With few exceptions, people did not imagine fantastically different scenarios, as they were aware of the limitations created by space (e.g. the constraints of a kilo, the ability to recharge devices; the ability to purchase items like cigarettes), but applied their models based on past experience to a

different setting. This is, what I imagine (as I myself begin to apply models of past experience to potential realities!) almost anyone would do, whether we ask them to imagine moving to Fiji or to Mars. But I would like to emphasize the ways that our minds constantly force the world into the molds of perception we already have in place. “Why in the world,” people would ask me when I discussed my research with them, “would somebody take Dumas to space? That is so French!” We could just as easily ask “Why not take Dumas to space?,” but it is clear that this choice is strongly influenced by French culture, and the ideologies of high culture and being versed in cultural texts like canonic literature and art. To take Dumas to space you first have to be exposed to Dumas as legitimate, ‘good’ literature and share these estimations. You would not talk to a researcher about taking Dumas (or any particular author) if you did not know Dumas, like Dumas and consider Dumas to be an acceptable response to the question. Furthermore, especially for older respondents, Dumas would have been literature they would have read as children and teenagers. The choice of Dumas therefore allows these people to capture not only a bit of French culture, but of their youth and formative years.

Beyond the fact that it may be ‘French’ to choose French literature, it is very human, in the sense that my interlocutors chose objects that corresponded to their basic experiences. As later chapters will demonstrate, people project their prototypical experiences onto the (im)possible in the contexts relevant to those experiences, but also in distant, unknown and imaginary contexts. The creation and recognition of patterns is crucial in human cognition (Ramachandran 2011) as well as that of other mammals, though “the cognitive repertoire of humans far exceeds that of other animals” (Mattson 2014, 1). Pattern recognition is a process where stimuli from the environment enters into short-term memory, activating content from long-term memory (therefore requiring repeated experience); recognizing patterns between this information allows us to predict what may come next and react accordingly (Eysenck and Keane 2003). Semantic memory, or our general knowledge of the world, obtained through socialization and experience within a particular community, is the primary form of memory involved with pattern recognition (Snyder 2000).

It follows that much of our perception of the world, and how we subsequently build upon the reality we perceive, is bound to the ways we categorize it (and how we have been socialized

to react to that categorization). As these categories often serve as the source domains in linguistic metaphors, this aspect of cognition is particularly relevant to my research. Studies concerning perceptual categorization provide evidence that, during the first years of life infants form perceptual categories by integrating information from multiple sources of sensorimotor input (e.g. Behl-Chadha 1996; Mandler 2000; Quinn 2002; Rakison and Yermolayeva 2010). After the first year of life, these perceptual categories are thought to be shaped by the use of ‘labels,’ meaning that cognitive categories are mediated by both perception and language (Westermann and Mareschal 2014).

Scholars (e.g. Mattson 2014) demonstrate how this penchant for patterning would have been adaptive for our ancestors (in order to retain the location of food sources and hazards, for example) as it remains useful to us when we go to buy vegetables at the grocer, shake hands with a new acquaintance, or walk home from work. Our brain saves energy in treating each of these situations according to models, or prototypes issued from past experience. I witnessed people engaging in this process when imagining the unknown (e.g. living in an intergenerational spacecraft) and when imagining the known (e.g. climate change, the basic necessities for human life). These conceptual shortcuts are efficient, but seek an adaptive accuracy that allows for survival, not the comprehension of every detail of a situation. To see that this same prototypical patterning occurs when we imagine distant unknowns and potential realities is troubling in many ways. If we desired the world to stay the same permanently, this repetition of patterns would be unproblematic. But if we desire, or need, the world to change it would seem we must take a more active, conscious role in what we do, how we perceive, and how we talk about things.

3.1 Research Objectives

The objective of my research is to better understand how people construct worlds with words. How does the process of wor(l)d-building work when people imagine the (im)possible and how does this affect their understandings of emergent reality? I propose to approach these questions through critical metaphor analysis of the primary metaphors people use to discuss outer space and extra-terrestrial existence. I made use of the MIPVU methodology to identify metaphors in order to determine the dominant source domains people used in metaphorical

discourse and to ascertain their experiential motivations. I conducted discursive analysis of linguistic data from individual speakers as well as participant observation to enrich my data and verify the interview findings. To maximize the richness of my data set, I interviewed participants of varying expertise on the topic of human spaceflight. Engaging a number of expert participants also allowed me to gauge differences between expert and non-expert discourse on the topic of extra-terrestrial existence.

3.2 Field Site

Because my project makes use of ethnographic and cognitive approaches in addition to discursive analysis, my analysis is not solely focused on linguistic data obtained through interviews but takes into account a larger discursive environment from which this data is issued. People's discourse takes place within and is shaped by the environment, or 'field,' in which it is constructed and it is within this field that imagination, information and socialization concerning the extra-terrestrial are diffused. The discursive field in which participant discourse exists is indexed (see Peirce 1982) by a number of sociocultural and technological influences, notably the production and consumption of science fiction, as well as scientific activity (e.g. participation in human space programs). These real and fictive elements contribute to the generalized cultural knowledge of research participants and influence how they imagine and comprehend space.

Bazerman (1994, 22) refers to textual elements populating the discursive field as "intertext" or "the relevant shared documents...upon which new utterances establish themselves." I find this concept useful in order to address the shared textual imaginations upon which participants construct novel imaginings. Intertextual analysis is an important factor to consider when determining primary source domains in the linguistic articulation of the 'imaginary' experience of extra-terrestrial human existence to ascertain whether source domains of knowledge issue from experience or from cultural knowledge.

In choosing a field site, I aimed to maximize the quantity and diversity of participant discourse concerning the topic of extra-terrestrial human existence, while minimizing major linguistic variation (i.e. I sought to conduct the study in a normalized, world language, and do not make extensive comparisons between Standard French and other languages, including other

languages present in France). I chose France (and primarily Paris) as the field site for my research for two key reasons 1) the richness in France of the imaginary of humanity in space, the production and consumption of this imaginary as evidenced in the tradition of the *bande dessinée* and France's active scientific role in space sciences (e.g. involvement in the European Space Agency and international astronomical projects) and 2) the French language and its status as a hyper-standardized national language.

The imaginary of humanity in space has been active in France for centuries in speculative and scientific literature preceding the formal recognition of "science fiction" as a literary genre (Fontanelle 1686; Voltaire 1759; Verne 1865). French science fiction, particularly the work of Jules Verne, is commonly referenced by literary historians as an important "starting point" for the science fiction genre in the Western world (Evans 1988). Recent studies on French readership confirm that science fiction is the top literary genre of the 15-25 year-old readership in France (Centre national du livre [CNL] 2015), however, classic texts of science fiction, notably the works of René Barjavel and Jules Verne, were and continue to be diffused across the population as canonic works of general fiction (for example, as part of the "*programme littéraire*" ["literature program"] in French high schools [Decitre 2018]). Because all project participants were educated in France, they have been exposed to some works of classic science fiction, for most people this was Jules Verne).

Of all potential sources of intertext concerning space, comic books and graphic novels represent the most explicit source of influence as they are the principal medium for the transmission of contemporary science fiction (Booker 2010). Comic books and graphic novels are two slightly different narrative formats, with the former being more associated with the cultural tradition of the United States, and the latter more associated with Europe, namely France and Belgium. Comic books are magazines (typically bound in paper or with a thick card stock back and cover) that present a serialized story in comic strip form. These stories have historically been about superhero characters and their exploits. Graphic novels also present narratives in a comic strip format, but tend to be, as their name suggests, complete novels, rather than serialized

stories (graphic novels normally wrap up a story in one or two books). Graphic novels also have a tendency to be more complex and do not focus primarily on the exploits of superheroes.

Because this genre is the primary medium of transmission for science fiction, it is a privileged site for the imaginary of space. Science fiction is the primary genre in which narratives about space and human existence in space are diffused, though the boundaries between science fiction and general fiction are historically difficult to delineate (Amis 1975). As I will discuss below, space travelers, aliens and alien worlds do creep into narratives in other literary genres. Consequently, the production and consumption of fiction, particularly that of comic books and graphic novels, is key to my study. France is both the largest producer and consumer of general fiction in the Western world (Grove 2010) and has a particularly strong market for science fiction (Cockcroft 2008).

The French comic book market is one of the three largest world markets¹⁰ (with the United States and Japan) for comic books and graphic novels and arguably the market with the most diversified production and consumption, as well as the greatest cultural legitimacy (MacDonald 2015). "*La bande dessinée*" has a singular history within France and is considered the "Ninth Art" (Dunyach 2012). The French comic book market also differs from its American and Japanese counterparts in that comic book readership is more widely distributed across the population, an occurrence partially explained by the aforementioned cultural legitimacy of the genre, and partially explained by economic factors and modes of production. Unlike 'comics' in the United States and 'mangas' in Japan, French comic books and graphic novels are often hard-backed 'albums' that cost an average of 10 euros, making them a product typically situated within the everyday budgets of adults rather than children (Evans 1988).

Longstanding series like *Les Mondes d'Aldébaran* (1994-2018) by Leo published by Dargaud, Denis Bajram's *Universal War One* (1998-2006) published by Soleil Productions, as well as the sizeable publishing houses that release them (and are both dedicated to BD publishing) are testaments to the continuing success and profitability of *bandes dessinées* in the

¹⁰ For example, comic books hold a more important place in the publishing market in France than in the U.S., with an average spending of 8,66 dollars per person in France and 0,36 dollars per person in the U.S (IPSOS 2014).

French literary market. In addition to these major corporate forces, that resemble more the production style of the majority of comic books in the U.S. and Japan, French comic books are frequently produced by small teams of writers and illustrators; it is a mode of production that starkly contrasts with the squads of artists responsible for creating a Marvel superhero comic. This method of creation allows for greater variety in the storylines and images produced, resulting in a rich imaginative landscape. The philosophical space opera created by Fabien Vehlmann and Gwen de Bonneval, *Les Derniers jours d'un immortel* (2010) published by Futuropolis, and the dark 1950's era science fiction-inspired *Mutafukaz: It Came From the Moon!* (2018) by Run published by Ankama Éditions are two examples of the spectrum of science fiction issued from this small-scale production style that reach a large audience. Smaller publishing houses like Futuropolis (which is now a sub-division of Gallimard), were created in order to prioritize the publication of works that are *création d'auteur* (or independent creation). In parallel, publishers like Délirium Éditions concentrate on independent creation as well as translating foreign comic books into French. These publishing houses are increasingly proliferate in the French book market and are now further supplemented by the appearance of “*micro-éditeurs*” or micro-publishers¹¹. These micro-publishers release *bande dessinées* on a variety of topics including science fiction, urban culture, fantasy and “the register of the imaginary” (Cité de l'image [CIBDI] 2011).

I spoke to several editors and authors in the French publishing industry, particularly those working in science fiction, to find out what they thought about the variety and quantity of science fiction *bande dessinées* in France. Doug Headline, journalist, author, editor and director, explained to me that he felt the quantity of original French science fiction *bande dessinées* had diminished in the past decade, but that with new translations of American comic books and manga, science fiction remained a “plethoric” genre.

“La BD de science-fiction a un peu baissé en quantité en France, j'ai l'impression (en dehors des traductions de bandes américaines Marvel ou DC qui sortent chez Urban Comics, Panini, ou Delcourt). Il y a quelques titres ou séries au catalogue de certains

¹¹ See a list of over 400 of these in the francophone comic book industry at the *Cité de l'image et de la bande dessinée*'s website: <http://www.citebd.org/spip.php?rubrique23>.

éditeurs de BD généralistes (par exemple *Valerian* chez Dargaud, *Orbital* chez Dupuis, les spin-offs de Moebius aux Humanos, *'Infinity 8'* récemment paru chez Rue de Sèvres, et surtout plein de séries ou adaptations de romans SF chez Delcourt comme *Aquablue*, etc.. Mais chez les petits éditeurs c'est généralement du coup par coup, par exemple il y a des titres de Charles Burns ou de Daniel Clowes qui s'apparentent un peu à de la SF que l'on trouve chez Cornélius, au Frémok, ou aux Requins-Marteaux, peut-être même à l'Association.

Ensuite il y a le manga SF, domaine que je connais mal, mais le manga représente 30% des parutions BD en France (soit environ 1500/1800 titres par an sur 5500 nouveautés publiées.) J'ai l'impression que, si on envisage toutes ses déclinaisons, c'est un genre pléthorique dans le manga. Les éditeurs dans ce domaine sont nombreux et généralement spécialisés, comme Kana par exemple” (Doug Headline, E-mail to the author, October 10, 2018¹²).

La Cité de l'image et de la bande dessinée produced a thorough overview of comic book readership across France in 2011, through a national survey involving 4,981 people ages 10 and up. The study concluded that one out of three French people claim to be active comic book readers, whereas 44% of individuals claimed to have actively read comics in the past. That makes 76% of the French population a past or present fan of comics. The study also demonstrates a direct correlation between science fiction readership and comic book readership, as 53% of the individuals surveyed were both science fiction and comic book readers.

Unfortunately, the study does little to address literary genres within comic book genres, and few studies of this kind exist. The Cité's study does distinguish readerships of "traditional albums," "American comic books," "manga," "graphic novels," and "alternative albums."

Twenty-seven percent of French readers ages 11+ read "traditional albums" (referring to Franco-

¹² “The quantity of science fiction *bandes dessinées* in France has gone down some, I think (besides translations of American comics like Marvel and DC that come out with Urban Comics, Panini or Delcourt). There are a few titles or series in the catalogues of some generalized comic book editors (for example, *Valerian* at Dargaud, *Orbital* at Dupuis, the *Moebius* spin-offs they're doing at Humanos, *Infinity 8* that came out recently at Rue de Sèvres, and especially a bunch of series or adaptations of sci-fi novels at Delcourt like *Aquablue*, *Sillage*, etc.. But, in small publishing houses it's generally one-shot publications, for example the work of Charles Burns ou Daniel Clowes who belong somewhat to the sci-fi you find at Cornélius, Frémok, or at Requins-Marteaux, maybe even at the Association.”

Then, there's sci-fi manga, a domain that I am fairly unfamiliar with, but manga represents 30% of comic book publications in France (so between 1500/1800 titles per year out of 5500 new titles published). I have the impression that, if we consider all of these various forms, that it's [sci-fi] is a plethoric genre in manga. There are numerous publishers in this domain and they are typically specialized in it, like Kana, for example.”

belge and other European albums), while 16% read "American comic books" and 15% read "mangas" (CIBDI 2011). Science fiction narratives and science fictional elements are prevalent in all of these genres and can be found peppered within otherwise non-science fictional texts (i.e. *Tintin Sur la Lune*, 1952; *Astérix et Obélix: Le ciel lui tombe sur la tête*, 2005).

Additionally, scientific vulgarization in France is increasingly widespread in comic books and graphic novels. An excellent example of this is the 2016 graphic novel *Mars Horizon* written by the television presenter and popular 'Youtuber' Florence Porcel. Porcel is passionate about science, especially space exploration, and works to create comprehensible explanations of scientific laws and discoveries for mass public diffusion. In *Mars Horizon* she explores the subject of human colonization of Mars and combines an imaginative storyline projecting human experiences in space with scientific projections for how this could be realistically accomplished. I had the pleasure of meeting Porcel at a packed book signing where adults and children alike lined up to meet her and talk about human life on Mars. Like other works of science fiction (e.g. *Star Wars*, *Star Trek*, *Valérian*) people of all ages were fascinated by this representation of humanity beyond the Earth and Porcel wrote the book to appeal to a wide audience. Her passion for the stars, and for making them accessible intellectually and literally to the public, caused Porcel to volunteer for the Netherlands-based Mars One project, where she passed through several rounds of astronaut selection (though she was eventually cut). *Mars Horizon*, for Porcel, is not simply fiction, but a trail-blazing narrative to demonstrate possibilities for human futures in space to readers of all ages.

It is important to note that science fiction and scientific vulgarization are not the only genres in which human existence in space is a topic or setting. For example, a number of non-science fiction French literary classics (and, yet again, eligible texts for public school curriculum) recount alien visitors and space and time travel. Voltaire's (1752) *Micromégas* recounts an extra-terrestrial giant who visits Earth to share knowledge. An interstellar traveler is also a central character in Antoine Saint-Exupéry's *Le Petit Prince* (1943). These are not minor publications in which the imagination of space appears briefly, but well-known, widely

distributed texts¹³ in which outer space places a crucial role in the narrative. These are a few examples of how engagement with fiction makes a participant population more likely to have encountered representations of space. The legitimacy of both classic French science fiction as canonized literature and of comic books as the “Ninth Art,” coupled with the high readership of the French population (See CNL 2015 and IPSOS 2014) make the probability of exposure even higher.

In addition to fictional representations of outer space, France is also an appropriate terrain in which to explore this imaginary because of its scientific, experimental and ‘factual’ commitments to outer space. As early as the 17th century, French scientists, such as Fontanelle (i.e. *Entretiens sur la pluralité des mondes*, 1686) and Camille Flammarion (i.e. *La pluralité des mondes habités*, 1862 and *Récits de L’Infini*, 1872) began exploring hypotheses about life on other planets and human travel beyond the Earth. Currently, France is an active member of the European Space Agency (ESA) and is a major player in the aerospace industry. This provides the possibility to francophones in the Hexagon¹⁴ to be exposed to novel science facts as well as science fiction. Sites such as the joint ESA and Airbus factory in Les Mureaux¹⁵ (where the Ariane 6 rocket is currently being built) contribute to the osmosis of information concerning spaceflight. Ariane launches are regularly featured on French television, as are other ESA events. There are also a number of television channels dedicated to science, such as *Sciences et Vie*, which regularly include specials on outer space (e.g. “*Les nouvelles frontières de l’espace*,” “*Destination Titan*,” and “*Les rendez-vous de l’espace*.”)

One widely publicized scientific event that validated my choice of field site was the presence of Thomas Pesquet, a French astronaut, on the International Space Station in 2016. During his time on the ISS, Pesquet was active in posting images, sound bytes and messages from space. This material was broadcast by the mass media in France and nine participants referred to Pesquet and attested that they had seen, or read something, he had sent from space.

¹³ Evidenced by France’s vote for *Le Petit Prince* as the best book of the 20th century (Van Gelder 2000).

¹⁴ Familiar nickname for continental France.

¹⁵ Suburb just outside of Paris.

When thinking about the public circulation of scientific discourse in the current sociopolitical climate of the “post-truth era” (Keyes 2004), it is important to take into account people’s perceptions of scientific discourse in general, particularly the exploration of outer space. For example, other nations such as the United States and Russia have had astronauts visit the ISS during my fieldwork and reported on their stay. However, the public relationship with mass media and discourse in the U.S. and Russia is significantly different than in France, particularly since the explosion of misinformation and “fake news” after 2016 (Einstein and Glick 2015, Grubb 2018, Lewandowsky et al. 2017). This is not to say that adults in France wholeheartedly trust their media. Nevertheless, the vast majority of interviewees expressed 1) a trust in the validity of scientific discourse and 2) a trust in the veracity of how this discourse was conveyed to them in the media. Many people discussed this, critiquing the distrust and disconnection they felt was characteristic of the public relationship with the media in the U.S. The moon landing, and American skeptics who claim it never occurred, were a source of humor to several participants who referenced this to characterize U.S. attitudes towards science and scientific discourse (e.g. “If they even went to the Moon. *laugh* You know, some Americans claim it was all filmed in Hollywood!”)

These rich and diverse texts, their frequent distribution across multiple forms of media, and the perceived legitimacy and importance of the sources of their distribution, augment people’s chances of being exposed to discourse concerning outer space and human space exploration, be it fantastic, scientific or a blend somewhere between. Sub-questions for my questionnaire included inquiries into what my participants were reading (e.g. “Do you like science fiction?” “Do you like films and novels?”). However, most people told me about the models and representations that influenced their imaginations before I could solicit this information. The first question in the interview was frequently a good indicator of whether interviewees modelled their imagination and understanding primarily on texts, previous embodied experiences or a mix of the two. Some people expressed the sentiment that science fiction had “*pollué*” (“polluted”) their imagination of space, (Louis, 1MNE), whereas others argued they did not imagine space, human colonies or aliens “*comme dans les films*” (“like in the movies”) (Éric, 2MNE). Twenty-two participants cited generalized cultural knowledge in

response to the first question (e.g. films, NASA reports, or images from space). The remaining 18 explicitly referenced embodied experiences when they imagine space (e.g. seeing the starry sky, the Moon, darkness or emptiness). A table of their responses can be found in Appendix VI.

Secondly, I have chosen France because of the pertinence of having a hyper-standardized language in which to conduct my research. As I explained in the introduction, French is highly protected and controlled, through both everyday linguistic practice and national legislation. There is a long tradition within French sociology, anthropology and linguistics that bears witness to the fervent standardization of the French language as well as the language's entanglement with the French state. A few examples from this scholarship include the history of the French language written by Ferdinand Brunot (*Histoire de langue française des origines à 1900*, 1905) and the study of the creation of a "national French" during the French Revolution by Balibar, Laporte, Balibar et Macherey (1974). The relationship between the French language and the French state also plays a central role in the theory of cultural reproduction proposed by Pierre Bourdieu (Bourdieu et Passeron 1977). Contemporary linguists, such as Nigel Armstrong and Timothy Pooley (2010), continue to demonstrate the extreme standardization of the French language through both state and cultural apparatuses, positing that it is the most standardized of all world languages.

As mentioned in Chapter 1, I find this normalization an important factor for this research as, in addition to metaphors, I analyze what I call proto-metaphors, or grammatical structures and preferences within a language that predispose speakers to particular conceptions. One can hypothesize that these proto-metaphors would have a greater impact on people's expression and conceptions in a language where grammatical forms are more restricted. My hypothesis is that the hyper-standardization of contemporary French results in more uniform linguistic production among its speakers (particularly those speakers who are residents of the Ile-de-France, where the French argue that 'ideal' Standard French is situated, Black 2009, Dryef 2011), and that this more uniform language will result in more uniform conceptions and expressions among its speakers.

I acknowledge the existence of sociolinguistic and regional variations of French, as well as the existence of over forty officially recognized French regional languages (albeit many of

these in their current form are political constructions). Standard French is itself a political construction (See Armstrong and Pooley 2010; Bourdieu and Passeron 1990), rather than a homogenous, naturally-occurring entity. The people I interviewed spoke a normalized version of Standard French with little variation. For the majority of participants, there was little deviation from a school-like French; a standard version of the language that was engrained into them through years of weekly dictations, grammatical analyses and other exercises typical of French language learning throughout elementary and middle school. Some interviewees spoke more or less informally, others (especially older participants) sometimes peppered their speech with more regionally-specific idioms and expressions. Paris itself has a number of dialects and linguistic variants, notably *le verlan*, associated with the young *beurs* from the projects around Paris, but which is spreading to mainstream youth speak. But my participants did not use these variants. This is not necessarily evocative of their everyday linguistic performance but is likely the result of how they felt like they should speak in an interview with a foreign academic.

The effect of an observer on language production has been problematized by many scholars, with Labov (1972) arguing for the existence of an “observer’s paradox” in sociolinguistic data collection. Labov (1972, 113) insisted that “to obtain the data most important for linguistic theory we have to observe how people speak when they are not being observed.” This issue remains pertinent to fieldwork like my own, with recent work concentrating on potential biases created by the 1) characteristics of the interviewer and 2) the characteristics of the interview itself (Cukor-Avila 2000). It was evident in my interviews that both of these issues were at play. Interviewees would sometimes talk about me or talk about our relationship (e.g. François’s [3MNE] recounting how we met in a Monoprix almost ten years prior]. Very few interviewees did not try to establish a social positioning between us during our meeting; whether it be by discussing our mutual acquaintances, shared history or simply by confirming my academic status and affiliations in Paris.

A second potential hurdle to my collection of natural language data is the utilisation of a questionnaire. This required me to take into account the ways asking questions can trouble linguistic data. Searle (1969) posits that there are two kinds of questions researchers can ask 1) real questions (those questions in which the “Speaker” [researcher] wants to know the answer)

and 2) examination questions (those questions in which the “Speaker” wants to know if the “Hearer” knows the answer). My questionnaire is intended to be composed of real questions. However, sometimes interviewees would respond as if I had asked examination questions, saying “How would I know?” or, in one of my favorite instances, encouraging me to go ask the pertinent experts my questions¹⁶.

In my role as researcher, I was likely privy to what my interviewees felt, according to their linguistic ideology, was ‘proper,’ correct French as well as sociably acceptable topics and views. Several participants spoke about the latter directly, as when Simon (2ME) protested that he was being too graphic in his descriptions of sex in outer space; protesting “You can’t include that!” (see Vignette 11). People were conscious of the fact that their linguistic production was being documented, both in its form and content. Some people seemed particularly sensitive to the fact that the interviews were recorded; they would shift the recorder, or verify with me that their voice was loud enough to be heard on the recording. At times people would repeat their phrases and engage in auto-correction; replacing elements or exchanging one pronoun or preposition for another. The language I had access to as a researcher in Paris interviewing educated, middle to upper class French people is a sample of what these people largely felt is Standard French. They performed according to what they believed to be the norm and, though it can be argued that this may not be purely natural linguistic production, in this way I am further able to engage with normalized linguistic production.

3.3 Data Collection

To collect data necessary for the identification of dominant source domains in metaphorical constructions used by French speakers, I spent a total of 18 months in France (1 August 2016 - 31 January 2018) conducting individual interviews, attending relevant events (e.g. science fiction conventions e.g. *Les Utopiales*, comic book conventions e.g. Comic Con and science fiction book fairs e.g. *Les Imaginales*) and observing informal discussions concerning

¹⁶ “C’est pas très sérieux cette histoire de multi-planétaire. Ben c’est à lui qu’il faut poser la question! ...à ce garçon....[Elon Musk]”

“This multi-planetary story is not very serious. It’s him that you need to ask the question...To that guy...”

extra-terrestrial human existence. My methods for collecting this diverse information are divided into two main areas: interviews and participant observation. All interviewees and major participants in my research signed an informed consent form and will remain anonymous within my research.

The primary method of data collection for this project is recorded interviews with 40 participants. This data was recorded using a Sony IC recorder and interview files were then transferred to a Macbook Pro and transcribed by myself using an audio player and basic word processing software. Participant observation hours and interview numbers follow the concept of “saturation of knowledge” (Bertraux 1981, 37; Glaser and Strauss 1967) for interviews with a heterogenous group about a topic informed by multiple categories of knowledge. I aim to ensure that important themes were uncovered (Ryan and Bernard 2006) while maintaining a practically sized data set (Mason 2010; Morse 1995).

This project engaged participants in three separate age groups (20>39, 40>59, 60+). Interviewees ranged in age from 24 to 80 years old. The majority of interviewees were middle to upper class, with the exception of one recent university graduate and two working class participants. Interviewees’ level of education ranged from high school graduates to multiple Ph.Ds; nine of the ten expert participants had a Masters or Doctoral degree and 25 of the 30 non-expert participants had a Bachelor’s degree or a BAC+3 (high school education, plus three additional years of training).

In addition to generational grouping, I divided people into groups of “Experts” (10 participants) and “Non-Experts” (30 participants). This division was motivated by the goal of identifying whether expert knowledge influences linguistic representations of space and the choice or creation of metaphors. Similarly, dividing people by generation allows me to further identify how previous experience influences metaphorical production. For example, both 20>39 and 60+ aged participants possess generalized cultural knowledge concerning the “Space Race” in the 1960s; will the latter group create more (and/or more-detailed) analogies between their personal experience seeing these events happen on television than the group of individuals who only possess general (second hand) knowledge of these events?

“Expert” participants are defined as those with professional experience in the comprehension and imaginary of outer space. This category is applicable to both science fiction authors and astrophysicists, for example, even though they deal with the imaginary of space in very different ways. Experts are those individuals who have spent a lot of time reflecting on this topic professionally and personally. They may explore and construct this imaginary in different ways, with different goals, but it is part of their daily lives. In addition to this, they consider themselves as being well-versed on this topic and having potential insight on questions concerning outer space and humans beyond the Earth. It was also the case that these individuals were passionate about outer space and advocated human involvement in projects concerning outer space (whether it be colonizing the Moon or investing more resources in science and technology education in primary schools).

“Non-Expert” participants are those participants without professional experience in this imaginary, though they may have varying levels of interest in the topic. Non-expert participants come from a variety of backgrounds, fields of study and professional domains. They include artists, nurses, business people, teachers and members of the service industry. Education ranges from those who never attended university to many who graduated from prestigious universities in France. The educational breakdown of participants can be found in Appendix IV.

Participants were asked five sociographic questions before beginning the questionnaire:

- 1) Name
- 2) Age
- 3) Education
- 4) Profession
- 5) Other languages spoken

I solicited information concerning participant language use in order to 1) confirm that all participants were in fact first-language French speakers and 2) to obtain a more complete vision of their language use. Knowing a participant’s linguistic competencies allows me to better index any instances of code-switching (of which several appear in the corpus, primarily between French and English) as well as to further sound their exposure to the imaginary of humanity in outer space in other languages (i.e. reading science fiction novels in Spanish, or watching science fiction films in English).

I did not ask interviewees to specify their gender, but divided them according to “male” or “female” based on their usage of gendered language to describe themselves (i.e. adjectives in reference to the first person singular) or explicit proclamations of gender (i.e. “*Je suis une femme...*”; “*En bonne bourguignonne*”). In total the study comprises an equal number of men and women (20:20).

I conducted interviews with ten people for each of the “Non-Expert” age groups (30 people) and interviews with ten people for the “Expert” category. The non-expert interviews are evenly divided between male and female participants. The “Expert” interviews are also equally divided, however, they reflect a gender divide in STEM¹⁷ professions. Eight of the expert participants are science fiction authors or illustrators (three men and five women). The remaining two expert participants are both male scientists in space sciences. This is not because I did not contact a number of female scientists for interviews. However, after contacting the same number of male and female scientists, I was unable to obtain interviews with any of the women. The two male scientists I interviewed were both present at the *Convention nationale de la science fiction* (though I would only interview one of them there). There were more male scientists (in the case of the convention mentioned above, no female scientists spoke on panels) at the events I attended and these men’s schedules seemed to more easily permit sitting down and chatting about space with a stranger. In the field, the ubiquity and accessibility of men’s expert opinions about space contrasted with a lack of accessible expert opinions from women and this is reflected in the data collected in my research.

The primary tool for data collection in the field is a ten-question survey I designed in order to maximize the narrative creation of each participant. The questionnaire employs a linear model of imagining preparation for and eventual departure from Earth, so that participants are led to compose a story and to imagine how the scenarios within their story might play out. In other words, the questionnaire begins with questions about initial images and feelings of space and then begins projecting participant imaginations into space in more specific ways (and physically further and further from Earth). The questionnaire encourages individuals to discuss

¹⁷ Science, technology, engineering and mathematics

the topic, but also to engage with this subject on a metalinguistic level (e.g. How else could we talk about this experience? How do different descriptions affect you?).

The questionnaire consists of the following 10 questions and was created in order to avoid particular conceptual frames (e.g. of a scientific or touristic voyage to space) as well as value judgements (e.g. the problems or advantages of human space travel). I tested the questionnaire in individual interviews and focus group interviews in Montréal in 2015 to fine tune the questions and garner preliminary data about how people understood them.

Project Questionnaire (English Translation, French Original in Appendix II):

1. What are the first images that come to mind when you think about space?
2. How do you see a multi-planetary human civilization?
3. If someone offered you a trip to space, would you go? Why (not)?
4. How do you imagine human life beyond the Earth?
5. Do you think it is, or will be necessary for humans to become a multi-planetary species? Why (not)?
6. Do you think that humans who live beyond the Earth will remain the same as terrestrial humans?
7. Currently, astronauts on the International Space Station are allowed 1 kilogram of personal effects. If you had to leave the Earth, what would you bring in your kilo?
8. What would you miss about Earth if you have to leave tomorrow? What wouldn't you miss about the Earth?
9. What do you feel when you imagine a person who lives beyond the Earth?
10. Do you think there is a reason to undertake space exploration? Exploration in general?

Overall, the questionnaire was effective in prompting participants to imagine themselves and other humans in space, and to imagine and discuss (im)possible speculations about human futures in space. Surprisingly, the questionnaire prompted more embodied reactions and descriptions than I would have hypothesized, as participants often focused on intimate descriptions of spaces and daily habits, rather than expansive descriptions of human civilizations or interstellar landscapes (see Chapter Nine for further discussion). People elaborated their discussions most in response to questions #3, 7 and 10. These questions provided participants with concrete anchors for their responses concerning their personal preferences, opinions and

lives. They also explicitly implicated the participant in the imagined situation, rather than more generally or abstractly asking them about "humanity" or potential future humans.

Contrarily, the more abstract questions (e.g. #2, #4 and #6) that asked interviewees to imagine more broad, impersonal scenarios were the questions that seem to challenge and/or disinterest them the most. These questions were often met with simple, "I don't know," or "I don't imagine that." Sometimes they developed their disinterest further, stating that we cannot know at this point in time what human civilizations or humankind may be like in the distant future.

I do not address movement, gesture or other paralinguistic elements in this study as it is beyond the purview of my project. However, these elements were ever-present in interviews. Notably, participants literally turned their heads and looked into the distance when imagining distant phenomena or looked above them when talking about space. These are fascinating elements that may further support conceptions of embodied language and suggest a rich terrain for further inquiry.

Frequently, supplementary questions concerning 1) beliefs in extra-terrestrial life, 2) religious beliefs and 3) personal interests in science or science fiction would be integrated into the interview. Most often these topics organically emerged in discussion and, in some cases, seemed to influence people's conceptions of humanity and space. However, the topic that seemed to be the most influential in framing people's imaginations was that of ecological questions (i.e. the care and preservation of planet Earth, the ecological "catastrophe" taking place on planet Earth, or human extinction). Though the questionnaire makes no reference to Earth's ecology, this framing appeared repeatedly in interviews. So important is this topic in the framing of participant discourse that Chapter Ten is dedicated to its analysis and discussion.

Interviewees were initially recruited at relevant events I attended for my research. As mentioned above, I met several of the expert participants for the study at the *Convention nationale de la science fiction* and these individuals graciously connected me to other scientists and science fiction authors. Non-experts were recruited through professional and personal contacts in Paris as well as through community organizations (e.g. a crafting club for retired women that meets weekly in a local church). Interviews took place in public spaces, such as cafés and libraries, as well as in individual's homes. The time and place of the interview were

chosen by the participant. In all cases I did my utmost to create an informal, relaxed environment in which respondents would feel at ease to explore their ideas (or lack thereof). Sometimes people were interested in the motivations of my study, which we would discuss in terms of imagination and language, and how we imagine the unknown using language.

Below is a list of codes used to identify participants based on their age, sex and expert status. These codes will correspond to all examples cited in the text:

(1): 20>39 years old

(2): 40>59 years old

(3): 60+ years old

(F): female

(M): male

(E): expert

(NE): non-expert

Examples:

“Marie,” 53 years old, science fiction author = 2FE

“Jean,” 31 years old, editor = 1MNE

In addition to these 40 interviews, I conducted participant observation (and sometimes just simply participated or observed) in a number of diverse events concerning the imaginary of space, such as: Paris *Comic Con* and science fiction festivals, including *Les Utopiales*. These events allowed me to witness representations of space, and their audiences and creators in high concentrations. They also allowed me to observe and talk to people while they were actively involved in consuming (and sometimes creating) these representations, debating their creativity, their realism, their artistic merits or engaging in these worlds by dressing up as characters, participating in role-playing or video games, or building spaceships. One of my favorite installations at *Les Utopiales* was a rounded, free-standing structure about seven feet high covered in *Lego* grids in swathes of different colors. Attendees could take *Lego* blocks and build upon the worlds that others had created earlier in the day. People built complex cities in squared, triangular and spiral patterns, some with wide boulevards and homogenous architecture, some eclectic and labyrinthine. There were pyramids, air fields, large natural spaces with lego trees and rocks, oceans, rivers, domed habitats in deserts. Like most every other booth and installation

at the festival, the *Lego* worlds exhibit was crawling with men, women and children all day long. They would talk about what they were building; they would explain their *Lego* world and how it worked to the people around them.

“Cosplay,” or “costume play” a performance art in which participants (“cosplayers”) dress-up in handmade costumes and take on the persona of their characters, is another highly participative, imaginative activity that is central to events like *Comic Con* (*Les Utopiales* is also considering hosting a costume contest during the festival in future years). At the Paris *Comic Con* this practice has not caught on widely, yet. Nevertheless, there were still many cosplayers in attendance who interacted with other characters and attendees, often children who wanted to take their picture with Captain Kirk or Spiderman.

The artists, organizers and presenters at these events were generous in discussing their projects and their work, its motivations and their goals in being professionally involved with science fiction. There was an element of personal passion and fandom for science fiction, as well as an interest in what these people felt like science fiction can *do*. Whether apocalyptic visions can warn humanity of its follies or fantasies of exploration and discovery into distant realms can remind us of our strengths, these people spoke of science fiction as a site of imagination that can affect reality and how people perceive their world and the vastness beyond it.

Participant observation is a crucial tool as it allowed me to engage in activities and observe people’s behavior to see whether it matches with what they say. It also augments the validity of my discursive analysis by enriching my understanding of what individuals deem important, desirable, possible or impossible in their imaginations of humanity beyond the Earth. Finally, this method allowed me to verify the prevalence of conceptions present in the corpus in everyday participant language use. In addition to these major national and international events, I also attended a number of smaller events, including *rencontres* with science fiction authors and graphic designers, such as the release of *Mars Horizon*, art and science exhibitions (such as the Cité des Sciences exhibition on *Valérian et Lauréline*), and book fairs (such as “*le salon de l’imaginaire*”) concerning space or humanity in space.

These field sites were invaluable as venues for participant recruitment and collection of naturally occurring data that I would not have been able to elicit via interviews. Each of these

events combined, to a greater or lesser extent, science fiction with science facts and provided an opportunity to engage with individuals as they negotiated the boundaries between the two. These events, particularly the *Convention nationale de la science fiction* and *Les Utopiales*, also provided an opportunity to discuss source domains of imagination in the presence of images, films or other representations (including cosplay at *Comic Con*) of these imaginations. For example, a large collection of science fiction art was on display at *Les Utopiales*, as well as a number of interactive exhibits concerning space science and imagining space.

These events also permitted me to gauge the popularity and the distribution of discourse concerning humanity in space in contemporary France. *Les Utopiales* is the largest science fiction convention in Europe, and in 2017 there were 92,000 visitors over the five-day period (record attendance in the festival's history). Discourse concerning humanity in space is not on the decline in France. On the contrary, as in the case of *Les Utopiales*, sites of production, distribution and sales of this discourse are on the rise among both adults and children.

This blend of fact and fiction allows for multiple sources of information and imagination concerning outer space and humanity beyond the Earth. These sources are crucial to my study as they account for “generalized cultural knowledge” within the participant group. None of the participants of this study have any personal experience beyond the Earth (though three people had heard first-hand accounts of this experience from astronauts they met personally). Therefore, the source domains of experience that participants may potentially use in order to create analogies and metaphors concerning the unknown of outer space will be limited to generalized cultural knowledge of this sort and their own terrestrial experience.

During my fieldwork, I also made an effort to regularly purchase different scientific and popular publications concerning space. For example, *Science et Vie* (“Vivre dans l'espace, pas si simple...” May 2017); *Ciel et Espace* (“Vivre dans l'espace: Planète ou station ?” July/August 2017); *National Geographic* (“Coloniser Mars,” November 2016); *Sciences et Avenir* (“Elon Musk part à la conquête de Mars,” November 2016); *Le Monde* (“Hors Série: L'Atlas des Utopies,” 2017); and *Pilote* (“Hors Série: Spécial Valerian,” 2017). This observation, participation and following of space news allowed me to familiarize myself with this imaginary and its multiple articulations as they currently exist in France.

3.4 Description of Data

The study resulted in thirty-three hours of recorded interviews with forty participants. I then transcribed these interviews resulting in a corpus of 435 pages of text (single spaced, 12 point font). In addition to the interview material, the study resulted in over 200 pages of field notes and over 1,000 digital photos from participant observation. I also collected some twenty magazines focused on topics concerning humanity in outer space, dozens of articles on this topic as well as Youtube videos, blogs and websites to which I was referred by project participants. These intertextual sources, including films and literary texts, have been compiled in a table to facilitate cross-reference and analysis (See Appendix V).

3.5. Analysis of Data

In my research I document source domains in conceptual metaphors used by participants in order to examine 1) the motivation behind metaphorical production in imagination as well as 2) the implications of the conceptual frames that these metaphors provide. I then analyze a number of dominant conceptual metaphors, and their accompanying surface metaphors, within the corpus, targeting what Cameron (2007) calls ‘metaphor-like uses of language.’ I also asked a number of follow-up questions, enabling me to infer what may guide people’s choices of metaphors.

In order to identify ‘linguistic metaphor’ within the data set, I make use of methods developed by Steen (1994, Steen et al. 2010) and Cameron (2003). I have chosen Steen and the Pragglejaz Groups’s methods because they are unique in the study of metaphor in their comprehensiveness and rigor. Cameron (2007) and Cameron and Deignan’s (2003) work permits me to deal with metaphors without knowing the intention of speakers when speaking. I analyze the conceptual content of people’s metaphorical language, without asking them what this conceptual content is. I want to know what people’s choices of metaphors tell me about how they conceive of outer space and how different metaphors convey different conceptions and reinforce particular perceptions and judgements. However, this does not require that I know whether a

person *intentionally* used a metaphor (or if this metaphor is “dead” to them as some scholars may suggest, Searle 1979). Cases, such as calling a space shuttle a ‘cocoon’ or a ‘sardine can,’ explicitly convey judgements and conceptions that I verify through follow-up questions and further open-ended discussion. These usages may be ‘choices’ of participants. Nevertheless, a large amount of metaphors and metaphor-related language in this corpus are fixed expressions, conventional ways of speaking or grammatical preferences or requirements of the French language. For this reason, interviewees’ intentions about metaphor use when speaking is not my primary interest. The literature upon which I base my study, and my own results, support a perspective in which metaphor is not a stylistic choice, but a fundamental cognitive mechanism. If a speaker uses a metaphor, how can it be dead? Simply because I do not understand, or am not conscious of automated bodily functions, does not mean they are not functioning. I will discuss this issue further in Chapter Six. For the current discussion, it is important to remember that when identifying metaphors in the corpus, I use Steen et al.’s (2010) method of first identifying all metaphor-related words, regardless of a speaker’s intentions

The method of metaphor identification (i.e. MIPVU) developed by Steen and his team (2010) (the “Pragglejaz Group”) is the most direct, complete and verifiable methodology that bridges approaches to metaphor from both cognitive science and the humanities. The Pragglejaz Group approaches metaphors as phenomena “out there in reality,” in other words, metaphors are treated as a scientifically measurable phenomenon “on par with the measurement of IQ, stress, economic class, wealth, education and so on” (ibid., 2). Metaphor Identification Procedure (MIP) and its refined version, MIPVU, are tools intended to “capture the bulk of the linguistic expressions of metaphor” within discourse (ibid., 5). After reading a text (in my case an interview transcription) to establish a general meaning, MIPVU requires a researcher to determine the lexical units in the text and then to determine that lexical unit’s 1) meaning in context and 2) more basic, contemporary meaning in contexts other than the given context (these ‘basic meanings’ tend to be concrete, related to bodily action, more precise or older [Ibid., 5-6]).

These contrasts are determined through dictionary-based comparison. The basic meaning of a lexical unit is found within a dictionary, including examples of its usage, and then compared with its meaning within a phrase to determine whether or not it is being used metaphorically. For

example, if a participant talks about humans in space living in a "bubble" or "can" I marked this phrase as potentially metaphorical, then compared each lexical unit in the phrase with its definitions in the research dictionaries, the *Larousse* (2017) and *Le trésor de la langue française informatisé*. In the case of "a person living in a can," I can determine that the noun and verb are both used literally, however, as the participant is referring to people living in spaceships, the word "can" would be deployed metaphorically (as the participant is not referencing the literal container object, but using a container metaphor).

I chose the *Larousse* because of its reputation of being a general dictionary 'for everyone.' The other major dictionary in France, *Le Robert*, is known for providing more focus on the French language itself and on technical and scientific terms. The *Larousse*, on the other hand, is more encyclopaedic. It provides information on the world in general and contextualizes words, rather than concentrating on linguistic elements. Harvey (2005), in his review of both dictionaries, argues that the *Larousse* provides "elements that are not of a linguistic nature, but that reveal the universe of the thing." This wider comprehension of lexical units is more appropriate for my analysis of imagination and metaphor than is a more technical definition.

In addition to this traditional dictionary, I have also chosen to employ *Le Trésor de la langue française informatisé*, an online database created by the Laboratoire d'Analyse et traitement informatique de la langue française, partnered with the Centre National de la Recherche Scientifique and l'Université de Lorraine. This database is unique in both the subtlety of the data provided - including etymological, historical and linguistic information - as well as in its structure, which permits three levels of research into the data, including complex or arbitrary requests (e.g. It is possible to search for all marine terms related to maneuvering with sails). This resource allows me to complement the basic sense comparisons I conduct using the *Larousse* while permitting an enrichment of my analysis by informing it with historical and etymological data.

Finally, I used the *Dictionnaire des cooccurrences* published online by the Canadian government's Translation Bureau/*Bureau de la traduction*. For any comparisons with English language collocations I consulted the *Online Oxford Collocation Dictionary of English* and the *Frequency Dictionary of Contemporary American English* (Davies and Gardner 2010).

Collocation dictionaries are important tools to determine the dominant conceptions associated with words people used in metaphorical expressions (e.g. verbs such as “voyager”) and allow me to compare these conceptions with those found in the corpus. Collocation comparison helps me to determine to what extent (if any) the metaphors used by participants are common in all discourse, or particular to them. Collocation dictionaries allow me to accomplish this on the level of individual lexical units, for example, to determine if certain verbs are more commonly associated with certain nouns or concepts in my data than in general discourse. These associations are important in order to analyze the motivations beyond source domains in participant discourse. Verbs are highly indicative of the kinds of experiences participants deploy (e.g. whether they 'know' something or 'read' something or 'saw,' 'felt,' 'heard,' or otherwise physically experienced something).

Once the contextual and basic meanings of a lexical unit have been determined, they can be compared to see if they contrast. If the contextual meaning contrasts with the basic meaning, but can be understood in comparison with it, a lexical unit is to be marked as metaphorical. MIPVU permits conceptual as well as linguistic analysis of metaphors that is intended to be “compatible with, but...distinct from” metaphor research concentrating on psychological processes (Steen et al. 2010, 9). While MIPVU concentrates on linguistic metaphor identification, it allows for an exploration of conceptual issues as “all comparison is a conceptual act, including the comparison between word senses” (Ibid.). The Pragglejaz Group created this methodology from the cognitive linguistic definition of metaphor as a cross-domain mapping. Therefore, though linguistic metaphor identification is the goal, the methodology positions researchers for further conceptual analysis of the metaphors identified.

Once I have identified a metaphor, I categorize it based on the categories of metaphor developed by Lakoff and Johnson (1980): ontological metaphors, orientational metaphors, personification and metonymy. As discussed in the introduction, this categorization remains foundational in metaphor studies and permits me to test the applicability of theories of conceptual metaphor on discourse concerning imaginations of the unknown and (im)possible. These categories were present in the interviews I conducted and using them proved to be a useful tool when teasing out the structure of metaphors and the conceptual systems in which they exist,

or how they are coherently structured within experiences (be they generalized cultural knowledge or past individual experience). Because the three categories in this model remain large, and metaphors typically overlap within them, all of the metaphors I analyze arguably correspond to Lakoff and Johnson's model. I also analyze metaphor-related words, that I call proto-metaphors, which are not accounted for by this model. I will discuss this in Chapter Six.

In addition to metaphor categorization, I compare the dominant metaphors within this data set to existing studies concerning similar metaphorical conceptions. As discussed in Chapter Two, a rich variety of metaphor studies exist that analyze major conceptual metaphors in world languages (i.e. anger, pride, love [Kovecses 1988], death [Turner 1987], time [Mueller 2016], or knowledge [conduit metaphor, Grady 1998; Reddy 1979; metaphors for communication Krippendorff 1990]). These comparisons allow me to determine to what extent the metaphorical production in this corpus differs from general discourse concerning known source and target domains and allows me to compare the structure of metaphors concerning the unknown against those concerning the known.

Finally, once the metaphors have been identified and categorized, I analyze them using Critical Discourse Analysis (hereafter CDA), as developed by Van Dijk (1993) and Critical Metaphor Analysis (hereafter CMA, Charteris-Black 2004). I employ CDA to study this data because it is a critical approach to studying text and talk that focuses on relationships between discourse and society, especially how these systems are *(re)produced* through text and talk. CDA is a useful tool in my research because it takes into account sociocultural context and historical dimensions when analyzing discourse. The ways participants imagine and evaluate possible futures are strongly informed by the dominant sociopolitical, economic and cultural ideologies within their nations and communities. CDA is attentive to these influences and approaches participant discourse as constructive social practice, rather than passive description or relaying of information.

CMA builds on Van Dijk's approach by integrating cognitive linguistics and conceptual metaphor theory, in which linguistic metaphors are analyzed as being surface manifestations of more generalized processes of cognition and perception (Deignan 2005; Gibbs 1994; Lakoff 1993), to explore intentions and relationships explicit in metaphorical expressions (Charteris-

Black 2004; Li 2016). This framework permits me to pair the ideologies and conceptions apparent through CDA analysis with the metaphorical frames that shape them within participant discourse. Combining these complementary frameworks allows me to address both the communicative and cognitive motivations of conceptual metaphors in participant discourse (CMA) while addressing how these metaphors function to (re)produce conceptions about the imagined or unknown (CDA).

**Vignette 4: “Comme si je partais pour de longues vacances”
(Male, non-expert, 44 years old)**

I lived in the same neighborhood during all of my fieldwork. This permitted me to get to know everything better. The spaces, places, seasons and rhythms of life in this little part of the city. I also got to know my neighbors and they got to know me. Coming home from work one afternoon, I passed the open windows of La Mascotte, heard my name and looked in to see Éric and François, two friends from the neighborhood, unsurprisingly nursing pastis at a table near the window. As custom dictates, they called me in for “un petit verre” and had a glass of white wine on the table before I could get to my seat.

After some small talk it came up that I had been doing interviews for my research that afternoon. Éric noticed the recorder in my bag and asked why I wasn’t going to interview him. “It would be my pleasure to interview you,” I responded, “Just let me know when you’re free.”

“Now,” he said, in his characteristic gruff manner.

“Very well,” I replied, and pulled out the questionnaire and my notebook, positioning my compact recorder on the table between us. François quickly lost interest and wandered off. Éric and I sat together in the sunlight; its rays streaming first past the bustle of our neighbors and the inevitable groups of tourists, pushing past them to finally tumble into our glasses on the marble table top. He sipped his pastis and scowled at me, signalling he was ready for my questions. As we talked he explained that he liked science fiction alright, but that he didn’t think the depictions in fiction could possibly do justice to the reality of things. He went on to detail his deep convictions about the existence of alien life and alien intervention in human civilization.

An ex-military man who had been raised in a no-nonsense household in Normandy, Éric’s answers to the questionnaire were concise and assertive as they were about most any topic. When asked about his single kilogram of personal affairs, he responded simply:

“Je prendrais du matériel pour écouter de la musique. Je prendrais des écouteurs et mon téléphone qui ne marcherait pas, mais avec lequel je peux écouter toutes mes playlists pendant des heures. Voilà. Parce que j’écoute de la musique toute la journée, tout le temps, tous les jours. Il me faut de la musique. Je ne peux pas vivre sans musique. Qu’est-ce que je pourrais prendre d’autre? Mes lunettes de soleil. “

He loved those sunglasses and admittedly they suited him well. A few months later he would end up sitting on them and breaking the frame. He threw an absolute fit.

He had quieted and returned to his pastis, so I prompted, “Éric, I think you still have some space in your kilo.” He scrunched his nose and passed a rough hand with a thick silver ring depicting the Kraken across his shaved skull.

“Ouais, mais ça me suffirait. Comme si je partais pour de longues vacances.”

Chapter 4: Target Domain Unknown, Human Existence in Space

“The world as lived and the world as imagined...
turn out to be the same world.” (Geertz 1973, 112)

As discussed in Chapter Three, metaphors are composed of two domains: the source domain and the target domain. In the preceding vignette, Éric used the source domain of his experiences on vacation to frame his imagination of travelling to outer space. He uses an analogy, “*comme si*” (“like” or “as if”) instead of directly describing how the situation in question would *be*. There are many salient qualities between the two domains he references: travel and leaving ‘home,’ his daily comforts whether they be in Montmartre or in a space capsule and parallels between not needing something on Earth and not needing it in space. Éric did not prod the peculiarities of what his life might consist of outside of the Earth, in the vast expanse of space or on unfamiliar vessels or alien planets. Instead, he made decisions based off of his daily life where, at the time of the interview, he lived two blocks from his work, about four blocks from the table at *La Mascotte* where I interviewed him and generally had little reason to leave the neighborhood.

In this study I analyze the metaphors and conceptions people like Eric used to discuss the target domain of space (or associated experiences or phenomena, such as the expansion of humanity into space, or a family vacation into space). None of my participants have been to space, therefore this target domain remains primarily unknown to them in terms of personal experience. In the following section I will give a brief overview of the target domain of space and an historical review of literature and sources of intertext, or “the relevant shared documents...upon which new utterances establish themselves” (Bazerman 1994, 22), concerning this target domain. I will then follow with a theoretical discussion of how one can ‘know’ the unknown through language. I will conclude with a discussion, informed by interviewees, concerning whether or not it is possible or useful to imagine the unknown.

4.1 The Unknown

It is evident that we can talk about many things for which we have no personal experience. For example, language affords us the faculty of displacement: when we talk, we are not bound by the physical realm. I can talk about Iceland and I can imagine that it might be “like this” or “like that,” even though I have never been there. However, a range of empirical and cultural knowledge exists concerning Iceland, as well as conceptual frames in which I could potentially understand the particularities of this place I have never been. Perhaps I am familiar with Icelandic sagas, pop music or Mike Fortun’s (2004) ethnography that takes place in Iceland. I may also make analogies between my embodied experiences in similar environments and extend them to my imagination of how Iceland could be.

This ensemble of cultural and experiential knowledge exists to a far lesser degree for the imagination of and discourse concerning human beings in space. Empirical human experience in space is rare. To begin, let us define ‘space.’ The common definition of space, used by numerous organizations including the Fédération Aéronautique Internationale (FAI, or in English, the World Air Sports Federation) is the territory beyond the Kármán line, an imaginary boundary 62 miles above sea level. Following this definition, spaceflight, according to the FAI, is any flight that goes higher than 62 miles in altitude (National Oceanic and Atmospheric Administration of the U.S. [NOAA] 2016). This line was originally calculated by Theodore von Kármán in the early 1900s at 50 miles above sea level. Kármán defined the boundary as such, because he calculated that at 50 miles above sea level, aircraft reach a point where orbital dynamic forces become more significant than aerodynamic forces, meaning that an aircraft cannot be supported by the atmosphere alone without traveling at suborbital speeds (Drake 2018). However, because the atmosphere slowly thins, rather than disappears, the exact height of this line has been debated for decades. Adding to the challenge of a strict definition is the fact that different satellites, with different orbital trajectories can stably remain in orbit at different levels. Though the FAI and NOAA have settled on 62 miles above sea level, NASA and the U.S. government define the boundary of space as 12 miles below, at Kármán’s original calculation of 50 miles above sea

level. With suborbital flight companies like Virgin Galactic getting closer to the ‘edge of space,’ the definition of this line becomes more important to standardize (Grush 2018), so much so that the FAI has called for a workshop in 2019 to evaluate and potentially revise the current calculation of the Kármán line (FAI 2018).

Humans have been exploring space since 1961 with Yuri Gagarin’s voyage into orbit (US National Archives ALIC 2016). According to FAI records a total of 536 people from 38 countries have been into space (World Spaceflight 2018). As NASA and the U.S. government define the boundary of space as 12 miles below the Kármán line, the U.S. Air Force records 562 people who have been to space.

The definition of space and who can be defined as an astronaut for having travelled there is not universal, nor agreed upon within the aeronautics community. Where space begins depends upon which authority one references, what community one is participating in and what context and environment one lives in. Expert discourse concerning space in France is dependent on all of these factors and is culturally specific, rather than scientific fact. As I will further explore in Chapter Six, interviewees’ conceptions of space follow these culturally specific discourses that are “enabled by the context of technoscientific late capitalism” (Valentine, Olson and Battaglia 2012, 1011). How people spoke to me about space in Paris in 2016 was greatly influenced by the socioeconomic and technological context in which they lived and had grown up (e.g. knowledge of Pesquet’s trip to the ISS). This context is further nourished by Western comprehensions (from the Greek and Roman traditions, to Copernicus, to Kepler) of space as being distant and scientific practices, for example, that have focused on the distance between Earth and other celestial bodies, using tools like telescopes to give primacy to vision and to bring images of these distant places nearer.

On the contrary, in many cultures, celestial bodies are considered near, even as family members or progenitors (Young 1987). For example, a number of etiological myths in North America explain human existence and natural phenomena through unions between humans and celestial bodies. The myth cycle of the “Astral Spouses” among the Assiniboiné, Wichita and Arapaho people recounts the marriages of the Moon and Sun to a lovely native girl and a frog, respectively (Lévi-Strauss 1968). The Skidi Pawnee tribe in the United States believe the stars

came to Earth and conceived the first human beings (Chamberlain 1982). On the other side of the globe, in the Solomon Islands, similar motifs are present, in which ancestors are descendants of the Sun and Moon (Christine Jourdan, Discussion with the author, February 4, 2018). In Papua New Guinea, a number of myths legitimizing ancestral clans do so by linking the members of these clans to the Sun (Godelier 2015). Godelier (2015, 201-5) argues that claims to being the “children of the Sun” are more than metaphors, as the Baruya clan in Papua New Guinea believed that their children were born from unions between male members of the clan, whose sperm created an unfinished fetus (lacking a nose, hands and feet) and the Sun. A woman’s uterus was considered a “sack” and therefore women within the clan were understood as vessels, rather than progenitors of children (ibid., 205). These conceptions of kinship with celestial bodies reinforce a conception of intimacy and proximity between Earth, humanity and outer space, rather than separating terrestrial and celestial worlds (for example, by defining space as a realm at a particular distance).

In addition to an intimacy based on kinship, many cultures have traditions of astral travel. Shamans, ancestors or initiates participating in rituals may journey in space, to other planets or even other solar systems (Isabelle Leblic, Discussion with the author, December 8, 2017). In his book *Elemental Shaman: One Man's Journey Into the Heart of Humanity, Spirituality & Ecology* (2009), Omar Rosales, a trained anthropologist and former captain in the U.S. Marine Corps, explores Toltec, Cherokee, Maya and Buddhist shamanistic traditions. Rosales describes astral space travel in the following way:

“By concentrating, a shaman can direct his astral form to any country, any continent, any time on Earth. The ultimate journey is travel amongst the cosmos. Once the shaman has broken the bonds of the planet, limitless space travel is possible - planetary space, interstellar space and intergalactic space are all pathways...” (Rosales 2009, 63).

Astral travel, projection and out of body experiences are understood as commonplace and normal in cultural contexts such as that of the aboriginals living in the Western Australian desert. Aboriginal “dreamtime” and astral travel have been the subject of numerous ethnographies (Elkin 1937; McCaul 2008; Peterson 2000; Rose 1956; Sheils 1978) and remains well-studied.

Among the Aborigines, astral travel is typically undertaken by a shaman or sorcerer, but it is possible for initiates and normal people to engage in what they call “fast travelling” (Elkin 1945). McCaul (2013) recounts a story that people repeatedly told him during his fieldwork. In all the versions of the story McCaul heard, people talked about seeing “Aeroplane George” at a train station in their city of departure and seeing him waiting for them at the train station upon their arrival in another city. In George’s obituary in 1978, one newspaper noted that “many a tourist was puzzled at seeing George at Cooper Pedy and then upon arrival at Kulgera, they would be greeted by Aeroplane George. No one knows how George managed to travel so fast” (McCaul 2013).

These journeys are not ‘spirit journeys’ or out of body experiences but described by people as physical journeys that they go on with their bodies. Waldo Vieira (2002, 195) terms this phenomenon “parateleportation” and defines it as “a phenomenon composed of dematerialization, levitation, apport and rematerialization, in which the intraphysical consciousness suddenly disappears and reappears in another location; the act or process of transporting objects, human beings or subhuman animals through space, without any mechanical means.” Individuals using parateleportation are not only able to travel rapidly to locations on and beyond the Earth, they are also able to act in these places, for example visiting ancestors, consulting with spirits and healing people (Reid 1984).

Similar traditions of astral travel have been documented around the world (e.g among the Sami in Siberia [Hutton 2001], Native American shamans in the United States and Canada [Tedlock 1979; Young 1987] and Tibetan healers [David-Neel 1965]). McCaul (2013) argues that these cultural contexts allow for a paradigm in which paranormal activities such as astral travel are considered possible and, for certain individuals, an expected part of their life trajectory. In these traditions travel to realms beyond the Earth is not distant from everyday human experience, but an essential part of it.

Astral travel is not a fundamental part of daily life in 21st century France and none of the participants in my study spoke about astral travel as a valid mode of space travel. For thirty-eight of the forty participants, space was distant and space travel rare for human beings. However, two participants did seriously posit intimate connections between human beings and space. The first

participant to do so was Jean Denis (3ME), a science fiction writer. Jean-Denis' colleagues and those familiar with his writing described him as 'esoteric' and he spoke to me at length on Buddhist ideas, non-materialism and perception. He explained to me that different spaces, on Earth and beyond it, only exist under a human gaze and that nothing but the present was real. He applied his conception of spacetime as existing only within human perception to outer space. Space, like all places (e.g. his home, the town where he vacationed last summer, the picnic table on the lawn where we sat during the interview) exists only while being perceived. Though Jean Denis felt outer space could only exist under a human gaze, he still harbored negative conceptions about human space exploration. His argument took the form of a metaphor in which humanity was an "unfinished" product. For him, it was essential that humanity should know itself fully before spreading into the cosmos.

It is interesting to note that Jean-Denis conceived of the distance of space differently based on whether or not he was talking about a personal experience of space and spaces, or a political project *for* space. Space, in his first argument, was something whose very existence was dependent on human perception, or consciousness that would cause it to exist. Space did not exist in his conception, unless a human was witnessing it, therefore one would assume that there was nothing to 'protect' or 'preserve' in space outside of its relationship with human beings (i.e. space is not a natural environment with an independent existence, but a phenomenon for human perception). However, when our conversation later turned to projects for human colonization, specifically imagining of human civilization beyond the Earth, he quickly began to criticize humanity's ignorance. For him, as long as humans remained as ignorant and violent as they are, there is no reason to export this ignorance into space; no value in planning projects with human intentions *for* space and *in* space. Humans needed to evolve further, to change profoundly before he could justify exporting humanity into space.

There are several common points between Jean-Denis' argument and comments made by Christine (2FNE), the only other participant to speak about space in a spiritual or esoteric sense. Christine was a fierce small-businesswoman and had run her own fitness studio in downtown Paris since 2011. She enjoyed fashion and luxury and she and her long-haired chihuahua were always well-coiffed. She also had a creative streak in her; she enjoyed dancing and photography.

The dog was quiet and subservient, to leave room for her booming, often feisty personality. Though not always inclined to conversation, when you caught her in a good mood she was effervescent; her opinions, arguments and criticisms would stream uninterruptedly from her surgically enhanced facial features. Her eyes and her wit were my favorite things about her; things no surgeon had developed.

When she learned about my project, Christine expressed a zeal for the interview that caught me off guard. I had incorrectly assumed that my nerdy science project about outer space would not interest her; while, *au grand contraire*, it fascinated her. I met with her and her chihuahua one afternoon at her desk in the fitness studio where we would begin a long conversation that she would supplement with a string of e-mails over the next few weeks. She was very interested in Western esotericism, referencing many of its strains such as kabbalism and New Age ideas. Her fascination with and frankness about alternative spiritual currents was singular in my interviews, especially in that she linked this spirituality directly to the human capacity for travel through spacetime. Jean-Denis spoke extensively about spirituality, but did not make such explicit causal links between spiritual ‘stuntedness’ and space exploration.

In both of the cases where interviewees talked about spirituality, this spirituality was based in primarily non-judeo-christian perspectives, and entirely unrelated to historically dominant forms of religion in France. None of my interlocutors linked conceptions of the cosmos to conceptions of the afterlife, a judeo-christian god, nor angels, demons or other supernatural beings. For both Christine and Jean-Denis, spiritual perspectives shed light on how we can develop *human* capacities, not on how humans can connect to other beings.

I find it important to note that secularism in France is widespread and considered, particularly in the Parisian context, as the social norm¹⁸. On the ground in daily life, French citizens report a growing secularism and decrease in religious practices in both native and

¹⁸ In 2007, the French government created the Observatoire de la laïcité (“The Monitoring Centre for Secularism”), a commission whose 23 members are intended to recommend secularist policies for the future. The gouvernement.fr website includes a section for the Monitoring Center (Observatoire 2019) that explains that France has been a secular nation since 1905, with the passage of the “Law on the Separation of the Church and State” (*la loi sur la séparation de l’Église et de l’État*). This secularism is rooted in the republican values of the French Revolution and is today considered more important than ever in a more culturally diverse France.

immigrant populations¹⁹. The self-reported religious beliefs and practices of the people in my study, as well as in the studies referenced above, may be accurate, but are also highly informed by what participants in these studies feel are acceptable or socially advantageous answers. For example, in my study the normalized “presentation of self” (Goffman 1956) in Paris in the early 21st century is highly secularized and avoids religious topics or can be openly disdainful of religious beliefs. It is considered impolite or uncouth to discuss religious subjects at social occasions such as dinner, where such conversations could spoil the mood (another of these subjects is politics). French people will tell you that “*ça ne se fait pas*” (“this isn’t done”).

When I told people in Paris that none of the 40 people I interviewed reported practicing any particular form of religion, several expressed surprise. They, like I, attributed this lack of discussion of religion more to French social norms (i.e. of avoiding religious topics and convictions) than necessarily to my interviewees’ level of spirituality or religiosity. Several interviewees made it a point to explain to me that they had abandoned religion or had never been religious (e.g. Adèle’s discussion of learning about Greek and Roman gods in high school). Jean-Denis and Christine’s spiritual discussions were rare in my interviews, but I do not think this can be argued to be fully representative of the imaginations of people in this study.

In any case, Jean-Denis and Christine are excellent examples of how spiritual beliefs can frame and influence people’s imaginations about outer space. Questions of orientation to space (e.g. the proximity or distance of space), the structure of space (e.g. concentric celestial circles or a expansive emptiness) and the nature of space (e.g. as being inhabited by our cosmic kin) are all influenced by overarching cultural narratives, whether they be esoteric or scientific. This is clear in Christine’s discussion of outer space and human futures:

Christine: Je pense que la prochaine étape de l’humanité, c’est d’apprendre à voyager dans l’espace pour essayer de découvrir d’autres dimensions...Mais, je ne suis pas sûre que les mathématiques vont nous aider à traverser les autres dimensions parce

¹⁹ Though an IFOP (*Institut français d’opinion publique*) study in 2010 showed 64% of French citizens claimed to be catholic, 57% of these individuals did not attend mass. This study reported only 4,5% of the survey population attended mass, compared with 27% in 1952 (IFOP 2010). Similarly, though immigrant, particularly Islamic populations, report higher levels of religious practice, a 2016 study from the INED (*Institut National d’Études Démographiques*) reported that children of immigrants reported being less religious than their parents, especially in cases where they were raised with a single immigrant parent (INED 2016).

qu'il faut pouvoir se dématérialiser pour visiter les autres dimensions parce que c'est trop loin. Donc, actuellement on n'a pas les moyens technologiques, il y a peut-être d'autres, d'autres portes qui peuvent nous permettre de voyager dans les autres dimensions qu'on ne connaît pas et qui n'auront aucun lien avec les mathématiques.

Primary Investigator (author): Est-ce que tu penses que la science nous emmènera à ça?

Christine: Non, je ne pense pas.

PI: Qu'est ce que ça pourrait être d'autre que la science?

Christine: Qu'est ce que ça pourrait être d'autre? Ça pourrait être...ça pourrait être... voilà une bonne question. Il y a plusieurs réponses. Ça pourrait être nous, notre cerveau, nos...notre fluide. Il y a peut-être un autre chemin qu'on pourra connaître qu'on n'a pas exploité qui n'a rien avoir avec la mathématique, qui serait d'une autre dimension...comment te dire...on a peut être cette capacité en nous pour voyager par l'esprit.

Voilà. Je ne pense pas que la mathématique suffira à nous faire voyager dans le temps et dans l'espace. Voilà. Vraiment, un autre chemin qui nous emmènera, qui...c'est pas spirituel, c'est pas...il faut que l'homme se connaisse mieux déjà.

On exploite seulement 10% de notre cerveau, donc il y a de quoi dans l'autre 90%, tu vois? Peut-être que c'est dans les 90% restant qu'il y a une manière d'aller voyager dans l'espace et d'aller voir nos voisins.

PI: Alors, tu crois qu'on a des voisins?

Christine: Ah oui, oui je pense. On est peut être déjà nous mêmes extra-terrestres, moi je pense.

Je dis plutôt qu'on vient déjà d'une autre planète, à l'origine. Qu'on a déjà été colonisé par des extra-terrestres et nous sommes restés ou que nous avons été créés par des extra-terrestres, d'ailleurs il y a plusieurs histoires à ce sujet quand tu reprends les anciennes civilisations, chez les Incas, dans la mythologie grecque, dans toutes les religions, dans la Bible aussi. Tu as différentes sources et oui, c'est très plausible qu'on est déjà nous mêmes des extra-terrestres, qui viennent d'une autre planète et qui ont colonisé la Terre, pourquoi je ne sais pas.

Ou alors, on était simplement les animaux sur la Terre et les extra-terrestres sont descendus et ils nous ont aidé à développer notre intelligence. Ça peut être un

mélange aussi, tu vois? Entre les extra-terrestres et les humains. Ça tu le retrouves dans la mythologie. (“Christine,” 2FNE). V4:1²⁰

It is interesting to note how Christine overlaps narrative elements from science, science fiction and spiritual and mythological traditions. She talked about the legitimacy of modern science (and attributes legitimacy to it herself, e.g. her reference to ‘scientific studies’ claiming humans only using 10% of their brain) and then passes to elements more associated with science fiction, such as travel through wormholes²¹ and “dematerialization.” All of this discussion is used as evidence to support her overarching narrative of alternate dimensions²² and undiscovered cosmic “doors.”

Christine expressed the strongest understanding of space as near, or proximal, in the entire corpus. This is directly linked to her perception of space as informed by her cultural context and personal beliefs. Furthermore, she extensively cited ancient civilizations as evidence for her claims, further demonstrating the influence of cultural texts such as the christian Bible or Egyptian and Greek mythology. For Christine, outer space was an integral part of the human condition, we just have yet to realize it. Humans were ethereal beings who possessed largely untapped spiritual powers, including the ability to travel between different realms and universes. Access to space and different dimensions did not require rocket fuel and astronauts, but spiritual and psychological resources.

Scholars such as Jason Beery (2016, 50-51) argue that space is “quintessentially social” and that, as outer space is a socially produced space, “how we make sense of those things we see in the sky, how we describe them, how we order them, how we talk about them, how we represent them, and how we use them are all social processes that incorporate outer space in particular ways. As such, outer space becomes a fundamental part of the political, economic,

²⁰ Translation in Appendix IX

²¹ Wormholes (“*trous de ver*”) are theoretical ‘short-cuts’ between two positions in spacetime that would permit long-distance travel in space. Wormholes are predicted by Albert Einstein’s theory of general relativity; Einstein described them as ‘bridges’ in spacetime in 1935 (Redd 2017).

²² Though the participant was not precise, we can think of the ten dimensions proposed by Superstring Theory, in which, the dimensions including and following the fifth dimension are other possible worlds; or the 26 dimensions proposed by Bosonic String Theory (Williams 2014).

social and ecological organization of society” (ibid., 51). Christine’s discussion of space as proximal and intimately connected to the human condition are in contrast to dominant popular conceptions of space that separate outer space from Earth, obscuring the role of outer space in the material and social composition of the planet. The very molecules from which the Earth and everything within it are composed are the product of cosmic interactions in space; the Sun and Moon directly influence the Earth in myriad ways (e.g. tides, liquid water, photosynthesis); and geomagnetic storms and other ‘space weather’ can create spectacular effects visible from the surface (e.g. aurora borealis and aurora australis) (NASA 2017). From a social and technological perspective, the increasing use of orbital satellites to transmit internet, television, radio and telephone signals, means that our daily lives are embedded in space and our digital world and social practices are more and more dependent upon it (ESA 2012). Conceptions of space as distant and alien negate these realities. Beery (2016, 50) proposes that we should change popular conceptions of space to correspond to its crucial role in the life of Earth and its inhabitants, arguing that “unity of space and society is crucial...to understanding the use of outer space.”

By and large, people in my corpus expressed a view of space in accordance with prevalent popular theories and orthodoxies that dominate common understanding of space in France, as can be garnered from science and technology, but also from literature and philosophy. They conceived of space as a realm external to the Earth, difficult, expensive and dangerous to attain, and only reachable through considerable technological mediation (e.g. rockets, fuel, space ships, space suits). Space is often a manifestation of the Other, the Alien, the Distant, and the Unknown; not a space inhabited by Gods and other supernatural beings.

In these interviews, space represents a realm of zero experience. This ‘unknown’ is relative to interviewees’ experience as they all live on a planet that is in space. People nourished their representations of space through the imaginations of others and, to a far more limited extent, the traces and images humans and human tools have gleaned from space. But space remains an experiential unknown to them. Interviewees possess little individual perceptual information, outside of possible stargazing, of the target domain with which they can create analogies to other domains of knowledge. This brings us to the guiding question of my research, presented in Chapter One: When there is no target experience with which to compare a source

domain, how does metaphor function to facilitate our comprehension and our imagination of the unknown?

It is important to define what I mean in this project when I talk about the unknown. In metaphor theory, source and target domains are typically domains of experience for which people have generalized cultural knowledge and/or personal experience. The unknown I use in my research to extend metaphor theory to the imagination is that of human life in outer space and outer space in general. As discussed, outer space remains a domain for which people have limited personal experience, though they possess cultural knowledge of it. Outer space is therefore a known unknown and familiar unknown. It remains that space is also a domain of many unknown unknowns.

The term "unknown unknown" can be traced back to the poem "New Heaven and New Earth" written by D.H. Lawrence in 1917. In the poem, Lawrence describes crossing into an "unknown world" with "unknown people." Section VI depicts his discovery of the "unknown unknown:"

VI

I, IN the sour black tomb, trodden to absolute death
I put out my hand in the night, one night, and my hand
touched that which was verily not me
verily it was not me.
Where I had been was a sudden blaze
a sudden flaring blaze!
So I put my hand out further, a little further
and I felt that which was not I,
it verily was not I
it was the unknown.

Ha, I was a blaze leaping up!
I was a tiger bursting into sunlight.
I was greedy, I was mad for the unknown.
I, new-risen, resurrected, starved from the tomb
starved from a life of devouring always myself
now here was I, new-awakened, with my hand stretching out
and touching the unknown, the real unknown, the unknown unknown.

My God, but I can only say
I touch, I feel the unknown!
I am the first comer!
Cortes, Pizarro, Columbus, Cabot, they are nothing,
nothing!
I am the first comer!
I am the discoverer!
I have found the other world!

The unknown, the unknown!
I am thrown upon the shore.
I am covering myself with the sand.
I am filling my mouth with the earth.
I am burrowing my body into the soil.
The unknown, the new world!

Lawrence defines the "real unknown" as the "unknown unknown," and characterizes this unknown as being vastly other than himself; a territory upon which he can be thrown. Donald Rumsfeld, in a February 2002 news briefing concerning weapons of mass destruction, divided the unknown in more specific terms.

"...As we know, there are known knowns; there are things we know we know. We also know there are known unknowns; that is to say we know there are some things we do not know. But there are also unknown unknowns – the ones we don't know we don't know. And if one looks throughout...history...it is the latter category that tend to be the difficult ones" (Department of Defense 2002).

Outer space, according to Rumsfeld's definition, is both a known unknown for project participants and a domain of the unknown unknown. Though humans have put great effort into better knowing the cosmos, only a few hundred human beings have first-hand empirical knowledge of the space outside of near-Earth orbit or of our Moon. Our ignorance of the solar system and interstellar space remains expansive and the data we have concerning these realms is collected through technological mediation. The mystery of the unknown of space is prevalent in the imagination of interviewees, expert and non-expert alike. Joseph (2ME), a planetary geographer, had been part of the first team of scientists in France to detect traces of an exo-

planet. Knowing he would be speaking at the *Convention nationale de la science fiction*, I arranged a brief meeting with him that took place at a picnic table on a crowded patio in the August heat. He was a pensive man who took the interview seriously and chose his words carefully. He was obviously passionate about his domain of study and, nearing the end of our interview, he explained to me that the pleasure of science was the relationship between the known and unknown. For him, this is what "*l'appel de l'espace*" ("the call of space") represents, a domain whose mystery excites the human desire for discovery.

“En fait, le scientifique il est où? Il est sur une sphère qui s’étend. À l’intérieur il y a ce qu’on connaît et qui donne sur ce qu’on connaît pas. Et...et...c’est ça qui, fin. Le scientifique, le jour où il observe une étoile ou il trouve une étoile, on voit un truc qu’on comprend pas, c’est génial. On pense toujours que le...le...le...que le frisson vient du moment où on a compris quelque chose. C’est vrai bien sûr, mais souvent ce frisson-là, il met du temps. On comprend pas quelque chose du jour au lendemain.”

“Mais vraiment le vrai frisson c’est le vertige. C’est le...l’abysse. Là on connaît, là on connaît pas. Et ça vaut toutes les années d’études qu’on peut faire avant de pouvoir goûter à ça. Et en fait, il faut ce bagage là pour goûter cet inconnu-là...Je pense que le mystère c’est ça. L’appel de l’espace c’est juste l’appel du...de ce qu’on connaît pas. De ce qu’on connaît pas” ("Joseph," 2ME) V4:2²³

Some of Joseph’s comments echoed the categorization of the unknown into different types. He talked about how sensational stories of UFOs and alien abductions (to which he ascribed no veracity) excited the desire for mystery and discovery in people without the intellectual baggage to be able to disprove these claims. This “cheap” mystery was still evidence of the thirst for the unknown, a thirst that he felt could be refined through acquiring expertise in a domain in order to better perceive what humanity knows, knows that it does know, and does not know that it does not know.

²³ "In fact, the scientist is where? He is on an expanding sphere. The interior is that which we know that extends into what we do not know. And...and...it's that, I mean. The scientist, the day he observes a star or finds a star, you see a thing you don't understand, it's great. We always think that the...the...thrill comes in the moment where you understand something. It's true, of course, but often that thrill, it takes time. We don't understand things overnight."

"But really the true thrill is the vertigo. It's the...the abyss. Here we known, there we don't know. And it's worth all the years of study that you can do to be able to taste that. And, in fact, all that baggage is necessary to be able to experience that unknown."

"I think that is what mystery is. The call to space is just the call of..of what we don't know. Of what we don't know."

As Joseph observes, whether or not humans possess empirical knowledge about space, they imagine space and project themselves into space; and have imagined their ancestors and their deities in the realms above and around the Earth for millennia. Cosmologies and world religions frequently separate the world between the terrestrial and the celestial, in which the Earth is a human-dwelling domain and the sky and/or space is a divine realm. Ancient Mesopotamians conceived of the sky as a series of domes in which the highest dome represented An, the sky god, and each of the celestial bodies represented a deity (Lambert 2016). The ancient Egyptian *Book of the Dead* describes Aaru, a heavenly paradise where Osiris reigns and where departed souls will come to reside eternally if their hearts are found to be lighter than a feather (Budge 1906). The Chinese “tian,” Christian “heaven,” Roman “elysium,” and Norse “Valhalla” are a few of the myriad of examples of human cosmologies associating the sky, the cosmos and space with the supernatural, death and the unknown.

The imagination of space is one that spreads across humanity, both geographically and temporally. Though the boundaries of science fiction are often delineated by the influence of technological and scientific advancement typically associated with the 19th and 20th centuries, the imagination of humanity in space (rather than its gods, spirits or ancestors) far precedes works of science fiction and space travel (Amis 1975; Evans 1988). Far before it was possible for these experiences to be known, humans were projecting themselves into potential realities of space travel and creating ways of knowing the unknown. The earliest recorded writings about human space travel are found in literature and poetry and are highly charged metaphorically. These works are considered proto-science fiction as they engage with themes including outer space, extra-terrestrial life and distant planets and celestial objects beyond the Earth. The first of these texts is *A True Story* or *A True History* by the Assyrian author Lucian of Samosata, in which he describes the Moon, space, aliens and extraterrestrial war. This novel, written in 2nd century BCE is often regarded as the earliest work of proto-science fiction (Fredericks 1976; Grewell 2001), though Kingsley Amis playfully argues that “the sprightliness and sophistication of *True History* make it read like a joke at the expense of nearly all early-modern science fiction, that written between, say, 1910 and 1940” (1960, 28).

Take for example the following passage, in which Lucian and the travelers are taken in their ship by a whirlwind which sends them “some three thousand furlongs into the air” from where they did not descend back to the sea, but continued through the sky until they “came in view of a great country in the air, like to a shining island, of a round proportion, gloriously glittering with light...” (Lucian 1894, 40). As they explore this new land, they discover that it is inhabited by the “Hippogypians...men riding upon monstrous [three-headed] vultures” (ibid., 41). They begin to speak with one of these men, Endymion, who explains that he is the king of the planet and that he is currently at war with the Sun.

“Then we asked of him what enemies he had, and the cause of the quarrel: and he answered, Phaethon, the king of the inhabitants of the sun (for that is also peopled as well as the Moon), hath made war against us a long time upon this occasion: I once assembled all the poor people and needy persons within my dominions, purposing to send a colony to inhabit the Morning Star, because the country was desert and had nobody dwelling in it. This Phaethon envying, crossed me in my design, and sent his Hippomyrmicks to meet with us in the midway, by whom we were surprised at that time, being not prepared for an encounter, and were forced to retire: now therefore my purpose is once again to denounce war and publish a plantation of people there.” (Lucian 1894, 42-3).

Within this brief passage, many of what will become the hallmarks of 20th century science fiction are already present: space travel, inter-planetary war and colonization of other planets. In each case, Lucian of Samosata creates analogies between terrestrial practices (e.g. wars and colonization) and the imagined practices of other worlds. The travelers fly literally in a ship with winds that fill its sails to take it to the stars. The Earth is implanted in an extra-terrestrial context and made fantastical.

Indian epics and poetry dating from as early as the 5th to 4th century BCE describe flying machines (*vimana*) able to travel both underwater and into space. These machines are found in the *Ramayana* as well as the first book of the *Rigveda* (1700-1100 BCE) where they “jump into space speedily with a craft using fire and water...” (Mukunda et al. 1974). Flying machines and extraterrestrial life also feature in Japanese fiction from the 10th century, for example in *The Tale of the Bamboo Cutter*, in which a Moon princess, Kaguya-hime, is sent to Earth to protect her

from galactic war and is raised by a bamboo cutter. Later, Kaguya-hime is repatriated to the Moon by her true family (Richardson 2001). Similarly, there are a number of stories within the *One Thousand and One Nights* (8th-10th century CE) in which space travel and alien worlds are described (e.g. “The Adventures of Bulukiya”) (Irwin 2003).

In cultural worlds closer to France, space travel and interstellar personae are rarer. Twelfth century chivalric romances are linked to proto-science fiction because of the presence of automata or robots (e.g. *Le Pèlerinage de Charlemagne*; *Eneas*; *The Roman de Troie*) (Bruce 1913), however these legends do not contain elements related to outer space. European folk tales speak of various ‘alien’ life forms, such as elves, giants and fairies, but again, these remain terrestrial.

In 17th and 18th century Europe, during the Enlightenment and “Age of Scientific Reason,” interest in technologies and exploration became widespread. This was accompanied by the appearance of narratives featuring extra-terrestrial travel, notably Johannes Kepler’s *Somnium* (1634). *Somnium* tells the story of Ludwig, an Icelandic boy and his mother, a witch, who are told of an island named “Levania” (Earth’s Moon) by a demon. The text contains detailed descriptions of the voyage to Levania, Levania’s geography and seasons and the Earth’s surface as seen from the Moon. *Somnium* is not only an imaginary story but is considered to be the first scientific treatise on lunar astronomy (Rosen 1967). For example, in Chapter Eleven “On Lunar Astronomy,” Ludwig recounts:

“Therefore, as geographers divide our sphere of the earth into five zones according to their celestial phenomena so is Levania divided into two hemispheres: one of these is the Subvolvan, the other is the Privolvan. The Subvolvans are forever blessed by the light from Volva [our Earth] which for them takes the place of our Moon. But the Privolvans are eternally deprived any sight of the Earth. The circle dividing their hemispheres, named the divisor, resembles the meridian passing through the solstices and the poles of our world.” (Somnium Project 2017).

Space was not only imagined from a scientific or speculative perspective, as in Kepler’s work, but also became a productive site for satire. Cyrano de Bergerac’s *L’Autre monde ou les états et empires de la Lune* (1656) describes voyages to both the Moon and Sun, alien beings and

fantastic machines. The distance and fantastic nature of space permit de Bergerac to position critiques about the existence of god, the crimes of humanity as well as how sex would work in a utopia (Science Fiction Encyclopedia 2019). In a similar mode, space is the site for Voltaire's critique in *Micromégas* (1752), in which he suggests that extra-terrestrial beings may be more advanced than humans.

Rich discursive traditions concerning outer space have existed across the globe for centuries, without the support of the “technoscientific context” of the late 20th century described by Valentine, Olson and Battaglia (2012, 1011) upon which European conceptions of space today seem to depend. It seems important to note that, compared to other world cultures, European traditions had fewer proto-science fiction tendencies related to outer space and space travel, and showed an imaginative interest in these topics later than some cultures (e.g. India and Japan). In all cases, it is evident that human beings can imagine experiences they have never had. In reviewing the examples from the texts cited, as well as other proto-science fiction works, it is apparent that these imaginative texts are constructed largely through analogy and metaphor between known experiences and extra-terrestrial unknowns.

4.2 Knowing the Unknown

Humans first knew outer space through observation from Earth, then through language, myths, stories and illustrations, rather than from personal experience of being in space. The scientific, sociopolitical and economic context that makes space travel possible today was not necessary to the imagination of this potential, and now emergent reality. Therefore, space is a target domain of knowledge people construct and inform largely without recourse to empirical experience (other than that of stargazing, seeing through a telescope, etc..) Conceptions of space lie at a cognitive intersection between the observation of celestial bodies and phenomena (e.g. planets, stars, comets and eclipses) and human imagination, fueled by analogy and by the capacity for linguistic displacement.

Though personal, embodied experiences of outer space may be rare, as “all human cultures have a sky” (Ruggles 2010, v) anthropology has long been interested in how human

beings understand outer space and the particularities of cultural cosmologies. Early anthropologists and sociologists such as Durkheim (1912), Evans-Pritchard (1937) and Malinowski (1925) documented human cosmologies and myths, attributing sociocultural influence to beliefs and practices related to religion, spirits, ancestors, witchcraft, healing, shamans and the like. Though these cosmologies are not always related to outer space, as discussed above, numerous cultural traditions possess rich cosmologies linking them to extra-terrestrial sites and entities.

Human relationships to, and understandings of the sky, are now the focus of two subdisciplines in anthropology: archaeoastronomy, which studies the conceptions of ancient peoples of the sky and ethnoastronomy, which studies the practices and understandings of contemporary sky watchers. Additionally, calls from anthropologists over the past sixty years (e.g. Maruyama and Harkins 1975; Finney and Jones 1985; Finney 1992; Valentine, Olson, and Battaglia 2009) have resulted in diverse studies in the anthropology of space: concerning cosmonauts' experiences in space, new technologies and companies in the space exploration industry (Valentine 2012), and simulations of human colonization on Mars (Black 2018). One of the central questions in this anthropology is how people construct knowledge about worlds beyond our own (See Vertesi 2015, concerning how we construct knowledge about distant places we have no experience of, in particular Mars, and Messeri's 2016 work with scientists documenting how they create worlds from planetary traces and other abstract data).

In her ethnography *Placing Outer Space*, Messeri (2016) observes the importance of make believe, and the language that functions to buttress this make believe, in the process of building new knowledge and practices. Metaphor is not one of her interests in particular, but she repeatedly signals the importance of analogies to experiences on this planet in order to understand potential experiences on other planets. Similarly, in his observations of the creation of scientific knowledge, Baake (2003) was keenly attuned to the way scientists describe discoveries and theories, especially through metaphors. He argues that metaphor became a central problematic in creatingXcommunicating knowledge as any metaphor a scientist uses to make sense of reality has value in bringing that "reality to light" (2003, 56).

Messeri (2016) and Baake's (2003) work, as is the case with much existing scholarship, examines how the scientific method and other scientific ways of knowing are informed and affected by other practices and phenomena, notably, metaphor. Knowing the unknown is not a clear-cut and sterile process as depicted in popular conceptions of Western science. Detailed studies document the processes scientists undertake to 'comprehend' and 'discover' and how these processes are often more about creation and invention than discovery, as all discoveries are mediated by social contexts, practices and objects. The work of Bruno Latour and Steve Woolgar (1979) on the "life of the laboratory" is an excellent illustration of the depth of influence that external factors, such as objects and our ways of using them, have upon our ways of knowing and constructing new knowledge.

Charteris-Black (2004) proposes that, in large part, this construction of knowledge (as opposed to its 'discovery') is facilitated by the "exploratory function" of metaphor (See Chapter Two, Section 2.4). This function encourages speakers to create new connections between elements, to conceive of new interactions between these elements and the results of these interactions, and to communicate about these interactions and conceptions. The conceptual shifts metaphors encourage are documented not only in scientific theories, but in all kinds of discourse. Paul Ricoeur (1978, 152) demonstrates the cognitive aspect of metaphor in what he calls "poetic" and "descriptive" language, arguing that "metaphor may be seen as a model for changing our way of looking at things, of perceiving the world." Mark Turner (1987) also argues that metaphors in literature and everyday life are products of the same cognitive mechanisms and that fundamental conceptual metaphors structure our ways of thinking and being in the world. George Lakoff (1996) explains this metaphorical structuring of experience in political discourse, positing that partisan political views in the contemporary United States can be understood through two different models of the nuclear family. He insists that this conceptual metaphor shapes not only conservative and liberal discourse, but their behaviors and worldview. Research concerning other forms of public discourse, such as immigration (Santa Ana 1999) and war reporting (Sandikcioglu 2000) demonstrates that metaphors shape "prosaic" or "common-sense thinking" (Santa Ana 1999, 194) so much so, that Fairclough (1989) argues metaphors can be instruments of social control. Johnson's (2005, 69) critical metaphor analysis of the rhetoric used

in media concerning Proposition 203 (“English for the Children”) in Arizona is one example of “the analytical power of critical discourse analysis by illustrating how language is utilised as a tool for political ends.” He argues that framing the debate about English instruction for minority language students as “War” and the students as “Victims” in metaphors used in media rhetoric influenced the voting population by constructing “a cognitive framework of social knowledge and worldview” (Johnson 2005, 71). Johnson’s research echoes the findings of Santa Ana (2002, cited in Johnson 2005, 71) that “when implemented strategically within the media, rhetoric imbued with negative metaphors can drastically sway public opinion.”

These studies demonstrate the myriad ways in which metaphorically framing a question, problem, theory or emotion is an effective tool for creating new associations or relationships and for bringing novel information and sensorimotor input to a human scale of comprehension. Whether it be understanding death (Turner 1987) or international relations (Chilton and Ilyin 1993), metaphor and analogy can take large, unwieldy and/or abstract domains of knowledge and re-package them in familiar forms and categories. We pick out salient elements of a stimulus and categorize them according to our previous knowledge, removing, either momentarily or permanently, elements that do not conform to our existing models.

Knowing the unknown then, is often more about creating that unknown, or shaping it into a “human-like” thing (Nietzsche, cited in Crawford 2011, 122); a thing on a human scale that we can perceive and act upon. One aspect of this process that is dependent upon language and symbolic systems is categorizing a phenomenon into a narrative frame through which to understand it. These narrative frames, or “cultural scripts” (Appiah 1994) frame experience within groups and permit individuals to understand their activity and the behavior of others. These scripts are informed by the beliefs, ideologies and contexts in which they function. For example, a cultural script of marriageability and womanhood for South Asian women in the Canadian diaspora (Mehrotra 2016) may differ greatly from the conceptions of marriageability and its perceived importance in another social group.

In the case of human space exploration, people mobilize a number of cultural scripts. These cultural scripts are important points of analysis in my study as often they are constructed from conceptual metaphors or invite the creation of metaphors. A strong example of this, that I

will discuss further in Chapter Five, is the script of human expansion associated with the conception of the American “Wild West.” The narrative of the expansion of the American frontier is prevalent in broader social discourse concerning space as well as peoples’ conceptions in this study. Equally present is an analogy between space exploration and the narrative of the European exploration and colonization of the “New World.” These cultural scripts with which interviewees understand past and present events are used to create metaphors with which to understand potential events, i.e. human expansion into space.

In addition to narratives of exploration and expansion, many people constructed their imagination of space according to cultural scripts of utopia or dystopia, predominantly the latter. When they imagined humanity beyond the Earth, interviewees talked about eugenics, transhumanism, the rise of artificial intelligence and violent contact with an extra-terrestrial Other. Several participants possessed utopian visions of humanity in space (especially those expert participants who write science fiction, for example Adèle and Margot), including the curing of diseases, the discovery of peaceful, intelligent life and the extension of human longevity. However, dystopian visions largely outnumbered utopias in participant discourse (with four utopias against thirty-six dystopias).

I would propose, as do other scholars such as Rabkin (2016), that utopias and dystopias form a chiasmus of mutual interaction. Often utopian societies are portrayed in fiction as deeply problematic (e.g. as being societies under totalitarian control or where social and cultural homogeneity is required). For example, this theme is found in Arthur C. Clarke’s *Childhood’s End*, in which he recounts an alien race that descends upon Earth and establishes a utopian society amongst humans. In the novel, this perfection causes an atrophy in human creativity and advancement, ultimately leading to a static, dystopian society.

Utopias in which control and planning are central to the achievement of social perfection have become less prevalent, particularly following the Russian Revolution and the Stalinist purges; a vision of a perfect, egalitarian human society that ended in the violent deaths of over 20 million people. Time and again it seems that human utopias cannot disconnect from dystopia, the dreamsXnightmares of utopiaXdystopia seem inextricably linked. Because of historical

precedents, utopian projects are now viewed warily and this genre of fiction has fallen out of fashion.

Yet, the idea of social, or human perfection, did not disappear with utopian fiction, but rather is now manifested in science fiction. In science fiction, the accomplishment of this perfection is displaced from imperfect human control to the perfection of science and technology. Especially in the texts produced during the “Golden Age” of science fiction in the United States, scientific and technological advancement are depicted as a panacea for human and terrestrial woes. Many people I spoke with, both in my corpus and in general, expressed the same conviction. Medical advancements, new sources of energy, new ways to exploit existing sources of energy, transhumanist projects for the ‘augmentation’ of the human body and projections for controlling terrestrial and extra-terrestrial climates are all based upon a utopian vision of scientific advancement.

These desires for a better world and improved human condition are tightly bound into discourse (whether for or against) concerning human space exploration. In my data, interviewees’ prime concern is for Earth’s future, and for humanity’s dependency upon Earth. When people talked about humanity in space, they rarely described potential human utopias. On the other hand, they often proposed that mounting large-scale projects for space colonization could have utopian effects on the Earth. Many people perceived human space exploration as a project that could unite humanity or provide humanity with an opportunity to gain a greater perspective about its place within the universe (on this “brilliant blue ball,” as Christian, a 2ME, affectionately described the Earth). The unknown target domain of space did not cause participants to project potential human perfection into the reaches of the universe, but to search for its realization on Earth, often before judging it appropriate to traverse the cosmos.

As none of the interviewees attested to living in or having lived in a utopian society, it may seem logical that dystopian conceptions dominated their discourse. Though none of the participants claimed contemporary France was a dystopia, their imagination of the target domain of space was fed by terrestrial human experiences and history. Of the thirty-six dystopian visions produced by participants, the majority were constructed by extending conceptions of destructive historical events or human behaviors on Earth into space. Though people sometimes spoke of

their fears of being alone or dying in space, their fears concentrated on the dangers of humanity more than of space. A frequent manifestation of this was in how they expressed fears of repeating history, notably war, exploitation and violence. Éric, a former French soldier who served seven years in the army, put it in the following way:

“À quoi ça sert d’aller faire [la guerre] plus loin pour étendre des territoires et dire ‘Voilà, on a conquis Mars, on a conquis Neptune, on a conquis Jupiter et maintenant c’est à nous.’ Ouais, je ne sais pas. Je ne vois pas l’intérêt” (Éric, 2MNE). V4:3²⁴

Éric pessimistically described a repetition of human war and conquest that he understood as inevitable, if humans were to expand their civilizations. Having served on active duty in the Iraq war, and subsequently having gone through a difficult transition from military to civilian life, his imagination of human expansion and human nature was negatively (and self-reportedly) informed by conceptual frames influenced by this past experience. He was gruff, implacable, and at times aggressive. These qualities made him a solid bar manager and bouncer. One day I ran into him and his arm was scratched and scabbed up; the night before he tried to escort an overly inebriated young woman out of the bar and she had clawed and spit at him. Another day he showed up to lunch with a black eye he had little desire to explain. There was no utopia for humanity in Éric’s conceptions and little patience for fantasies of progress, whether on this world or beyond it. His only interest in space was to experience zero-gravity, a sensation he thought would be like sky diving.

Though Éric’s personal context was unique in the participant group (he was the only interviewee who had served actively in the military outside of the mandatory service required of male citizens, abolished by Chirac in 2001), many people shared his vision, saying that space is not an opportunity for human change and advancement, but another arena in which our violent nature can play out and terrestrial motivations will persist. For the majority of participants, utopian evolution and advancement are precluded by humanity itself. Many people argued that a radically changed, ‘perfect’ humanity would no longer be human at all. For them, discussing the

²⁴ “What is the point of going and making war further off so that we can expand territories and say, “There you go! We conquered Mars, we conquered Neptune, we conquered Jupiter and now it’s ours. Yeah, I don’t know. I don’t see the point.”

future of this form of no-longer-human existence in space did not respond to my questions about imagining humanity in space.

4.3 Can We Imagine the Unknown?

More crucial to many people was not whether space was a utopia or dystopia, but whether it is possible to imagine the unknown at all, even a familiar unknown. Frequently people would stop and say that they could not imagine or “project” themselves in order to respond to the questions I posed. (E.g. “*Je ne peux pas imaginer*” [“I cannot imagine”] or “*Je ne peux pas m’y projeter*” [“I cannot project myself there”]). The “distance,” “vastness,” or pure alterity of space made it “*inimaginable*” (“unimaginable”) for several interviewees and on a number of occasions people would dryly respond, “*Je ne l’imagine pas.*” (“I do not imagine it”).

A frequent contestation from interviewees was that the project questionnaire was not specific enough. To the question “How do you imagine human life beyond the Earth,” some participants retorted: “Imagine life in space how? Where? On a planet? Is it a habitable planet? Is there an atmosphere?” People often posed a number of follow-up questions to pare down the possibilities that informed their imagination; these follow-up questions seemed to suggest that participants felt further precisions were important to their imaginations. My response to these questions was typically, “However you imagine it,” which was not always met with great pleasure.

The open-endedness of the questionnaire fits into the greater problematic of the research: the lack of information available to participants with which they can imagine, understand and predict. Many people adopted a more predictive or prescriptive discourse, describing what they thought ‘would’ happen in the future or ‘would not’ be possible, or whether or not humanity ‘should’ or ‘should not’ engage in space exploration. The lack of information with which to make specific predictions seemed to be a source of frustration, with some interviewees claiming that it was senseless to even discuss these things because there are so many unknown factors.

For example, Léon, a 60 year-old male non-expert participant and a copyright attorney (who had notably worked in the domain of space law), debated with me for several minutes as to

whether or not it was possible to imagine the unknown. For him, it is impossible to imagine the unknown and, because it is impossible, it is a senseless activity. In response to the arguments of this practically minded individual²⁵, I brought up Jules Verne, as Verne is commonly recognized in France as being an innovator and visionary, and asked Léon whether he thought Verne contributed to technological advancement. Léon responded that Verne was a different case because he nourished his imaginations with existing technological realities. Verne was not imagining the unknown, but dancing on the cusp between current reality and potential (and probable) reality. Léon argued that there is a big difference between Verne's imagining of the voyage to the Moon, for example, and those of Mars One for their one-way mission to Mars. What Verne imagined was often a basic extension of extant technology and practice, whereas, Léon observed, projects such as Mars One assume a number of non-existent elements and practices, and therefore are not useful sites for imagining innovation, but simply sites of fantastic storytelling.

During our lengthy discussion, Léon brought up several important questions concerning imagination that are pertinent to my study: How much do we actually 'imagine' the unknown, and how much do we simply extend the known? Extending the known is precisely what metaphors accomplish, as, similar to Verne, metaphors bootstrap off previous experience to understand novel stimuli. What is the relationship between realities and imaginations, as in the case with Verne's practice of imagining extensions of existing technology? Is it unproductive to imagine the fantastic, or the improbable? Can this projection and displacement of human conceptions into potential future contexts be useful?

I argue that this projection and imagination of the future can be useful to both individuals and larger groups and networks to which they belong. Imagining the future, whether it be fantastic, nightmarish, practical or unfeasible, forces people to categorize these imaginings based on what they know as real and desirable and currently (or potentially) impossible or undesirable. The process of imagining human futures 1) reinforces our comprehension of reality 'as is' in the present and 2) necessitates an inquiry into how present reality could or should change. Projecting

²⁵ Funnily enough, in French an expression to describe this practicality and lack of whimsy is that a person is "*terre à terre*" ["down to Earth"].

into the unknown opens us up to new questions and considerations as well as potentially novel applications of existing knowledge. When this projection occurs in fiction, however fantastic it may be, these fictions still have the potential of expanding current knowledge, whether it be about the topic in question (i.e. space travel) or about seemingly unrelated subjects (e.g. human sociality or the ‘purpose’ of humanity).

“From imagination to reality,” roots the slogan of the British Interplanetary Society, and this goal is shared by a number of my participants, explicitly so by Margot, a young science fiction author who argued that:

“...la science fiction, la culture montre que les choses sont possibles parfois avant qu’elles arrivent dans le monde. J’espère que notamment le retour de films de science fiction qui essaient d’avoir une vraie crédibilité scientifique derrière, de livres de science fiction qui essaient de faire à nouveau rêver à l’espace, ça permettra de repousser à nouveau donc les préjugés qu’on a maintenant culturellement dans beaucoup de parties de la société contre l’exploration spatiale. Je pense que la première barrière à enlever elle est vraiment dans les esprits, avant d’être une barrière technique, avant d’être une barrière financière” (“Margot,” 1FE) V4:4²⁶

Margot argues that culture, especially cultural texts, demonstrate possibilities to people. Works of fiction can suggest potential experiences and ways of being before these experiences are possible in people’s daily lives. Not only do these texts present possibilities, Margot argues that they can function to “push back biases,” for example those against space exploration. She is convinced that texts are methods through which one can potentially access “the spirits” of individuals and remove conceptual barriers from avenues of progress, in order to subsequently change policies, investment strategies and the direction of research and scientific innovation.

Margot’s passion and positivity about space exploration is in drastic contrast to Éric’s pessimistic projection (V4:3). Margot has bathed in the ideology of knowledge as creating human progress her entire life. Both of her parents are prominent scientists who are founders and

²⁶ “Science fiction, culture demonstrate that things are possible before they come into the world. Notably, I hope that the return of science fiction movies that attempt to have a real scientific credibility, science fiction books that try to once again make people dream about space, that will permit us to once again push back against biases against space exploration that exist culturally in this moment in many parts of society. I think that the first barrier to get rid of is really in peoples’ spirits, before any technological or financial barrier.”

active teachers in a non-profit organization to enrich science education in undeveloped regions of the world. She spoke of her parents with admiration and believed in the power of their educational project, and in the power of her creative project as a science fiction author, to advance knowledge and to ‘open’ human spirits. Her past experience confirms that human benevolence can create positive change. Additionally, she has never been in a hostile, dangerous environment, a fact that came up during a discussion of her past travel. She described her conceptions of space, education and possibility as being highly informed by her past (e.g. stargazing with her father, her studies, her parents’ work). She talked about imagining potential possibilities based on possibilities she has already experienced, as Éric spoke about his imagination of impossibilities based on his own prior experience.

This connection between factXfiction and reality and between the demonstration of possibility and its eventual attainment/manifestation will be explored in the next chapter. I will analyze many of the source domains, including cultural texts and experiences, that inform participants’ imaginations and perceptions of human space exploration. I will argue, like Margot, that texts are crucial steps for integrating the unknown into present human reality. These texts are an integral part of emergent human reality and the forms that it takes. In response to the current question, concerning the usefulness of this imagination, I agree with Margot that it is not only useful, but critical to imagine, to consider (im)possibilities and to play in mental virtual realities whether or not they become manifest.

Following the interviews, people often talked about their impressions of the interview itself, making comments like “*Je n’avais jamais pensé à cela*” (“I had never thought of that”) or “*Ça m’a fait réfléchir*” (“That made me reflect/think”). Véronique confided in me that a friend who had referred her to me had warned her that the interview was “bizarre” and that I would “ask a bunch of questions about things [she] had never thought about.” Many people attested to the fact that considering the unknown caused them to “think” to “reflect” and to “consider” questions about space, Earth and humanity in novel ways.

Engagement with an unknown target domain was not a neutral experience for interviewees. Whether they found the activity ridiculous or stimulating, the questionnaire elicited emotions and judgements, concerning not only the content of the interview, but the process of

imagining the unknown itself. Part of these affective responses are provoked by experiences and people that interviewees knew exist or had existed (e.g. the astronauts who died in the Challenger explosion). However, much of this affective content is what Boruah would call “fictional emotions” based on “unasserted beliefs” or those beliefs “about actions and characters which we know do not exist” (cited in Illouz 2012, 210). Boruah argues that imagination can provoke real emotion, but he defines this as a subset of “fictional emotions,” or emotions that mimic ‘real-life’ emotions, but are triggered by that which “we know to be unreal, and even impossible” (ibid.)

Interviewees extensively analyzed their own discussion, talking about their difficulties imagining and how they felt their imaginations were informed (e.g by movies, reading science fiction, watching the Moon landing on the television). This kind of talk resonates with Illouz’s (2012, 2010) argument that “fictional emotions...constitute the building blocks for the cultural activity of imagination.” Illouz explains that people imagine and anticipate emotions and scenarios they have been exposed to in the media, one of her central reasons for establishing a definition of imagination as being an institutionalized cultural practice:

“I offer a sociological definition of imagination as an organized and institutionalized cultural practice. First, it has a social organization: for example men’s and women’s imaginations may be activated in different ways and may contain different objects... Second, it is institutionalized - it is stimulated and circulated by specific cultural genres and technologies, in print and visual forms - and pertains to institutionalized social domains, such as love, domesticity and sex. Third, it is systematic in its cultural content and has a clear cognitive form - it revolves around well-trodden narrative formula and visual clichés. Fourth, it has social effects: for example, estrangement from one’s husband or experiencing everyday life as dull. And finally it is embodied in emotional practices...Imagination is thus a social and cultural practice which constitutes a significant part of what we call subjectivity” (Illouz 2012, 209).

My interviewees’ imaginations correspond well to Illouz’s approach and they were conscious of how different genres, narratives and visual clichés influenced their imagination and judgements about the unknown of outer space. These narratives and images frequently served as the source domains for metaphors people used when describing their imaginations. Chapter Five

will explore these source domains and how they are connected to generalized cultural knowledge and existing technologies and realities as well as to people's personal and prototypical experiences. A survey of the source domains deployed in interviewees' metaphorical production permits an examination of the tools individuals use to imagine and discuss an unknown target domain of knowledge and the influences of these tools upon that imagination and subsequent knowledge. Determining the source domains active in metaphorical production also allows for a closer look at the relationship between factual and fictional domains of knowledge and imagination.

Vignette 5: “C’est un peu la question “si tu étais sur une île déserte qu’est-ce-que tu emporterais avec toi?”

(Male, non-expert, 30 years old)

I went over to Olivier’s apartment near La Chapelle to have dinner with him and his girlfriend. We sat closely around his small kitchen table in his studio apartment lined with posters and shelves, the latter packed with books, DVDs, CDs and records. All of these artefacts attest to his lifelong interest in music and film, and to his pastimes as a musician and filmmaker. From the kitchen window he had a lovely view of the Sacré Coeur and he stayed near the open window, smoking while he talked to me about space. In his typical humor, he was somewhat patronizing of much of the questionnaire and the purpose of the study in general. I have known Olivier for over a decade. He had never liked science fiction, nor Queen, nor David Bowie and when he volunteered to participate in an interview, I was curious to see what this non-fantastical, ‘realist’ and self-titled pessimist would have to say about potential human futures beyond the planet.

When the kilo question came around, he laughed and said, “C’est pas facile. C’est un peu la question ‘Si tu étais sur une île déserte qu’est-ce-que tu emporterais avec toi?’”

“Pour ne pas en revenir? À priori....ben...un téléphone...non, pas un téléphone! Non, mais je peux prendre une tablette avec plein de livres...là je peux stocker plein de musique, plein de livres, plein de photos, donc tout ça. Tout ce que je pourrais dématérialiser. Ça, ça pèse peut être 200 grammes. Là j’ai de la place. Je peux stocker tout ma mémoire. Ça fait du sens. C’est moins lourd que de prendre toutes les oeuvres en Pléiade...”

He continued with an admission of his materialism. “C’est dur parce que je suis à la fois assez matérialiste, dans le sens où j’aime bien acquérir des objets, mais je ne suis pas attaché à un objet en particulier. Tu vois j’aime les disques, les livres, tout ça, mais tout ça c’est à priori des choses que je ne pourrais pas prendre.”

“Pas facile,” he repeated and then paused. “Let me see.” Taking a long drag of his cigarette, he turned his head around the studio apartment and began looking around; literally seeing what he might want to have with him if he were to leave the planet.

“Entendu que la tablette ça peut prendre des photos aussi. Ça fait tout. C’est ça qui est bon.”

Having come to the conclusion that a tablet device would take photos, contain books, music and films and generally allow him to document what he wished and amuse himself, his reflection shifted.

“Alors je pourrais prendre un bout de la Terre. Quelque chose comme un beau caillou, un truc minéral qui me rappelle là d’où je viens. Un bout de la Saintonge, je ne sais pas. Une coquille d’huitre.”

Putting out his cigarette, he said, almost to himself, “Est-ce que je prendrais un paquet de clopes pour des moments difficiles? Il y aura vingt moments dans ma vie où je me dirais ‘j’ai besoin d’une cigarette.’”

After his brief aside concerning his cigarettes, a dilemma he left unresolved, he went back to talking about the Saintonge, his past and his family.

“Je pourrais prendre ma médaille que j’ai eue pour mon baptême. Quand même. Oui, parce qu’on est baptisé quand on est enfant et on a une petite médaille avec la vierge. Moi en tout cas c’était une petite médaille en or avec la vierge. Donc ça, je l’ai pas sur moi, je la porte pas, mais elle est à Royan dans un petit coffre. Je la garde. J’ai pas beaucoup de bijoux ni rien, mais ça, ça me rappelle ma famille, c’est quelque chose qui m’a été transmis, un baptême, quelque chose de spirituel. Voilà. Je ne sais pas si on a atteint un kilo.”

Then his spiky personality resurfaced quickly and he gave a wolfish grin to his girlfriend,

“Mais je ferais, par défi je ne prendrais que 800 grammes. Je dirais, les 200 grammes qui en restent je m’en fous. Je les donne à mon voisin.”

Chapter 5: Primary Source Domains in the Data

“Whether you can observe a thing or not depends on the theory that you use.
It is the theory which decides what can be observed.”
Albert Einstein (1926, quoted in Salam 2005, 99)

5.1 Source Domains in the Present Study

In the previous chapter, I defined and discussed the target domain of knowledge elicited by the research interviews: human existence in outer space. In this chapter, I will discuss the role of source domains of knowledge in this study, the kinds of knowledge and experience that inform these domains, and potential implications of the presence of these domains in the corpus. Source domains are in many ways the theories that people deploy through metaphor to observe and understand their observations in the world. As Einstein reminds us in the quote above, what is observable at all is highly dependent on the theory one uses when observing. How we frame or categorize stimuli does much to determine how we perceive those stimuli, whether they be everyday emotions, or the workings of the universe.

Source domains are key in my study, as they represent the experimental element, the (potentially) variable factor. People’s responses made use of different kinds of metaphors that described the same target domain through the intermediary of different experiences and kinds of knowledge. My analysis targets these source domains and how they inform people’s imagination and ways of speaking about their imagination.

In metaphor theory, source domains of knowledge issue from embodied experience or generalized cultural knowledge. For example, immediately following my discussion with Olivier in the previous vignette, I then asked him what he felt when he imagined a person beyond the Earth. He responded, “*Une angoisse...l’angoisse un peu du créateur devant la page blanche; ou la toile blanche. Qu’est-ce qu’il va pouvoir sortir de l’inconnu?*” (“Worried...a bit the worry of a creator before a blank page or a blank canvas. What will he be able to bring out from the unknown?”) In this metaphor, Olivier uses the source domain of an artist in front of a blank canvas to create a culturally motivated metaphor describing the feelings he experiences when

thinking about the target domain of a human being beyond the Earth. He knows well that space travelers typically do not have canvases. His metaphor relies on salient qualities of stress and worry when one is faced with the unknown. In Olivier's discussion, humans beyond the Earth (and artists) are expected to produce, not to simply witness. As a song and screenwriter, Olivier has experiences with blank slates of creation and compares the unknown of space to his experiences with other abstract realms, such as that of artistic creation.

However, as we kept talking, Olivier became dissatisfied with his own metaphor. With no prompting from me, he began to unpack the elements in his comparison that did not match up between the source domain of the blank page and the target domain of space. "*Mais en même temps, bon, je ne sais pas si c'est une bonne comparaison. Parce qu'une page blanche ou une toile blanche, on sait bien délimiter. On connaît l'espace. Tandis que l'espace il est infini par définition*" ("But at the same time, well, I don't know if it's a good comparison. Because we know how to delimit a blank page or canvas. We know space. By definition space is infinite"). His parallel between the stress and worry of blank space in the creative process and 'blank' space in space was insufficient as he considered the finitude of human artistic space and the infiniteness he imagined in space.

Our discussion of this metaphor went one step further as he finally decided to abandon it. He argued that he was tempted to respond to all of my questions that he 'couldn't answer,' because he had not been "*confronté à la chose elle-même*" ("confronted by the thing itself"). He explained:

"Donc oui ça fait appel à l'imagination mais je ne sais pas si cette imagination, elle est...mais oui, en même temps c'est ça que tu recherches...tu recherches pas la vérité. Non, non, mais bien sûr tu recherches pas la vérité. Tu t'en fiches. C'est le langage et l'imaginaire²⁷. Je peux pas là...en général, en fait, on imagine toujours par rapport à la

²⁷ I found this an interesting declaration of Olivier's linguistic ideology and epistemological ideology in general, in which inquiries into language and imagination did not reflect or produce any 'truth' as opposed to other forms of inquiry.

vie réelle. Dans mes rêves c'est toujours assez réaliste" (Olivier, 1MNE)
V5:1²⁸

Olivier seems to have a problem with whether or not the imagination he has of space (and his ways of describing it by comparing it to his own experience) are true. He argues that we always imagine in relation to what we know of reality, and he claims that he is not entirely comfortable imagining things so distant from his experience. My interlocutors sometimes described the challenge of imagining the "*inimaginable*²⁹." Despite this fact, like Olivier, people often mobilized previous embodied experiences (e.g. with travel, tight spaces and containers) as well as cultural texts (e.g. television programs or historical events) to categorize unknown experiences in outer space. It is these source domains that structure their ways of understanding the target domain of space. In the following chapter, I will briefly comment on source domains issuing from both embodied experience and cultural knowledge and analyze a number of entailments of each.

5.2.1 Source Domains in Science Fiction and Space Sciences

To begin, I will discuss source domains people deployed that issue from science fiction and space sciences. The influence of the former largely dominates the latter, with interviewees citing literature, films and television on average five times more frequently than scientific or

²⁸ "So yeah, that makes me imagine, but I don't know if that imagination...is it...but, yes, at the same time that's not what you're looking for. No, no, of course you are not looking for the truth. You don't care. It's language and imagination. I can't...in general, actually, we always imagine according to real life. My dreams are always pretty realistic."

²⁹ "Cent ans c'est immensément long. Imagine il y a cent ans. 1916. C'était la guerre. Même si tu veux prendre 1913, c'est juste un autre monde. Imagine-toi en 1913, c'est pas facile. Et penser le monde en 2016, genre pose un téléphone portable, pose même ça sur la table" [He gestures to my handheld Sony recorder on the table between us]. Ben, ils comprennent pas. Ils ont des enregistrements, des phonographes. Ils te disent, 'Oui, oui je comprends.' Mais il y a des piles! Des petites piles comme ça, ah ben nous... **Donc c'est juste inimaginable. Inimaginable**" ("Christian," 2ME)

("A hundred years is immensely long. Imagine a hundred years ago. 1916. It was the war. Even if you want to take 1913, it's just another world. Imagine yourself in 1913, it's not easy. And to think about the world in 2016, like put a cell phone, even put that on the table" [He gestures towards my handheld Sony recorder]. "Well, they don't understand. They have recordings, phonographs. They tell you, 'yeah, yeah, I understand.' But there are batteries! Little batteries like that, ah, well, we...So it's just unimaginable. Unimaginable.")

historical texts. After a survey of the prevalent cultural texts informing these source domains I will briefly discuss the relation between these two ‘genres’ of knowledge, fact and fiction.

The corpus contains 32 references to science “facts” or events and 152 references to fictive texts (films, books, authors, science fiction culture, visual art). The vast majority of science “facts” cited by participants were in reference to Thomas Pesquet, a French astronaut who was active on social media during his stay at the International Space Station. Pesquet was most discussed by participants in response to the ninth question “What do you feel when you imagine a person living in space?” Though participants talked about his isolation, his distance from loved ones and his home, the most frequent sentiments associated with his stay at the ISS were pride, admiration and respect. These emotions can be linked to secular French values, and Enlightenment principles, that attribute value and importance to science and ‘advancing’ knowledge. Among the possibilities people have for “interpreting, representing and making sense,” the “emotional subject” who trusted, respected and valued scientists and astronauts materialized across the interviews (Wetherell 2012, 14). People described their pride in Pesquet as not issuing from a desire to forward French military or political agendas, but as a way of advancing science and humanity. Many people talked about Pesquet’s impressive qualifications, his years of study and intensive training and his passion for his work in outer space. He was perceived as having a privileged place in science and society, both because of his ‘natural’ qualities (e.g. intelligence, bravery) and his achieved status within the French scientific community. Despite the difficulty and risks of the mission, overall people positively judged and supported Pesquet and his work. Whereas participants like Jules and his wife talked about missions to Mars as “collective suicide,” they praised Pesquet’s exploits. Take, for example, the following quote from Bernard, a 65+ year-old male (he did not want to provide any further detail on his age³⁰), a non-expert participant with an advanced degree in the social sciences:

“Là, en l’occurrence, une certaine admiration pour le chemin parcouru, pour pouvoir faire ce qu’il fait c’est...en l’occurrence dans son cas particulier à lui [Thomas

³⁰ “Je ne donne pas mon âge.” (“I will not say my age”)

“Ce n’est pas grave. Tu peux donner une tranche d’âge?” (“No problem. Can you give your age group?”)

“Ma tranche d’âge c’est 65+” (“My age group is over 65.”)

Pesquet] bon, j'ai plus les détails en tête, mais c'est un parcours particulièrement talentueux. Donc beaucoup de respect, d'admiration. Je pense qu'il y a du courage. Parce qu'il faut prendre le risque. Les risques qui sont énormes en fait, non seulement sur le voyage aller-retour, mais pendant toute la période... Donc admiration, je pense qu'il y a du courage. Il y a une énorme prise de risque, donc on a envie de dire chapeau." ("Bernard," 3MNE) V5:2³¹

References to Pesquet outnumbered those to other astronauts, past or present, including Neil Armstrong and the Apollo missions. As may be expected, references and analogies to the Apollo missions were more frequently produced by people 60+ years old. Seven participants discussed Neil Armstrong and the Moon missions in detail and created analogies between their imaginations of these missions and future human exploration in space: Jules a 71 year-old male expert; male experts Simon (47 years old) and Christian (51 years old); Marie, a 52 year-old female expert; two male non-experts Bernard (above) and François (70 years old); and Lucas, a 51 year-old male non-expert. Jules, Bernard, François and Adèle (all aged 60+) recounted their experiences watching Armstrong walk on the Moon on television.

For several people, the source domain of the Apollo missions was such a self-evident source domain that it was understood as *being* the target domain. François, a 71 year-old male non-expert and retired librarian, insisted that future space travel would be "just like with the Moon!" I met François ten years ago at a Monoprix while picking up cans of tuna I had dropped onto the linoleum floor. He was a well-educated man from a well-educated family and had worked for years at the prestigious Collège de France. Throughout my university studies he sporadically read and commented my work, always quick to point out its weaknesses. He is quite a character, with big, almost wild eyes that dart back and forth behind round, black-rimmed glasses. I know him to be an intensely emotional person laced into a rigid Parisien intellectual frame. For our interview, he had chosen the rooftop patio of the Printemps department store, a

³¹ "As it is, a certain admiration for the path he has taken, to be able to do what he does it's...actually in his particular case, well, I no longer have the details in mind, but he has a particularly talented background. So, a lot of respect, admiration. I think that he has courage. Because you have to take the risk. The risks are enormous, in fact, not only on the round trip, but during the whole period...So, admiration, I think that he is courageous. There is an enormous risk to take, so you want to say, 'Hats off!'"

perch from which he assured me we would have a great view of downtown and of “*les longues cuisses*” (“the long thighs”) of passing young women in their summer attire.

He found many of my questions dubious. When I asked him how he imagined future space exploration, he gave a classic “*bof*” with lip rattle, followed by a “*ben*,” evidence he found the topic self-evident and my question uninteresting.

François: Ben, comme l’expédition dans la Lune. C’est à dire, il y a des grosses caisses, des trucs, et des machins, on se pose sur Mars, on a emporté, on a tout emporté, le Quaker Oats, l’eau, le beaujolais...

PI: *rire* Le beaujolais? Et le Quaker Oats? Que ce qui est absolument nécessaire.

François: *rire* Absolument. On a emporté tout ça. On a emporté de l’air aussi dans des bouteilles, comme ils ont fait sur la Lune, mais en plus grand. Parce qu’il faut que...c’est beaucoup plus loin comme voyage, mais le principe est quand même le même.

Ils vont faire comme sur la Lune. Ça ne peut pas être différent. Si tu raisones sainement, ça ne peut pas être différent. Simplement c’est plus loin, donc on met beaucoup plus de temps à y aller... Cette histoire est pré-pensée du fait qu’on a fait l’expérience en 1969, toi, t’étais pas née. On a fait l’expérience sur la Lune, donc on sait ce qui se passera” (“François,” 3MNE). V5:3³²

For François the 1969 Moon mission operates as a prototype for human space exploration. In his discussion of what future exploratory missions would be like, he developed a direct analogy between the Moon and a potential mission to Mars. Rather than talking about Mars, he described the Moon mission and explained that a future mission would be identical, only on a larger scale. He specifically says that if one “reasons sanely” the Apollo model is the only possible model for future exploration.

³² François: “Well, like the expedition to the Moon. I mean there will be huge crates, stuff, things, we’ll land on Mars, we have brought, we brought everything, Quaker Oats, water, wine....”

PI: “*laugh* Wine? Quaker Oats? Only that which is absolutely necessary.”

François: *laugh* Absolutely. We brought all that. We brought air too, in bottle, like they did on the Moon, but on a bigger scale. Because it’s essential that...it’s a lot longer trip, but the principle remains the same.

They will do like they did on the Moon. It cannot be different. If you reason sanely, it cannot be different. It’s simply further, so it will take a lot longer to get there... This thing is already thought out because we did the experience in 1969, you, you weren’t born. We did the test on the Moon, so we know what will happen.”

While this Apollo analogy is useful in a number of ways when imagining future human space exploration, it precludes a number of possibilities, dangers and differences between brief, crewed missions to a proximal celestial body, and other forms of human space travel. For François, Apollo was not only a prototype in his generalized cultural knowledge, but a prototype in his personal, lived experience. He witnessed the Moon landing on television and possessed evidence gained through embodied experience with which to construct his conception. As an adult he has witnessed subsequent human spaceflight and exploration, including the Challenger explosion, the Space Race and Thomas Pesquet's visit to the ISS. Even among these more recent experiences and discourses concerning spaceflight, his argument for the Apollo model, the prototype for human spaceflight, persisted.

The Apollo conception places emphasis on human spaceflight as a method of transportation between celestial bodies and on human contact with *something in space* rather than simply floating in space itself. This conception operates within the assumption that knowledge is connected to physical experience with a territory, with punctual exploration of a place rather than extended experience within a space. Many vestiges of the Apollo vision - existence in space as being extremely confined, the intention to repatriate astronauts safely 'home,' or the astronaut as 'cowboy,' 'adventurer' or 'explorer' - continue to cling to generalized conceptions of spaceflight and human existence in space, not surprisingly, particularly among those who have personal experiences observing the denouement of the Apollo program.

The Apollocentric conception of human spaceflight, and the analogies produced using this conception, often do not take into account the fact that there are currently, at all times, human beings living outside of the Earth "in space." Though the International Space Station (ISS) is a static entity that does not explore other celestial bodies by physically engaging them, it remains a central achievement in the history of human spaceflight and provides a recent parallel through which to create analogies to understand future human spaceflight than the Apollo program. The ISS provides a model in which human beings spend increasingly long periods of time away from 'home' (though their eventual return is always intended) and in which individuals in space are not only 'cowboy' test pilots, but researchers from a variety of fields.

The International Space Station and astronauts involved with the station were mentioned by nine interviewees. This may not reflect a high rate of interest in the ISS, but, as I do not reference the ISS in the questionnaire, this result is not necessarily indicative of overall participant interest. In addition to Pesquet, the retired Canadian astronaut Chris Hadfield was referenced by two participants (Marie, 2FE and Charlotte, 1FNE), who also discussed Pesquet. Similar to Pesquet, Hadfield was active on social media during his time at the ISS in 2012-2013, ending his stay on the station by singing “Space Oddity” while floating in zero-g in the space capsule as a tribute to David Bowie. This particular video was mentioned by both Charlotte and Marie, the latter began to tear up telling me about it.

“Tiens c’est marrant je pense aussi à un astronaute canadien avec des grosses moustaches qui a chanté une chanson de David Bowie dans sa capsule” (“Charlotte” 1FNE) V5:4³³.

“Et quand, comment il s’appelle cet astronaute canadien...? Quand il a enregistré “Space...renregistré “Space Oddity.” Bon, tu vois, celui-là, quand j’ai vu la photo, mais je me suis mise à pleurer, parce que pour moi c’était le rêve de l’espace là, tu vois? Le mec avec sa guitare en train de chanter “Space Oddity” dans la Station Spatiale. *ah* C’était extraordinaire” (“Marie,” 2FE) V5:5³⁴.

The video of Hadfield singing “Space Oddity” encapsulates the “dream of space” for Marie. As “the most media savvy astronaut to leave the Earth,” with over 2,170,000 Twitter followers (Kantrowitz 2013), Hadfield’s feed from space not only piqued the interest of die-hard space advocates like Marie, but millions of others. Marie told me seeing the “Space Oddity” video brought her to tears, as did discussing it four years later. She was not the only participant to discuss the “dream of” or the “call to” space (see discussions from Margot and Joseph). This formulation was also present in popular media publications during my fieldwork, such as Dominique Gallois’ June 2017 article “*L’espace fait à nouveau rêver.*” Jacques Villain (2019),

³³ “It’s funny I also think about that Canadian astronaut with the big mustache who sang a David Bowie song in his capsule.”

³⁴ “And when, what’s that Canadian astronaut’s name? When he recorded ‘Space...’ re-recorded ‘Space Oddity.’ Well, you see, that, when I saw the picture, I started to cry, because for me that was the dream of space, you see? The guy with his guitar singing ‘Space Oddity’ in the Space Station. *ah* It was extraordinary.”

member of *l'Académie de l'air et de l'espace* and the International Academy of Astronautics, as well as former president of the *Institut français d'histoire de l'espace*, describes the “*rêve de l'espace*” as “*un rêve millénaire*” in his entry “*Espace (Conquête de L')*” in the *Encyclopædia Universalis*. Villain argues that the “dream of space” has been part of the human imaginary since around the 2nd century C.E. and cites many of the same authors discussed in Chapter Four (e.g. Lucian de Samothrace, Cyrano de Bergerac and Jules Verne). Though dreams of space and space travel have populated the human imaginary for centuries, the “dream of space” that Marie and others describe, is nourished by the technological, scientific and cultural context of France in the early 21st century.

Gallois' (2017) article links cultural texts, particularly the release of Luc Besson's (2017) science fiction film *Valérian et la Cité des milles planètes*, and current events in the aerospace industry to a renewed public interest in France in space and human projects beyond the Earth. The “dream of space” is contingent on the dreamers, and their positioning - in time, geography, socioeconomic status, etc. In fact, people I spoke with did not homogeneously ascribe to the “dream of space” - many considered space a dystopian realm. People who talked to me about the dream of space were well-educated, middle class and more or less well-connected to “expert systems³⁵” of knowledge (Giddens 1991, 12). Marie, Joseph and Margot were all expert participants (two science fiction authors and a planetary geologist). Though Giddens (1991, 12) explains that expert systems are not “confined to areas of technological expertise,” there was a clear link in my data between expert participants and a trust in expert knowledge. The people who talked about the “dream of space” and subscribed to it, also subscribed to the greater ideology of science and technological innovation as being sites of human progress and advancement.

No matter how participants felt about human spaceflight, exploration and space programs in general (as many participants expressed distaste for these programs or considered them a ‘waste’ of resources and energy), on the individual level people often expressed positive opinions about astronauts themselves, though they remained largely ambivalent about projects such as the

³⁵ “Expert systems bracket time and space through deploying modes of technical knowledge which have validity independent of the practitioners and clients who make use of them.”

ISS and their usefulness. The desirability of these projects was also informed by people's ideas about the well-being of the Earth and immediate problems on this planet. A conception of space as "distant," "separate," and "away" from participants - a conception reinforced by both the Apollo and ISS models - seems to reinforce participants' convictions that human space exploration is unnecessary, superfluous or a (dangerous) waste of time and resources.

Contemporary scientific representations of space and humanity in space, with some exceptions, largely reinforce conceptions of space as distant and challenging for human life. These representations, especially portraits of space (or 'spacescapes'), also emphasize the vastness, beauty and mystery of the realms beyond the Earth. NASA and ESA's websites contain a wide range of easily accessible information to the public, complete with breathtaking full-color photos of nebulae, supernovae, planets, their moons and, of course, our own Earth as photographed from 'above.' Though people occasionally referenced these kinds of images and descriptions, predominantly the influence of scientific 'fact' and representation of space that affected their discourse came from discourse and representations of other humans who had been to space.

The trend of projecting oneself into space through the embodied experiences of other human beings is also found in the references people made to science fiction. When participants referenced science fiction, it was almost always in reference to imaginations of human beings in space. Rarely did a participant talk about an image or an aspect of space featured in science fiction without relating it to human experience. For example, a few participants cited the extreme exoplanet landscapes (void of structures and inhabitants) shown in the film *Interstellar*, but this kind of discussion of space landscapes or phenomena in general was rare.

The majority of my research participants were not science fiction fans. Nonetheless, as I intended when designing the study, they all had a non-negligible exposure to the science factXfiction of space exploration. Though several of them had to wrack their brains a bit, everyone in the study was able to reference a work of science fiction, whether it was Jules Verne or the latest blockbuster alien film. Out of forty people, fifteen were self-proclaimed fans of science fiction, ten of these being the expert participants.

Films were the most frequently cited medium in science fiction, followed by television, novels, and comic books. The most cited films in the interviews were *Star Wars* (10 times), *2001: A Space Odyssey* (7 times), *Alien* (6 times), *E.T.* and *Interstellar* (5 times each), and *Close Encounters of the Third Kind*, *The Martian* and *Gravity* (4 times each). The most cited television shows were *Star Trek TOS* (4 times) and *The Twilight Zone* and *Battlestar Gallactica* (2 times each). *The Expanse*, *Stargate* and *Fringe* were also mentioned (each by a separate participant). Both *Star Trek TOS* (1966-1969) and *The Twilight Zone* (1959-1964) were television programs popular in the 1960s and three of the four mentions were from interviewees over the age of 50. The fourth mention of *Star Trek TOS*, from Charlotte (1FNE), was in reference to general pop culture concerning space, as she did not like science fiction and was trying to recall science fiction with which she may be vaguely familiar.

Literature and comic books were the third and fourth most cited intertextual sources of imagination, with Jules Verne (5 times) being the most referenced. After Verne, participants cited the authors Isaac Asimov (2 times), Robert Heinlein (2 times) and Ray Bradbury (2 times, both in reference to *The Martian Chronicles*). *Frankenstein* was also cited twice in the corpus and was one of four science fiction texts cited that was not related to space (*Les Fourmis*, Francis Weber and *Animal Farm*, George Orwell). One participant also talked about *The Strange Case of Dr. Jekyll and Mr. Hyde*, by Robert Louis Stevenson. Though there are some proponents for the categorization of *Jekyll and Hyde* within the science fiction genre, typically it is considered a horror, gothic, or mystery novel.

Two participants cited adventure novels: *Treasure Island* by Daniel Defoe and *Robinson Crusoe* by Robert Louis Stevenson. Though neither of the novels is related to space, these adventure narratives provided frames with which to imagine human exploration and colonization in space, particularly that of single individuals. Rather than using these adventure narratives to create analogies with astronauts, both interviewees who cite these novels created analogies between the protagonists and themselves in space. For example, Jean (1MNE), a non-fiction editor and avid reader, talked about Robinson Crusoe's perseverance, inventiveness and his isolation from his home and other humans. He then mapped these characteristics onto the experience of being alone in space. The characteristics that helped Robinson Crusoe survive in

Stevenson's novel were extended to the space traveler and the kinds of characteristics that such a person would need to possess. Jean created direct parallels between the desert island narrative and that of being isolated in a space capsule³⁶.

It is worthwhile to note that people linked space exploration to canonical texts in Western and primarily European literature from the 19th and 20th centuries. Aside from the references to Robert Heinlein, all of the texts people talked about are literary 'classics.' Jules Verne was the only French author to be cited widely, while the other authors are British and American. It seems that these canonical texts operate as narrative prototypes and/or assumed to be a common conversational ground. The models and imaginations of space in classics, like Verne, continue to operate as the exemplars (or "best-match" examples Rosch 1973) of their genre and of general imagination about space in my participant pool. Never in human history has access to information about life and living conditions in space been more proliferate, nor easily accessible. Anyone with internet access and a computer can watch live streams from the ISS with complete audio and video of the daily activities of astronauts on the station. Though these representations of the reality of space far outnumber canonical science fiction novels, the prototypical images and scenarios generated by these novels continued to have a significant influence on what my interviewees thought about space. This is a testament to the power of past patterns and models in the way people think, even when more recent and (insofar as we know) accurate information is available. Models from centuries ago continue affecting people's reasoning and the way these people engage with the world.

Though only a minority of interviewees used these literary models when talking about space, the vast majority of interviewees cited literature as something they would take with them in their kilo if they went to space³⁷. A number of people said they would bring hard drives with large libraries of texts. While others talked about specific books that they would want to have

³⁶ In fact a number of people created this parallel explicitly, as Olivier did, when reflecting on the "What would you take to space in your 1 kilogram of personal effects?" Several responded, "This is the same [question] as what would I take to a desert island, isn't it?"

³⁷ Question #7: Actuellement, les astronautes sur la Station Spatiale Internationale ont droit à 1 kilo d'effets personnels. Qu'est-ce que vous apporteriez avec vous si vous partiez aujourd'hui ?

Currently, the astronauts on the International Space Station are permitted to bring 1 kilogram of personal effects. What would you bring with you if you left today?

with them if they were leaving the Earth forever. Some of these texts, such as adventure and maritime novels provide a basis for analogies between past human exploration and the imagined experience of exploring space. The vast majority of these books, however, had no explicit connection to space or exploration, but rather, people described them as being personally formative or beloved. Madeleine, a 28-year-old FNE told me she wanted to bring any book by Bertrand Russell as he always ‘gets her mind going.’ Jean (1MNE) insisted on bringing a paper book but was torn between a canonical spiritual text like the Bible and a classic work of fiction like *Moby Dick*. For interviewees, literature was both a way for them to project into the future, by understanding it through previous narratives and logics and to preserve the past and keep it near to them. This is compelling evidence of the importance of human culture and cultural transmission and the human need for sociability. In the absence of other people, almost everyone desired to attenuate their isolation in space by bringing traces of human conversation, language and experience in the form of stories in literature, music and film.

While analyzing this aspect of the data set, it also occurred to me (and to friends and colleagues with whom I discussed my project) that there seemed to be something particularly French about the fact that twenty-five interviewees spoke immediately about bringing books with them. Books were not an afterthought, but their first instinct. Books were cited by nine non-expert men and nine non-expert women, with slightly more women aged 60+ citing books than their male counterparts. The remaining seven people to talk about bringing books to space were expert participants; four men and three women. These numbers show that expert participants are more likely to cite literature, particularly the authors (whereas the illustrator I spoke with did not mention books, but insisted on pens and paper).

It could be argued that humans on long journeys would universally attempt to find ways to pass the time. It may also be important to take into account that the digitalization of media such as books allows people to take a maximum quantity of entertainment in a minimal amount of space. These are valid reasons for bringing books to space that could apply to any person, but it would be interesting to pose this question to other populations, to whom literature may not be as important of a symbol of culture and education. I think the people I interviewed for this study, predominantly educated and middle class, said they would bring books not only because as a

pastime, but also because they perceive reading as being highly valued in French culture. Some participants had very specific ideas of what books they would want with them. However, for many, the general idea of having books around was simply self-evident. Instead of responding with specific authors or titles, many people simply said they would bring “*de quoi lire*” or “*de la lecture*” (“something to read”), “*quelques grands bouquins*” (“a few big books”), or “*une tablette plein de livres*” (“a tablet device full of books”). Édouard, a 69 year-old retired film professor summed it up saying, “*Musique, films, littérature*” (“music, movies, literature”). Obviously, having devoted his professional life to films, taking movies with him would be important to Édouard, a decision influenced by his personal, embodied experiences in the world. However, it is only possible for Édouard to be a film professor because he lives in a culture where cinema possesses a strong cultural legitimacy (“*le septième art*,” “the seventh art form”). Édouard’s comment about music, films and literature highlights the major, portable forms of high culture in France. The French cultural subject, especially in the well-educated middle and upper classes, is socialized in an environment where literature and the ‘arts’ (as they are commonly recognized in Western Europe, e.g. prototypical art forms being more associated with performing arts, like theatre, than crafting arts, such as weaving) are important and familiarity with them is an essential form cultural capital (Bourdieu and Passeron 1990). It is interesting to note that one of the few participants to not mention books (but who did mention music) was Éric, who works in the service industry. There was a spectrum of ‘book responses’ where some people insisted on bringing a specific book and others just cited “books” as generally important to have in the context in question. I think the responses of the latter are, in part, affected by interviewees’ conceptions of books as a general pastime, and as a marker of social knowledge and participation within certain communities (be they artistic, academic, etc.). In some cases, talking about bringing books to a researcher may be a more socially appropriate response to present oneself as cultured, than responding that you would bring beauty products, your teddy bear or taboo items such as pornography. I will explore this issue of the “presentation of self” (Goffman 1956) further in Chapter Ten, where I will analyze in detail the other items people chose to bring with them. Books were the most popular choice across the participant group, but not everyone focused on pastimes or cultural pursuits. Some people did just want their whiskey and teddy bear.

Though few people explicitly referenced science fiction in their literary analogies with space travel, I do not think this low occurrence is representative of the influence of science fiction on the corpus. I estimate that when a person explicitly referenced science fiction that it represented an above average influence on their imaginary. However, whether or not they talked about science fiction, or even liked it, the majority of people said that they felt their imaginations of space were informed or “*polluée*” (“polluted”) or “*parasitée*” (“parasited”) by popular representations. This did seem to be the case, as people described prototypical images or narratives from science fiction even when they did not cite science fiction texts. I found it interesting what this admission said about a belief among participants in polluted versus unpolluted imaginaries. Sometimes, especially at the beginning of an interview, people would tell me that they did not particularly imagine space or space exploration. They then might talk about images they had seen in sci-fi, what they considered the imaginations and creations of other people, but not their own. This was not the case for expert participants like Marie, who immediately talked about science fiction images, but referenced them as what came into her mind, what she imagined. There was a division between people in the study, like Marie, who felt that their imaginations were ‘nourished’ or ‘fed’ by cultural texts, and those who felt that these texts ‘polluted’ their imagination of space.

As none of my interviewees have been to space, their imagination of space cannot be informed by individual, empirical knowledge. It must be ‘fed’ or ‘polluted’ by external sources of information. The source domains deployed in the metaphors in this corpus come from individual terrestrial experiences and generalized cultural knowledge concerning space issued from the intertextual sources discussed above. The cultural knowledge that influences this imaginary often issues from science fiction and science “faction,” to use a term coined by Clifford Geertz (1988, 141) to refer to “imaginative writing about real people in real places at real times.” Geertz spoke specifically about this kind of writing in the social sciences. I extend his term from its original usage to apply to this kind of writing in all sciences.

Imagination and simulation are at the heart of many efforts in the “hard” sciences to comprehend and formulate laws and theories that explain the material universe. In her ethnography of exoplanet astronomers, Messeri (2016, 257) observes that, “Scientists structure

ways of seeing and embodied experiences around an imagination of what might lie just beyond their bounds of perception.” Direct observation is not the only method scientists use to know this world and beyond; imagination can function to structure imaginings of potential realities and the ways scientists engage with data and science ‘facts’ in the present.

Inversely, the imaginings proposed by science fiction are understood by many to be so nourished by facts that they function as “a remembrance of events yet to happen” (Messerli 2016, 243). Kim Stanley Robinson, author of the *Red Mars* trilogy, proposes that science fiction can be classified as an “historical simulation” that “does not represent experience but simulates the possible future of experience” (quoted in Markley 2005, 355). Science fiction does not attempt to understand the potential future through a scientific method, but projects simulations based on current realities and (often) scientific probabilities and theories in order to create hypotheses of what these realities might look *like*.

Robert Markley (2005, 356) suggests that “the utopian possibilities of science fiction occupy a register of simulation: they give an imaginary form to the desire to think beyond the contradictions of our existence in history and ...beyond our positioning in time, culture and geography.” Science fiction texts can function as sites of simulation through narrative, allowing people to extrapolate what it might be *like* if certain scenarios came to pass. Science fiction creates analogies between the present and the potential future, without always holding itself to the laws of physics as we know them.

Science fiction is informed by present facts and realities, and in turn, it influences these facts, and has historically impacted a number of technological innovations and practices. A strong example of this is the widely documented influence of the television show *Star Trek TOS* on space scientists and astronauts (Howell 2016). NASA itself recognizes this influence on innovations in human space flight. A recent demonstration of this appeared on NASA’s twitter feed after the death of Leonard Nimoy (Figure 5:1). NASA invokes the closing line from *Star Trek TOS*’ introduction - “Boldly go...” The prototype shuttle in the photograph bears the name of the primary ship in the fiction series; here fiction and reality blend together, feeding each other, drawing one another further into the unknown.

Figure 5:1, in which actors from *Star Trek TOS* intermingle with NASA scientists at the unveiling of the shuttle prototype, speaks powerfully to the intimate connections between imagination and present and emergent realities. The prototype shuttle pictured is just that, not a working reality, but a model of one, like the props on a stage or film set. This prototype is, however, the model after which an authentic, working Apollo shuttle was constructed. Fiction, simulation and imagination were the inspiration and basis for an emergent reality; the myth becoming the real, the imagination of the unknown shaping the known to come.

Nichelle Nichols (pictured above, fourth from left), who played Lieutenant Ahura on *Star Trek TOS*, is an excellent example of the cross-fertilization between *Star Trek*, NASA and American culture. Nichols was one of the first African American women on television, and the only woman on television at that time in a competent role of authority. Her character, Lieutenant Ahura, became a sensation that was lauded by cultural figures in the United States, including Martin Luther King Jr. (Olheiser 2015). Following Ahura's popularity, NASA hired Nichols to recruit astronauts. The first black woman in space in fiction would recruit, among others, the first black astronauts to go to space in reality (NASA Archives 2014). In the 1960s, Ahura's character was a fictional representation of potential realities (e.g. racial and gender equality, human technological advancement, human



Figure 5:1, NASA tribute to Leonard Nimoy following his death. 2015. Copyright @NASA Twitter account.

space exploration) that made these possibilities available in the conceptual field of popular American discourse. Things like female officers and human space travel were possible in the fictional world of *Star Trek* and this suggested their possibility in the real world, and eventually contributed to the realization of many of these depicted possibilities.



Figure 5.2: Nichelle Nichols and President Obama, “Live Long and Prosper.” 2012. Copyright *The Guardian* (2015).

When asked about *Star Trek* creator Gene Roddenberry's bold, multicultural casting of the show, Nichols responded, “He just did it. He believed in that world. If you got it, you got it. If you didn’t, you would see it anyway” (Olheiser 2015). *Star Trek* was based in Roddenberry’s ideals for social equality, peaceful exploration and exchange of knowledge. He created that fictional multiverse and its possibilities, and his fiction continues to inform current and emergent reality in the United States, and as this data set suggests, other nations such as France.

5.2.2 FactXFiction

Nichelle Nichols and *Star Trek* are one of numerous instances that demonstrate the interrelation of empirical experience, reality and imagination. Western traditions of knowledge production have inherited and perpetuate a paradigm in which fact and fiction are understood as being mutually exclusive. However, in the last several decades this dichotomy has been productively questioned. In recent research, a number of anthropologists, particularly those interested in the anthropology of space, explore interactions between imagination, speculation and the ‘real.’ For example, Janet Vertesi’s doctoral thesis (2009) and subsequent related publications (2015) explored how scientists “see like rover[s]” when using technology and terrestrial analogies to construct knowledge about the past, present and future of Mars. Similarly, Robert Markey (2005) argues that analyses of unknown worlds, such as Mars, provide us with a terrain in which to better understand the planet Earth and ourselves. Research like this demonstrates a new mode of inquiry in which the frontier between the ‘real’ and the ‘fictive’ is a porous, liminal space, rather than a distinct boundary of separation.

In his ethnography *Promising Genomics* (2004) Mike Fortun places this interaction between fact and fiction at the heart of his analysis, demonstrating the profound, mutual influence these domains of knowledge and ways of approaching and producing knowledge have upon one another. Instead of separating these terms in a dichotomy, Fortun places them in a couplet, “factXfiction.” He defines this term as a *chiasmus*, or “a couplet of terms that are conventionally taken as distinct or even opposed, but which in fact depend on each other, provoke each other, or contribute to each other” (Fortun 2004, 13-4).

As the chiasmus that fuels the imagination of space is primarily a projection or a hypothesis, the factXfiction of human space exploration is particularly dependent upon analogy and metaphor. Lisa Messeri presents extensive evidence of this in *Placing Outer Space* (2016). She shows how exoplanet astronomers transform abstract data points into visual and linguistic representations. In the latter case, astronomers write and speak about exoplanets using analogies with our familiar solar system (Messeri 2016, 47-8). She notes that the empirical, physical experience of “seeing” a planet (or rather traces that suggest the presence of a planet) is:

“complemented by the capacity to use language to situate objects as planets and worlds. Astronomers turn to analogies and metaphors to make sense of the unfamiliar. Most of the exoplanets detected so far are unlike planets in our Solar System. Yet, in papers and informal discussions, astronomers use phrases like ‘hot Jupiter,’ ‘mini-Neptune,’ and ‘super-Earth’ to describe these objects. In addition, astronomers also use the cognitive and phenomenological resources of their own terrestrial experiences - of being on a planetary surface and experiencing weather, days and nights and seasons” (Messerli 2016, 47-8).

The factXfiction of human spaceflight is not only composed of explicitly space-related narratives and scientific discourses. There are a number of other historical frames through which people understand and imagine human spaceflight, notably those of European colonization of the “New World,” and American expansionism, including conceptions of manifest destiny and taming the “Wild West.” Though embodied experiences of past humans, these are now generalized cultural narratives (or cultural “scripts” as Appiah [1994] argues) for understanding exploration and settlement in general.

As Europeans, the cultural script of exploration of the “New World” and “conquest of the West” is certainly pertinent to the people in this study. For example, there are twenty-eight references to “colonisation” in the corpus, eight of which are direct analogies between the motivations, techniques and dangers of maritime exploration and colonization of the Americas and space exploration and potential colonization of other “new worlds.” Jean (1MNE), Adèle (3FE), Édouard (3MNE), Olivier (1MNE) and Martin (3MNE) all developed basic analogies between past colonial projects on Earth and those they imagined in space. The albeit false idea that North America was a large, ‘virgin’ territory for Europeans to populate and exploit is pervasive in the ways they compared the vastness of space with European colonization in the “New World.” Other participants would make similar analogies without using the term “colonization.” Take for example the following parallels between past European expansion and future human expansion:

“On envoyait deux cent navires vers les Amériques, on ne peut pas envoyer deux cent vaisseaux dans l’espace comme ça. On va les envoyer un par un et on va, on va devoir déjà tout calculer” (“Arthur,” 2MNE) V5:6³⁸.

“Alors, peut-être on va tuer des scientifiques en les envoyant, peut-être. Quelqu’un va mourir c’est forcé, mais alors. Lorsque Christophe Colomb est parti entre guillemets ‘découvrir l’Amérique,’ je suis pas sûre qu’il est revenu avec tous ses marins.” (“Marie,” 2FE) V5:7³⁹.

Arthur and Marie’s discussions are representative of how people apply the source domain of historical knowledge concerning European expansionism to the target domain of human space exploration. Not only does this process allow people to populate their imaginations with images and past experiences/generalized cultural knowledge, it permits them, as demonstrated in V5:6-7, to make judgements concerning the desirability and legitimacy of projects for human space exploration. In V5:7, Marie, a female science fiction writer, makes an analogy between the human cost of Columbus’ exploration (she goes on to describe the deaths not only of explorers, but indigenous peoples following Columbus’ arrival in the “New World”) and the human cost of space exploration. Marie’s opinion is that even though terrestrial exploration was destructive, it is justified, and she applies this same logic to the target domain of space exploration. In the conceptual metaphors **SPACE IS THE NEW WORLD** or **SPACE IS THE (AMERICAN) FRONTIER**, collateral damage is acceptable because the benefits of exploration and cultural expansion outweigh the costs.

This judgement is highly informed by people’s perspectives as Europeans. For countries like France, the destruction wrought from European expansionism was ultimately more beneficial than hurtful. Even in a post-colonial context, European colonizers continue to benefit from the colonial past and the full extent of the damage that colonization cause(d)(s) to colonized nations is almost impossible to calculate. Although many interviewees commented on the horrors

³⁸ “We sent two hundred ships towards the Americans, we can’t send two hundred ships into space like that. We are going to send them one by one, we will have to have everything calculated already.”

³⁹ “So, maybe we will kill some scientists sending them, maybe. Someone is going to die, that is certain, but so what? When Christopher Columbus left to supposedly ‘discover America,’ I am not sure that he came back with all of his sailors.”

of colonization⁴⁰, rarely did they propose another model, and more often than not, the past model was deemed acceptable.

There seems to be a strange slide in logic where people begin to equate ‘human sacrifice’ with genocide. One could say that the Apollo missions were undertaken with ‘human sacrifice.’ Even though the utmost precautions were taken to protect them, astronauts and technicians who were working as a community of colleagues towards a common goal were accidentally killed on many occasions. However, this kind of human sacrifice is in no way analogous to the genocide of indigenous peoples perpetrated by European colonial powers. The inhabitants of North America did not die accidentally while working with Europeans towards the common goal of colonization. There is a dangerous mental jump when people analogize space exploration with the conquest of the “New World,” and when they equate elective participation in a united group (with the potential for fatal accidents) with slavery, rape, purposeful spread of epidemic and mass murder. See Adèle’s comments in V5:8, where she explains that she sees space colonization as being modeled after terrestrial colonization, commenting that “We find. We discover. We install ourselves. And afterwards, alas, the problems begin.” This is an intelligent, warm woman, who I believe, if questioned otherwise, would never define genocide simply as a “problem.” I do not think she would say, “Ah, alas, mass murder!” However, the analogy between space exploration and colonization allows, and in many ways encourages, ‘genocide’ to slip through the conceptual cracks and fall into a vague, general group of ‘problems’ that resulted from past human colonizations.

The pervasiveness of the analogy between space exploration as it is currently conceived and the conquest of the “New World” is not original in this data set. This analogy is part of the cultural narrative of the United States, in which ‘brave’ explorers and pioneers set out to ‘make a better life for *themselves*.’ This narrative is as canonical to American culture as annual Thanksgiving celebrations, including seasonal decorations depicting pioneers and Native Americans peaceably sharing a meal, or holding hands. Figure 5:3 is stock clip art I pulled off of

⁴⁰ For example, when describing his disinterest in colonial projects in space, Jean (1MNE) said: “Moi, je suis français tu vois? Il y a pas que ça...la colonisation c’est aussi les hollandais fous en Afrique du Sud...la colonisation c’est aussi les israéliens tarés au-delà de la bande de Gaza. Tu vois c’est quand même un geste...c’est du viol, tu vois?” (“I’m French, you see? It’s not just that...colonization is also the crazy Dutch in South Africa...colonization is also the psycho Israelis in the Gaza Strip. You see, it still this act...its rape, you see?”)

Google by searching “pilgrims and indians - images.” A plethora of these representations exist, in varying permutations, ranging from simplistic, animated images like Figure 5:3 to paintings in museum collections. The narrative of ‘brave’ pioneers does not stop with Thanksgiving kitsch but is widespread in identity constructions in the United States, including those of NASA itself (Crusan 2015). Scholars such as Slotkin (1973, 1992) argue that the frontier myth, or myth of the west, is fundamental in American identity constructions and the continuation of this myth into space was present at NASA from the outset (O’Neill 1977). Explicit use of this myth can be found from pictures of Apollo astronauts wearing cowboy hats to the names of ships, probes and entire space programs. Between 1958 and 1978 NASA undertook its “Pioneer” program of unmanned spacecraft. The most well-known of these missions were those of Pioneer 10 and 11, upon which the “Pioneer Plaque” designed by Frank Drake and Carl and Linda Sagan was attached (See Figure 5:4)

It may be because I am an American that so many people talked to me about the history of the colonization of my own country, about pioneers and unknown dangers and the historical links between my birthplace and that of my interlocutors. No one I spoke with talked about British colonization of India, nor French colonization of North Africa. It may also be because my interviewees were French that they focused on Spanish and English colonial projects, more than their own colonial history. However, I believe this lacuna in our discussions can also be attributed to the force of the “New World” narrative in European imaginations. My data supports an argument that this is particularly the case for middle to upper class caucasians. It would be interesting to see if this model of understanding space exploration is justified in other groups. For example, would the Skidi Pawnee tribe I discussed in Chapter Four talk about space exploration in terms of the conquest of their lands? We could imagine that a Skidi Pawnee’s understanding of the benefits and dangers of colonization may be different than that of a Parisian. Firstly, the organization of Skidi society was highly informed by their cosmology, in which the stars ordered social life and grouped people into villages and families (Hodge 1912). In fact, Skidi villages were positioned according to the stars and the shrines in each village corresponded to the star under which it was located. Beyond the Earth, Skidi cosmology considers space to be populated by other beings and kin (Chamberlain 1982). This comprehension does not lend itself to

imagining space as a ‘virgin’ territory just waiting to be exploited by human beings.

In terms of embodied experiences in history, the Skidi have experience with migration, but not with genocide or colonization of another tribe. According to tribal tradition, the Skidi had experienced several large migrations, one of which resulted in them being

separated from the Arikara Pawnee when they settled in Nebraska (Hodge 1912). In 1874 the Skidi would be relegated to Indian Territory (where the tribe is still

registered in what is now the state of Oklahoma). During the centuries before their removal to Indian Territory, the Skidi were hunters who relied on horses to protect their hunting grounds from intruders. However, there is no history of genocide, subjugation or colonization of their neighbors. For these reasons, I hypothesize that Skidi discussions of human space exploration would be considerably different, and, in particular, that models of ‘space colonization’ may be less pervasive.

Whether entirely accurate or not, people in my corpus deployed conceptual metaphors based on these conquest analogies with ease and subsequently used these analogies to justify value judgements concerning whether or not space exploration should be pursued (see Marie’s arguments in V5:7). In many ways these analogies are useful methods for understanding a potential unknown, as the source domains of knowledge they deploy have a number of salient characteristics with the imagined target domain. However, it remains that the contexts of 15th century Europe and the global village of the 21st century are vastly different. Even when recognizing these differences, interviewees remain convinced of the accuracy of these analogies, especially concerning the motivations behind exploration (e.g. need for more space because of population growth and lack of resources, potential profit and unexploited resources). Take the following examples in which Adèle (3FE) and Nathalie (3FNE) explain similarities between space conquest and the conquest of the “New World.” Both women spoke at length on how a



Figure 5:3: “Thanksgiving pilgrims and indians” 2018. Copyright Melbournechapter.net.

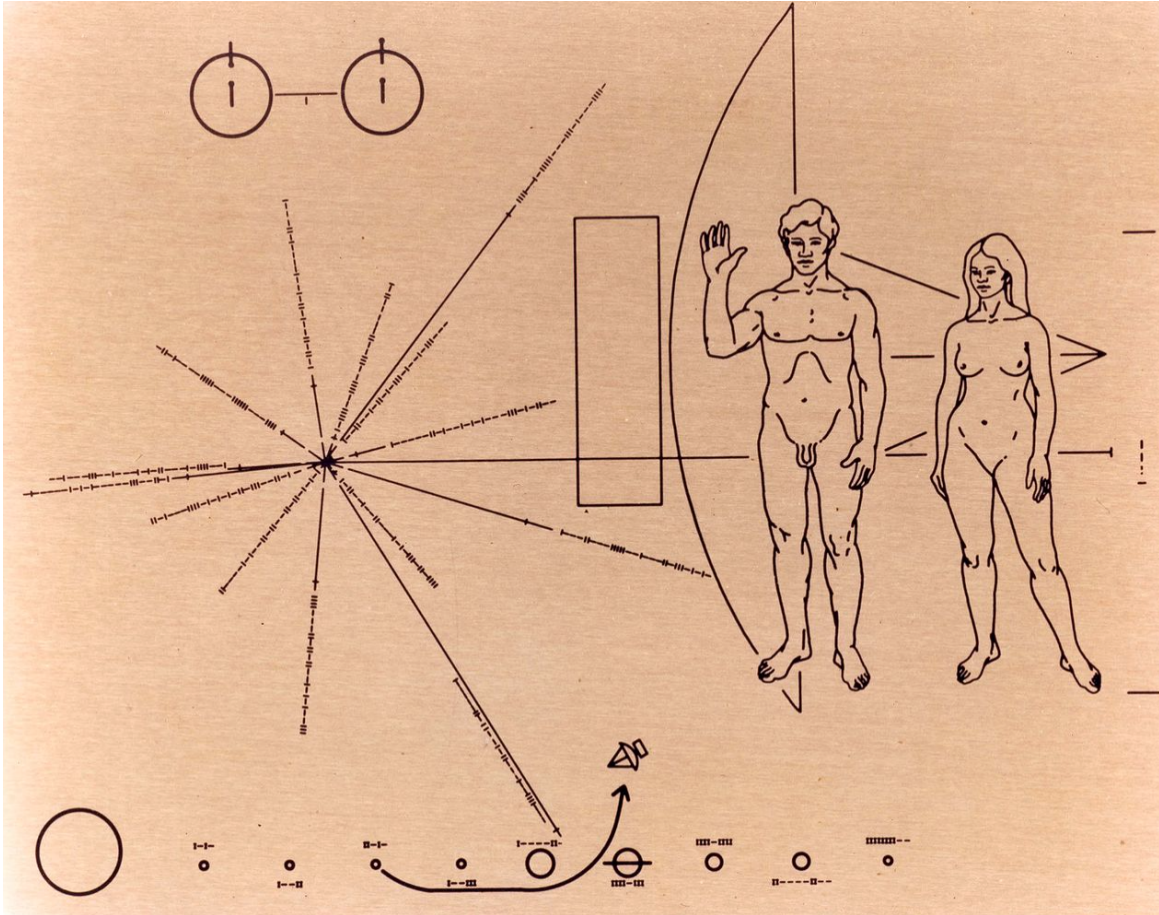


Figure 5-4: “NASA image of Pioneer 10's famed Pioneer plaque features a design engraved into a gold-anodized aluminum plate, 152 by 229 millimeters (6 by 9 inches), attached to the spacecraft's antenna support struts to help shield it from erosion by interstellar dust.” Wikipedia 2018. Public Domain.

model of 15th century colonization could be mapped onto the potential risks and gains of human space exploration.

“Je le vois à partir d’une colonisation qui part de la Terre, déjà. C’est à dire, il y a des découvreurs qui vont trouver des planètes peut être avant. *Un peu les Christophe Colomb, si j’ose dire, de l’espace.* Et après une fois qu’on aura vu que c’était viable, je pense d’ailleurs qu’on ne respecterait pas vraiment le principe de précaution. C’est à dire, on aurait des gens qui voudraient y aller très vite et qui se fichent éperdument de savoir s’ils vont ou emmener des microbes ou emporter des microbes là-bas ou en rapporter ailleurs. Parce que pour vraiment coloniser un monde il faudrait une mise en quarantaine et des principes de précaution à très long terme. Et je pense que si on trouve d’autres mondes on va vouloir y aller vite. Si on peut y aller. Si on a la technologie pour y aller, on va vouloir y aller vite.

Alors, moi je n'ai jamais envisagé le problème d'une pandémie ou quoi que ça soit. Mais on fera courir des risques pour l'humanité. Mais, pour moi ça se passe bien. C'est à dire qu'on a des découvreurs. On découvre d'autres planètes. Les humains ont envie d'aller s'y installer. *Ils vont s'y installer comme colons*. Je veux dire que c'est à partir de ce moment-là où ça commence à aller moins bien parce que chacun veut *comme dans toute colonisation*, soit dominer ceux qui sont déjà sur place, soit prendre leur indépendance par rapport aux gouvernements centraux de confédération etc..

Mais pour moi c'est vraiment *calqué sur les modèles des colonisations humaines* sur notre propre monde quoi. On y va. On trouve. On découvre. On s'installe. Et après hélas, arrivent les problèmes" ("Adèle," 3FE). V5:8⁴¹

"Oui, mais enfin, l'analogie est aussi dans le fait que, par exemple à l'époque de Christophe Colomb est des grands, et, fin, les explorations ont été déclenchées par des crises...aussi des crises sociales, des crises économiques, enfin des problèmes économiques, je ne sais plus en détail pourquoi en Espagne à ce moment-là il était nécessaire de trouver des sorties vers ailleurs, je me souviens plus, je l'ai su, mais je ne me souviens plus les problèmes qui se posaient aux gens de ce temps, économiques qui les ont incités, oui, parce qu'ils pensaient faire du commerce avec les Indes et trouver une route plus rapide pour les Indes et par là, mais oui, il y a eu la poussée, je pense que ce qui fait pousser pour chercher des nouveaux horizons, de nouvelles terres, c'était lié à des problèmes là où on vivait, dans les pays de départ, de même que je crois que l'exploration, en dehors de l'intérêt scientifique de connaissance de repérage de l'univers, la question de la colonisation des autres planètes, elle est, elle sera liée à des problèmes sur Terre, d'exiguïté, de limitation de

⁴¹ "I see it as beginning from a colonization that sets off from Earth. What I mean, is that there will be explorers who will maybe have already found planets. A little, I daresay, the Christopher Columbus's of space. And, once they have seen that it is viable, I think that we also will not really respect the principle of precaution. I mean, we will have people who will want to go quickly and who won't care at all if they are going to take microbes with them there or bring them back. Because to truly colonize a world it would be necessary to have a quarantine in place and precautionary principles for a long time. And I think that if we find other worlds we will want to go there quickly. If we can go. If we have the technology to go, we will want to go quickly.

So, I have never imagined the problem or a pandemic or whatever. But humanity will take risks. But, in my opinion, it will go well. I mean, there will be explorers. We will discover other planets. Humans will want to go live there. There will go there like colonizers. I mean it's at that moment where things will start to go badly because everyone will, as in every colonization, either dominate those who are already there, or declare their independence from the central governments of confederation, etc..

For me it's really modeled after human colonizations on our own world. We go. We find. We discover. We move it. And afterwards, unfortunately, the problems begin."

ressources. Donc, je crois qu'il y a quand même quelque chose de commun, des points en commun dans les deux cas" ("Nathalie," 3FNE). V5:9⁴²

The above examples demonstrate the extent to which people consciously construct patterns between two domains of experience and knowledge. I find it important to note that these constructions are primarily based in affirmative declarations. As interviewees develop their analogies they have a strong tendency towards matching salient characteristics, affirming their similarity, rather than discussing contrasts. Unlike the more simplistic analogies in examples V5:6-7, where Arthur and Marie mapped one or two characteristics from the source domain to the target domain, Adèle and Nathalie fleshed out their comparisons at length. Whether analogies match up a few characteristics or map a more complete schema onto the target domain, analogies look for positive points of connection and emphasize the presence of similarity, instead of focusing on dissimilarity.

This focus on similarity allows for the swift categorization of the target domain by finding a 'best-match' between a known kind of experience and the unknown experience of space exploration. Matching all available source information to a target domain by process of elimination requires greater cognitive effort and energy than identifying more broad similarities.⁴³ As people concentrate on the similarities between domains, on how two domains are *like* one another, these analogies are easily naturalized for participants. Analogies based on past experience are not only sites of comparison but can become complete models for understanding. Interviewees equate these models with the target domain to different extents, for

⁴² "Yes, but in the end, the analogy is also in the fact that, for example at the time of Christopher Columbus and the great, well, exploring was set off by crises...social crises, economic crises, economic problems, I don't remember in detail why in Spain, at that time, it was necessary to find pathways towards other places, I don't remember, I knew, but I don't remember what the problems were that people had at that time, the economic problems that incited, yes, because they thought they were going to trade with India and find a quicker route to India and, yes, there was a push, I think that what pushed to look for new horizons, new lands, was linked to problems there where people were, in the original country, in the same way I think that exploration, outside of scientific interest and the mapping of the universe, the question of colonizing other planets is, and will be linked to problems on Earth, needs, limited resources...So, I believe there is something in common, common points in both cases."

⁴³ Here we can think about the toys for toddlers where there is a box with a number of differently shaped holes and a corresponding number of differently shaped pegs. Instead of testing each peg in every hole to find the best match, it may very well be possible to slide many pegs into holes to which they do not correspond perfectly. A circular peg may fit through a square hole. The goal of passing the peg is accomplished, whether or not the highest level of possible correspondence between the shapes of the peg and hole are achieved.

some people these models are more or less accurate representations that “*ressemble un peu*” (“are somewhat similar”) to the target domain, while for others they are identical, “*pareil*.”

“Comme ça a pu se produire dans les premières découvertes des États-Unis des Amériques par les européens, et je pense que voilà on va vers des choses qui ressembleront un peu à ça. C’est à dire on va...***ça va un peu ressembler à la conquête américaine, la conquête de l’espace***, qu’en fait finalement, on va avoir beaucoup de pertes, beaucoup de déception aussi, pas forcément à l’arrivée beaucoup de bonnes surprises, parce qu’on sait déjà ce qui nous attend sur Mars, par exemple, c’est vraiment une désolation et des difficultés qui vont ramener l’humain à des...à un manque de confort total (“Arthur,” 2MNE). V5:10⁴⁴

“***Pareil. La même***. Si on peut aller vivre hors de cette planète c’est qu’il y a les conditions nécessaires pour nous accueillir. Donc, au fait finalement ça sera la même chose. ***Ça reviendrait peu à peu comme justement la conquête des États-Unis***. Au départ il y avait très peu de personnes et puis ça s’est rempli peu à peu jusqu’à devenir un vrai pays et un pays où il y aurait plusieurs millions de personnes.

Des conditions difficiles, mais en même temps peu à peu, voilà, ***ça reviendrait un peu à la même vie que sur Terre***. Sauf que ça serait loin, donc évidemment, mais comme à l’époque quand c’était la conquête des États-Unis c’était très loin parce qu’il y avait pas actuellement, il y avait pas les mêmes moyens de déplacement. Maintenant ça serait encore peut-être beaucoup plus loin, mais comme...mais si on va là-bas c’est que les moyens nous permettraient d’y aller beaucoup plus facilement qu’actuellement” (“Camille,” 2FNE). V5:11⁴⁵

The models in the above examples seem to be motivated not only by salient characteristics, but also by discursive primes. In V5:5-10, Camille, Arthur, Nathalie, Adèle and

⁴⁴ “Like it happened during the first discovery of the United States and the Americas by the Europeans. I mean, we are going...it's going to be a little like the American conquest, the conquest of space, and, in fact, in the end we are going to have a lot of losses, a lot of disappointment, not necessarily good surprises when we arrive. Because we already know what awaits us on Mars, for example, it's truly desolate and there are difficulties that will force humanity to...a total lack of comfort.”

⁴⁵ “Identical. The same. If we can go live outside of this planet, it's because the necessary conditions exist to welcome us. So, in the end it will be the same thing. It will end up being little by little exactly like the conquest of the United States. At the beginning there were very few people and then it filled up little by little until it became a real country and a country where there are several million people.

Difficult conditions, but at the same time, little by little, it will become more or less the same as life on Earth. Except that it will be far away, obviously, but like during the time of the conquest of the United States, it was far away because there were not, at that time, the same modes of transportation. Now it would be maybe a lot farther, but...but if we go there it's because we would have the ability to get there much faster than we can now.”

Marie use the model of European colonization of North America to comprehend human space exploration. However, the term “colonization” (“*colonisation*”) is deployed slightly less (28 occurrences) than the term “conquest” (“*conquête*”) (33 occurrences). This makes sense as “*conquête de l’espace*” is a common expression in French to refer to space exploration, particularly the “space race” between the United States and the U.S.S.R. during the Cold War. Because “conquest” is a key characteristic in the target domain, people have a tendency to match the conquest of space with other terrestrial conquests, more so than with other terrestrial forms of exploration (e.g. human exploration of the deep sea).

As referenced in Chapter Four, the analogy between space exploration and the American frontier, including its pioneers and cowboys, vast potential, and untapped resources, has been part of space exploration discourse for almost a century. Examples of the application of the Western genre to space narratives include the character Han Solo from *Star Wars* (1977), the novels and later television series *Firefly* (2002-2003), and films such as *Space Cowboys* (2000). NASA has also actively exploited this analogy, particularly in the Apollo program (Billings 2007). President Kennedy referred to space as the “next frontier” and the **SPACE IS A FRONTIER** metaphor is widespread in scientific discourse concerning space (Hartman, Miller, and Lee 1984; O’Leary 1981; O’Neill 1977; National Commission on Space 1986). Publications of scientific vulgarization explicitly describe future space colonies as being “like in the Old West” (Redd 2016). A strong example of this is Jason Crusan’s, principal advisor for NASA in human exploration, 2015 talk entitled “Pioneering Space: Not Your Great-Great-Grandparent’s Manifest Destiny” (Crusan 2015).

In his talk, Crusan argues that exploration is an “innate characteristic of the human species” (Crusan 2015). Often the extension of the cultural script of the American frontier includes American exceptionalism (e.g. that exploration is “part of the American character,” Dick 2007). Crusan extends the motivations of exploration found in American exceptionalist narratives to all humanity. My research participants widely echo this belief, proclaiming a human exceptionalism in curiosity, adaptation, and ‘moving further’ or ‘going beyond’ (these metaphors will be analyzed in greater detail in Chapter Eight).

In fact, a belief in innate human curiosity and drive to explore motivates a variety of metaphors present in the corpus. This conception is a rich source of imagery and abstraction of human behaviors and history into generalized, universal qualities found in humans. Many people argue that humans are “enriched” by “contact with the exterior” and that it is beneficial for us to go “beyond” ourselves rather than staying “folded in upon ourselves.”⁴⁶

A handful of participants expressed sentimental, and frankly romanticized visions of human exploration and the crucial role human curiosity plays in the ‘spirit’ or ‘character’ of humans. The “spirit of exploration” is iconified in historical figures of exploration, such as Magellan, Marco Polo and Columbus. The desire to go “further” and “see what is happening” is often respected or considered “beautiful.” Franck (1MNE), the manager of a restaurant in my neighborhood, told me about his interest in science fiction and space exploration in general. His thin frame, gentle eyes, closely cropped hair and unassuming manner belie many surprises. At 36, he has successfully constructed two different careers (in business and the restaurant industry). He abandoned international business for the small French bistro he manages, where his language skills and easy manner with strangers serve him well.

He was curious about all sorts of things, including space, and he regularly followed the Twitter accounts of astronauts and ESA. He talked to me about the “marvelous” images he saw and experiments he read about. For him, space is an exceptional project, but it is also ingrained in human nature. He explained:

“C’est pas tous les hommes qui vont avoir envie d’aller plus loin découvrir ce qui se passe, mais il va y avoir toujours une poignée d’hommes qui vont avoir envie de découvrir et je trouve que c’est ça qui est beau.

Comme les grands navigateurs de l’époque, Colomb, Marco Polo et compagnie. Evidemment pour moi ça représente cet esprit de découverte. Parce que pour nous en Europe, on était là en Europe et puis d’un coup on a des gens qui se sont dit, ‘Putain, on a dit que la Terre est plate, c’est bizarre quand même. Il y a un océan qui est gigantesque. Nous on s’en fout on y va quoi. On va voir.’

⁴⁶ “Là de toute façon...bon, moi je suis absolument convaincue qu’on ne peut que s’enrichir avec le contact avec les autres et avec l’extérieur. Je suis absolument incapable de rester repliée sur moi-même en tant que personne.” (“At any rate...well, I am absolutely convinced that we can only enrich ourselves through contact with other people and with the outside. I am absolutely incapable of staying folded in on myself as a person.”) “Adèle,” 3FE.

Les mecs ils ont pris un bateau, c'était pas les paquebots qu'on a aujourd'hui. C'était entre guillemets un petit bateau quoi. Et ils sont partis tout droit dans l'Atlantique. Ça me fait penser à l'esprit qui fait pousser les hommes. Nous on s'en fout, on va aller voir.

Et ça je trouve ça beau. Parce que pour ne pas rester ignorant de ce qu'il y a de l'autre côté. Parce que moi j'aime savoir ce qu'il y a de l'autre côté." ("Franck," 1MNE) V5:12⁴⁷

The visual metaphor **KNOWLEDGE IS SIGHT** and the metaphor **TERRITORY IS KNOWLEDGE**, "*on va aller voir*" ("to go see"), is so prevalent in the corpus that I will analyze it in further detail in Chapter Seven. For now, we can remark its presence in this excerpt and how Franck does not question the motivations or consequences of the act of exploration, of "going to see." Enlightenment values of expanding knowledge are also present here (e.g. "*pour ne pas rester ignorant*," "to not remain ignorant") along with their assumptions that this knowledge would be accessible and beneficial to explorers, with no detrimental effects.

A few participants went further than a positive value judgement and voiced the opinion that human curiosity and exploration are articulations of our profound need for mystery. Several people talked to me about how the Earth no longer possessed uncharted territories or "virgin lands." Though some referenced the fact that the majority of the planet is covered in oceans that remain vastly unexplored, the general sentiment was that humanity 'knows' the Earth and its mysteries. Their perspectives resonate with Giddens's (1999, 3) argument that a key characteristic of our modern risk society is the "end of nature." "The end of nature does not mean a world in which the natural environment disappears. It means that there are now few, if any aspects of the physical world untouched by human intervention" (ibid.) This is eloquently expressed by Joseph (2ME), when he described the "*l'appel de l'espace*" ("call of space"):

⁴⁷ "It's not every man who wants to go further to discover what's happening, but there will always be a handful of people that will want to discover, and I find that beautiful. Like the great explorers of the past, Columbus, Marco Polo and that lot. Obviously, for me, they represent the spirit of discovery. Because for us in Europe, we were in Europe and then all of the sudden some people said, 'Shit, people say that the Earth is flat, but that seems bizarre. There is a giant ocean. We don't care. Let's go. Let's go see. The dudes took a boat, it wasn't the kind of ships we have today. It was, let's say a little boat. And left went straight into the Atlantic. It makes me think about the spirit that pushes people. We don't care, we're going to go see. And I find that beautiful. So as not to remain ignorant of what is on the other side. Because I like to know what's on the other side."

“Mais, j’ai l’impression, voilà, qu’on a fait un peu le tour de la Terre, et on commence à s’uniformiser, à se mondialiser. On commence à tous parler un peu des mêmes choses. À s’habiller tous pareil, à vivre de la même façon. Il y a plus vraiment de....le dépaysement en tout cas ça devient vraiment dur de le retrouver et donc voilà, à un moment donné il y a ce...ce...peut-être les aspects aussi de surpopulation qu’on commence à ressentir...

Donc, cette idée qu’on a fait le tour. C’est superbe, c’est bien. Non seulement on a fait le tour, mais on est en train maintenant d’un peu tout casser. Et, donc l’appel de l’espace c’est aussi ça...C’est plutôt une volonté d’exploration et c’est plus même en fait, si je réfléchis bien, c’est plus un besoin de mystère. C’est-à-dire que....le fait que la Terre soit parcourue, explorée, etc.. Elle a pas beaucoup d’aspects mystérieux.” (“Joseph,” 2ME). V5:13⁴⁸

Though overall people expressed positive opinions concerning curiosity and exploration, their opinions concerning the importance of exploration were far from homogenous. Their opinions ranged from considering exploration unacceptable or acceptable under certain conditions (e.g. “to not touch” [*“ne pas toucher”*]); acceptable, but not a priority; or essential and in grave need of being furthered. Most non-expert participants, even in echoing conceptions of human exceptionalism, express the opinion that it is more important to “sort out” problems on Earth before exploring beyond it. Olivier’s argument is common:

“C’est une idée très...occidentale, de vouloir coloniser les planètes comme ça parce qu’on a eu la colonisation de l’Amérique et puis des colonies en Afrique et dans le monde, maintenant il faudrait coloniser les planètes. Je ne sais pas, il vaudra mieux arriver à vivre en harmonie avec les gens de la Terre avant de vouloir coloniser des planètes.” (“Olivier,” 1MNE). V5:14⁴⁹

⁴⁸ “But, I have the impression that we have kind of seen the whole Earth, and we’re starting to become uniform, globalized. We are all starting to talk about the same things. To dress the same, to live the same way. There is no longer any real culture shock, or in any case, it is becoming very difficult to find and therefore, there comes a time when...maybe it’s the effects of overpopulation that we are starting to feel. So, this idea that we have seen it all. It’s superb, it’s great. Not only have we seen it all, but now we are beginning to break it all. And so the call to space is also that...It’s more a will to explore and, if I think about, a need for mystery. I mean that...because the Earth has been seen, explored, etc.. It no longer has many mysterious aspects.”

⁴⁹ “It’s a really Western idea, to want to colonize planets like that because we had the colonization of the Americas and then the colonies in Africa and around the world, now we must colonize the planets. I don’t know, it would be better to be able to live in harmony with people on Earth before wanting to colonize other planets.”

As in this example, the majority of non-expert participants were quicker to romanticize terrestrial harmony than the adventure of exploration in outer space. Solving global problems, in particular those problems linked to ecology, war and terrorism, was seen as a far more pressing issue than space exploration. Unlike the utopian society projected into space by *Star Trek TOS* and the inspiration the show and similar cultural texts created for a generation, by and large people did not describe space as a realm of solutions.

I find that this focus on immediate global problems and its articulation within the corpus demonstrates, if not the *zeitgeist* of the Western world, generalized conceptual tendencies in how individuals conceive of the state of this planet and human society. I find that Giddens' (1991) conception of the "knowledge environment" of high modernity resonates with this data set. People spoke about radical uncertainties as well as trust in expert discourses. For many faith in progress, science and technology was surpassed by their suspicions of the political motivation of scientific and exploratory projects, of the stakeholders who benefit from investment in technologies and of the ideologies with which space exploration discourses are associated. Government and corporate corruption were bemoaned by many, while at the same time people would appropriate the positions of expert institutions.

In addition to this complex relationship with technology and scienceXgovernment, people talked about their pressing worries concerning the sustainability of governmental systems and the planetary climate. Many argued that governments do not concentrate their resources and development into the right kinds of initiatives. Greed and corruption are seen as more powerful forces in social change, or lack thereof, than scientific fact and the well-being of the human population and planet.

People did not express a sentiment of currently living in a dystopia themselves, but of dystopia being manifested in other parts of the globe. In some cases, they projected the eventual arrival of many of these dystopic elements (e.g. overpopulation, resource scarcity, epidemic and a compromise or destruction of "*les valeurs républicaines*") in France (these fears are manifested particularly in the 40>59 age group). Population growth, decreasing resources and increasing poverty are all cited as elements contributing to a potential global catastrophe.

The most cited of these concerns is the relationship of human civilization with the Earth and changes in the environment that could potentially cause a global extinction event. The Earth's well-being and potential catastrophes that may diminish or extinguish the human population were central preoccupations for interviewees' when imagining humanity in the future and in their discussions of the desirability of current projects for expansion, exploration and technological advancement. People almost exclusively associated the idea of human colonization of space with conceptions of "saving humanity," "preserving a sample of humanity," "providing humanity with an emergency exit," in other words, creating a context of survival beyond an Earth upon which humans can no longer exist.

The conception of exploration motivated by terrestrial apocalypse is one of many possible frames in which people understand human exploration of space. Conceptions of exploration with goals of discovering new lands, new peoples and new phenomena are greatly outnumbered in this data set by conceptions of human exploration as a method of survival, or as a potential means for furthering human destruction in the universe. Romanticized visions of outer space and exploration such as those offered by the "Golden Age" of science fiction are rarely the sources for people's descriptions. Participant imaginations are not informed by curiosity for the exotic and unknown, but rather by fears for the survival of the proximal and their own kind.

5.3 Source Domains in Embodied Experience

One might imagine that the participants would only use source domains issuing from generalized cultural knowledge, the factXfiction discussed above, when constructing their imagination and discourse concerning a physically unknown experience. Why, when a range of textual sources exist on the subject, would a participant use the logic of her own body in order to understand something that her body has no experience of?

Here we can observe the insistence of analogy and the omnipresence of embodied experience in thought and in human methods for making sense of perceptual input. Briefly, we can think back on the example of Iceland from Chapter Four. I have never been to Iceland. Maybe I have seen films or images of Iceland, or I have read Icelandic literature, etc.

Nevertheless, it is probable that I will still create analogies between the experience of Iceland, that is completely unknown to me, and my own, known physical experiences. Maybe I will think about the time I have spent in other Northern climes, focusing on characteristics such as the cold or limited daylight. I would be able to mentally conjure these embodied experiences and pair them with the generalized cultural knowledge that I possess about Iceland and similar locations, creating analogies using source domains from my embodied experienceXcultural knowledge.

In this study, this is precisely what occurs. Interviewees make use of a number of cultural texts concerning space, but they also project themselves physically into this imaginary, with little to no strictly cultural supports. They make use of their previous embodied experiences - of trips, walks, solitude or constraint - to imagine and comprehend a potential reality that no human body has ever experienced (e.g. to go to Mars, into interstellar space or to live on an intergenerational spacecraft). Table 5:1 (Appendix VI) provides a series of examples of both cultural models of space and embodied models of space used by participants. This table is composed of responses to the first interview question, “When someone talks to you about space, what are the first images that come to mind?”

Because this was the first question I asked, interviewees should not have been primed by the questionnaire to prioritize a particular source domain of knowledge (i.e. personal experience or generalized cultural knowledge). As Table 5:1 demonstrates, the initial images to come to participants’ minds have a slightly greater tendency to issue from general cultural/scientific knowledge, rather than their own physical experience. Out of the forty examples, 17 (or 43%) of responses are informed by cultural knowledge and models, whereas 14 responses (35%) are informed by embodied models. Nine interviewees described images that issue both from cultural knowledge (i.e. videos and images distributed by NASA) and from personal experience (i.e. seeing the night sky).

People understand the unknown domain of space, about which they can gain knowledge primarily through scientific and other cultural texts, by using their bodies. This is accomplished in evident ways, such as imagining the constellations or the Milky Way that people have seen with their own eyes, as well as by imagining other embodied experiences (e.g. with darkness, the cold, immense spaces and light and movement). People did not shy away from using embodied

models to imagine realities and experiences far beyond their bodies. Fifty-seven percent of interviewees made some use of past, terrestrial embodied experience when initially imagining space (See Table 5:3).

Table 5:3: Breakdown of Use of Models Across Expert and Non-Expert Participant Groups

	Embodied Models	Cultural Models	Mixed Models
Expert Participants	5	4	2
Non-Expert Participants	9	13	7
Total	14	17	9

Out of all participants, experts had a stronger tendency to use embodied models of space. Yet, these models were not particularly linked to their ‘expert experiences’ (i.e. images from telescopes or other professional equipment). Among the two male space scientists, one cited science fiction films as the first images in his mind, and the other discussed seeing the night sky. Neither of these participants cited ‘expert’ knowledge in their initial imaginations. Similarly, two female science fiction authors, one in her thirties and the other in her sixties, both discussed stargazing as a child as being the first images of space that came to mind. Take, for example, Adèle’s (3FE) discussion of stargazing with myopia. This was her immediate response to Question #1: “When you hear the word ‘space’ what are the first images that come to mind?”

“Moi, d’une façon flagrante, immédiatement le mot “espace” s’associe aux étoiles. Je pense toujours espace-étoiles. Parce que j’étais myope quand j’étais petite. On m’a trouvé ma myopie plus tard. Mais mon oncle, le frère de ma mère me disait, ‘Ça m’étonne pas que tu écris de la science fiction. Tu m’as toujours demandé qu’est ce que c’est que les étoiles dans le ciel?’

Et quand je me mets devant le ciel, je suis très, très amateur, mais j’aime beaucoup l’astronomie. Et quand je me mets un soir le ciel étoilé devant ma maison, ou plutôt derrière parce que là il y a moins de pollution lumineuse, j’enlève mes lunettes et je vois des tâches de couleur dans le ciel. Parce qu’avec la myopie ça grossit énormément ces petits points lumineux dans le ciel et je pense que quand j’étais

gamine, étant déjà myope sans doute enfant, les étoiles me fascinaient parce que je voyais des tâches lumineuses plus grosses que les autres personnes dans le ciel.

Et donc moi, l'espace c'est les étoiles. D'ailleurs j'ai toujours ancré mes romans de SF avec des références d'étoiles existantes. J'ai inventé des planètes, mais jamais des étoiles" ("Adèle," 3FE). V5:15⁵⁰

What fascinates me about Adèle's discussion is her own insight into how her embodied experiences, as being myopic and seeing the stars big and bright in the sky, dominate her imagination. She critically reflected on how her eyesight informs her appreciation and fascination with space. I particularly loved her admission that, to this day, when stargazing she takes off her glasses to be able to have a different embodied experience of space.

For me, this is strong evidence of the importance of prototypical embodied experiences in the ways these people imagine the unknown. Though some of these experts have a vast array of embodied experiences with space (and some of them discussed these experiences with me, for example, using high-powered telescopes), the initial process of imagining space brought out their most prototypical experience of space - looking at the stars with their 'naked' eyes.

Non-expert participants made the greatest use of mixed models of space, often beginning by citing pictures or films and then developing their conceptions using their embodied experiences. Whereas, many of the experts had specific answers to what came to mind when they thought about space (as in Adèle's response above), non-experts had a greater tendency to *bricoler* their conceptions as they thought about the question and developed a response. Non-experts more frequently began their responses with a "*Je ne sais pas...*" or by repeating the question, while experts often responded succinctly and immediately (e.g. the first example in

⁵⁰ "For me, immediately the word 'space' is associated flagrantly with the stars. I always think space-stars. Because I was myopic when I was little. They only found my myopia later. But, my uncle, my mothers brother, told me, "It doesn't surprise me that you write science fiction. You always used to ask me what the stars were in the sky."

And when I put myself in front of the sky, I am very, very novice, but I really like astronomy. And, when I put myself in front of the starry sky in the evening in front of the house, or rather, behind the house because there is less light pollution, I take off my glasses and I see spots of color in the sky. Because the myopia causes those little points of light to get much bigger and I think that when I was a little girl, already myopic as a child without a doubt, the stars fascinated me because I already saw bigger spots of light than other people saw in the sky.

And so, for me, space is the stars. In fact, I have always anchored my science fiction novels in references to existing stars. I have invented planets, but never stars."

Table 5:1 in Appendix VI where Marie immediately described in detail the opening scene of a film).

As participants developed their discussions of space beyond the first question, they extended these discussions using further models and metaphors for space. The source domains that issue from people's past embodied experiences were as diverse as their lives, and often as common as their shared cultural knowledge. For example, François (3MNE) described interstellar space craft in comparison to the Opéra Garnier (which was visible from our seats on the roof of the Printemps department store during our interview): "*Ça suppose un énorme machin, mais, c'est prodigieux de penser à un truc comme ça. Ça fera un truc qui rentrera pas dans l'Opéra!*" ("We would need a huge thing, but, it's prodigious to think about a thing like that. It would be a thing that wouldn't fit in the opera!") Margot (1FE) defined space exploration as "*le choix d'Achilles*" ("Achille's choice"), a source domain of knowledge issued from her familiarity with Greek mythology.

People used analogies and metaphors that were inspired from varied domains such as history, dance, travel, finance and architecture. Yet, most often analogies were created between simple, everyday activities, such as taking a walk (see Vignette 6), and other basic-level experiences, such as embodied interactions with objects, spaces and modes of transportation. Some people developed extended analogies based explicitly on their personal experience, describing it in detail. Take for example, Jean's (1ME) comparison of "*liberté*" ("freedom") in the region where he grew up and in conceptions of outer space:

"Moi, je te dis que je viens d'une région où on voit très bien les étoiles quand il fait beau. C'est au mois de juillet que tu es avec un ami, que tu fais du vélo dans la campagne alors que tes parents croient que tu dors à la maison. C'est une liberté qui est complète. Ce n'est pas que la liberté que 'dans l'espace tout est possible'" ("Jean," 1MNE). V5:16⁵¹

Similarly, Arthur (2MNE) described constructing a shuttle system between Earth and the Moon, basing it on the different stages of taking a trip:

⁵¹ "I'm telling you that I come from a region where we see the stars really well when the weather is nice. It's the month of July, you're with a friend, you're riding your bikes in the countryside though your parents think you're sleeping at home. It's a complete freedom. It isn't that kind of 'in space everything is possible' freedom."

“On peut envisager ça avec des fusées nucléaires qui seraient uniquement des fusées, comme...quand on prend l’avion, on a d’abord le taxi, ou la voiture pour y aller, après on prend l’avion. Et là on peut très bien envisager des vaisseaux qui sont que uhhh extra-planétaire. C’est à dire ils n’atterrissent pas, ils ne repartent pas. Ils restent juste dans l’espace. Ils font la navette comme ça” (“Arthur,” 2MNE). V5:17⁵²

Interviewees also frequently used fixed French expressions that issue from basic-level embodied interactions (though interviewees themselves may not be familiar with these source experiences). Marie (2FE) confided to me that she cried “like a calf” when Laïka, the dog the U.S.S.R. sent into space, died: “*J’ai pleuré à sa mort comme un veau*” (“I cried about her death like a calf”). This is an agricultural expression linked to experiences with the noise of a crying calf. Jean-Denis (3ME) talked to me about the last time he moved houses and how he sold everything and just brought his suitcase into “*la maison nue*” (“the naked house”). Éric talked about only missing a few people if he left for space permanently, describing how people and the space they are in form a unity in which he “gravitates”: “*Non, parce que c’est un tout. Mes amis sont dans un lieu dans lequel je vis, dans lequel je grave. Donc, si mes amis me manquent l’endroit me manquera aussi*” (“No, because it’s a whole. My friends are in a place where I live, in which I gravitate. So, if I miss my friends, I’d miss the place, too.”)

The prevalence of container metaphors (e.g. **EARTH IS A CRADLE**) and orientational metaphors (e.g. **TIME IS A HORIZON**) provides further evidence of the use of basic-level experiences as a source domain of knowledge. Lakoff and Johnson (1980, 29-30) argued that these metaphoric modes (See Chapter 6 for further discussion) are omnipresent in the English language and likely universal, as they are representations of movements and sensations that are common to all human bodies (e.g. sensations of hot and cold, darkness and light or using cultural artefacts such as structures and containers). In the case of container metaphors, they explain that humans construct these conceptual metaphors by projecting their experience as a delimited entity onto the world around them. Though I did not perform an exhaustive survey of the use of these

⁵² “We can imagine it with nuclear rockets that would only be rockets like...when you take a plane, first you take the taxi, or a car to get there, then you take the plane. And we can imagine ships that are extra-planetary. What I mean is that they would never land and take off again. They would just stay in space. They’d shuttle back and forth like that.”

metaphoric modes in French, these modes are widespread in the language used by my participants. My data set suggests that these metaphoric modes operate to structure unknown and imagined experiences as they do known and ‘real’ experiences.

In container metaphors, our experience of possessing a delimited surface and an interior-exterior orientation is taken as the source domain for a range of metaphorical conceptions. For example, we apply this interior-exterior orientation to our conception of the visual “field” and describe what we see as being “in” or “out of” our “field” of view. We also apply this orientation to our understandings of events, activities and mental or emotional states as being “container objects” (e.g. a bathtub) or “container substances” (e.g. water) (ibid., 30). Events such as boxing matches can be understood as container objects when we say things like “Sugar Ray Robinson knocked Randy Turpin *out* of the match” or “Mike Tyson was *in* 58 boxing matches.” Similarly activities are perceived as container objects when we talk about putting “a lot of work *into*” an activity or describe what we “get *out* of” doing something. Activities and emotional states can also be conceived of as container substances, for example when we talk about “getting into deep trouble” or being “profoundly in love.”

In this corpus, the conception of the container is dominantly extended to our experience “*d’être sur notre planète*” (“of being on our planet”) or “*dans l’espace*” (“in outer space”) and this conception furnishes a model with which we can subsequently determine the positionings of all sorts of places, spaces, objects and phenomena, including the positioning of our planet in a larger container, outer space.

The frequency of container conceptions and metaphors in the corpus makes sense when we consider that the research questionnaire incites people to imagine changes in physical state and position in space, therefore to ‘leave one container to enter another.’ This argument can also be applied to the strong presence of orientational metaphors, as interviewees are asked to imagine themselves in different (kinds of) spaces. In Chapter Six, I will concentrate my analysis on the most dominant container conceptions and conceptual metaphors in the corpus: **EARTH IS A CONTAINER, SPACE IS A CONTAINER AND TIME IS A CONTAINER**. Chapter Seven will focus on a series of prevalent orientational conceptions and their accompanying conceptual metaphors. In both sets of metaphors the source domains discussed here will be more or less

relevant, with a strong tendency in participant discourse towards metaphors based in prototypical, embodied experiences. For example, Chapter Six demonstrates the prevalence of container prototypes like cans, crates and boxes as source domains in people's metaphors. I will discuss how these prototypes are widespread in generalized cultural knowledge about outer space (i.e. science fiction films) as well as in my interviewees' daily lives (e.g. opening tin cans or being "crammed into the metro like sardines"). Similarly, the orientational metaphors I discuss in Chapter 7 have source domains issuing from prototypical experiences, such as UP/DOWN orientations and experiences with horizons, both of which are informed by embodied experience and cultural knowledge.

Vignette 6: “Une bouteille d’eau et une bonne bouteille de vin.”

(Male, non-expert, 45 years old)

Of excellent humor as usual, Antony laughed throughout our interview as we sat huddled in the warm, back corner of a café in the 18ème arrondissement. He told me about his mild interest in science fiction, his conviction about the existence of extra-terrestrial life and spoke about his work. Antony is the purchase manager for a large factory in the south of France where he has worked for years. He typically collaborates with a team of people and he talked at length about what he believes humans can accomplish through teamwork. He extended his experience of working on a team, to the teams of humans sent into space and to his own imagined space travel. When I asked him what he would take to space if he had a single kilo, he laughed again.

“Je réfléchis. Un kilo? Je ne sais pas. Qu’est-ce que je prendrai si je pars... qu’est-ce que je prends. Franchement....Demain, je pars...”

“Le premier truc qui me vient c’est que je prends une bouteille d’eau. Je prends une bouteille d’eau. Je prends mon sac à dos, là-dedans je mets une bouteille d’eau. Je fais quoi, franchement, j’imagine que je pars je vais me promener...”

“Je prends une bouteille d’eau, je prends des barres de céréales...je prends une serviette. De quoi se...de quoi se laver, allez mon savon, mon savon et puis. Allez, je pars à Koh Lanta, Koh Lanta⁵³ je pars je prends une brosse à dents, un savon, une serviette, une bouteille d’eau. De quoi me changer au moins une fois. Franchement....”

“So,” I asked him, “You leave the Earth with your soap and toothbrush?” He confirmed once more, “We’re not coming back, right?” “Right,” I responded. He continued, describing how he would only take the “strict minimum to live.” He returned to the necessity of the water bottle and then, producing a response cited by four other participants, the desire to bring a bottle of wine. Water and wine, he says. “Allez, une bouteille d’eau et une bouteille de vin et après, voilà.” This is the “strict minimum” in his mind.

Then, his kilo began to transition from necessity, to sentimentality.

“Un kilo? Un kilo c’est tout petit quoi. Après, si tu as une photo ou deux d’ici quoi...des petits coins que je connais ou voilà. Les photos de vacances je dirais, d’un endroit, je ne sais pas, n’importe, d’un endroit qui est con, mais une photo de vacances qui me plaît, ou d’ailleurs, la photo avec, et peut-être, si... des photos de famille quoi. Je prendrai des photos de famille, histoire d’avoir des photos de famille, des petits souvenirs quand même. Tu sais pas si elles sont parties avec toi ou non les personnes...”

⁵³ French reality TV show

“Et sinon....on n’a pas besoin de prendre l’argent...ça sert à rien. Non, franchement, non. Le minimum quoi. Vraiment le minimum....de quoi se rappeler un petit peu la Terre. Donc....ouais, des photos je ne sais pas, de paysages d’ici quoi, de la Corse, j’allais voir la Corse, de la Bretagne, des Alpes, des petites photos...histoire de dire, ‘c’était ça quoi.’ Oui, histoire de se rappeler un petit peu la Terre, quoi.”

His reflection slowed. He stopped to take a drink and, as if cued after swallowing, returned to the “strict minimum” he had insisted upon.

“Une bouteille d’eau et une bouteille de vin. Une bonne bouteille de vin.”

Hearing the recording I was taken aback when I realized that his strict minimum consisted in the basic ingredient of life on Earth (water) and one of the basic products of human (agri)culture on Earth (alcohol). It is accepted by the scientific community that water is essential to life on Earth (Ghose 2015) and recent archeological research demonstrates that some groups of humans first began growing grains to produce alcohol, before they had domesticated grains for other uses (Hayden, Canuel and Shanse 2012) Antony’s micro-level assurance of his health and happiness, of his basic experiences in his body, reflected a macro-level reality about human experience. His comments also resonate a prevalent assumption among participants that there will be no good wine in space. Many people would tell me that it is not only a natural environment that sustains human beings, it is culture as well. Though water and oxygen are paramount, most interviewees made arguments for the necessity of culture, particularly when culture culminates in an excellent Bourgogne.

Chapter 6: Structural Metaphors and Proto-Metaphors

As I discussed in Chapters Four and Five, the data in this corpus suggest that people use metaphors with source domains based upon both their past embodied experiences as well as cultural texts. The preceding vignette, in which Antony models his preparation for emigration to space based on how he prepares to take a walk in his neighborhood is an excellent example of this. In describing this process, he frames the potential reality of going to space within his embodied experiences of what he needs when he leaves his house. He is working, as he says, on a very basic level of understanding, in which he imagines the “strict minimum” he would need when leaving home. However, his discussion, though explicitly based on embodied experience, is also informed by cultural texts. For example, he talks about not taking money to space because it would be ‘useless.’ This is not knowledge he has acquired through embodied experience. This is cultural knowledge, based potentially off of what he knows about space stations and science-fiction texts in which currency is absent or infrequently referenced (e.g. *Star Trek*). Antony’s embodied experiences are dominant in this discussion, but they are supplemented with cultural knowledge. His imagination is influenced by both these ways of ‘knowing’ reality and evaluating (im)possibility and (un)desirability.

The sources of knowledge people use to understand and categorize unknown phenomena are diverse and result in a spectrum of metaphors they use to describe their imagination. However, as we shall see, these metaphors are always grounded in a form of cultural or embodied knowledge. People I spoke with did not develop ‘pure imaginations’ of outer space and did not frequently create neologisms or novel metaphors. They used the tools of their language and their own individual experiences within the cultural context of France in the early 21st century. All of these elements - the language they speak, their experiences, and their sociocultural, historical context influence how they categorized and discussed outer space.

In the following three chapters, I will analyze the dominant metaphors and conceptions in the corpus according to the three metaphoric modes identified by Lakoff and Johnson (1980): structural, orientational and ontological metaphors. These metaphoric modes remain pertinent in metaphor studies today (as discussed in Chapter Three) and my data set confirmed their presence

in the discourse of French speakers. However, my data also pushed me to include another category of analysis: the proto-metaphor. Whereas the metaphors interviewees used lined up well with previous research concerning source and target domains, elements of the data suggested that linguistic preferences within the French language itself also prompted people to develop particular conceptions based off of the conception encouraged by French grammar (e.g. to be “in” or “on” a planet). These uses of language cannot be defined as metaphors according to my own definition of metaphor (see Chapter Three), therefore I define them as ‘proto-metaphoric’ as they are linguistic elements that prime speakers to use certain metaphors.

First, I will review the classic metaphoric modes traditionally used in metaphor studies: structural, orientational and ontological metaphors (Lakoff and Johnson 1980). A structural metaphor is a metaphorical system in which one complex concept is “partially structured, understood, performed, and talked about in terms of [another concept]” (often a more concrete or basic concept) (Lakoff and Johnson 1980, 5). A classic example of this is the metaphor **ARGUMENT IS WAR** in which the conception of an argument is structured in terms of the concept of “war” (e.g. “She attacked my position” or “He won the argument”). Orientational metaphors give a spatial orientation to concepts (e.g. Front-Back, Up-Down, In-Out) that are understood to be motivated by the embodied orientations of humans. I will analyze these kinds of metaphors in Chapters Seven and Eight. Lastly, ontological metaphors are typically deployed in order to conceptualize emotions, ideas, events and systems in terms of entities or substances. For this reason, ontological metaphors include personifications in which an abstract or complex domain is understood anthropocentrically (for example, referring to Earth as a ‘damsel in distress’). Ontological metaphors and the ontologies they imply in participant conceptions will be further discussed in Chapter Ten. Conceptual metaphors may and do overlap multiple categories. These metaphors are not mutually exclusive from other structuring metaphors, or from other types of metaphors.

In addition to conceptual metaphors, the data allows for a rich analysis of conceptions of space and humanity beyond the Earth that are encouraged by grammar, notably the semantic value of certain prepositions. These are the lexical units I identify as proto-metaphors that predispose speakers to use particular conceptual metaphors. Analysis of these semantic elements

and how they reinforce particular representations provides further evidence concerning the motivation of conceptual metaphors in the grammatical structure of languages themselves.

I will now proceed to the analysis of grammatical elements that reinforce conceptions in the data, focusing in particular on the use of prepositional phrases and how these grammatical ways of describing the world inform metaphorical ways of conceiving the world. Then I will discuss examples of the most recurrent metaphoric mode in the corpus: structural metaphors. People often use structural metaphors, particularly those of containers, to extend conceptions of being ‘within’ or ‘outside of’ the planet Earth, outer space or time. Though in the following analysis I concentrate on those container conceptions using locative prepositions, people use container metaphors without these prepositions. These container metaphors often use verbs such as “*ouvrir*,” “*s’ouvrir*,” “*enfermer*” and “*se renfermer*,” as in the conception of the human spirit being a container, therefore an individual can possess an “open” or “closed” spirit (in French this is discussed as an “*ouverture*” or “*fermeture*” of the spirit). For example, “Antony” (2MNE), described living in space as ‘no life at all.’ “*Pour moi, c’est pas une vie. C’est tu t’enfermes dans un truc...Il faut parler...il faut s’ouvrir*” (“For me, that’s no life. It’s that you close yourself up in a thing...it’s necessary to talk [to others]...to open oneself up”).

6.1 Locative Prepositions and Container Conceptions: Evidence of Proto-Metaphor

Many language groups, including Turkic, Uralic and some Indo-European languages, possess a locative grammatical case which indicates location. In French, like in English, this locative case is not marked morphologically, but marked syntactically through the use of a group of locative prepositions (e.g. “in/*dans*,” “at/*à*” “on/*sur*” “by/*à côté*”). These prepositions provide distinct locations for the description of objects and events and positions what speakers talk about in particular ways. There are grammatical preferences for the uses of locative prepositions in languages such as English and French. For example, in English I will say that my suitcase is “in” or “at” the house. However, I would not say that my suitcase is “at” the plane, but “in” or “on” it. Each of these prepositions evokes a particular structural or orientational conception. To be “on”

something evokes a representation of the location as a surface. To be “at” something depicts a location as a destination as well as often remaining exterior to the destination, rather than “in” it (for example, the nuances in phrases such as, “meet me at the car” and “meet me in the car”). To be “in” something evokes a representation of the location as possessing an interior and exterior that allows the possibility of entrance and exit.

I am fully aware that these prepositions are not metaphoric, as they do not mobilize source and target domains. Here I am musing about the possibility that the meanings embedded in these prepositions contribute to speakers’ conceptions of the world in which they live, making them proto-metaphoric. These proto-metaphorical elements of speech offer possibilities for specific conceptualizations of events, entities and abstractions. Conceptions of being ‘in’ or ‘out,’ ‘under’ and ‘above,’ etc., are enforced by grammar and are therefore more readily available for speakers to create and extend into metaphors. In English, we are guided by the grammar of our language to think about being “in” cars, buildings and cities. This conception of the container is then extended metaphorically to talk about a range of experiences and emotions. In English, I can be “in love” and can even “fall in love.” In French⁵⁴, this preposition is not used in expressions pertaining to love. Rather, love is a state of being that is described using the verb “to be” (“être”) with an adjective (“*amoureux/amoureuse*”). I can “fall” into being “*amoureuse*” in French, but again I would simply “*tomber amoureuse*” without the use of locative preposition to evoke a conception of a container. Incidentally, in French I do not “fall out” of love, as I can in English, it is my state of being that shifts from “*amoureuse*” to no longer “*amoureuse*.”

The preposition “*dans*” (“in”) and the container conceptions and metaphors that use this preposition are widespread in my interviewees’ discussions concerning outer space and life beyond the Earth. This can be attributed to the fact that in these expressions “*dans*” is often the only syntactic option available. In many of the examples I discuss, syntax is a straight jacket to peoples’ discourse. “*Dans*” appears in the corpus 1,870 times (in a total of 180,794 words, therefore representing 1% of the total linguistic production in the corpus)⁵⁵. This preposition is found in container metaphors such as “*survivre dans une boîte*” (1x), to be “*enterré dans une*

⁵⁴ However, in Québec French, speakers make use of the calque from English, saying “*tomber en amour*.”

⁵⁵ When I cite total numbers, I do not include my linguistic production, nor the questionnaire.

boite” (1x) or to go “*dans une planète*” (1x). Nonetheless, the most recurrent use of “*dans*” in the corpus is in the prepositional phrase “*dans l’espace*” and a number of other prepositional phrases that refer to being “in” events (e.g. a movie), locations (e.g. the sky, the suburbs) and objects (e.g. a spaceship). Whether “*dans*” is found in metaphors, or in prepositional phrases describing literal states and events, the use of this preposition evokes a container, as opposed to other sorts of locations and spaces (e.g. a surface).

The most recurrent container conceptions supported by prepositions in the corpus are:

- 1) “*dans l’espace*” (225 x + 3 variations, total of 228 instances)
e.g. “*les voyages dans les espaces infinis*”(3MNE) (3 instances)
- 2) “*hors de la Terre*” (144 x) (+ 9 related surface metaphors, total of 153 instances)
- 3) “*dans le temps*” (14x) + “*dans + durée*” (26x) + “*dans l’avenir/le futur*” (12x), (total of 52 instances)

The above conceptions necessitate a comprehension of barriers between places or states of being. They also structure the conceptual priorities of speakers. When we are “on the Earth” we do not notice the fact that we are also “in space” (as the Earth, therefore we, are in space at every moment). Participants spoke about humans “on planets” (“*sur des planètes*”) or who “go up into space” (“*là-haut dans l’espace*”), these expressions separate space between celestial objects and the sky itself (or space) in which these objects are situated. No participant spoke of being “on space,” “under space,” or “above space.” Space, in this discourse, is always “exterior” to humans and humans “go out into space” (“*sortent dans l’espace*”), an act that requires that we “leave” planet Earth.

6.2 “*Dans l’espace*” (“in space”) : SPACE IS A CONTAINER

“*Dans l’espace*” (“in space”) is by far the most frequently used container conception in the data, with a total of 228 instances. Existing in space is a primary human experience, translated by our senses and reinforced by other experiences with containers. Humans are creatures that live “in” space (whether it be the space of a room, or of a universe). We have

experiences of being “inside” and “outside,” not only of physical spaces, but also structures, modes of transportation, clothing, as well as “in” and “out” of our own minds, states of mind, and the past and future.

Though many uses of the phrase “*dans l’espace*” refer to ‘literal’ descriptions, nonetheless this preposition reinforces the conception of interiors and exteriors. This conception is motivated by terrestrial embodied experiences like those mentioned in the previous paragraph, as well as the way our size and the size of other objects and spaces determines what can go ‘inside’ or ‘outside.’ Using the phrase “*dans l’espace*” literally does not mean that the phrase does not structure ideas conceptually. It remains that prepositions such as “*dans*” encourage a certain understanding of the world by parceling reality into elements that are potentially ‘inside’ of something, whether it be natural landscapes, cultural artefacts or the interior spaces of our minds and hearts (e.g. “*dans mon coeur*; “*dans ta tête*”).

When we talk about being “*dans l’espace*” (“in space”) we separate space from ourselves. Though we are contained by space, it is a separate container entity, rather than an extension of our bodies or vice versa. Inside and outside delineate clear boundaries and when we are inside or outside of something, that thing is not ‘part of’ us (though there may be a few examples with fuzzy conceptual boundaries - i.e. being inside of a mother’s womb, where the container does partially constitute its content). Additionally, this phrase provides us with a conceptual opportunity to be “outside of space.”

This preposition encourages certain conceptions, whether used literally or not. These conceptions are not always 100% ‘accurate,’ but can be figurative or shift into the spectrum of the metaphorical. For example, literally or scientifically, from an atomic perspective on space and matter to speak about being “*dans l’espace*” or potentially “*hors de l’espace*” (“outside of space”) is metaphorical. Take the well-known quote from scientist Carl Sagan, “We are all made of star stuff.” Modern science postulates that everything in our universe is composed of the same elements, organized differently, but all existing together as the ‘fabric of the universe.’

Similarly, “empty space,” in a room or in which the Earth may be described as being “*suspendue*” (“suspended”) is also an illusion. All space we perceive as being empty is actually filled (as with Whorf’s gasoline drums!). Dr. Derek Leinweber (2012) at Adelaide University

explains that “empty space is actually full of quark and gluon fluctuations.” Even in cases where participants are literally using the expression “*dans l’espace*,” it becomes problematic to argue that language using conceptions of containers to describe space is literal, as it does not describe reality to the best of our knowledge. The ways participants speak about space - “*être dans l’espace*” (“to be in space”), “*être hors de l’espace*” (“to be outside of space”), “*aller dans*” and “*sortir de l’espace*” (“to go into” and “to leave space”) - are founded in basic experiences rather than a scientific way of describing reality as it ‘really is.’ These are conventional codes in language that, in many cases, have been used for centuries with little to no change in popular speech to accommodate for changes in scientific comprehension. They are not conceptions or metaphors, but predispose speakers to certain ways of structuring the world, based on the way their language necessarily structures discussions of that world. My constructivist perspective of language resonates with that of Whorf, or as Leavitt (2014, 194) describes it, “the continuing impression, through the generations, that different languages convey different worlds.”

The analysis of linguistic metaphor as embodied and constructive, already Whorfian in its own right, has enticed me to speculate about the edges of the boundaries between metaphor, embodiment, speech and wor(l)-building. As Leavitt (2014) remarks, and decades of cognitive and linguistic science attest, there is *something* to the relationship between language and thought that we have yet to sufficiently explain for ourselves. The diverse literature I reference in this thesis provides evidence that this relationship exists, but without providing a comprehensive understanding of this relationship. The concept of the proto-metaphor that I use here allows me to play with the boundaries of metaphoric language, literal language and the relationship of language to embodied experience.

As I stated above, the lexical units I describe as proto-metaphors are not technically metaphorical, but retain conceptual content beyond their literal meaning. In my corpus, for example, the grammatical preference of French speakers to use the locative preposition “*dans*” (“in”) rather than “*sur*” (“on”), does not require the use of a source domain to understand a target domain, but nonetheless creates and reinforces certain conceptions of the world. Speakers may be, and often are, oblivious to these effects and they may be but conceptual whispers, but it remains that these differences in expression and syntax exist and are 1) linked to

embodied experience and 2) do much to determine the form (and possibly function) of particular utterances. In English I can speak about being “on a plane” or “in the plane,” however, in French to be “*sur l’avion*” would mean to be on top of it, not seated within it. When English speakers speak about being a passenger in the interior of an airplane, both prepositions can be used and the idea remains the same. Nevertheless, I cannot use any preposition and end up with the same information. “Under” or “over” the plane would be confusing (and dangerous!), “above,” “beside” and “beyond” would create a different image in my mind. “*Dans*” and “on” are literal ways of talking about being in an airplane, but these prepositions still refer to generalized, often embodied experiences that structure the way the world is categorized. They reinforce the conception of interior/exterior that can also be applied to cases where this conception is less literal or entirely metaphorical. “*Dans l’espace*” is one such instance of a shift from literal meanings to figurative meanings.

Counter examples such as “*dans l’avion*” are useful in recognizing the assumptions made by the deployment of a particular preposition, and therefore conception of all kinds of spaces, including outer space. “*À l’espace*” (“to” or “at space”) is not ‘French,’ though it is grammatically possible, semantically it has no meaning. However, to use the preposition “to” instead of “in” may predispose speakers to think of space more as a destination than as a container, or as a point on a plane upon which we can be situated, rather than as an encompassing, ‘inky’ substance that surrounds us. A terrestrial example of this is the way speakers can talk about going to Paris as a destination (“*je vais à Paris*;” “I’m going to Paris”) or talk about going to Paris as a location (“*je rentre à Paris*;” “I’m going back to Paris”). It has also become common for younger speakers to say “*je suis sur Paris*” (“I am on Paris”) when they mean to say “*je suis à Paris*” (“I am in Paris”).

At this point one can rightfully argue that these examples are purely questions of syntax; the straitjacket of language that speakers cannot choose, but are obligated to use in order to ‘correctly’ speak a language and be understood by others. I find these moments interesting, especially those that depend on the straitjacket of syntax, as these are spaces where we can play with Whorfian analysis to find the limits of this perspective. It may be, to take the example of locative prepositions, that we are simply held by syntax to use certain prepositions that happen to

reflect certain conceptions of space. In the distant past, these conceptions issued from embodied experience, but are void of that conceptual information for speakers. I argue that documenting how these prepositions reflect embodiment and possess conceptual potential to predispose speakers to extending conceptions in particular ways, is a useful evidence to support both weak Whorfian perspectives and embodied theories of language and cognition; enriching these perspectives by contributing to a comprehension of the pervasiveness of embodiment in our ways of thinking and speaking.

For example, in my corpus ways of speaking about being “in space” and displacing oneself to different locations “in space” reflect the size of these spaces relative to human scale. This manner of conceiving and categorizing is based on our experience of being a particular size in spaces of particular sizes, and of other objects and how they fit into different spaces. This analogical way of thinking is not a literal description of reality. This is evident as these prepositions and conceptions change across languages; proof that this knowledge and way of perceiving the world are relative to culture. These are metaphors in our cultures and cognition that manifest themselves in language and are reinforced by language.

The metaphors in this corpus demonstrate a cascade of containers that make use of a relative scale in which size is always the determining factor when a participant attributes the roles of “container” and “contained.” For example, when discussing the Earth “in” space, space is conceived of as being larger than the Earth, therefore it operates as an Earth-container. However, when describing terrestrial events and beings, the Earth becomes the container for that which is smaller than it (and located “upon” or “in” it). This use of relative scale is typical in discourse concerning places on Earth (e.g. I could tell someone I am from Oklahoma, or from the United States, or a citizen of the world, depending on whom I am speaking to and the scale and meaning I want to evoke).

I argue that the pervasive use of container metaphors in my data is partially motivated by the understanding of space as a dangerous environment. Because space is not a viable environment for human beings without some form of technological mediation, people often described the necessity of being protected from space. People in my corpus were very preoccupied with the need to separate themselves from space; with being ‘contained’ or being the

‘content’ within another more life-sustainable medium (e.g. orbital space station, space suit or planetary habitat). Take for example the handful of excerpts below in which people describe being “enclosed” and “confined” and link this to the lack of breathable air in space and on other planets.

“Parce que c’est sur si on est obligé d’être dans un scaphandre et qu’on peut pas respirer dehors, déjà c’est un peu compliqué” (Franck, 1MNE). V6:1⁵⁶

“Avec ce qu’on peut projeter aujourd’hui, c’est c’est une vie très confinée. On est obligé de vivre dans des habitacles, dans des...dans des domes, dans des capsules où on recrée l’atmosphère qu’on peut respirer. Éventuellement, où on cultive ce qu’on peut cultiver...Pour aller plus loin il faudrait imaginer des choses comme le terraforming. Donc, ça...ça a été envisagé notamment à une époque pour Mars où on croyait qu’il y avait beaucoup plus d’eau et de gaz sur Mars, donc on pensait qu’on pouvait le faire extraire du sol et des calottes glacières pour refaire une atmosphère” (Joseph, 2ME). V6:2⁵⁷

“Psychologiquement ils ne seront pas aussi détendus que nous qui n’aurons qu’à sortir pour respirer” (Marie, 2FE). V6:3⁵⁸

“Parce que tout ce que tu as sur Terre c’est compliqué de le reproduire et de le retrouver ailleurs dans les mêmes conditions avec, surtout le fait de pouvoir être à l’air libre. Essayer de reproduire les mêmes conditions de vie dans un endroit hostile où que tu sois obligé d’être dans un espèce de vase clos, sans pouvoir être à l’air libre, c’est pas pareil quoi...Je verrais sous un dome sous protection. C’est pas la liberté que tu as en France, fin que tu as en France, que tu as sur Terre...” (Éric, 2MNE) V6:4⁵⁹.

⁵⁶ “Because it’s certain that if we are obligated to be inside a spacesuit and we can’t breathe outside, already it’s a little complicated.”

⁵⁷ “With what we can project today, it’s a very confined life. We are obligated to live in habitats, in...in domes, in capsules where we have recreated a breathable atmosphere. Possibly, where we can cultivate what we can cultivate...To go further we have to imagine stuff like terraforming. So, that...that was imagined for Mars at a time when we thought that there was a lot more water and gas on Mars, so we thought that we could extract glacial hunks from the ground to remake an atmosphere.”

⁵⁸ “Psychologically, they will not be as relaxed as we are, we only have to go outside to breathe.”

⁵⁹ “Because all you have here on Earth is complicated to reproduce or to find in the same conditions, especially the fact to be able to breathe in the open air. To try to reproduce the same conditions for life in a hostile place where you are obligated to be in a kind of bell jar, without being able to be in the open air, it’s not the same. I imagine it under a protective dome. It’s not the same kind of liberty you have in France, well in France, on Earth...”

“...cette possibilité de pouvoir marcher parce que, si je quittais...fin...d’être sur la navette, dans l’ISS, par exemple, c’est quand même assez confiné, hein, et on devient vite claustrophobe...Voilà, donc c’est un peu ça... de pouvoir marcher et d’être habillée sans avoir une combinaison d’ouf qui pèse des kilos et des kilos.” (Nayla, 1FNE) V6:5⁶⁰.

“Être dehors [me manquerait]. Parce que tu es toujours enfermé en fait. L’air.” (Agnès, 2FNE) V6:6⁶¹.

“Partir pour visiter une planète...visiter ouais, après rester sur une planète enfermé dans un truc parce que l’air n’est pas respirable. À un moment donné, ça sera pénible...toujours dans la même structure fermée, c’est...ouais, mais il y a des limites, quoi, il y a des limites.” (Antony, 2MNE) V6:7⁶².

Each of these discussions describes different containers - space stations, spacesuits, domed space colonies and how people must be enclosed within them to survive. The necessities of human bodies are prioritized in these descriptions of space, for some to the detriment of human minds. There are minimum requirements for human life that we must recreate. Most interviewees imagined this occurring through the use of suits and structures (methods used by today’s astronauts), while others talked about terraforming entire planets so that these planets become viable containers for human life. In the next section, I will discuss the conception of being ‘within’ a container that sustains human life that people apply to the Earth.

6.3 “Hors de la Terre” (“outside of the Earth”) : EARTH IS A CONTAINER

“hors de la Terre” (144 instances)

“hors Terre” (1 instance)

“hors de la planète Terre” (2 instances, outside of my questions)

“La Terre vue de ...dehors” 1FNE (1 instance)

⁶⁰ “The possibility to walk because if I left, if I was on the space craft, or the ISS for example, it’s all the same pretty confined, and you would quickly become claustrophobic...So, it’s a little like that...to be able to walk and to be dressed without having to wear a spacesuit that weighs kilos and kilos.”

⁶¹ “[I would miss] being outside. Because you would always be enclosed in fact. Air.”

⁶² “To go and visit a planet...yeah visit, afterwards to stay on a planet closed up in some thing because the air isn’t breathable. After a while that would be obnoxious...always in the same closed up structure, it’s...yeah, but there are limits, you know, there are limits.”

E.g. “*sortir en dehors de la Terre*” 1FNE (4 instances)
“*sortir de la planète*” 1FNE (1 instance)

Typically, in French when one speaks of being “*dans la terre*” (“in the earth”) the reference would be to earth with a lowercase “t,” and the sense of the expression would be one of being “*enterré*” (“buried”) under the surface of the planet Earth, in the dirt, or “*la terre*.” The word “dirt” does not exist in precisely the same way in French as in English. In SAE one can say “earth” or “dirt” (dirt referring to a substance, such as mud, dust or soil from the Earth). In French “*terre*” or earth is the most commonly used word to refer to “dirt” (in addition to “*sol*” which would translate more as “ground”) and we see “*terre*” appear in a number of expressions such as “buried,” literally to be put “in earth” in French⁶³.

Because of syntax, people do not refer to being “in Earth” when they talk about their terrestrial lives, but will say “on Earth” (“*sur la Terre*”). There are no occurrences of a participant describing an imagination of space, nor recounting their lives or other topics, in which they talked about being “in the Earth.” However, when it came to imagining no longer being “on” Earth, but off planet, the orientational conception of being “on” the Earth’s surface was uniformly replaced by a container conception of being “out” rather than “off.” The conception of being “out of Earth” or “outside of the Earth” is a common thread in how people talked about being “in space” or “in the beyond” (“*l’au-delà*”) “above the Earth” (“*en-haut de la Terre*”). The following examples come from discussions of space and science fiction films. In V6:8, Christian, an astrophysicist, describes current realities in sustaining human life “*en dehors de la Terre*” (“outside of the Earth”). Adèle talks about problems for human biology “*hors de la Terre*” (“outside of the Earth”) in V6:9, and in V6:10 Olivier expresses his doubts about the human capacity to establish colonies “*hors de la Terre*.” Finally, in V6:11-12, Édouard, a retired film professor, describes representations from sci-fi movies in which humans are “exiled outside of the Earth” or alien technology arrives “from the exterior of the Earth.”

⁶³ “*Enterrer*”

“Donc, maintenir un écosystème terrestre *en dehors de la Terre*, l’ISS le fait” (Christian, 2ME). V6:8⁶⁴

“Moi, je pose toujours la question *hors de la Terre* le problème du cycle de reproduction humaine” (Adèle, 3FE). V6:9⁶⁵

“Des colonies humaines *hors de la Terre*...bah je sais pas” (Olivier, 1MNE). V6:10⁶⁶

“Et donc c’est [*Things To Come*, directed by William Cameron Menzies] une histoire de lutte entre deux factions disons, bon, qui à certains égards préfigurent la Seconde Guerre Mondiale, en tout cas c’est l’idée d’un conflit important, pas simplement à l’échelle européenne et donc cette idée d’exile *hors de la Terre*” (Édouard, 3MNE). V6:11⁶⁷

“On a l’arrivée du monolithe, de *l’extérieur de la Terre* vers...sur la Terre” [discussing the opening sequence of *2001: A Space Odyssey*, directed by Stanley Kubrick] (Édouard, 3MNE). V6:12⁶⁸

We know empirically, from embodied human experience, that space is dangerous to humans and lacks many elements crucial to human survival (e.g. oxygen, water, terrestrial gravity). The conception of the container is therefore useful in highlighting many salient elements in the experience of human space travel and is arguably a logical method for framing human experience. The Earth is conceptualized as a protective container that is separated from space and its dangers (e.g. our atmosphere is frequently described as a ‘shield’ against deadly rays). Earth conditions are conceived as perfect and comfortable for our species.

People conceived of the Earth as a container “in” which humans live and that space is “*au-delà*” or “*là-haut*,” disconnected from the Earth; its own domain. A number of metaphors found in the corpus function using the conception of the Earth as a container. People develop these metaphors by specifying what kind of container the Earth is, using different source

⁶⁴ “So, maintaining a terrestrial ecosystem outside of the Earth, the ISS does this.”

⁶⁵ “I always question myself about the problems of human reproduction outside of the Earth.”

⁶⁶ “Human colonies outside of the Earth...hmmm, I don’t know.”

⁶⁷ “So, it’s a story about a struggle between two factions that, let’s say, in many ways prefigures the second World War, at any rate, there’s this idea of a major conflict, not simply on a European scale, and so there’s this idea of exile outside of the Earth.”

⁶⁸ “We have the arrival of the monolith from the exterior of the Earth towards...towards the Earth.”

domains to describe the target domain of Earth. For most people, the Earth is not only *a* container, but *the* container par excellence for humanity. This is the case of expressions that refer to the Earth as “*le berceau*” (“the cradle”) of humanity as well as the predominant conception of Earth as humanity’s home.

The metaphor **EARTH IS HUMANITY’S CRADLE** is used eleven times, by three people, all science fiction authors or artists. Here are a few examples from their discussions:

“À partir du moment où nous quittons notre planète notre berceau, nous sommes condamnés à être ensemble” (Simon, 2ME). V6:13⁶⁹

“...après je ne sais pas, sorti de notre berceau humain ce qui va se passer quoi” (Jean-Denis, 3ME). V6:14⁷⁰

“OK, l’autre motif est “La Terre est notre berceau mais on ne reste pas éternellement dans un berceau”. Les sub-textes idéologiques de cette position sont trop problématiques pour moi (rejet de la Terre-Mère, séparation nécessaire du petit garçon... mais, les gars, les femmes existent aussi, et peut-être leur opinion est-elle plus nuancée là-dessus?)” (Danielle, 3FE). V6:15⁷¹

Simon and Jean Denis deploy the metaphor in similar ways in V6:13 and V6:14. The cradle ensures a minimum of security and stability. The first quote also implies that human beings have a certain independence, possibly even a potential for mobility that Simon did not envision as being possible beyond the Earth. He speaks of a forced “togetherness” in which humans must band together to survive once they are off-planet. Using the word “condemned,” he paints a somber picture of humanity’s departure from the cradle.

The final quote is from Danielle, a long-time science fiction and fantasy writer, and the only woman to use the metaphor. She explicitly calls this conception into question, citing the gendered and problematic character of its “ideological subtexts.” She deploys this conception differently than the two male participants, as, in her opinion, a requisite of the conception is that

⁶⁹ “From the moment we leave our planet, our cradle, we are condemned to be together.”

⁷⁰ “Afterwards, I don’t know what will happen once we have left our human cradle.”

⁷¹ “Ok, so the other motif is “The Earth is our cradle, but you don’t stay in a cradle forever.” The ideological subtexts of this position are too problematic for me (rejection of ‘Mother Earth,’ the necessary separation of the little boy from his mother - but dudes, women exist too, and maybe they have a more nuanced opinion on the subject?”

humanity will eventually leave its cradle. This entailment is not active in the first two quotes, in which leaving the cradle is not described as necessary nor inevitable and may even be problematic.

In all three cases, the source domain is an infant's cradle, a prototypical human artefact in which we place newborn human beings, notably while they sleep. Cradles evoke a beginning and connote infancy and are perceived as a protective container that both staves off exterior harm and provides comfort for the infant at its interior. Conceiving of the Earth as the 'cradle of humanity' maps these characteristics of safety and comfort onto the planet and attributes a 'fit' to humanity within the Earth. If humans are not native to 'the cradle' (this is not a necessary entailment of the metaphor) than they were placed in it at a point very early in their development. The cradle fits humanity.

This conception of a safe and comfortable 'fit' for humanity within the Earth-cradle obscures the dangers posed to humanity on Earth, as well as the eventual future of the Earth predicted by scientists. When people evoke the concept of the cradle, their descriptions do not typically involve the potential of nuclear holocaust or natural disasters within the cradle, nor of the cradle's eventual destruction when a nearby star goes supernova. The concept of the cradle as a container does not imply the destruction of the container itself, albeit the fact that Earth's eventual destruction is, to the best of our scientific knowledge, a certainty.

An entailment of this metaphor that is not explicitly referenced is the fact that cradles are built for babies, not vice versa. **EARTH IS HUMANITY'S CRADLE** is a conceptual metaphor that renders the Earth a human artefact intended for human use. In extended versions of the metaphor such as those used by Danielle (V6:3), in which humanity should, as it "grows and develops," leave its cradle, the state in which the cradle is left is often not considered. If **EARTH IS HUMANITY'S CRADLE**, then when humanity develops beyond this cradle, the cradle's purpose has been served. This metaphor does not include preserving the cradle for future generations. As participants do not discuss Earth as the cradle of all life, only their own, there is no entailment of preserving the Earth for other forms of life - past, present or future. This metaphor binds the planet's function and purpose to humanity's development, and obscures other functions and relationships.

The **EARTH IS HUMANITY'S CRADLE** metaphor is in contradiction with a number of other perceptions voiced by participants that humanity is “*faite pour la Terre*” (“made for the Earth”), or well-adapted to terrestrial environments. The majority of participants expressed the notion that humanity could not easily leave the Earth and thrive elsewhere, and that, in the event that they did, humanity may no longer be “human” in the same way. A strong example of the conception of humanity being made for Earth is that of the Earth as “*chez nous*” or Earth Is Humanity’s Home.

It is necessary to note the prevalence of the expression “*chez*” in Standard French in which the prototypical, literal space of one’s home (“*chez soi*”) is used to comprehend a range of concrete and abstract experiences (e.g. residences - “*chez elle*,” nations - “*chez les japonais*” or “*chez les chinois*,” or other locations - “*chez le dentiste*”) or people themselves, as in expressions in which people say they have certain character traits “*chez eux*,” not meaning at their homes, but in their personalities or when talking about traits of others, especially, in this data set, of authors (e.g. “*chez Asimov on voit...*”). People used the expression “*chez*” 75 times within the data set, referring to both physical places and abstractions. The choice to use “*chez*” to describe a location personalized these locations. It is also possible in French to say “*à la maison*” (“at the house”) instead of “*chez moi*” or “*au Japon*” (“in Japan”). The distinction between these two locutions is one between belonging (*chez*) and being (*au, à la*).

Six people used “*chez nous*” as a metaphor to describe the Earth as humanity's home. Two were expert participants, both science fiction writers, over the age of 60. The other four were non-experts, three men, one aged 20>39 and the other two aged 40>59, and one woman, aged 20>39. Franck and Antony, both non-expert participants, used the expression “*chez nous*” to refer to the Earth as a way of orienting that which was “far” from “*chez nous*” (i.e. extraterrestrial life and astronauts on the ISS). The two quotes below are examples from their discussions:

“Potentiellement ça peut exister, certainement très loin de chez nous” (Franck, 1MNE). V6:16⁷²

⁷² “Potentially, that can exist, certainly very far away from here.”

“...je me dis, il est loin de tout le mec. Il est loin de chez nous, alors que tout le monde est là pour l’instant” (Antony, 2MNE). V6:17⁷³

Neither Franck nor Antony develops the concept of “*chez nous*” much further than an idea of proximity to ‘here’ where we are and where we live. However, it is clear in these examples that both men are referring to “*chez nous*” as the home of humanity, rather than their country or region within France. The discussion in V6:17 above makes this particularly clear as Antony develops his discussion saying that an astronaut is “far away from everything” and “far away from our home, when everyone is here for the moment.” The Earth Is Humanity’s Home and all of humanity is home!

Madeleine and Arthur were the other two non-experts to use the metaphor “*chez nous*. ” They deploy this metaphor as a site of comparison between humanity's home and other sites of human life and use “*chez nous*” as a way of discussing preferences for, or against, the Earth as a human habitat.

“C’est tellement...j’arrive pas à imaginer parce que c’est tellement difficile de vivre. Je pense que les gens qui vont aller, ils vont rentrer sur Terre. Ils vont se dire, ‘Je préfère vivre chez moi, là où je respire sans masque. Et, je mange du varié...’” (Madeleine, 1FNE). V6:18⁷⁴

“Le cauchemar pour l’humanité ça serait qu’un jour on dise, ‘Ah ouais, c’est vachement mieux que la Terre.’ *rire* Ça sera un cauchemar, ça voudrait dire que chez nous on aura tout démolé quoi” (Arthur, 2MNE). V6:19⁷⁵

In V6:18, Madeleine, a young digital artist, refers to the Earth as Humanity’s Home and references salient qualities of oxygen and varied food sources. She estimates that humans who travel beyond the Earth will prefer their “home” to other extra-planetary habitats because of both

⁷³ “I think to myself, he is far away from everything, that guy. He is far away from here, even though everyone is here right now.”

⁷⁴ “It’s so...I can’t even imagine it because it would be so difficult to live. I think that the people who go, they will come back to Earth and they are going to think to themselves, ‘I prefer living here, where I can breathe without a mask and I can eat a varied diet...’”

⁷⁵ “The nightmare for humanity would be that one day we say, “Oh, yeah, it’s so much better than Earth.’ *laughs* That will be a nightmare. That would mean that here we would have destroyed everything.”

1) elements present that are necessary to survival and 2) elements of comfort/personal preference (note that she did not say “I prefer because there is something to eat” but “I prefer because I eat a varied diet.”) The Earth, in her imagination of human exploration of space, remains our familiar home where we can exist with the greatest facility.

V6:19 presents a situation in which humans would prefer extra-terrestrial habitats. This is not because these habitats are paradises, but because humanity has “demolished” everything on Earth. Arthur describes the scenario as a “nightmare,” a clearly dystopian vision of humanity’s future.

The two expert participants who used this metaphor extend the conception further. The first example comes from a discussion with Jules, a science fiction writer who described seeing images of the Earth from space for the first time in 1960:

“C’est en 1960 quand la sonde de Luna 3, des soviétiques, a pris la première photo de la Terre isolée dans l’espace. Et je me suis dit... “On est chez nous!” ...Chez nous, c’est ça. On est chez nous, et chez nous, c’est la Terre. Il y a plus de frontières vu de loin. Nous sommes une île dans l’espace” (Jules, 3ME). V6:20⁷⁶

Jules describes Earth as “*chez nous*” not only a point of orientational reference, but as humanity’s home (i.e. “*chez nous c’est la Terre*,” “our home is Earth”). He insists upon this idea, repeating the phrase “*chez nous*” four times in this brief excerpt. He further develops this description of our home with another metaphor, **EARTH IS AN ISLAND** (In Space), by talking about the Earth as “isolated in space;” “we are an island in space.” This conception implies that the Earth is surrounded by a vast expanse of territory hostile to human life, but which human beings may traverse. There are connotations of solitude in his description of Earth as an “isolated...island.”

The second example comes from one of my conversations with Adèle, a female science fiction writer. She describes her conviction that humanity is “made” for the Earth, specifically its surface:

⁷⁶ “It’s in 1960 when the Luna 3 probe, the Soviets, took the first picture of the Earth isolated in space. And I said to myself, ‘We’re home! Home is that. We are home, and home is the Earth. There are no borders when you see [the Earth] from far away. We are an island in space.’”

“On n’est fait ni pour l’espace, ni pour les grandes profondeurs. Nous sommes des êtres de surface. Nous sommes faits pour être à la surface de la Terre, mais au-dessus et en-dessous, non. C’est quand même assez marrant quoi de penser à ça. On est...on est adapté à notre biotope, mais notre biotope est limité quoi. Il est chez nous, point barre...On n’a pas d’issue de secours. On ne peut pas aller ailleurs. On est chez nous ici et on est bien. Il faut faire attention à la maison, quoi. C’est tout” (Adèle, 3FE). V6:21⁷⁷

There are several metaphorical conceptions at work here, each reinforcing the other: that of human beings being “made” for an environment (e.g. “surface beings”), of space travel functioning as an eventual “emergency exit” for humanity, and that humans are “at home” on Earth and they need to “take care of the house.” The notion that humans are “made” or “designed” for their environment is prevalent and operates here, as elsewhere, to reinforce the idea that Earth is humanity’s home. Her discussion of “*la maison*” (“the house”) echoes other literary uses of this metaphor, for example the science fiction author Michel Jeury’s (2013, *Adieu à la verte prairie*) description of humanity as “*les pauvres locataires de la maison ronde, notre Terre!*”⁷⁸ Adèle implies this when she says we have no “emergency exit” from the Earth; there is no other home for humanity beyond this planet. She ends by extending the metaphor with a description of a house that must be cared for.

As in the metaphor **EARTH IS HUMANITY’S CRADLE**, **EARTH IS HUMANITY’S HOUSE** renders the planet a human artefact within human control. In Adèle’s assertion in V6:21, “we have to take care of the house,” preserving the Earth as a human habitat is assumed as being within human control; humans are caretakers of their planet-house⁷⁹. This conception of human control and management is less present in Jules’ discussion of the **EARTH IS AN ISLAND** in V6:20. An island remains a natural environment that exists without human intervention. Note

⁷⁷ “We are made neither for space, nor great depths. We are surface beings. We are made to be on the surface of the Earth, but above and below, no. It’s all the same pretty funny to think about it. We are...we are adapted to our biosphere, but our biosphere is rather limited. It is our home period. We have no emergency exist. We cannot go somewhere else. We are home here and it’s nice. We have to take care of the house, you know. That’s all.”

⁷⁸ “The poor renters of the round house, our Earth!”

⁷⁹ A conception that is found in a number of myths, including the Christian creation myth in which Adam is the caretaker of the garden of Eden.

that Jules' comments lack references to human maintenance of the Earth-island. In fact, in his description human systems of control on Earth, such as borders between nations, are invisible from space and rendered irrelevant.

People's conceptions of Earth as humanity's home are heterogenous. The implications of these conceptions - of Earth as a natural environment or a human artefact - are potentially wide-ranging in terms of how people conceive of other phenomena, both known and unknown. Particularly prevalent in the corpus are personifications of the Earth as being either a "damsel in distress," or as an independent organism that needs to be allowed "to breathe." As I will discuss further in Chapter Ten, conceptions of the Earth as passive or active, vulnerable or robust, are often concurrent with conceptions of the Earth as a kind of container - a cradle, a home, a house.

It may seem 'logical' or 'natural' to conceive of the Earth as a stable, stationary "home" to humanity, as in the examples discussed above. These conceptions emphasize the Earth as a container separate from, but always "in space." Each of the metaphors creates a conceptual distance or separation of humanity from space in reinforcing a conception of the Earth as a protective container. This seems to further reinforce respondents' conceptions that they themselves are not "in space" and that space is distant and exterior to them⁸⁰.

The separation of the Earth and humanity from space in these metaphors obscures the fact that humanity and the terrestrial environment are not hermetically sealed off from "outer" space and the objects and phenomena "out there" "in" space. Popular conceptions of Earth as a separate environment from space are a motivation for the thrills and terror produced by science fiction and the disaster film genre in scenarios in which celestial bodies (e.g. asteroids) hurtle to the Earth causing death, destruction and chaos. Though diverting asteroids is an active interest of many space programs (e.g. NASA's Asteroid Initiative, Bonilla 2015), these visually dramatic (and statistically rare) scenarios are not the only threat to a humanity in expansion beyond the "barriers" of its planet.

⁸⁰ Opposing conceptions are also possible, and even popular (or well-known) within Western European discourse, though they are not present in this data set. For example, Buckminster Fuller's (1968) proposal that, "We are all astronauts on spaceship Earth." His declaration is striking to some because it presents the Earth as a vessel, moving through space and humanity as passengers, captains or navigators, rather than passive inhabitants.

For example, as diverse technologies become more widespread, our “terrestrial” systems are no longer confined to Earth and our daily lives become increasingly susceptible to events that happen “in space” “outside of the planet.” Solar flares, a relatively frequent event in the life of our sun, are an excellent example. During a solar flare dangerous rays are emitted from which the Earth is largely protected by its atmosphere. However, super solar flares have the potential to create strong enough rays to penetrate Earth’s atmosphere and cause serious damage to electrical systems, satellite communications, and the Internet.

The last super solar flare occurred in 1859, when human technology and telecommunications were considerably less extensive. Nevertheless, the super flare knocked out the telegraph system in the Western world. Today scholars predict that a solar flare of similar magnitude would cause more than 10 trillion dollars worth of damage (Crane 2017; Manasvi and Loeb 2017). Because we increasingly place technological infrastructure outside the planet, these structures are more and more vulnerable to all forms of space weather and other dangers in the vacuum of space (e.g. the havoc impacts from space debris can have on satellites. A chunk of debris the size of a sugar cube roughly produces the impact of a hand grenade [Clark 2012]). Our terrestrial way of life is increasingly connected to phenomena as seemingly distant as solar weather. Space is not distantly exterior but located at a porous boundary of our “home;” at a proximity from which it deeply affects human systems (be they biological, technological, or mythological). Yet, this intimate relationship is largely obscured by the ways people speak about space and seem to understand it. Discourse like Adèle’s (3FE, a science fiction writer) in the following example was rare among participants. Here is her response to the question “how do you imagine human life beyond the Earth?”:

“Difficile. De toute façon, moi je pose toujours la question, le problème du cycle de reproduction humaine hors de la Terre. Les femmes sur Terre ont un cycle d’ovulation lié au cycle lunaire. On est vraiment des bêtes terriennes. Nous sommes des mammifères terriens. Si on va loin dans l’espace...il suffit de regarder déjà le choc physique que ça représente rien que d’être dans l’ISS pendant quelques mois. Pour moi, on n’est pas adapté à autre chose. Ça c’est quelque chose que j’ai toujours dans l’esprit quand j’écris. Je l’occulte volontairement parce que je sais que je suis dans l’imaginaire et je n’écris pas de la hard science, donc je fais l’économie de ce genre de problème. Mais j’en suis parfaitement consciente à savoir que je sais que ça

serait très difficile. Comment seront le cycle d'ovulation? Comment se reproduiront les femmes? Ça c'est...je ne sais pas. Difficile.

Difficile lié au métabolisme humain quoi. La gravité. La respiration. La circulation cardiaque. Nos besoins d'oxygène. La reproduction sexuée. Enfin...et puis alors le corollaire avec ça c'est la terraformation. Ça veut dire que si on va sur un monde complètement différent mais qu'on peut y reproduire la Terre. Mais on arrivera jamais, jamais à reproduire la Terre ailleurs. On aura toujours de la vie sur un monde extra-terrestre qui voudra reprendre le dessus à un moment donné. On n'arrive déjà pas à désherber complètement un champ pour faire pousser quelque chose. Alors, comment voulez vous qu'on y arrive sur une planète extra-terrestre?" (Adèle, 3FE). V6:22⁸¹

Adèle listed off many particularities of the human relationship with Earth, nearby celestial bodies and its place in the solar system. She reminded me that it is not only the Earth that affects human lives, but the Moon, stars and Sun. "Female menstrual cycles are regulated by the lunar cycle...What will happen to ovulation cycles?" She then goes on to describe a fundamental difference between being native to a planet, and colonizing it, in particular terraforming it. She makes an analogy between attempting to completely weed out a field in order to plant something. If we cannot completely clear the weeds out of a terrestrial field, how, she asks, can we imagine that we would be able to clear off an entire planet? It would never be *like* Earth, she insists.

Adèle describes a human relationship to the planet and its place in the cosmos that is symbiotic in a way she doubts human science can reproduce. She admitted to enjoying imagining these possibilities, and even expressed a considerable faith in human projects for space exploration. Nonetheless, she articulated a conception of an irreproducible link between human

⁸¹ "Difficult. I always think about how the human reproductive cycle would work outside of the Earth. Women's ovulation on Earth is linked to the lunar cycle...we are really terrestrial animals. We are terrestrial mammals. If we go far into space...just look at the physical shock that happens going to the ISS for a few months. In my opinion, we aren't adapted to anything else. That's something I always keep in mind when I write. I overlook these problems because I know I am in the imaginary and I don't write hard science, so I economize this kind of problem. But, I am perfectly conscious of the knowledge that it would be very difficult. How would the ovulation cycle work? How will women reproduce? That is, I don't know. Difficult.

Difficult because of human metabolism. Gravity. Respiration. Cardiac circulation. Our oxygen needs. Sexual reproduction. And then a corollary of all this is terraformation. Meaning that we if we went to a totally different world we could always reproduce the Earth there. But we will never succeed, never succeed at reproducing the Earth somewhere else. We will always have alien life on an alien planet that will want to reclaim its place at one moment or another. Already, we can't completely weed out a field to plant something. So, how do you think we would succeed at clearing out an entire alien planet?"

life and Earth. The excerpt above does not deploy conceptions of the Earth as an object, an anthropomorphized actor, nor a point of orientation in space. Earth is life as we know it, no metaphor. And, it is interesting to see that Adèle does not use a metaphor, but an enumeration when describing human life on Earth, because of Earth. This was not the way most other people I talked to described the possibilities of terraforming, colonization and human technology. Human beings in the 21st century, when they have never been technologically more capable of attaining the stars, seem to be the most forgetful of how intimately connected “outer space” is to human “inner space.” The discourse of participants in this study attests to the predominance of conceptions that separate space from humanity.

A final, important implication in each of the conceptions of Earth as a container is that the Earth would be a container from which we *could* leave or exist. Many participants made arguments against the conception of Earth as a place that humanity could just “leave.” Earth was not simply a container, some sort of basket, in a universe of other baskets that humanity could transfer itself to seamlessly. As discussed above in the metaphors **EARTH IS HUMANITY’S CRADLE** and **EARTH IS HUMANITY’S HOME**, there is a recurrent theme in descriptions of the intimate, and for some people essential connection between humanity and the Earth. People talked about humanity as being “*liée*” (“linked to”) or “*faite pour*” (“made for”) the terrestrial environment.

Be this as it may, 100% of study participants used metaphorical schema in which the Earth was imagined as a container, possessing the entailments of containers, including the possibility of extracting oneself from them. When space exploration advocates speak about “leaving the Earth,” one of the basic assumptions at work is that it would be *possible* for humanity to leave the Earth because the Earth is not an integral part of human existence, but simply the container in which humans exist (e.g. **EARTH IS THE CRADLE OF HUMANITY**). All discourse concerning human colonization of other planets, or the preservation of the human species in space, partially depends upon conceptions of Earth as a container.

6.4 “*Dans le temps*” (“in time”) : TIME IS A CONTAINER

“dans + durée”

“dans + durée déterminée”

For example: “dans 100/200 ans” ($4 + 2 = 6x$) or “dans 10/20/30/50 ans” ($2 + 5 + 3 + 7 = 17x$)

“dans + durée indéterminée”

For example: “dans des milliards d’années” (2x) or “qui sera abordable dans quelques années” (1x)

Total: 29x

“dans le temps” or “dans (pas/très) longtemps” ($13 + 2 = 16$ instances)

For example: “C’est important que ça soit limité dans le temps” (1FNE)

Total: 16x

“dans l’avenir/un avenir” ($3 + 2 = 5$ instances)

“dans le/un futur” ($5 + 2 = 7$ instances)

For example: “Je me suis jamais projeté dans l’avenir” or “Et la pensée, elle t’envoie dans le futur” (3ME)

(In this corpus this usage is especially associated with an “avenir proche” or a “futur immédiat” [“near” or “immediate future”]).

Total: 12x

People used numerous time metaphors in our discussions (e.g. **TIME IS A RESOURCE**, **TIME IS AN ACTOR**, **TIME IS A MATERIAL**, such as a fabric or liquid). The most frequent were based in the conception of time as a container. **TIME IS A CONTAINER** is the third most frequently used container conception in the corpus. Using this conception and conceptual metaphors, people most often talked about time 1) in relation to distance between human events and 2) in relation to the durations of potential human survival in space.

TIME IS A CONTAINER is a conception that we use constantly in daily life. In English and French, people use this metaphor for time *all the time*. It is one of the most frequently used expressions for the description of duration (“in 30 minutes” or “in 1000 years”). Nonetheless, we also know that time is not a container, neither can we contain it. The nature of time remains the subject of intense debate. During my fieldwork I attended a round table with three scientists entitled “Time: Is it An Illusion?” Near the end of the discussion, a cosmologist responded to an

astrophysicist, who spoke about the “flow of time,” “*Non. Non. Le temps n’existe pas. Le temps ne s’écoule pas. Nous nous écoulons*⁸².”

I was overjoyed to observe the metaphors the scientists used, and that they began to debate each other’s metaphorical production! These men possessed decades of experience in their fields and were debating what data suggests about the existence of time. They also disagreed about ways of speaking about time, and what these ways of speaking about time suggest and whether or not they evoke the most accurate conceptions. In this abstract debate, the data did not ‘speak for itself’ and the ways in which scientists spoke about the data, or for the data, were among the most heated points of contention.

In addition to **TIME IS A CONTAINER**, the representation of the passage of time as a flow or “*écoulement*” was prevalent among non-expert interviewees. For example, Nathalie, (3FNE) talked to me about the film *Solaris* (1972) and its impact on her, particularly the voyage “*dans le temps*” in which “*le temps ne s’écoule plus dans le vaisseau spatial de manière linéaire*” (“time no longer flows in the space ship in a linear fashion”). She develops the metaphor according to embodied human experience by specifying the way in which time flows ‘normally’ - linearly. The conception of a linear flow, moving ‘forward’ in one direction at a constant pace, corresponds to embodied experiences with contained liquids and terrestrial gravity. Time as a fluid in motion is never discussed in this corpus as a tsunami, rain, a geyser or champagne. This is logical according to theories of embodied language, as the human experience of time is not typically one of being drenched immediately, nor of time bursting forth in intervals, nor bubbling over from its container.

Metaphorical expressions like these, that describe time as moving ‘forward’ in a linear sense are common in French and English (e.g. time as a being that “runs,” “flies,” or the basic conception of a “line” of time that could be ‘short’ or ‘long’ as in “*longtemps*” [“long time”], which has 72 occurrences in my corpus [Boroditsky 2000]). My interviewees used linear expressions for time in Standard French, for example the metaphor “*le fil du temps*” (“the thread of time”) and “*au bout du temps*” (“at the end of time”) or “*au bout d’un moment*” (“at the end of

⁸² “No. No. Time does not exist. Time does not flow. We flow.”

a moment.” Other expressions, like “*l’échelle du temps*” (“the ladder/scale of time”) also express a conception of linear time, albeit that this line rises vertically, instead of extending horizontally.

Though these expressions and conceptions are widely used and widely understood as being more or less ‘literal,’ just like conceptions of time as a container, they can be contested and negotiated. Each of these ways of talking about and conceiving of time place emphasis on our embodied experience of the passage of time, rather than on current scientific theories of time. The simple ways in which our perceptions, scientific data and culturally coded ways of speaking come into conflict demonstrates that our metaphors are motivated by our experiences and expectations of possibility and probability. These metalinguistic debates also belie our perceived importance of the words we use to describe ‘reality.’

The dominant container conception of time (“*dans le temps*”) within this corpus is a way of describing our temporal experience that may be less markedly figurative than conceptions of time “flowing,” “flying,” or widely studied conceptual metaphors such as **TIME IS MONEY** (Mueller 2016), however the conception of time as a container remains figurative, rather than literal. Participants talk about being “in time,” other objects existing “in time,” traveling “in time” and being able to “exit” or “go out of” time. All of these expressions are extensions of the metaphorical conception of time as a container.

As the questionnaire prompts participants to imagine a potential future, they typically orient ‘ahead’ or ‘in front’ of them, people frequently use ‘amounts’ of time (making use of the **TIME IS A [VALUABLE] RESOURCE** conceptual metaphor, Black 2018) to describe their imaginations of this unknown future. Time is often described as a material, partitionable resource that one can have (e.g. “*avoir le temps*”/“to have time”), can take (e.g. “*prendre le temps*”/“to take time”), place or put in or on (e.g. “*mettre du temps*”/“to place time”). Here the container conception of time often operates in conjunction with an orientational, linear conception in which participants position the future on an event timeline. To move along this timeline participants do not make use of further metaphors of length (e.g. “after the length of 20 years”), but rather conceive of time as a substance of which they can have indefinite quantities: a lot (“*beaucoup de temps*”), or a little (“*peu de temps*”). The common expressions “*dans longtemps*” (“in a long time”) and “*dans un temps (assez) court*” (“in a short time”) combine

these two perceptual schema (i.e. orientational and container) of experiencing lengths of space and being ‘in’ a container.

The conception of time as a container in this corpus was used most frequently to position human accomplishment or action within a field of possibility. As noted in Table 6:1 (page 196), the vast majority of the container expressions refer to specific amounts of time and to events that may occur within them. Similarly, this conception is used to discuss human life within a field of possibility (that missions be limited in time, journeys between planets be accomplished quickly, etc.). Take the following examples:

“avec le temps...**dans 20 ans, dans 30 ans**, on aura peut-être trouvé un autre système” (Marie Rose, 3FNE). V6:23⁸³

“Je ne pense pas que la mathématique suffira à nous faire *voyager* **dans le temps** et dans l’espace. Voilà. Vraiment, un autre chemin qui nous emmènera, qui...c’est pas spirituel, c’est pas...il faut que l’homme se connaisse mieux déjà. (Christine, 2FNE). V6:24⁸⁴

“Ce n’est pas l’espace material c’est plutôt l’idée que la...la sortie dans l’espace nous ramène au contraire sur nous-mêmes et que c’est plutôt *un voyage* **dans le temps**.” (Nathalie, 3FNE). V6:25⁸⁵

“Il y a un moment, donc là c’est *le voyage* **dans le temps** et pas dans l’espace, et quand il revient à son point de départ il revient exactement à l’instant où il est parti en fait. Parce que son voyage a duré *très peu de temps* en fait.” (Édouard, 3MNE). V6:26⁸⁶

“Après, effectivement je prendrais des objets technologiques, peut-être, mais j’éviterais parce que si jamais je n’ai droit qu’à un kilo, je veux des choses qui puissent me *durer* **dans le temps**.” (Charlie, 1MNE). V6:27⁸⁷

⁸³ “with time...in 20 years, in 30 years, maybe we will have found another system.”

⁸⁴ “I do not think that mathematics will be sufficient for us to travel in time and in space. Voilà. Really, another path will take us, that...isn’t spiritual, it’s not...first of all, mankind needs to know itself better.”

⁸⁵ “It’s not material space, it’s more the idea that...going into space, on the contrary, brings us back upon ourselves and more a voyage in time.”

⁸⁶ “There is this moment, so it’s a voyage in time, not in space, and when he comes back to where he started he comes back to exactly the moment when he left, in fact. Because his trip lasted very little time, in fact.”

⁸⁷ “Afterwards, effectively, I would take technological objects, maybe, but I would avoid that because if I only can have one kilo, I want things that will last in time.”

In these examples, interviewees describe a time-container in which events can occur and in which humans could potentially travel. In V6:23, Marie Rose describes containers in a sequence of progressive higher numbers (longer durations of time) and links these containers to the passage of time (i.e. “*avec le temps*” - “with the [passage of] time”). An alternative to “*dans 20 ans*” would be to say “*en l’espace de 20 ans*” (“in the space of 20 years”). It is interesting to note how the different expressions alter the nuances in the description of time. In saying “*dans 20 ans*,” Marie Rose uses a 20 year time container (a bit like using a measuring spoon) to decide what can(not) be done within that period of time (something ‘in’ which events would take place). The expression “*en l’espace de 20 ans*” changes the time container from being a discrete receptacle, to being a delineated space. Instead of a container, in which events are placed according to periods of time, “*en l’espace de 20 ans*” encourages an understanding of time as a zone; an area that can be measured off and *in* which certain events may take place. Both of these expressions do much to ‘contain’ events within time by representing time as a space.

In V6:24-26, Christine, Nathalie and Édouard are all talking about traveling “*dans le temps*” (“in time”). The expression used in these examples does not identify a particular time container (or measuring cup) but refers to time in general (“*le temps*”). “*Le voyage dans le temps*” is the French equivalent to “time travel,” but rather than using an adjective (e.g. “*le voyage temporel*”), this expression uses “*dans*” (“in”), typical in French descriptions of travel within environments (e.g. “in the mountains,” “*dans les montagnes*,” “in the forest,” “*dans la forêt*”). The preposition of location “in” allows for the “figurative senses of [the] preposition [to be] extended from its spatial senses through conceptual metaphors” (Islami 2014). I will assume that the three interviewees who use this expression are not trying to speak figuratively. Nonetheless, the locative preposition in these phrases encourages certain conceptual possibilities over others.

Similarly, Charlie’s use of “*dans le temps*” in V6:27 is not referring to time as a container but to a duration. In this sentence, we could replace “*dans le temps*” with “*longtemps*” (“a long time”). This second expression refers to time linearly (measuring it by *length*). Even though Charlie is not talking about time as a container in which events take place, the use of this

expression is still informed by figurative senses of the preposition “*dans*” or the adverb “*longtemps*.” The usages of these different parts of speech, that are semantically related to difference physical experiences (of interiors/exteriorities, lengths and widths) are proto-metaphors that sway conceptual frames and are more or less in tune with different conceptual metaphors. These usages are proof of the subtle and ubiquitous influence of embodied experience and how discursive choices to speak according to different frames of experience (albeit often unconscious) can reinforce some perceptions over others.

As I mentioned above, many of the occurrences of the conception of time as a container combine the container with a linear, or orientational conception. I argue that this is further proof of the predominance of embodied experience in how people speak and categorize the world. The abstract and mysterious nature of (space)time permits, or possibly encourages, speakers to discuss time simultaneously using different categories of meaning. As mentioned above, people talk about time as a substance, an actor, an environment. Whereas no one discussed time simultaneously as an actor and a container (e.g. no one talked about time flowing inside of itself, or ‘flying’ within itself), people did describe time simultaneously using structural and orientational conceptions. Time could be a container, but a ‘short’ or ‘long’ one. In French we can say “*longtemps*” (“a long time”, using a reference to length) and “*dans longtemps*” (“in a long time,” making reference to both length and an ‘interior/exterior’). Time could be an all-encompassing environment, and a measurable space. Both of these conceptions line up with human experience of time and, according to that experience, are not mutually exclusive. We can be ‘in’ time and have the sensation of its linear passage forward, a passage we can mark in ‘lengths’ of minutes, days and millennia.

For example, Arthur (2MNE), described human intelligence as being the capacity to “*Intervenir rapidement ou dans un temps assez court sur des phénomènes nouveaux, en fonction des connaissances acquises*” (“to react quickly or in a short time to new phenomena according to acquired knowledge”). Here the time-container is described as being “short” and this characteristic is equated with rapidity (therefore **SHORT IS FAST** and **LONG IS SLOW**). It is less common in French to talk about containers as being short or long, but rather big or small. For example, the discussion of container metaphors in Chapter Nine provides evidence of this as

people describe small spaces in space and compares them to small (rather than short) spaces they are familiar with. However, participants do not say “*dans un petit temps*” to describe time-containers as they would say “*dans une petite boîte/caisse/maison*” to discuss physical containers.

I think that this capacity to use structural and orientational conceptions simultaneously and interchangeably when talking about time correlates with previous embodied experience of spacetime for my interlocutors. The expression “*dans un premier temps*” (e.g. “*Dans un premier temps je vois ça comme ça*” 2MNE, Lucas) is an excellent example of confounding between space and time, and the fuzzy conceptual boundary we seem to place between them. “*Dans un premier temps*” would literally be translated into English as “in a first time,” but its meaning in French corresponds more with the idea of “in a first step” or simply “firstly.” The use of the locative preposition makes this expression reinforce a proto-metaphoric container conception, while the idea of a “first time” (“firstly [in time]”) reinforces a linear, or sequential conception of time in which there are time containers that can come ‘before’ (or ‘after’) others. As in the preceding example taken from my discussion with Arthur, the container metaphor occurs with an orientational metaphor, which may attribute qualities to time that do not follow from the container conception alone. In French, “firstly” can be expressed in a number of different ways (e.g. “*d’abord*,” “*premièrement*”). The expression “*dans un premier temps*” equates the experience of a ‘first time’ to a ‘first step,’ analogizing an experience of space to an experience of time. This hybrid conception reflects a hybrid comprehension of spacetime and permits the inclusion of characteristics of spacetime that would have been otherwise obscured through the use of only one proto-metaphoric system (structural or orientational) (i.e. length, rather than size to describe duration; sequentiality)

These figurative senses may seem bleached in expressions such as those discussed above, but they remain present in the way this preposition subtly reinforces a conception of interiority and exteriority that corresponds to our experience of spacetime. This is evidence of how even our most basic syntactic devices (e.g. prepositions) profoundly reflect and reinforce our embodied experiences. This resonates with Sapir’s (1929, 209-210) argument that we “adjust to reality”

and “experience largely as we do because [of] the language habits of our community” and with Gibbs (2006; 2013), Gibbs and Falck (2012) and Gibbs and Silva de Macedo’s (2010) extensive evidence that metaphoric language activates mental image schema that correspond to the embodied experiences that inform them. This process of language passing from actively constructed discourse to syntax, or to fixed expressions whose metaphorical content has disappeared, echoes Ralph Waldo Emerson’s (1844) description of language as “fossil poetry.”

The poets made all the words, and therefore language is the archives of history, and, if we must say it, a sort of tomb of the muses. For though the origin of most of our words is forgotten, each word was at first a stroke of genius, and obtained currency because for the moment it symbolized the world to the first speaker and to the hearer. The etymologist finds the deadest word to have been once a brilliant picture. Language is fossil poetry. As the limestone of the continent consists of infinite masses of the shells of animalcules, so language is made up of images or tropes, which now, in their secondary use, have long ceased to remind us of their poetic origin.

I acknowledge that speakers are not being purposefully metaphorical; that these expressions are no longer recognized by the majority of speakers as being figurative. But I agree with Emerson that the limestone of grammar, the grammatical preferences and constraints of our languages, is composed of direct correlations between embodied experience, thought and language. These syntactic devices retain figurative meaning that has the potential to prime us to develop our understandings in particular ways. My argument supports a weak version of Whorf’s principle of linguistic relativity, which states “*at least as a hypothesis*, that the structure of a human being’s language influences the manner in which he understands reality and behaves with respect to it” (Carroll 1956, 23 cited in Schulz 1990, 14, author’s emphasis). In a passage that has frequently been cited as a defense for linguistic determinism (or a strong version of the Whorf hypothesis) Whorf explains that a language’s grammar becomes a “shaper of ideas” that provides speakers with a guide for “analysis of impressions” and “synthesis of mental stock” (Whorf 1940, 212-214):

“... the background linguistic system (in other words, the grammar) of each language is not merely a reproducing instrument for voicing ideas but rather is itself the shaper

of ideas...Formulation of ideas is not an independent process, strictly rational in the old sense, but is part of a particular grammar, and differs, from slightly to greatly, between different grammars. We dissect nature along lines laid down by our native languages. The categories and types that we isolate from the world of phenomena we do not find there because they stare every observer in the face; on the contrary, the world is presented in a kaleidoscopic flux of impressions which has to be organized by our minds - and this means largely by the linguistic systems in our minds..."

I argue that this passage does not assert the deterministic nature of language in human thought, but the constructivist role of language. Whorf's dethrones cartesian rationality as the source of thought, though he insists on the primacy of mind in thought (e.g. the "kaleidoscopic flux...which *has to be organized by our minds*"); a position that disembodies language. Whorf uses the container metaphor of the mind in which language is held, and is a tool among others (though he does not discuss what they may be) that we use to categorize and make sense of the world. Albeit that I find this disembodiment problematic, I do not interpret determinism through any one cognitive process in Whorf's arguments. To me, he remains guarded in stating that language is a "shaper of ideas" (and not the mold of thought) and that the formulation of ideas is "part of a particular grammar" that can have "slight" or "great" effects on human thought (see Boroditsky's [2017] discussion of these effects as modern neuroscience has observed them in Section 10:3).

Whorf's argument in this passage does not focus on metaphors, but on grammatical structures themselves. For the purposes of my arguments here, I want to connect the resonances between my speculations about proto-metaphors (that I do not extend to all of grammar) and Whorf's assertion that grammatical structures can create a range of effects in human cognition. In cases of metaphoric language, Baake (2003, 80) refers to these effects as "harmonics" or the "unintended connotations and implications" that accompany metaphoric, and I argue proto-metaphoric language. I find Baake's musical terminology useful because it does not imply a precise determinism. Harmonics in music are overtones that accompany tones produced by vibrating a string, air, etc. at an exact fraction of its length. Harmonics are not the tones themselves, but resonances that can(not) accompany them. They are not necessary to a tone, but

are always potentially available. Baake (2003) analyzes harmonics in expert scientific discourse, but argues that they are a fundamental characteristic of all metaphoric language.

These subtle effects of reality shaping/categorizing/defining may go unperceived or as conceptual whispers. But, they become more pronounced in certain instances, for example, in expert discourses that must use them to define precise theories or observations. This is the case with discussions of spacetime, as attested to by the debate from my corpus about the “*écoulement du temps*” (see Section 6.4), and as can be seen in thousands of pages of scientific debate seeking to define and describe spacetime for practical and philosophical purposes (see Sattig’s [2006] effort to develop a framework for a philosophy of time that addresses the temporal dimension of the material world and the temporal dimension of discourse). When defining quarks or relativistic variations in spacetime, precision is key and articulating scientific discovery in language can be challenging (Gell-Mann 1995). It seems that this is particularly the case with those parts of language that may seem the most literal or self-evident. Baake (2003, 79) describes the challenges of embodied perception of scientific knowledge and of communicating that knowledge through language:

“The truth of scientific knowledge depends on, among other things, the limits of our senses to perceive the world around us and the preconceptions we may have about reality that affect *a priori* the reality that we choose to see. The limitation of our senses is a physiological problem, while the preconception problem is, to some degree, a psychological or sociological matter.

Yet, once we observe something - however imperfect our observations may be - we enter the linguistic realm in trying to describe it and represent it. Word meaning can be maddeningly elusive, as we saw earlier when a scientific meeting became tangled in the effort to define the word ‘rules’...”

Like our observations in daily life, scientific observations get tangled in our embodied cognitive processes, including our language and generalized cultural knowledge. These effects are more pronounced when a global community of scientists must reach consensus on a topic, but they are ubiquitous in all language. Explicit metaphors are more attention-grabbing, but

whether time “flows” or we are “in” it or at the “end” of it, these terms shape our knowledge about the world (Baake 2003; Satigg 2006).

Concordant with the two other container metaphors analyzed within the corpus, conceptualizations of time as a container extend the quality of size to these containers. Additionally, like the other container metaphors, the sizes referenced correspond to people’s experiences with spaces that are bigger and smaller than themselves, demonstrating that people have a tendency of scaling their discussions of both times and spaces to human size and to their own experiences of temporal duration.

These container conceptions, and the tendency to scale the containers with the human body functioning as the ‘normal’ or ‘base point’ in size, are anthropocentric in many ways: Earth is a container for humans; space is a void but is also a container for humans. When informants talked, though intellectually they knew it was false, they positioned humans as the center of the universe. Though it is beyond the purview of my current project, I think this is a productive site for future research. Has anthropocentric discourse increased as human influence on the planetary environment has become more widespread?

To explore this question of anthropocentric discourse, I provide a breakdown in Table 6:1 of the 77 total occurrences of “*le temps*” (“time”) in the corpus. Not all of these occurrences use the preposition “*dans*,” nor are all of these occurrences metaphorical, although I would argue that most of them (with the exception of “*le temps de*” and “*le temps que*”) are highly figurative. However, whether or not people use container conceptions and scale them according to human size, the vast majority of people’s discussions of time are structured in relation to the human.

Table 6:1: “*Le temps*” (Breakdown of 77 occurrences of the lexical unit in the corpus)

“tout le temps”	25x	“de changer d’endroit tout le temps”	
“le temps” (general references)	23x	“remonter le temps” “explorer le temps” “mesurer le temps” “avec le temps”	

“dans le temps”	12x	“tellement loin dans le temps” “le voyage dans le temps” “limité dans le temps” “La pensée qui projette dans le temps”	*Compare to “dans X ans” (21x) “...10 ans” - 2x “...15 ans” - 1x “...20 ans” - 5x “...50 ans” - 7x “...100 ans” - 4x “...500 ans” - 2x
“le temps de...”	7x	“le temps de la Guerre froide”	
“avoir le temps”	6x	“Est-ce qu’on aura le temps?”	
“le temps que...”	4x	“le temps que ça vienne”	

To begin, we can look at the most frequent use of the lexical unit “*le temps*” in the common expression “*tout le temps*” (“all the time”). This is a figurative expression that does not literally refer to “all the time” in existence, but to experiencing or doing something recurrently (to more literally describe this phenomenon one could say “*encore et encore*” [“over and over”]). This expression is clearly anthropocentric, and furthermore egocentric, as it references only the time experienced by the speaker.

The second most frequent uses of the word “*le temps*” occur in generalized discussions of time. Take the following examples:

“Je pense que aller dans l’espace c’est vaincre le temps. Et vaincre le temps, on est encore très, très loin de vaincre le temps parce que le temps c’est la condition humaine, quoi. Donc, est-ce que sortir du temps ça serait sortir de la condition humaine? C’est la question que je me pose” (Jean Denis, 3ME). V6:32⁸⁸

“On peut très bien imaginer une machine à remonter le temps, alors on sait très bien que c’est pas possible” (Jules, 3ME). V6:33⁸⁹

“Parce que le temps est élastique. C’est comme ça” (Simon, 2ME). V6:34⁹⁰

⁸⁸ “I think that going into space is to vanquish time. And to vanquish time, we are still very far off from vanquishing time because time is the human condition. So, is going out of time to go out of the human condition? That’s the question I ask myself.”

⁸⁹ “We can very well imagine a machine to go back in time, even though we know very well that it is not possible.”

⁹⁰ “Because time is elastic. It’s like that.”

It is only in the final example, Simon's discussion in V6:34 of the characteristics of time, that time is discussed for itself, rather than in relation to human sizes or goals. As seen in Table 6:1, most generalized discussions of time represented time as the direct object to human action. V6:32-33 above, are solid examples of this. Jean Denis personifies times as an actor, an opponent, in fact, that some may desire to vanquish. He uses an ontological metaphor saying that time *is* the human condition; finally, he uses the structural metaphor of a container in questioning whether or not humans can "leave time."

In V6:33, Jules references a "time machine" (or a "machine to go back in time"). This is another instance in French where time is not used as an adjective (e.g. "*voyage dans le temps*," "time travel"), but as a direct object. In French, the preposition "in" is absent, and people directly, in an approximative literal translation, 'climb time backwards' ("*remonter dans le temps*"). This usage is similar to examples where time was the passive subject to a number of human actions, including measurement and exploration.

Time is not simply a logistical fact in these discussions. It is an abstract concept that can be discussed in all three metaphoric modes (structural, orientational and ontological) and for which I suggest there are proto-metaphoric tendencies within French. Container conceptions are the most prevalent of these tendencies and give rise to a common set of metaphors in discussions of time, container metaphors. However, as the comparison of all uses of the word "time" in the corpus demonstrates, container conceptions are not an exception to comprehension of time, but an example of an underlying phenomenon of comprehension. They belie and reinforce anthropocentric patterns in how people speak about the world. This tendency to describe the world in relation to the human is present throughout the corpus, as I will demonstrate through analysis of the two other metaphoric modes found in the corpus (orientational and ontological metaphors).

Vignette 7: “Du tabac à chiquer. Je ne peux pas sortir fumer sur le balcon.”

(Female, expert, 52 years old)

On a calm patio in the 20ème, Marie and I sat for several hours and talked about what seemed like most everything. Sipping red wine and smoking cigarettes, she talked to me about her career, space, motherhood, gendered bias in the sciences and the arts, french fries and butter, and the list continues. A science fiction writer passionate about human space travel, Marie answered quickly that yes, she would go to space if given the opportunity. When we came to the question of her kilogram, her response came immediately.

“Une liseuse⁹¹. Du tabac à chiquer. Je peux pas fumer dans une station spatiale. Et je ne peux pas sortir fumer sur le balcon. De quoi ai-je besoin? Il y a mon mec...il y a mon bonhomme. Mais il pèse pas un kilo.”

“Des enregistrements, de tout entre Igor Stravinsky et les Ramones. Jusque dans les années 1990, parce qu’après, ça passe.”

“Une robe du soir. Ça peut ne pas peser lourd, une robe de soir. La pilule bien sur, encore que ça devient de moins en moins nécessaire, mais...”

As her remarks drifted into silent speculation, I prompted her further, citing an earlier conversation in which we had discussed the effects of zero gravity on the development of human fetuses. “You would not want a baby with bird bones...”

She snapped back to the conversation, and what was a discussion about her future in space, became a narrative about her experiences in the past.

“Je ne veux pas de bébé du tout. D’ailleurs j’en ai jamais voulu. J’en ai fait, mais je n’en ai jamais voulu. Je me suis jamais projetée dans l’avenir en me disant, ‘Je veux un enfant.’ C’était pas mal sur le moment, mais c’était pas mon but, tu vois?” Adding in English, “Shit happens.”

Then she shifted her imaginings from remembrances of the past, back to the pertinence of these memories to the discussion at hand.

“Voilà la pilule. Je n’aurai pas besoin de tellement d’autre choses. La bouffe me manquerait, mais on ne peut pas la transporter. C’est débile emporter du vin dans l’espace. Tu te rends compte? Il se prend 10G dans la gueule au décollage, il est mort ton beaujolais.”

“À la limite tu pourrais emmener un whiskey, ça tiendra. Là ça ira, je peux emporter un whiskey, Lagavalin tant qu’à faire. Alors, peut-être une bouteille de whiskey, oui. Parce que, quand même, j’ai l’habitude quand j’ai fini un texte

⁹¹ I.e. a “Kindle” or similar tablet reading device.

de boire un verre de whiskey. Une célébration, du Lagavalin, 30 ans d'âge, vieilli en fut."

"Et on commence à être pas loin du kilo. Déjà les deux liseuses et la clef USB qui contient la musique. Je pense que ça suffirait."

"Par contre il y a un truc qui manque je vois, il manque le graphique. Des films, il y en aurait, mais des films ça prend de la place, beaucoup. Alors, est-ce que je prends des films que j'ai déjà vus, ou des films que j'ai pas vus? Les films que j'ai pas vus, je suis sûre que non. Je pense que je prendrais des films qui m'ont formée. Comme À bout de souffle, comme Le mépris, comme La règle du jeu ou Les enfants du paradis."

Her response concerning novelty and familiarity interested me. Rather than taking new movies to discover, she was certain that she would prefer to take her favorite films, all from the Nouvelle vague in French cinema. For someone who obviously had a thirst for adventure and discovery, over novelty, she chose movies that had "shaped her," that were important in her life. When projecting herself into an imaginary future, she did not imagine herself without crucial elements of her past.

She was cut short by two male voices that had been rising considerably and had now reached a pitch that attracted the attention of the patio patrons and passerby. "One moment," she said, sliding her purse across the table to me. I sat still, watching like everyone else, as she walked over to the two disputing drivers, one who had gotten out of his car and approached the van in front of him brandishing a hockey stick. I could not hear what she said, but after a minute or so, the hockey stick driver got back into his car, the van drove off with the car following shortly afterwards. She came back to the table, "Parfois il faut un peu d'œstrogène pour équilibrer la testostérone." Lighting a cigarette, she encouraged me to continue with the next question.

I was, and have remained terribly impressed with Marie. I say: send this one to space.

Chapter 7: Orientational Conceptions and Metaphors

D'autres métaphores spatiales très répandues, peut-être universelles, caractérisent le monde physique à partir des termes dans lesquels les hommes le découvrent au niveau de la perception, comme si la terre était plate, le soleil et la lune se déplaçaient alors que la terre restait au repos (le soleil se « lève » et se « couche »), même si cela n'est pas en accord avec les connaissances astronomiques modernes (Keesing 1985).

Second to structural metaphors, orientational metaphors are the most frequent conceptual metaphors within the corpus. This seems logical as the questionnaire encourages participants to physically position themselves within an unknown experience. In describing this positioning, people mobilize orientational conceptions and metaphors to orient their bodies within space and spaces. This is a symptom of embodied cognition and a tendency to understand situations according to our physical positioning, notably in relation to how we categorize what is “around” us.

As with structural metaphors and the locative prepositions that seem to predispose speakers to particular conceptions of the world, orientational metaphors present in the corpus rely upon a number of orientational conceptions that are grammatically required or preferred in French, most notably a number of prepositional phrases requiring the use of the preposition “*sur*” (“on”).

The most recurrent orientational conceptions in the corpus are:

- 1) “*sur (la) Terre*” (“on Earth”): 145 instances, including metaphors motivated by terrestrial orientation.
- 2) “*sur la Lune*” (“on the Moon”): 75 instances.
- 3) “*l’au-delà*” and “*le dépassement*” (“the beyond” or “going beyond”): 48 instances, including other metaphors referring to the “*lointain*” (“distant”).

The first two prepositional phrases encourage a conception of celestial bodies as being surfaces ‘upon’ which objects and creatures exist (i.e. the Earth and Moon as surfaces). These are

conceptions that shift within French, as participants spoke both of being ‘on’ Earth and the Moon and ‘in’ Earth and the Moon (e.g. “*le voyage dans la Lune*,” “the trip in the Moon”). Being ‘on’ these celestial bodies was the most frequent way people described being at a location on the Earth or Moon. This conception is reinforced by embodied experiences of being ‘upon’ or ‘on’ surfaces and placing other objects ‘on’ surfaces, as well as by dominant ways of talking about surfaces in Standard French.

The third most frequently referenced conceptions are those in which interviewees describe the “beyond” or “going beyond” and are closely linked to the conceptions of Earth as a container or surface, as people generally use these expressions when describing what is ‘beyond’ that which is located ‘within’ or ‘upon’ the Earth. The preposition “*au-delà*” functions as a proto-metaphor in a number of conceptions of the ‘beyond’ (i.e. “*Plus loin [que tel lieu], de l'autre côté [de]*,” Larousse 2017) and the idea of ‘*dépassement*’ or to “*dépasser*” (i.e. “*Être plus haut, plus grand, plus large que quelqu'un, avec quelque chose (de tant); Aller au-delà d'un point considéré comme repère, limite fixe ; passer, franchir*,” Larousse 2017). People use the same proto and surface metaphors issuing from their embodied experiences of going ‘beyond’ to characterize domains such as space and possibility (e.g. **POSSIBILITY IS THE BEYOND**). Unlike the first two conceptions I will discuss (“*sur la Terre*” and “*sur la Lune*”), conceptual metaphors concerning the beyond refer both to geographical points (e.g. borders and planetary boundaries), as well as points in time and human history.

When imagining themselves “in space,” ten people talked about their individual physical orientation (in other words High/Low/Behind/In Front/Above/Under, etc.) in space stations or on planets. Only seven people spoke about the experience of zero-gravity. The orientational metaphors interviewees used are terracentric and describe an individual positioning in relation to Earth, its moon and that which is “beyond” these human points of interest (i.e. ‘beyond the Earth’).

7.1 Terracentrically Orienting Imagination: Earth Is A Bounded Surface [Bounded by an “above” “beyond” the Earth]

“*sur la Terre*” or “*sur Terre*” (“on Earth”): 145x
“*là-haut*” (“up there”): (21x)
“*en haut*” (“above”): (4x)
e.g. “*En fait, chaque fois qu’il y en a un qui monte là-haut à l’ISS*” (2FE)

One of the predominant orientational conceptions in the corpus is that of Earth as a bounded surface. Interviewees positioned themselves and the rest of the universe in relation to Earth. They discussed anthropocentric and terracentric conceptions of space that provide evidence of the predominance of embodied language and cognition. People I spoke with knew that the Earth is not the center of the universe, nor the galaxy, however the most frequent way of discussing space and celestial bodies was by positioning them vis-à-vis planet Earth. Space was referred to as being “above” or “up there,” reflecting people’s embodied experiences of witnessing the night sky, rather than their generalized cultural knowledge that space is all around the Earth.

Another terracentric tendency was that, when asked to talk about space, people spoke twice as frequently about being on Earth as they did about being in space. The container conception “*dans l’espace*” (“in space”) is far more predominant than the orientational conception “*sur Terre*” (“on Earth”), however, it is necessary to take into consideration the second most deployed container conception in the corpus, “*hors de la Terre*” (“outside of the Earth”). These terracentric conceptions suggest the primacy of embodied, terrestrial experience; people consistently positioned themselves based on their experience of being “on Earth” in order to imagine “beyond” the Earth, or “in space.”

In addition to “*sur Terre*,” a handful of other conceptions are also based on a terracentric orientation in which Earth is here and other objects and phenomena are “above” or “up there.” The majority of participants describe space from the perspective of their current positioning “in the world” (e.g. “on Earth,” “in Paris,” “in France”). People rarely imagined or described space from unearthly perspectives. The other two predominant orientational conceptions in the corpus - “on the Moon” and “beyond” - are examples of this. However, often, even when people’s perspectives were off-planet, orientations in their discussions still revolved around Earth. For example, many described the thrill of seeing the Earth “from above” or having the Earth “float below” from their perspective in a space station or on the Moon.

Images of the Earth as seen from space, particularly the Apollo “Earth rise” images are cited by a number of interviewees and are the space images people talked about most often (rather than nebulae, stars, other planets, the Moon). Recurrently, images of the Earth from space were the first images to come to mind when people imagined space.

Primary Investigator: Quand on te parle de l’espace, quelles sont les premières images qui te viennent en tête?

Madeleine: La Terre vue de dehors (Madeleine, 1FNE). V7:1⁹²

The view of the Earth from “outside” (“*dehors*”) is one of the principal experiences that interviewees cite when discussing being “in” space; they talk about seeing the outside and the entirety of their “home.” Take the following discussion from Christian (2ME), an astrophysicist:

“PAF! t’es sur la Lune, tu lèves la tête t’as la Terre dans le ciel. Et la Terre vue de la Lune elle est 4 fois plus grande que la Lune vue de la Terre. La Terre est plus grosse que la Lune. C’est un machin comme ça, bleu un peu brillant. Ils sont dans la poussière...à mon avis, toi t’es, t’es quand même maté, t’es stupéfait quoi.” (Christian, 2ME). V7:2⁹³

Christian insists on the size of the Earth in his imagined vision on the Moon. Using his expert knowledge, he discusses the proportions of the Earth and the Moon, describing the Earth as huge in the blackness, “blue and a little shiny.” He pauses to imagine the sight further, and to imagine the people who have seen it (standing “in the dust” on the Moon, as he says). “You’re stupefied,” he argues, moved by imagining this experience. Christian’s expert knowledge, which he deployed in this discussion, did not preclude his use of metaphor or a terracentric perspective of the phenomena being discussed.

Similarly, Simon (2ME), a graphic artist, described an Earth-view from space. He talked about seeing Earth both from an orbital space station and from Mars. Not only did Simon’s

⁹² “When someone talks to you open space, what are the first images that come to mind?” “The Earth seen from outside.”

⁹³ “Poof! You’re on the Moon, you lift up your head and you have the Earth in the sky. And the Earth seen from the Moon is four times as big as the Moon as seen from Earth. The Earth is bigger than the moon. It’s a thing like that, blue and a little shining. They’re in the dirt...in my opinion, you, you’re all the same flabbergasted, you’re stupefied.”

discussion concentrate on Earth, he went further and explicitly talked about how being able to see the Earth would be a comfort and psychological stabilizer. He argued that a proximity to the Earth, where the Earth remains clearly visible (e.g. in an orbital space station), would be reassuring. He describes the potential psychological strain of the opposite situation, being so far from Earth that it becomes only “the head of a pin:”

“Il y a eu des études psychologiques menées par la NASA sur les voyages longs pour aller sur Mars. Mais quand on est dans une station spatiale, on voit la Terre. Et quand on va sur Mars, ou on va vers Mars, ben la Terre c’est une tête d’épingle” (Simon, 2ME). V7:3⁹⁴

The centrality of Earth in people’s experience and imagination is evident in the orientational and container conceptions and metaphors that are dominant in the corpus (accounting for the second most frequent group of container metaphors and the dominant group of orientational metaphors). However, Earth’s centrality is prevalent throughout the corpus. People’s concerns about the environment, human destruction of the planet through various means (i.e. pollution, global war) and of the human ability to continue to thrive on Earth were central in our discussions. It was surprising to what extent speaking about distant “outer space” incited reflection about proximal spaces, notably Earth. Participant preoccupations with Earth in their imaginations of distant places are logical in conceptions where Earth is both the container that holds them and the central point in the orientation of all experience. And, these conceptions of Earth as a container and point of orientation are widespread in the data.

Not only did people rarely voluntarily offer up non terracentric orientations, it also seemed to be a challenge for them to imagine human experience in a non-terrestrial environment. In cases where they did re-position human experience into space, it typically required imagining an Earth-like planet or the projection of historic scenarios of terrestrial, human colonization. Examples V7:4-6 demonstrate to what extent interviewees imagined human existence in space under Earth-like conditions in terms of survival and of comfort.

⁹⁴ “There are psychological studies that have been conducted by NASA concerning the long trips required for a journey to Mars. But, when you are in a space station, you see the Earth. And when we go to Mars, or go towards Mars, the Earth is a pinhead.”

“Je l’imagine difficilement. Au moins que ça soit construit, que des choses soient faites pour qu’on se sente un peu comme si on était sur Terre.” (Agnès, 2FNE). V7:4⁹⁵

“Si on enlève la pressurisation ils sont complètement déformés au bout de quelques années, ils ont la tête qui grossit, les membres qui gonflent, et on est obligé de les pressuriser en permanence pour qu’ils aient la même pression que sur Terre.” (Arthur, 2MNE). V7:5⁹⁶

“Des conditions difficiles, mais en même temps peu à peu, voilà, ça reviendrait un peu à la même vie que sur Terre. Sauf que ça serait loin, donc évidemment, mais comme à l’époque quand c’était la conquête des États-Unis c’était très loin parce qu’il y avait pas actuellement, il y avait pas les mêmes moyens de déplacement.” (Camille, 2FNE). V7:6⁹⁷

Even when space was not considered impossible, nor undesirable, Earth remains central to the imaginary of what it would be “like” to live beyond the Earth. This is the case in the first quote below (V7:7) taken from a discussion with Arthur (2MNE), a nurse and science fiction fan, who is currently writing his first sci-fi novel.

“Après tout, on peut vivre partout. Ça serait un petit peu comme vivre sur un bout de Terre, mais ailleurs, donc ça ne serait pas énorme.” (Arthur, 2MNE). V7:7⁹⁸

“Parce que je pense que [l’humanité] peut s’habituer à peut-être toutes les conditions, survivre, on le voit sur Terre où les gens vivent sous des conditions extrêmes comme au pôle nord.” (Jean Denis, 3ME). V7:8⁹⁹

⁹⁵ “It’s difficult for me to imagine. Unless it is completely constructed, unless things are made so that we feel as if we were on Earth.”

⁹⁶ “If we take away the pressure, they’ll be completely deformed after a few years, their heads get bigger, their appendages swell, we are obligated to remain in a permanent pressurization so that we live in the same pressure as on Earth.”

⁹⁷ “Difficult conditions, but at the same time, a little, I mean, it would become a little the same life as on Earth. Except that it would be far away, obviously, but like at the time when it was the conquest of the United States, it was far away, because we didn’t have the same modes of transport.”

⁹⁸ “After all, we can live anywhere. It would be a little bit like living somewhere on Earth, but far away, so it wouldn’t be a huge change.”

⁹⁹ “Because I think that [humanity] can adapt to maybe all conditions, to survive, we see it on Earth where people live in extreme conditions, like at the North Pole.”

Arthur and Jean Denis create analogies between extreme environments on Earth, and those imagined in space. Living in a stark environment like a research base at the North Pole is considered comparable to living on Mars. This analogy fuels judgements about the possibility of human life beyond Earth for both men: “we can live anywhere” and “humanity can adapt to maybe all conditions.” Unlike the conceptions of the participants in the previous set of beyond Earth analogies (V7:4-6), Arthur and Jean Denis focused on challenging contexts on Earth by extending the past successes of extreme human settlements on Earth to human extra-planetary settlements (omitting references to failed human settlements in similar contexts). In both sets of analogies, from those who postulate the undesirability and/or impossibility of going to space (V7:4-6) and advocates of going to space (V7:7-8), the possibilities appropriate to the source domain (i.e. Earth) are extended to the target domain (i.e. space). Earth is the source domain for numerous analogies and the terrestrial characteristics people focused on greatly informed their judgement of the probability, and desirability, of human existence beyond Earth. When talking about human space exploration, advocates cited historical precedents for human adaptation to extreme, terrestrial environments; in counter-discourse, space is understood to be far more extreme than any environment on Earth. In both cases, Earth functions as the point of reference for possibility.

Earth is such a forceful source domain of experience for “human life” that imagining outer space becomes, for many of my informants, an act of imagining the reproduction of Earth or human civilization in another context. Of course, Earth is the only experience my interviewees have of life, but the people with whom I spoke were largely confident in the human capacity to transform environments and mold the natural world to align with human needs and desires. Talk about interaction with alien civilizations and planets, that was rampant in the imaginations of the “Golden Age” of science fiction (roughly 1938-1946 [Nicholls 1981], is largely missing from my corpus. There seems to have been a shift in people’s imaginations in France from being at the mercy of natural environments and unknown dangers, to being the master of these environments, and to being armed with science to combat new dangers. As people concentrated on ‘re-creating’ Earth so that humans could live in space, they concentrated primarily on methods of colonization

and terraformation. The first method artificially creates conditions for human survival within a planet or space ship, while the second transforms entire celestial bodies into Earth-like environments. People spoke with me easily about taking entire planets and converting them into human environments. Sometimes they would mention contamination of potential indigenous species or other destructive eventualities of terraforming an unknown world into *our* world. However, even when this topic came up, most people felt that humans would partially or largely ignore quarantine and other safety protocols when engaging in the ‘conquest of space.’

For many people, the recreation of Earth on another planet remained a purely environmental affair. Oxygen, air pressure, gravity and food sources were frequently cited as material and environmental necessities.

“Hors de la planète Terre? Je l’imagine pas. Je l’imagine pas à vrai dire. Parce que, comme je disais, reproduire les conditions de notre planète ailleurs ça va être très difficile à retrouver, et puis vivre dans un autre environnement ça me paraît difficile, quoi” (Manon, 2FNE). V7:9¹⁰⁰

“Vivre dans un environnement qui n’est pas fait pour [l’humanité] où on essaie de reconstruire des conditions qui soient aussi proches que possible de la Terre en termes d’atmosphère, en termes de ressources alimentaires, d’eau...” (Charlotte, 1FNE). V7:10¹⁰¹

“Il faut reproduire un habitat comme sur Terre. Dans un premier temps je vois ça comme ça... Un truc avec plutôt du confort, si on est dans une base avec, oui, qui ressemble le plus possible à la Terre... Ensuite, je pense qu’il serait aussi intéressant d’emmener des familles, des enfants, de reconstruire un peu près la même chose que sur Terre, emmener des animaux aussi. ...quelque chose qui soit suffisamment proche de façon à pas être trop déconnecté, parce que je pense que si tu es trop

¹⁰⁰ “Beyond the Earth? I don’t imagine it at all. I do not imagine it to be honest. Because, as I was saying, to recreate the conditions of our planet somewhere else, it is going to be very difficult to find and then living in another environment seems difficult to me.”

¹⁰¹ “To live in an environment that is not made for [humanity] where we try to reconstruct the conditions so that they are as close as possible to those on Earth in terms of atmosphere, food resources, water...”

déconnecté brutalement je pense que tu peux développer des pathologies.” (Lucas, 2MNE). V7:11¹⁰²

The terrestrial environment, as a source domain in the analogies in V7:9-11, is the ‘normal’ and ‘healthy’ baseline for human life. No one seriously argued that a paradise, superior to Earth, awaited human discovery in space. A few participants joked about finding a planet more beautiful than Earth, or as Véronique (2FNE) joked, a planet populated by aliens that look like George Clooney¹⁰³, but swiftly negated the possibility of these propositions.

In addition to the terrestrial environment, some people extended the reproduction of Earth to human culture and contact. Oliver, (1MNE) described a link between human culture (not only human bodies, as is more common in the corpus) and the terrestrial environment:

“Ça peut-être de rompre le contact avec les gens qui sont restés sur Terre et du coup de devoir réinventer une nouvelle civilisation. Puisque notre civilisation est basée sur celle de la Terre et elle a été façonnée par notre environnement. Le fait d’être transposé dans un environnement complètement autre, il faudrait re-fonder des bases d’une nouvelle civilisation. Finalement, nos valeurs et nos croyances n’auraient plus tellement de sens hors de la Terre. Il faudrait sans doute inventer autre chose.

Rien que la religion. Enfin, ‘Dieu créa la Terre,’ enfin il y a quand même...tout tourne autour de la Terre. Et puis pendant longtemps la Terre a été le centre du monde, le soleil qui tournait autour de la Terre. Ça serait un renversement des valeurs.” (Olivier, 1MNE). V7:12¹⁰⁴

¹⁰² “It is necessary to recreate an environment like that on Earth. At first, I see it like that. Something more or less comfortable, if we’re in a base with, yes, that resembles as much as possible the Earth...Afterwards, I think that it would also be interesting to bring families, children, to reconstruct somewhat the same thing that we have on Earth, to bring animals too...something that would be sufficiently close so that we would not be too disconnected, because I think if you are too disconnected, too brutally, I think that you could develop pathologies.”

¹⁰³ “Après s’il nous offre des extra-terrestres qui ressemblent à George Clooney, moi je suis preneuse, hein, mais j’y crois pas.”
“Afterwards, if they offer us aliens that look like George Clooney, I’m a taker, but I don’t believe in that.” (2FNE, “Véronique”)

¹⁰⁴ “It could be that we break contact with people on Earth and suddenly have to reinvent a new civilization. In the end, our values and beliefs wouldn’t make much sense beyond the Earth. It would be necessary to invent something else without a doubt. Nothing but religion. You know, ‘God created the Earth...’ there are still...everything revolves around the Earth. And for a long time the Earth was the center of the world, the sun that revolved around the Earth. It would be an overthrowing of values.”

The pervasiveness of conceptions and accompanying metaphors that orient participants and the multiverse to the Earth demonstrates the influence of terrestrial experience on their imaginations and the explicit relationships they perceive between themselves, their ways of life and the Earth. Though “*sur la Terre*” is the most frequent formulation in the corpus, a host of other expressions terracentrically orient the multiverse and objects and phenomena within it (e.g. “*autour de la Terre*” [“around the Earth”] “*en dessus de la Terre*” [“below the Earth”] and “*en dehors de la Terre*” [“outside of the Earth”]). Charlie (1MNE) negotiated between container and orientational metaphors when discussing the Earth, beginning by talking about life “in” Earth, then switching to “upon” Earth to finally finish by saying “on” Earth. “*Moi, j’aime bien la Terre. Je pense qu’on peut vivre encore longtemps dedans. Fin, dessus plutôt et que, si jamais on fait pas trop n’importe quoi, on vivra longtemps sur la Terre.*” (“I like the Earth a lot. I think that we can still live a long time inside. Well, upon, and that, if we can just not screw things up too much, we will live a long time on Earth.”)

We can see that “*sur Terre*” applies to a relationship between the Earth and anything located “upon” it (whether on or below its surface, or in its waters), rather than “within” it. On the other hand, people used the metaphor “*dans la Terre*” (Chapter Six) to express a relationship between the Earth and anything exterior to it. In all of these instances, people used orientations based on their previous embodied experience to discuss their imagination of the ‘beyond.’ Space, even when it is the central point of interest and discussion, remains external¹⁰⁵ and, though interviewees spoke of the vast, or “infinite” reaches of space, they oriented their imagination of this infinite unknown according to the realms most known to them.

7.2 *Dans* or *Sur la Lune*: Orienting Unknown Experience

The second most frequent positioning deployed by participants in their imaginations is that of being “on the Moon” (“*sur la Lune*”). As with the preceding orientational conception, being “on the Moon” is an embodied experience, albeit one only experienced by a minute

¹⁰⁵ In English people commonly say both “space” and “outer space” to refer to the space beyond the Earth’s atmosphere. In French, “outer space” does not exist as a term, only “space” (“l’espace”). The term “outer space” could arguably prime participants to think about space as “outer” or external.” But because this term does not exist in French, I find it all the more interesting that in people’s conceptions of space, space is always external.

percentage of the human population. It remains that human engagement with the Moon means that all of the participants in this study had been exposed to images, video or reenactments/parodies in popular culture of the Moon or the moon landing (e.g. Figure 7:1 at right)

The Moon as a human experience was cited by many people in reference to both real (e.g. “*J’avais 24 ans quand Armstrong a posé le pied sur la Lune.*”/“I was 24 years old when Armstrong set foot on the Moon.” 3ME, Jules) and imagined events. *Tintin Sur la Lune* was cited by three participants and Lucas (2MNE) discussed China’s plans for a human moon expedition in 2020. The Moon was already a human destination for interviewees. After the Earth, the Moon was the most cited celestial body in the corpus and the dangerous, alien nature attributed to other locations in space (e.g. Mars, orbital space stations) was absent from participant discourse concerning the Moon.

When speaking about being “on the Moon” people predominantly used the expression “*sur la Lune.*” To be “on the Moon” evokes a conception informed by embodied human experiences of being “upon” terrestrial surfaces. However, this conception of the experience of humans “on” a celestial body is not the only way to conceive of this orientation. In French this is evident because it is possible to say either “*sur*” or “*dans*” a celestial body, though the latter is relatively rare for celestial bodies other than the Moon. In my corpus, people refer to both being “*sur la Lune*” (75x) and “*dans la Lune*” (11x) as well as being “*sur une/la planète*” (19x and 16x) or “*dans une/la planète*” (1x and 1x).

The use of one, or the other, locative prepositions in French to formulate the idea of being “on” or “at” a celestial body (in French either “on” or “in”) is possible, however there is marked preference in people’s discourse for the use of the former. The preposition “*sur*” (“on”), evoking a conception of a surface rather than encompassing container, is used 8.46 times more than the preposition “*dans*” (“in”). This prepositional preference is not arbitrary but seems to be motivated by people’s conceptions of celestial bodies as being dynamic, immersive environments (i.e. Earth) or as being static surfaces. Deploying grammar to evoke a conception of the Moon as being a surface to be “on” (rather than a place to be “in” or “at”) corresponds well to interviewees’ more developed descriptions of the Moon (i.e. as “dusty” and “boring,” 3MNE, Bernard).

The following are a handful of examples in which interviewees deploy the phrase “*sur la Lune*” in varying contexts including descriptions of space exploration and lunar landscapes. People associated the orientation of being “on” the Moon with the ideas of walking (“*marcher sur la Lune*”) or of placing one’s feet on the Moon, a metonymy for general human presence on the Moon. Whereas metaphors and metonymies of knowledge or ‘knowing’ places and things often use source domains of touch or sight (e.g. to get a “feel” for something; to “set sight” on virgin territory) (Andriesson and Van Den Boom 2009; Kövecses 2010), in this corpus the Moon is associated with metaphors of exploration; of setting foot (“*mettre le pied*”) and advancing physically by walking into unknown territory. The influence of images of Armstrong’s ‘moonwalk’ and his footprint on the Moon are evident in participant discourse.

“J’aime que la science soit capable d’emmener des hommes loin, comme sur la station spatiale, ou éventuellement sur d’autres planètes ou sur la Lune” (Franck, 1MNE). V7:13¹⁰⁶

“La notion vraiment d’espace...c’est à dire, l’objet, je ne sais pas si on peut dire, mais dans l’immensité du vide. Je pense pas d’abord à la marche sur la Lune ou des choses comme ça. Moi, c’est plutôt, le fait d’être au milieu de nulle part.” (Valérie, 3FNE). V7:14¹⁰⁷

“Oui, c’est toutes les planètes, mais moi surtout ‘l’espace’ déjà tout de suite c’est quand on a marché sur la Lune quoi. Je vois ça parce qu’on avait passé la nuit devant la télé à attendre que Armstrong sorte et marche sur la Lune quoi. Ça c’est l’image qui me reste” (Marie Rose, 3FNE). V7:15¹⁰⁸

“Pour moi, le rêve de l’espace, je suis née avec. J’ai cru qu’on irait de mon temps. J’ai cru que j’irai sur la Lune un jour quand j’étais petite. Quand j’étais petite j’y croyais. Je suis née en 1965” (Marie, 2FE). V7:16¹⁰⁹

¹⁰⁶ “I like that science is able to take men far, like on the space station, or eventually on other planets or on the Moon.”

¹⁰⁷ “Really, the notion of space, so to speak, the object, I don't know if we can say that like that, but in the immensity of the void. I don't think first about the moon walk or things like that. For me, it's more the fact of being in the middle of nowhere.”

¹⁰⁸ “Yes, it's all the planets, but for me especially ‘space’ is immediately when we walked on the Moon. I think of that because we spent the night in front of the television waiting for Armstrong to get out and walk on the Moon.”

¹⁰⁹ “For me, I was born with the dream of space. I believed that we would go during my lifetime. When I was little I believed I would go to the Moon one day. When I was little I believed that. I was born in 1965.”

“C’est des milliards de kilomètres, même si c’est tout petit comme voyage, c’est quand même aller dans la lune, se poser sur la lune, uhhh...c’est...it’s a small step for man, and a big step for mankind” (François, 3MNE). V7:17¹¹⁰

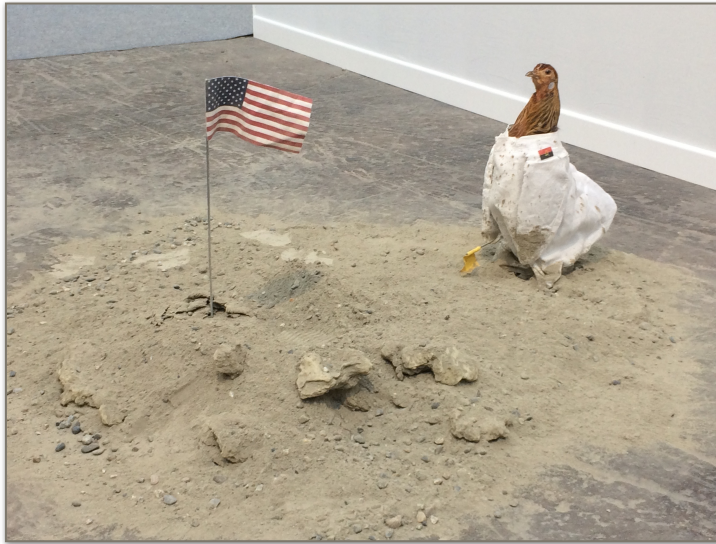


Figure 7:1 Chicken On The Moon at *la Foire internationale d’art contemporain*, Paris, October 2017.
Photo by author.

“Je veux dire quand j’étais même c’était déjà acquis que l’homme avait marché sur la Lune, alors que maintenant il y a des complôtistes qui remettent ça en cause. On croyait tous dans la classe de primaire qu’on allait voir le premier homme sur Mars” (Margot, 2FE). V7:18¹¹¹

“Je me suis dit, ben, là ce n’est plus de la science fiction. On commence à y aller, peut-être que je verrai l’atterrissage de l’homme sur la Lune. Je savais bien que Tintin n’avait pas mis le pied sur la Lune” (Jules, 3ME). V7:19¹¹²

“Donc là, on se pose la question de ‘comment je vis sur le terrain?’ Là il n’y a pas de paysans que tu peux baffer pour te donner du blé sur la Lune” (Christian, 2ME). V7:20¹¹³

“Mais la Lune, toutes les images qu’on a sur la Lune, ça a l’air d’être très ennuyeux...C’est gris, enfin, évidemment c’était essentiellement du noir et blanc, mais c’est pas très excitant comme environnement quoi” (Bernard, 3MNE). V7:21¹¹⁴

¹¹⁰ “It’s billions of kilometers, even if it’s a short trip, it’s still to go ‘in’ the Moon, to stand on the Moon, it’s... ummm...a small step for man and a big step for mankind.”

¹¹¹ “I mean, when I was a kid it was taken for granted that man had walked on the Moon, and now there are conspiracy theorists that question that. We all believed in elementary school that we would see the first man on Mars.”

¹¹² “I said to myself, ‘Well, it’s no longer science fiction. We’re beginning to go, maybe I will see the landing of the first man on the Moon.’ I knew that Tintin hadn’t set foot on the Moon.”

¹¹³ “So there, we have to ask ourselves, ‘how do we live on that terrain?’ There aren’t any peasants that you can slap around and make them give you their wheat on the Moon.”

¹¹⁴ “But the Moon, all the pictures that we have of the Moon, it looks really boring. It’s grey, I mean, obviously it was mostly black and white [photos], but it’s not a very exciting environment.”

“Donc, je ne me sens pas l’esprit sportif *rire* d’aller moi-même expérimenter, ou je ne sais pas, de mettre le pied sur la Lune, non, franchement, pas de, tellement de curiosité” (Nathalie, 3FNE). V7:22¹¹⁵

There is an obvious preference for “on” orientations for celestial bodies (e.g. “*sur Mars*” [109x] and “*dans Mars*” [0x]; “*sur Saturne*” [1x] and “*dans Saturne*” [0x]). In fact, for many participants, especially younger ones, being “in the Moon” seemed to be a strange formulation and being “in” other planets was never mentioned. The usage “*dans la Lune*” seems to be an anomaly. Why would it be possible to speak about being “in the Moon” and not “in Mars”?

The phrase “*dans la Lune*” appears 10 times in people’s descriptions of existing on the Moon’s surface, but never appears in descriptions of other celestial bodies. “*Dans la Lune*” is not only a particularity within this data set but exists in general discourse in France and French popular culture, for example the 1902 adventure film *Le Voyage dans la Lune* by George Méliès. The expression “*voyage dans la Lune*” occurred seven times in the corpus (therefore accounting for 64% of the total usage of the phrase “*dans la Lune*”). “*Voyage dans la lune*” is used by participants to refer to 1) the complete voyage (the round-trip from the Earth to the Moon, including the lunar landing) as well as 2) the time spent by astronauts “on” the Moon’s surface. There are alternate ways of talking about both of these experiences in French (e.g. “*le voyage de la Terre à la lune*” [“the voyage from the Earth to the Moon” and “*aller sur la Lune*” [“to go on the Moon”]).

The idea of the “voyage” is therefore dominant in this corpus in usages of the phrase “in the Moon.” The only other co-occurrences of the verb “*voyager*” and the preposition “*dans*” in this corpus were in reference to space travel and time travel (i.e. “*voyager dans l’espace*” and “*voyager dans le temps*”). This corresponds to the dominant use in general French discourse in which the four common nouns that co-occur with the verb-preposition pair “*voyager + dans*” are: 1) *l’espace*, 2) *le temps*, 3) *la Lune* and 4) *les îles*.

¹¹⁵ “So, I don’t feel very athletic *laugh* to go experiment myself, or I don’t know, to set foot on the Moon, no, frankly, I’m not that curious.”

Among these common co-occurrence nouns, the Moon represents a particular case for several reasons. Space, time and “the islands” are all more or less regions that can be understood as non-delineated. The Moon is a celestial body with definite, visually perceivable boundaries. Being “in” space and “in” time are common conceptions in world languages and, as discussed in Chapter Six, traveling “in space” (**SPACE IS A CONTAINER**) is the predominant conception in participant discourse within this corpus.

Space and time are abstract domains in human experience (though specific places and times are definable). To voyage in space and time is not to voyage “in” a specific place or “on” a moment, but within these abstract domains. The Moon and the islands therefore represent a different case as they are specific geographic locations. However, unlike the islands, the Moon is one location rather than several to move among. Parallels are possible between the conception of traveling “in the islands” and common conceptions of traveling “in” other natural landscapes (e.g. “*dans la forêt*,” “*dans la montagne*,” “*dans les marais*”), however these nouns are far less frequent with the verb “*voyager*”). It would seem that the Moon, being an unknown location, is conceptualized by people according to orientations for traveling in abstract or non-delineated domains (i.e. space and time). Additionally, this conception is almost exclusively deployed by older project participants; those who were born before the Apollo missions to the Moon. For pre-Apollo participants, the Moon was an abstract, distant place. However, the conception of traveling “in the Moon” was rare among younger interviewees. For post-Apollo generations the Moon is described more commonly as a location like any other (e.g. a city, a restaurant). The eleven uses of “*dans la Lune*” are from three non-expert male participants, all over the age of 55. Take the following examples from the discussions of each of these men.

“Quand je pense à...ceux qui sont allés dans la Lune...Oui, je pense que déjà... c’est...cette idée de l’apesanteur... On peut imaginer qu’un voyage dans la Lune dans quelques dizaines d’années ça sera possible.” (Édouard¹¹⁶, 3MNE). V7:23¹¹⁷

¹¹⁶ This participant also made use of the only example of “*dans une planète*” in the corpus, i.e. “*Le film se termine par une fusée qui s’apprête à partir dans une planète autre pour coloniser justement une planète autre. Il s’appelle **Things To Come***” (“The film ends with a rocket preparing to depart in another planet precisely to colonize it. It’s called *Things To Come*.”)

¹¹⁷ “When I think about the people who went in the Moon...Yes, I think that already...it’s...the idea of zero gravity...We can imagine that a trip in the Moon in a few dozen years will be possible.”

“Je pense que si Jules Vernes n’avait pas tant écrit sur le voyage dans la Lune, il aurait pas modifié l’imaginaire des gens pour le fait que ça soit possible.” (Arthur, 2MNE). V7:24¹¹⁸

“C’est 1969, le voyage dans la lune.” ; “Ben, comme l’expédition dans la Lune.” (Francois, 3MNE). V7:25¹¹⁹

It is possible that this generation of participants was more influenced by cultural texts using this formulation, such as the aforementioned film by Méliès, or the work of Jules Verne, referenced by the youngest of the three participants to use the phrase (and in reference to Verne). However, as human engagement with the Moon became more widespread, a greater variety of cultural texts discussing this voyage is available, and the expression “*sur la Lune*,” which is more common in scientific and popular discourse, is now predominant among speakers.

Whether this choice of expression reflects the level of abstraction of the Moon in their imagination, or the amount of contact they had with cultural texts using this expression, in both cases there is evidence of the influence of embodied experience and generalized cultural knowledge upon ways of comprehending and orienting things-in-the-world (and beyond it). This supposedly literal expression is the product of individual and cultural influence upon how speakers orient themselves and things around them, rather than the product of an accurate understanding of the Moon.

Whereas the less frequent “*dans la Lune*” seems to be partially motivated by the abstraction of the Moon as an unknown domain, the more frequently deployed “*sur la Lune*” reflects human sensory experience (e.g. of walking on, putting our feet on, falling down on the ground, etc.). Being “in” or “within” a planet carries connotations of the physical experience of being inside spaces; of being surrounded by them, possibly therefore beneath or below parts of them, and having our field of vision defined by them. On the other hand, being “on” or “upon” provides us with a perspective in which above and below may be two different domains (for

¹¹⁸ “I think that if Jules Verne had not written so much about the voyage in the Moon, he would not have modified the imagination of people to realize that it could be possible.”

¹¹⁹ “It’s 1969, the voyage in the Moon”; “Well, like the expedition in the Moon.”

example, “*la tasse sur la table*” [“the cup on the table”] which supposes a space below [table] and above [air in the room] the cup). In many cases the “in/on” fluctuation that is possible when describing celestial bodies is not possible between objects without significant changes in meaning.

This fluctuation seems to be motivated by physical experience and embodied orientations within spaces. When participants are imagining being “on the Earth/Moon/a planet” they imagine themselves physically positioned on its surface (rather than “in” its core). They explicitly talk about being on-planet (i.e. “*sur la planète*”). However, when off-planet, there is a preference for talking about being “outside” of a planet, or “in space” (in-out, rather than on-off orientation). Talking more about being “in space” than about being “off planet” (and talking about being “on a planet” rather than focusing on how planets are “in space” as discussed in Chapter Six) are ways of speaking that reflect the predominance of sensory experience (real or imagined) in the categorization, comprehension and description of stimuli. Participants shift orientational systems depending on their point of perspective. When imagining themselves in space the focus of discourse shifts to space, rather than the planet, following the speaker’s body in their imagination.

This seems evident. My research demonstrates that the orientations provided by our physical experience go on to structure the imagination of potential and unknown experiences of informants. Locative prepositions like those discussed above issue from people’s embodied experiences. What is universal about these linguistic tendencies is that the people using language all have human bodies. The language that we use to more or less literally describe our experience becomes the figurative frame for our understanding of potential experience. These locative prepositions and their literal meanings provide frames of experience for more abstract, complex and unknown phenomena; simultaneously furnishing literal, orientational information and a constellation of conceptual information (the “harmonics” of metaphors that Baake [2003] describes). Proof of this conceptual baggage has been documented in experimental studies, suggesting that the harmonics of our language greatly inform our perception of a situation by activating image schema for embodied experience, regardless of whether we consciously perceive this metaphor-related language as metaphorical. The extensive research of Raymond

Gibbs (2006; 2013; Gibbs and Falck 2012; Gibbs and Silva de Macedo 2010) provides compelling evidence of how understanding a metaphor requires a mental simulation of the source domain; this simulation has consequences on individual comprehension of the metaphor and the situation it describes.

The example of being “on” or “in” the Moon provides evidence of the conceptual baggage a seemingly simple preposition contains. In French, being “on” the Moon or “in” the Moon are often interchangeable phrases that literally possess the same semantic content, however, each preposition emphasizes and obscures different aspects of experience, encouraging different conceptions of being at a Moon location. “On” carries entailments of a vantage point, a place of perspective in which there exists a dominance; an ‘upper hand’ or ‘higher’ positioning of the human being ‘above’ and ‘upon’ an environment. “In” carries entailments of immersion, of being surrounded, contained, possibly constrained. Being “inside” is a point of perspective that does more to equalize the human with the ‘surrounding’ environment, it is participative and interactional (be it cooperative or conflicted); being “on” an environment is observational, explorational and potentially more detached.

The predominant representation of the Moon is of being ‘upon’ the Moon, of ‘setting’ a foot ‘upon’ the Moon or placing a human artefact ‘on’ its surface (e.g. rover, lunar lander, flag). The predominant participant conception of the Earth is the opposite of this - being ‘inside’ the Earth; of cultivating ‘in’ its soil, of the processes at the Earth’s core and the layers of atmosphere that surround the planet at the boundaries between this planet and ‘exterior’ space. Earth is a dynamic, layered environment in participant imaginations, whereas the Moon is frequently described as a barren rock, or as one 3MNE put it, “*pas très excitant comme environnement...il y a de la poussière, il y a...voilà...bon*” (“not a very exciting environment...there’s dust, there’s... well...”).

So strong is the conception of being “on” the Moon, that the container conceptions people often applied to the Earth are non-existent in the data set for the Moon. For example, the phrase “*hors de la Lune*” does not occur in the data set, compared to 144 instances of “*hors de la Terre*.” The Earth is people’s reference point within space and the dominant conception for one celestial body (the Earth) is never applied to another celestial body, even when speaking about

human arrival, departure and other activity “on” or “in” these locations. Though participants apply their basic experiential and cultural knowledge about the Earth to the Moon, a number of basic conceptions and conceptual metaphors they use to understand the Earth and their positioning within it are never deployed for non-terrestrial contexts.

Is it because participants have no basic experience “within” these extra-terrestrial contexts that they can only produce a “surface” imagination (i.e. an imagination of these planets as [flat] surfaces)? The terracentrism of participant discourse is not only in its content (e.g. explicit discussions of Earth and human life on Earth) but also in the availability and/or deployment of conceptual resources with which to engage the Earth as a phenomenon. I would argue that all participants could comprehend the phrase “*hors de la Lune*,” but not one participant deployed this metaphor when discussing the Moon. It is not grammatically incorrect, nor semantically bizarre, yet remains an unconventional perspective in discourse. This imagination of positionings vis-à-vis the Moon was absent, though participants imagined a variety of different scenarios and historical events concerning the Moon. It seems to me that this can be attributed both to 1) a lack of dynamism on the Moon as well as 2) a lack of dynamic, embodied experience with the Moon. The way informants talked about the Moon evoked conceptions that are concurrent with embodied human experience and that reinforce marked categories of experience. Being “on” the Moon was considered a major accomplishment and became the marked category of experience concerning the Moon (as, in conventional Western science and ‘common sense,’ we are always off of the Moon). No one talked about “being off of the Moon,” probably because most of the people I talked to would have found this silly or self-evident. Nonetheless, this demonstrates the dominance of egocentric orientations, whether this orientation be to the speaker’s own body or their planet.

People could have talked about “being off of the Moon” and would understand the meaning of this expression, though it is unconventional. I find no evidence of strong Whorfianism (when language establishes perceptual habits that are stable over the long-term, see Section 2.2) in this data. It is not impossible for people to imagine or describe the unknown just because their language (be it the language itself, or their own personal vocabulary) may not have conventionalized ways of speaking about these things. However, I do find evidence of weak

Whorfianism (where language provides short-term cues during perceptual processes, otherwise known as the “language as meddler effect,” Wolff and Holmes 2011; Winawer et al. 2007), as their ways of imagining do seem to be shaped by linguistic and cultural conventions. Moreover, my data supports arguments that these Whorfian tendencies are motivated by embodied experience, as, when describing the unknown, people had a far greater tendency to deploy grammar in ways that correspond to their dominant physical experiences than to generalized knowledge about the topic.

For my French respondents in the 2000s, the Moon is arguably the celestial body with which humanity has the most intimate relationship, certainly the most direct experience and imagery. The Moon is an unknown embodied experience to participants, but not an ‘unknown’ domain of imagination. However, despite the pervasiveness of images, video and a diverse range of factXfiction texts concerning the Moon, interviewees still described surface imaginations of the Moon, limiting its conceptual possibilities to “On/Off” schema.

I would argue that this conceptualization of the Moon as a “surface” celestial body can also be attributed to the perceived absence of activity or diversity ‘on’ the surface of the Moon, ‘in’ the lunar environment. “Dust” was cited by participants in reference to outer space 5x in the corpus; three of these instances refer to the idea that humanity and all of the universe is made of “star dust” (*“la poussière des étoiles”*), the other two instances are descriptions of the Moon. The Moon is widely perceived as a static, lifeless, dust-covered rock in the sky and one of the few notable things about this rock in human imagination is that humans have been ‘on’ it. The post-Apollo imagination of the Moon for participants is centered on this event in the lunar-human relationship, focusing on the Moon as a surface and precluding other conceptual possibilities.

7.3 Going Beyond: *l’au-delà*

The last group of orientational conceptions and their accompanying metaphors that I will discuss in this chapter are those associated with “going beyond” (*“dépassement”*), “the beyond” (*“l’au-delà”*), and that which is “distant” (*“là-bas”*). Contrary to the other orientational conceptions interviewees associated with celestial objects, conceptions of “going beyond” are

used to position oneself in a physical environment as well as to metaphorically describe abstractions and emotional states. Again, these metaphors almost exclusively utilize a terracentric perspective, a non-marked terrestrial “here” position from which individuals may travel to a marked non-terrestrial “there” position.

The most frequent conception of the ‘beyond’ deployed by participants is that of exceeding or going past, found in the verb “*dépasser*.” “*Dépasser*” was used in its verb, adjective and noun form (i.e. *le dépassement*) a total of 22 times. The nine entries in the *Larousse* for current meanings of the verb testify to the heavy charge of connotations “*dépasser*” possesses. The basic meaning of the verb is to be “higher, taller, or bigger than someone or something,” as in the phrase, “His son is 20 centimeters taller than (beyond) him” (Larousse 2017). The subsequent entries describe “passing” vehicles, to go past a geographical point or exceeding quantities or durations. In each of the secondary entries for the verb, the influence of the basic, embodied meaning of being “higher” and going “past” another entity in height, is present. There is a defined, visually perceived point and other points, objects and people can be at this point (or on it), before this point, or past (beyond) this point.

To go “beyond” something, or to “do more” is the fifth entry for “*dépasser*,” the illustrative examples given are to “go past (beyond) 60 km/h” or for an event to “go past (beyond) one’s hopes.” It is this fifth sense that is most dominantly used in participant discourse when discussing space, both in the sense of physically go past a speed, or other set point (e.g. “*dépasser la vitesse de la lumière*”) or to go past one’s expectations, limits or ego. Christian and Jules, both expert participants, one an astrophysicist and the other a science fiction author, discussed travel beyond light speed. For example:

“Mais l’intérêt n’est pas tant dans la possibilité, que ça soit pas possible, de dépasser la vitesse de la lumière, ou je ne sais pas quoi, ou des vaisseaux incroyables. Mais là où c’est intéressant c’est pas tant dans la possibilité, que dans les questions humaines que ces oeuvres posent” (Christian, 2ME). V7:26¹²⁰

¹²⁰ “But the interest is not so much in the possibility, that it would be possible, to go beyond light speed, or I don’t know what, or incredible spaceships. But where it’s interesting, it’s not in the possibilities, it’s in the human questions that these projects present.”

“Même si la science fiction l’utilise et on ne dépassera pas la vitesse de la lumière, on peut pas réussir à plier l’espace” (Jules, 3ME). V7:27¹²¹

Lucas (2MNE) talked about going to space as being “...*le dépassement de la frontière et au delà tu es un pionnier. Comme les navigateurs, comme la conquête de l’Ouest*” (“going past the frontier, and beyond that you are a pioneer. Like the navigators, like the conquest of the West”). He combines the notion of “going beyond” the frontier with that of “*the beyond*” where one becomes a “pioneer.” Though he remains focused on a physical, set point in the environment (a frontier, or border), he links this going-beyond-a-set point with going into *the beyond*.

Navigators and pioneers in the American West were the most salient categories of comparison for Lucas and many others. Even though they were French, no one spoke to me about the pioneering work and exploration of Jacques Cousteau, or of non-geographical pioneers in the sciences or arts. The territory of space spread out before humans was paralleled by most people with exploration of terrestrial territories; albeit in simplified narratives of these historical events that group a range of different kinds of exploratory practices into a prototype of the “explorer” of “the beyond.”

It is interesting to note how Lucas (2MNE) romanticizes going beyond and the transformation that an individual undergoes when going into the beyond (“*l’au-delà*”). Explorers, navigators and colonial presence are wrapped up into a clean package that Lucas titles “pioneers.” A pioneer is literally defined as an individual who is among the first to explore and settle a new territory; a meaning which is metaphorically extended to people who develop new areas of knowledge and practice. Lucas’s reference to the “conquest of the West” is particularly interesting, as he knows well that the true ‘pioneers’ of the North American continent were not European explorers who could be compared to astronauts traveling great distances in space, but rather the indigenous peoples who explored and inhabited the continent centuries before Europeans. Like Lucas, people often used the categories of “pioneer” and “explorer” interchangeably, without problematizing the historical precedents they referenced. This resonates with Valentine’s (2017) observations while doing fieldwork among space scientists and

¹²¹ “Even if science fiction makes use of it and we will not go beyond light speed, we will not be able to succeed in folding space.”

advocates for space exploration. He notes that “there are critiques of problematic framings that we must make with necessary gravity: chronotypes of the American West sanitized of violence and terror; the absence of the Middle Passage in accounts of white spacefaring adventurers; and technical solutionism that promises to put modernity back on track” (Valentine 2017, 204).

This abstract, and often romanticized notion of going beyond into *the* beyond accounts for the majority of uses of “*dépasser*” in all its forms.

“C’est une manière de dépasser nos limitations humaines.... Je pense que c’est important d’évoquer cette question de surhumain, de superhuman pas dans le sens nietzschéen bien sûr, mais dans le sens de quelqu’un qui possède des pouvoirs extraordinaires, qui encore rejoint un fantasme du dépassement des limites humaines” (Édouard, 3MNE). V7:28¹²²

“Si on est sur une planète X, l’homme est capable de dépasser son intérêt habituel et de voir un partage commun pour que tout le monde soit bien, l’homme aurait fait un grand pas” (Martin, 3MNE). V7:29¹²³

“C’est vrai aussi que l’exploration, ça aussi ça a obligé l’être humain de se dépasser. À affronter à des continents qu’on connaissait pas avec des contraintes - toutes les maladies et aussi les climats différents...Donc c’est vraiment un dépassement de soi” (Louis, 1MNE). V7:30¹²⁴

“C’est un lieu de rêve [space] parce que ça nous invite à nous dépasser, à découvrir, à explorer. Et ça, c’est passionnant. Même si c’est pas, moi, ma tasse de thé, je suis pas un explorateur, je suis pas un voyageur, ça reste quand même le domaine du rêve. Parce que ça nous permet de nous projeter aussi, d’imaginer des choses” (Charlie, 1MNE). V7:31¹²⁵

“C’est ça d’aller voir vers les étoiles. C’est aussi que si l’humanité se fixe un but qui est plus grande qu’elle, alors dans ce cas-là elle dépasse...évidement ça sera pas

¹²² “It’s a way of going beyond our human limitations...I think that it’s important to evoke the question of the superhuman, not superhuman in the nietzschean sense, of course, but in the sense of someone who possesses extraordinary powers, which comes back to the fantasy of going beyond human limits.”

¹²³ “If we’re on Planet X, man will be able to go beyond his habitual, personal interest and see a common, shared goal for everyone’s wellbeing, mankind will have made great progress (‘taken a big step’).”

¹²⁴ “It’s also true that exploration, that obligates human beings to go beyond themselves. To tackle continents they have never seen avec constraints - all the diseases and different climates...So, it’s really a ‘going beyond oneself’.”

¹²⁵ “It’s a place of dreams [space] because it invites us to go beyond ourselves, to discover, to explore. And that is fascinating. Even if it isn’t, for me, my cup of tea, I am not an explorer, I am not a traveler, it still remains a domain of dreams. Because it permits us to project ourselves too, to imagine things.”

facile, évidemment voilà, elle peut dépasser en tout cas tout ce qui — en ce moment, c'est à dire ce règne des petits arrangements, des régimes qui sclérosent, des profits et tout" (Margot, 1FE). V7:32¹²⁶

"On veut se dépasser soi-même et on veut montrer des limites, du corps humain, de l'inconscient, de tous ce qu'ont veut, bon" (Jules, 3ME). V7:33¹²⁷

The beyond prompted most people to gravitate towards discussing humanity, rather than the beyond itself. The unknown *beyond* is less a point of focus for participants than its effects on them and on humanity in general. What exists in space, far 'beyond' our current capacities of perception is not a central point of imagination in interviewees' discourse. Rather, the beyond in the corpus is quickly focused on an existential 'beyond' for humanity. Especially in the case of the verb "*dépasser*," we can observe a clear analogy in participants' imaginations between physical boundaries and borders and psychological or developmental boundaries. To go 'beyond' the boundaries of the planet represents a project of exploration that people perceived as going 'beyond' not only physical limits, but the limits of the human spirit and human capacities (sometimes including our evolutionary, or adaptive limits).

To "go beyond oneself" in participant discourse is largely viewed in a positive light, when it is considered possible at all. People did not negatively discuss "human limits," as one participant referred to them, at length, but when they imagined humanity in space, they imagined a humanity beyond its limits both literally and figuratively. The majority of people thought that space exploration will profoundly change humanity, even if only our perspective on ourselves and the planet¹²⁸. In the above examples, Margot discusses space colonization and its potential to push people past their habitual, egocentric interests and Charlie argues that exploration necessarily changes humanity, by forcing human beings "to discover [and] explore."

¹²⁶ "That is what it means to go towards the stars. It's also that if humanity gives itself a goal that is bigger than itself, then in that case, humanity goes beyond....obviously it will not be easy, obviously, but humanity could move beyond everything that...at this time, what I mean is little tyrants, old regimes, profit, and everything."

¹²⁷ "We want to go beyond ourselves and we want to demonstrate the limits of the human body, of the subconscious, of whatever we want, really."

¹²⁸ "Ça va me changer toute ma perception de sortir en dehors de la Terre. Déjà je sors de ma chambre, ma perception change. Si je sors de la planète Terre..." ("It would change my whole perception to go outside of the Earth. Already, when I leave my room my perception changes. If I leave the planet Earth...") (1FNE, "Madeleine")

Interviewees' positive view of discovery and exploration is motivated by a link between exploration and new knowledge, encapsulated in my corpus in the **TERRITORY IS KNOWLEDGE** metaphor. The widespread opinion among participants that furthering knowledge furthers humanity is deep-seated in French culture, through the Enlightenment, the establishment of what the French refer to as "*les valeurs républicaines*" ("republican values") and in a continuing ideology celebrating the republican model. A national, homogenous education, language and culture were central goals of the French Revolution in order to battle what revolutionaries considered ignorance within the nation that facilitated domination of the population by institutions such as the monarchy and the catholic church. The French were to be liberated from the monarchy both politically and intellectually and this was to be achieved, in part, through the establishment of an official national language and universal educational system intended to spread core Revolutionary values of liberty, equality and fraternity (Les Antignes 2017). Revolutionaries perceived the "*barbarisme*" of the proliferation of regional languages as hindering the transmission of their philosophy (Leclerc 2019). Standardized language and education were key elements in the project for national unity and to this day this ideology persists and is incarnated in a host of national institutions (e.g. *l'Académie française*, *Ministère de l'éducation nationale*, *Commission des Grandes Écoles*). The symbolist poet and anarchist writer Adolphe Retté (1913, 99) describes how French students in the early twentieth century were inculcated with revolutionary, anti-obscurantist ideology:

"On sait qu'au programme de l'école primaire, la Révolution tient une place capitale. On s'attache surtout à persuader aux enfants que la période qui précéda cette époque mémorable fut un temps de barbarie, d'obscurantisme et de souffrance où le peuple se composait de faibles agneaux dévorés par les bêtes féroces de la noblesse et du clergé¹²⁹."

Though no one explicitly discussed the French Revolution in connection with their ideas about space and the advancement of knowledge, there was a widespread opinion that it was

¹²⁹ "We know that in primary school curriculum, the Revolution holds a capital position. We are especially attached to persuading children that the period preceding this memorable era was a period of barbarism, obscurantism and suffering where the people were weak lambs devoured by the ferocious beasts that were the nobles and clergy."

important to eradicate ignorance and to push humanity ‘beyond’ the boundaries of what it currently knows. My interviewees’ discussions resonate with Valentine’s (2017, 187) arguments about the “the enduring gravity of universalizing Euro-American Enlightenment, free market, and imperial chronotopes that promise fixes through claims of general human equivalence and a future human diversity in as-yet-uninhabited places.” The largely well-educated, middle class people I spoke with continued to espouse Enlightenment values and many recommended education and scientific vulgarization as remedies to what they discussed as risky ignorance and “*les obscurantismes de nos jours*” (“the obscurantisms of today”) (See Margot, 1FE, V8:16). Margot’s reference to obscurantism directly employs French revolutionary language. I find this term interesting as it refers to an obfuscation, a darkening, a conception that is related to Enlightenment metaphors like **KNOWLEDGE IS LIGHT** (and inversely **IGNORANCE IS DARKNESS**).

Many people perceived the intellectual and social project of space exploration as an opportunity for profound, positive change to humanity. However, imagining humanity in the context of space often provoked people to question whether or not humans adapted to life in space would be ‘human’ at all. Participants cited both biological and cultural adaptations that they imagined may occur, or may be necessary or preferable, in human civilizations beyond the Earth. Space was an unchanging element in their imaginations. It was humanity, going “into space” that would potentially be changed by this experience.

“*Le dépassement de soi*” (“to go beyond oneself”), and its various forms, establish a conceptual metaphor in which **SELF IS A TERRITORY OF A BOUNDED ENTITY** that can be surpassed. In this conception human beings are not contained in one territory of self or being, but have the potential to access other territories of self. So closely is this metaphor linked to the experience of physical territories, limits and measurements that people equated the act of going beyond a physical limit or territory with “going beyond” the self.

This is evident in the second most frequent orientational metaphor in the corpus, “*aller plus loin*” (“to go farther”). This expression was used 17 times in the corpus, 15 of which were metaphorical. Two instances referred to physically going further in space (e.g. “*on arrivera à aller plus loin et plus vite [dans l’espace]*” [“we will be able to go further and faster”], 2MNE).

The other 15 instances discuss going further in more abstract terms; on several occasions the phrase refers simultaneously to going further abstractly and to going further in distance.

“Et quand on est face à ce ciel, c’est à la fois le ciel qui a guidé tous les navigateurs, qui a guidé tous les hommes qui voulaient aller plus loin. Donc, je suis aussi une grande fan de roman marine. De tout ce qui pousse les hommes à aller plus loin... C’est à dire vraiment c’est l’horizon, c’est l’aventure, c’est l’être humain qui va plus loin, même avec toutes les difficultés qu’il y a. Et pas pour le profit, pas pour des raisons égoïstes mais juste parce qu’il y a quelque chose qui le pousse à aller plus loin et être plus libre” (Margot, 1FE). V7:34¹³⁰

Margot frequently deployed this concept, using the phrase “*plus loin*” 18 times, both literally and metaphorically. In the above excerpt, it is ambiguous as to whether or not “*plus loin*” refers solely to geographical distance, or also to other states of being and qualities (e.g. freedom, “*être plus libre*”). She makes references to physical, geographical markers (e.g. the sky, the horizon) and references sea navigation and maritime novels. However, she clearly links this geographic “going further” with an abstract sense of advancement, and one that can be positive, “not for profit, but...to be more free” (again, echoing French revolutionary ideology).

The concept “*plus loin*” was also frequently employed with the verb “*voir*” (“to see”) ten times in the corpus, as well as the verb “*réfléchir*” (“to reflect”) one time. The use of the metaphor “*voir plus loin*” (“to see further”) is essentially metonymic as participants deploy one of their senses (i.e. sight) to communicate the complete physical experience of “going beyond,” which would engage all of their senses, not only their sight. “*Voir plus loin*” is an instance of the well-studied **KNOWLEDGE IS SIGHT** conceptual metaphor (Kövecses 2010). “*Aller voir plus loin*” (“to go further”) makes use of the source domain of the embodied experience of moving across a space and seeing things that were not visible from the point of departure to describe the target domain of exploring the far away or unknown.

¹³⁰ “When you are facing the sky, it is simultaneously the sky that guided all the navigators, that guided all men who wanted to go further. So, I am a big fan of maritime novels. Of everything that pushed people to go further... What I mean is really the horizon, adventure, human beings that go further, even amidst all the difficulties that arise. And not for profit, or for egotistical reasons, but just because there is something that pushes them further and to be more free.”

The equation of seeing territory with knowledge of that territory reinforces a territoryXknowledge conception in which the metaphors **TERRITORY IS KNOWLEDGE** and **KNOWLEDGE IS TERRITORY** both operate. For many people, experience with territory - whether it is “seeing what is further” or “placing a foot somewhere else,” as in Franck’s (1MNE) argument for going to space to “...*aller voir ce qu’il y a plus loin. Aller mettre un pied ailleurs*” - is analogous with knowing that territory. The implication of knowledge present in metaphorical constructions using “plus loin” reinforces the conception of “going beyond oneself” by going beyond geographical boundaries, and particularly reinforces positive entailments of “going beyond” metaphors.

“Ils avaient tout d’un coup accès à des horizons, et à des cultures complètement étrangères qui les remettaient...qui les poussaient forcément à remettre en cause les repères qu’ils avaient, qui les poussaient à réfléchir plus loin et à réfléchir différemment” (Margot, 1FE). V7:35¹³¹

Quotes like these reflect the positive connotations people associate with the act of “going beyond.” For some interviewees seeing, touching, experiencing beyond what we do not know brings us beyond ourselves and can be the catalyst for thinking and reflecting “further” and “differently.” Terrestrial analogies like the one above, between human exploration in history and future human exploration, were frequent. European contact with the “New World” was a recurrent parallel; for its violence and destruction (therefore as a warning to future projects for exploration) and for the ways in which it changed humanity and altered the course of the human future.

Exploration, therefore, is not just about spaces, physical territories and geographic discovery, whether it be space exploration or otherwise. Exploration is also directly linked to the furthering of human “horizons” (a metaphor discussed in further detail in Chapter Eight) - knowledge, skills, self-awareness and perspective. As is evidenced in the quotes above, this conception often completely obscures, or significantly minimizes the potential dangers or harm

¹³¹ “All of the sudden they had access to horizons and to cultures that were completely different and forced them.... that pushed them to question all of the points of reference they possessed, that pushed them to think further and to think differently.”

of exploration in order to emphasize its positive effect on humanity. Why is *further* necessarily positive? Is this linked to the experience of faster, taller, and bigger being better? These conceptions have been substantially documented in world languages (e.g. **UP IS GOOD/MORE, DOWN IS BAD/LESS**, therefore **TALL IS GOOD/MORE, SHORT IS BAD/LESS**; Lakoff and Johnson 1980) in ways of understanding abstract concepts (e.g. the stock market). Lakoff and Johnson (1980) argue that positive associations with that which is perceived as faster, taller, bigger - in general 'more' - are linked to physical experiences possessing more of a good thing (e.g. water, food, currency) and the sensory input associated with greater quantities (e.g. more water or liquid in a container is visually perceived as being 'higher' than a lesser amount of water in the same container; when we fill a container the amount of substance within it gets 'higher' or 'taller' as the quantity increases). These experiences with quantities are then mapped onto more abstract (sensorimotor) input, such as graphs showing economic activity as going 'down' or 'up' using lines or bars to communicate the 'amount' of financial 'growth' or 'diminution' or associating the feeling of 'lightness' when we are happy with being 'up.'

Over and again, people positively described the act of going "beyond," though there were occasions when they questioned whether going "beyond" can go "too far." People criticized different aspects of space exploration, notably the expense in resources and energy required for these projects, which they perceived as being 'wasted' on space when they could be used for projects on Earth. But, the idea of exploration itself - going beyond, seeing further, and setting foot in unknown territory - was widely accepted, even glorified.

As the beyond in question was unknown, when people imagine going beyond or going farther, where do they go? The Moon, Mars and other planets do not count as beyond, rather participants talk about going further than these destinations, into *the* beyond, or the "*au-delà*" (e.g. "*Je veux aller au delà dans l'espace inter...voilà...inter-système*"). "*Au-delà*" (23x) and "*là-bas*" (42x) were the most frequently used terms of destination occurring with the metaphors of "going beyond" and "going further."

These phrases establish the existence of a realm other than the present here-and-now and reinforce the conception of going 'past' or 'beyond' set limits, points or boundaries. "*Là-bas*" is an expression commonly used to refer to terrestrial locations both near and far. Because of its

prevalence to describe locations at more or less comprehensible distances, “*là-bas*” adds a connotation of proximity or familiarity. When interviewees discuss space exploration as a way to “*aller voir plus loin là-bas*” (“to go see further over there”) they are producing a formula for a scenario that could happen on Earth or in a number of other contexts. “*Là-bas*,” though it separates space from the here-and-now, reinforces a conception of possibility.

“*Au-delà*,” on the other hand, is conventionally used to describe that which is beyond terrestrial (possibly even natural) human experience. The “*au-delà*” (also described as the “*au-dessus*” and “*par delà*”) is a conception with a rich tradition in French poetry, particularly in romantic and symbolist works. One of the central themes in the poetry of Charles Baudelaire, for example, is the sacred role of Nature as a site of communication (“*un temple où des vivants piliers laissent parfois sortir des paroles confuses....*” from “Correspondances,” Baudelaire 1857, 11) between human existence and the beyond (“*l’au-delà*”). His poem “Elévation” in the *Fleurs de Mal* (1857, 10) volume focuses on describing this “*au-delà*.” It is a realm “above” (“*au-dessus*”) and he explicitly links this realm to space and celestial bodies in the poem’s first stanza, citing the sun, the stars and the “confines of the starry spheres.” (See Annex VII for English translation.)

Au-dessus des étangs, au-dessus des vallées,
Des montagnes, des bois, des nuages, des mers,
Par-delà le soleil, par-delà les éthers,
Par-delà les confins des sphères étoilées,

Mon esprit, tu te meus avec agilité,
Et, comme un bon nageur qui se pâme dans l'onde,
Tu sillannes gayement l'immensité profonde
Avec une indicible et mâle volupté.

Envole-toi bien loin de ces miasmes morbides ;
Va te purifier dans l'air supérieur,
Et bois, comme une pure et divine liqueur,
Le feu clair qui remplit les espaces limpides.

Derrière les ennuis et les vastes chagrins
Qui chargent de leur poids l'existence brumeuse,
Heureux celui qui peut d'une aile vigoureuse

S'élancer vers les champs lumineux et sereins ;

Celui dont les penses, comme des alouettes,
Vers les cieux le matin prennent un libre essor,
- Qui plane sur la vie, et comprend sans effort
Le langage des fleurs et des choses muettes !

The concept of the “*au-delà*” functions for poets such as Baudelaire and Victor Hugo as a glorious beyond that humans can access through Nature; a realm above the baseness of everyday existence, often associated with the after world. Whereas all of my participants have experiences going “*là-bas*” none of them, to my knowledge, have experiences in the “*au-delà*.” This expression separates space from potential human contact and interaction by positioning distant space in an almost supernatural conceptual realm. “*Au-delà*” evokes connotations of vastness, distance, and often infinity and death (the ultimate unknow[n][able] experience).

These two phrases, used in conjunction with orientational conceptual metaphors, nuance these metaphors and the perceived probability and desirability of extensive space exploration. Participants, such as Margot, (see V7:34-35) used phrases like “*plus loin*” and “*là-bas*” with positive connotations about the potential and reward of human space travel. Interviewees who spoke about ‘going beyond’ into *the* beyond often coupled these conceptions with romanticized notions of space travel and far-off, less concrete projections about its possibility. The physical positionings of participants vis-a-vis space, as well as the metaphorical positionings of their imaginations were directly linked to their perceptions and judgements of this topic. Conceptions of distance, vastness, infinite space and other abstract notions and descriptions often accompanied perceptions of human space exploration as impossible. Inversely, conceptions of space as being “over there” and just a bit “further” accompanied perceptions of the probability of this potential reality. How people categorized and oriented outer space in their imagination did much to determine and reflect how they perceived real and emergent possibilities.

7.4 Alternative Conceptions: Near or Far?

Oriental conceptions and metaphors, like the container metaphors discussed in Chapter Six, are conceptions of sensorimotor input that are mediated by physical experience and culture. My data attests to the relevance and prevalence of these conceptions but, these are not the only available, or universal ways of conceiving of human experience in space. There is nothing necessary, nor natural about the distance and foreign (or ‘alien’) nature of space and human experience in space that is widespread and perceived as ‘normal’ in Western European discourse. In his 1987 article “Pity the Indians of Outer Space,” M. Jane Young explains Native American comprehensions of space and the Moon and compares this discourse to the conception of the “Western frontier” so often adopted by NASA, and equally found in my research corpus from France.

Young argues that for Native American tribes, such as the Zuni, space is not “exterior” but “interior” (Young 1987, 15). Native American cosmology describes intimate links, often kinship links, between humans, stars and other celestial objects (Messerli 2016, 15). These relationships permit a method of space travel to and from celestial objects without recourse to spaceships. Young describes an anthropologist who recounts the Apollo moon landing to Alaskan Inuits. They reacted to this piece of news with surprise, responding “We didn’t know this was the first time you white people had been to the Moon. Our shamans have been going for years. They go all the time” (Young 1987, 272).

Notions of embodiment, possibility and appropriate (re)actions to space are reinforced by a conception of space as being, firstly, near (or interior) or far from us. The notions and concepts that populate our imaginations, whether they be from shamans or astronauts, define the field of the possible and the probable, and determine the value of action in these fields. The distance, dangers and challenges of space travel that people describe in this study are not present in Young’s (1987) study, or other studies of Native American cosmology (Chamberlain 1982; Tedlock 1979). These are not necessary characteristics of the imagination of space, but culturally charged conceptions that affect how an individual views the probability and desirability of particular futures.

Chapters Six and Seven demonstrate that container and orientational conceptions and metaphors are used without exception by all interviewees in this study. As mentioned, this

preponderance underlines the importance in all discourse of a comprehension of our physical orientation in an environment as well as the importance of our basic embodied experiences with containers (e.g. our bodies, buildings, boxes, etc.). Yet, as Young demonstrates, participants' tendency to orient themselves at great distances from "infinite space" ("*un espace infini*") is proof of the presence of generalized cultural conceptions of space as being "outside" of the Earth and "distant" rather than being in the interior or intimate (even family).

The omnipresence of these metaphors in the corpus confirms the importance of embodied experience, even when we project ourselves into an unknown and when we attempt to imagine what several interviewees referred to as the "unimaginable" ("*l'inimaginable*"). Because of this, I propose that theories of metaphorical and embodied cognition can be applied to discourse concerning imagination. When a target domain is an unknown experience, people continue to imagine themselves "in" this unknown and to physically position this unknown "around" them. The metaphors discussed in the preceding chapters are based in the embodied experience of existing "in" a bipedal body oriented "within" the world.

Beyond these fixed metaphorical conceptions, source domains in participant metaphors exhibit a range of diversity. Nevertheless, a number of source domains remain consistent, for example those recurrent in the metaphors: **SPACE IS AN OCEAN**, **SPACE IS A DESERT**, **SPACE IS AN EMERGENCY EXIT**, etc.. Many of the same conceptual metaphors reappear, reinforcing the same kinds of conceptions and perceptions concerning human space exploration.

In the following two chapters, I will examine two source domains of knowledge in participant discourse, the conceptual metaphors motivated by these domains as well as their implications. In Chapter Seven I will analyze orientational metaphors using the source domain of "*l'horizon*" ("the horizon"), such as **TIME IS A HORIZON**. In Chapter Eight I will examine container metaphors using the source domains of "*la bulle*" or "*la boîte*" ("the bubble" or "the tin can"), namely **LIFE IN SPACE IS LIFE IN A CONTAINER**. Both of these conceptions are prevalent across the data, in all age groups and in expert and non-expert discourse. When imagining an unknown experience, these source domains recur in metaphors to shape people's ways of speaking and ways of perceiving potential human realities.

Vignette 8: “Des témoignages de vie. C’est ça que j’emporterais.”

(Female, expert, 68 years old)

Adèle, a delightful science fiction author in her sixties, was unavailable to speak with me in person. However, she was generous with her time over the telephone and over the course of almost 4 hours (separated into three interviews) she spoke with me in equal measure about life on Earth and her visions of life beyond it. When I asked her about her one kilogram of personal items, she giggled, repeated the question and laughed again. She began with the recurrent mention of a method for stocking digital information (“un petit outil comme une carte SD”), but, unlike many people who talked about music or literature first, she cited photographs and the first thing she would stock to take to space.

“J’emporterais des photos de mes êtres chers. De mes chats aussi peut-être, fin je veux dire des photos, quoi.”

“Parce que je sais, j’ai beaucoup, beaucoup, beaucoup souffert d’avoir perdu dans ma mémoire juste après la mort de ma grand-mère. C’était un de mes gros tourments. Dans les jours, fin, dans les jours même, oui, très proches après son décès, j’avais la sensation que j’oubliais son visage. Et je pense que tous les gens qui ont fait l’expérience de la perte d’un être cher passent à un moment ou un autre par cette étape dramatique de se dire, ‘Je suis en train d’oublier son image.’”

“Parce que c’est pas pour rien ‘l’image’ et ‘l’imaginaire;’ c’est quand même de la même famille cette affaire-là. Et donc, oui je pense que j’emporterais des images. Parce qu’à partir des images moi, je suis capable de créer des textes, si j’ose dire. Je me crée des textes mentaux, parce que je suis capable de me reconstituer des dialogues ou des choses comme ça, des événements passés, des souvenirs à partir d’une image.”

She then began discussing music. She told me she was seated next to her mother’s piano and said, “as the daughter of a pianist, I would bring music, too. Finally, I would bring, in the proper sense of the word, that which has always fascinated me in the modern world, the audio-visual.”

We had talked at length about her fascination with the audio-visual. She recounted to me in detail the first time she ever saw a television and sang the song back to me that she had watched that evening in the early 1950s¹³². She described in detail the first science fiction movie she had ever (surreptitiously) seen on the television, while hiding behind the couch in the living room one night. As she continued talking about the music she would bring, she began to describe other sounds she would want to take with her; nature sounds, the sound of the wind. Then immediately she began imagining

¹³² Odette Laure, “Moi j’tricote” (1955). <https://youtu.be/NMarogPJzSA>

a virtual reality headset with her in space so that she could go back to a terrestrial reality; see images and listen to the “sound of the wind, whale songs, things like that.”

“Pourquoi?” I asked.

“Parce que ce qui me manquerait de la Terre, si je devais partir loin, c’est ces choses-là. C’est ces choses-là. Les visions des visages, des paysages. Le bruit de la mer. Le bruit du vent. Le chant des oiseaux. La vie, quoi. La vie. Des témoignages de vie. C’est ça que j’emporterais.”

When I read back through the transcription, this phrase puzzled me. Adèle has written dozens of science fiction narratives in which she does not depict space as lifeless but populated with extra-terrestrial humans and life forms of all sorts (including bio-technologies). However, when imagining what she would take to space, (what she determines would be lacking there) she comes to the conclusion that she would take “proofs of life.” She would bring evidence to bear witness to the forms of terrestrial life, specifically the forms most familiar to her in her personal experience.

Having decided on the virtual reality headset, she shifted to a more specific cultural logic and added: “I would also maybe bring a good bottle of Burgundy. Voilà, the bourguignonne that I am!”

“Why, she continued, “is the expression ‘bon vivant’ always masculine? Why not ‘une bonne vivante’? I think I’m a bonne vivante, too!”

Chapter 8: The Horizon

“J’espère que nous allons toucher la porte des étoiles. Donc, je crois que si nous voulons survivre, nous devons être optimiste. Nous devons réveiller les Carl Sagans qui sont dans nos coeurs et commencer à penser comme lui, avec optimisme et bienveillance et véritable humanité quoi. Je crois que l’épanouissement de l’humanité à travers les astres devra passer par une abolition de systèmes de frontières, des systèmes d’exception. Ça veut pas dire que je suis un communiste, hein, tout le monde est bien d’accord, mais nous devons de faire l’effort de projeter notre conscience au-delà de ce que nous convoitons, mais de ce que nous souhaitons pour nous tous. Mais ça se fera avec audace, ça se fera avec des tragédies, ça se fera avec des sacrifices, mais ça se fera aussi avec des infinis bonheurs.”
(Simon, 2ME¹³³)

I love this quote from Simon, because of its positive outlook on human potential and potential futures, but especially because of how Simon describes space. “The door of the stars” is a powerful metaphor that both reinforces the exteriority of space, while emphasizing a way to access it. He talks about the “fulfilment of humanity across the stars,” a fulfilment only possible through the abolition of mental, social and geographical boundaries. Simon described space as a realm that gives humans an opportunity to go “beyond” (“*au-delà*”) what we “covet” or desire currently. As discussed in the previous chapter, orientational metaphors in this corpus, such as the “*au-delà*,” are motivated by basic embodied experiences (e.g. of the ‘here’ and a there ‘beyond’ here) as well as cultural knowledge. In this case, the “*au-delà*” is a central concept in the French romantic tradition, particularly in literature. Simon clearly deploys this concept to further reinforce the romanticism of his idealistic vision space exploration (a project that will give us “infinite happiness”).

These kinds of orientations do much to frame and ‘set the stage’ for how people discuss and evaluate the unknown of outer space. Simon’s poetic reference to the “door of the stars”

¹³³ “I hope that we will touch the door to the stars. So, I think that if we want to survive, we must be optimistic. We must awaken the Carl Sagans in our hearts and begin thinking like him, with optimism and benevolence and a veritable humanity. I believe that the fulfilment of humanity among the stars must come by pass through an abolition of systems of borders, of exceptions. That does not mean I am a communist, okay, we’re all in agreement, but we must make an effort to project our consciousness beyond what we desire, to that which we wish for all of us. It will occur with audacity, with tragedies, with sacrifices, but it will also bring us infinite happiness.”

establishes a scene to which the rest of his discussion is oriented. This “door” is a boundary through which we can pass if we destroy other boundaries; on the other side of this door there is an expansive realm that humans can spread “across” physically. The “door” of the stars also parallels the boundary of humanity’s ‘desires’ and consciousness. Simon’s delineation of the physical, yet imagined, boundaries of space is mirrored by his delineation of humanity’s psychological and emotional states.

Orientational metaphors and proto-metaphors, that spread humanity “across” space or locate us “in” or “beyond” the Earth, “in front of” the “door of the stars” are the second most frequent metaphoric mode people use in their discussions. As seen in the above excerpt from Simon’s discussion, proto-metaphorical elements like locative prepositions operate in conjunction with explicit metaphors to flesh out his imagination of an unknown experience. People used these orientational (proto-)metaphors to situate objects and phenomena and to delineate physical and psychological spaces. While Simon’s reference to the “door of the stars” was unique in the corpus, other source domains of knowledge, notably the horizon, were more prevalent in people’s descriptions.

Expert and non-expert interviewees spoke about horizons. At times they discussed real horizons, but mostly they talked about horizons metaphorically. In this chapter, I will discuss how people deployed the horizon as a source domain in conceptual metaphors when talking about time, knowledge and domains of experience/discovery. I argue that this is a fixed, or generalized cultural metaphor, that remains motivated by participants’ embodied experiences (e.g. their individual experiences of horizons as distant, out of reach, and as delineating visual space in particular ways).

The corpus contains 27 instances of the word horizon, 25 of which are metaphorical. The basic sense of the word “*l’horizon*” is “1) *Ligne imaginaire circulaire dont l’observateur est le centre et où le ciel et la terre (ou la mer) semblent se confondre*” (Larousse 2017). The first three definitions of “horizon” in the *Larousse* make reference to the physical experience of the horizon and the perception of the horizon. The following two examples of the word horizon in the corpus correspond to these literal categories:

“Le jour où on tire la fusée qu’on voit Mars à l’horizon il ne s’agit pas de, de lancer la fusée vers Mars qu’on voit dans le ciel...” (François, 3MNE). V8:1¹³⁴

“Ce qui me manquerait finalement, c’est ça. C’est les paysages. C’est l’air pur. C’est paradoxal ce que je vais vous dire, mais aller dans l’espace, ce qui me manquerait c’est l’espace sur Terre. Je veux dire, c’est à dire, le volume d’air, les paysages, l’horizon, l’infini de l’horizon quand on est au bord de la mer” (Adèle, 3FE). V8:2¹³⁵

François and Adele describe the physical horizon of the Earth, using the word in its basic, or literal sense. François and I were talking about the mathematical calculations for launching rockets towards celestial targets. He explained that when humans launch a shuttle “towards Mars,” they cannot literally launch the shuttle in the direction of Mars according to sight, but must orient it mathematically, taking into account the curves of Earth and Mars, their different orbits, etc. He positioned Mars ‘on the horizon,’ discussing the experience of a natural horizon and contrasting this with the geographic location of Mars in the universe. In V8:2, Adèle also talks about a physical horizon, saying it is one of many terrestrial views she would miss. However, immediately after this reference to a literal horizon, she repeats the word and develops her description figuratively, talking about the “infinity of the horizon.” This usage begins to transgress the basic sense of the word, as the horizon in a terrestrial landscape in reality is not infinite. As Adèle extends this description figuratively in reference to a literal horizon, I have classified this instance of the word as non-metaphorical.

The following three definitions of “*l’horizon*” in the *Larousse* (2017) are metaphorical usages:

- 4) Lieu où l'on vit et qui borne l'existence : Il faut changer d'horizon
- 5) Domaine qui s'ouvre à l'esprit et à l'activité de quelqu'un : Élargir son horizon.
- 6) Perspectives d'avenir dans un domaine : L'horizon politique s'éclaircit.

¹³⁴ “The day when we shoot the rocket up and we see Mars on the horizon, it will not be a question of sending the rocket towards the Mars that we see in the sky.”

¹³⁵ “What I would miss, ultimately, is that. Landscapes. Pure air. It’s paradoxical what I am going to tell you, but if I went into space, what I would miss is the space on Earth. I mean, in other words, the amount of air, the landscapes, the horizon, the infinity of the horizon when you are beside the sea.”

When my interviewees used the word “horizon,” it is largely these metaphorical senses of the word that they expressed: that of a place where we live that provides the perimeter of our existence, of a domain of experience or activity and of future perspectives within a domain. For people I spoke with, the horizon chiefly functioned as boundary between domains of knowledge and experience, falling into the first and second figurative meanings in the *Larousse*. The domains of experience most frequently metaphorized with this term in the corpus are those of time, space and personal experience.

The horizon functions well as an analogy when describing both time and space, as both serve as boundaries between our experiences just as the literal horizon serves as a visual boundary. In our embodied experience terrestrial horizons - their geographic distance, our visual perception of them as a line in front of us and the way in which this line seems to cut between the ‘sky’ and the ‘ground,’ the possibility of directing our bodies towards or away from the horizon - serve as a boundary between Earth and sky and between the viewer and what lies on the other side of the horizon. All of my interviewees have experiences of horizons on Earth and, though the questionnaire did not elicit discourse concerning horizons, people widely deployed this domain of experience in their discourse, particularly in the metaphors: **TIME IS A HORIZON** and **SPACE IS A HORIZON**.

8.1 LE TEMPS EST UN HORIZON: TIME IS A HORIZON

In the metaphor **TIME IS A HORIZON** events are located more or less “near” or “on” the horizon of time. The conception extends characteristics of the physical horizon to time: it is possible to go away from or to approach the horizon of time; to be distant from it; or to potentially never reach a point in time. In the majority of examples, people use this metaphor to discuss a near future and temporal proximity, and probabilities within this near future.

The Horizon As A Near/Far Future

“Mais ça suppose des breakthroughs, des percées conceptuelles majeures, qui sont pour le moment pas à l’horizon” (Christian, 2ME). V8:3¹³⁶

“Et voilà, l’espace sera ça, à moins d’avoir une nouvelle source d’énergie...fin je veux dire, une percée qui ne soit pas destructive, mais je ne vois pas ça à l’horizon” (Christian, 2ME). V8:4¹³⁷

“Ben oui, parce que...uhhh...quel multi-planétaire...où...à l’horizon de la date où nous sommes 2016...” (François, 3MNE). V8:5¹³⁸

In V8:3-5, future time is conceived as being ‘in front of’ or before the speaker and the horizon functions in the third figurative sense of the noun, as a reference to future perspectives. The metaphorical spatialization of these future times as a horizon is coherent as the horizon is conceived as being in front of us. It follows that scientific breakthroughs and new energy sources that people imagine as being improbable in the short term are imagined as not being “on the horizon” (but, on the contrary, “far from the horizon”). This usage reinforces a conception of the horizon as being distant, but within view (therefore, at a feasibly reachable distance).

For example, Nathalie (3FNE) discussed how the reality of humanity in space is still “far away” and provided a physical orientation to the possibility of this reality. “*Mais je pense qu’actuellement...jusqu’à un horizon encore lointain ...c’est plutôt un désir de connaissance scientifique, d’exploration*”¹³⁹. As in V8:3-5, Nathalie understands the horizon as being relatively near (near enough to be seen with the ‘naked’ eye), so it is necessary to mark it with the adjective “*lointain*” (“distant”) in order to specify that certain realities are still in the distant future.

These examples extend the basic conceptual metaphor of the horizon using embodied experience, namely visual experience of seeing a horizon (versus not being able to see more distant objects). Future possibilities are positioned according to the perspective of the viewer in the present moment, more specifically in a present technological and sociopolitical context. In

But that supposes breakthroughs, major conceptual breakthroughs, that are not currently on the horizon.”

¹³⁷ “And so, space will be that, unless we have a new source of energy...I mean, a breakthrough that isn’t destructive, but I do not see that on the horizon.”

¹³⁸ “Well, yes, because...ummm...what multi-planetary...where...at the horizon of the date where we are, 2016...”

¹³⁹ “But I think that right now...until a distant horizon...it’s more a desire for scientific understanding, for exploration.”

the case of my interviewees, living in France and being more or less up-to-date on scientific events - experiences such as hearing Thomas Pesquet broadcasting from the ISS over the radio or seeing an Arte special on space pollution - brings the 'horizon' of human possibilities in space that much closer and makes it possible to conceive of this potential future as a horizon (rather than pure fantasy). The fact that many people, not solely outliers, spoke to me about space being on the 'horizon of time' situates them in the 20th and 21st centuries and reinforces European conceptions of space as 'distant,' yet potentially attainable through human science and technology.

When talking about space as a horizon, people did not create analogies between the literal distances of far-away planets or galaxies but made a parallel between the feasibility of future events and geographic distance. Though the lexical units in the metaphor refer to distance and time, the domains of knowledge referenced are historical context and possibility. These complex, disembodied concepts are anchored in human physical experience of time and distance and understandings of these concepts are developed in greater detail based on these human scales.

The use of spatial metaphors to understand time has been widely documented cross-linguistically (Clark 1973; Traugott 1978) and supports the psychological validity of a weak version of the Metaphoric Structuring view (which proposes that "metaphors provide relational structure to domains whose structure may not be obvious from world experience" [Boroditsky 2000, 3]). Clark (1973) provides a detailed description of this process by outlining human perceptual space (or P-space) and linguistic space (L-space) and demonstrating the direct correspondences between them. He argues that "descriptions of time appear to be based on a spatial metaphor in which time is viewed in a single dimensional, asymmetric continuum, running horizontally from front to back of the speaker" (Clark 1973, 52).

Boroditsky's (2000) study on the effect of spatial metaphors on the comprehension of time provides similar evidence of this process. She concludes that linguistic similarities between space and time have profound conceptual motivations and that as spatiotemporal metaphors differ, so do speakers' conceptions of time. Her results support a metaphorical theory of concept learning in which abstract domains (e.g. time) are shaped by metaphorical mappings from "more concrete domains of experience" (e.g. space) (ibid., 26). This is how metaphors always work, but

not always how cognitive scientists have understood human learning. Discussing mapping space onto time, Boroditsky (2000, 24) argues:

“Of space and time, space appears to be the richer, more elaborated, and more familiar domain; space has more dimensions than time, is more flexible with regard to direction of motion, and is more readily perceptible. From all this, one should predict that time (the smaller, less common domain) should remind us of space (the larger, more common domain) more than space should remind us of time. This prediction is, indeed, exactly the opposite of what was observed in Experiments 2 and 3 which showed that spatial thinking affected temporal thinking but not the reverse.”

The **TIME IS A HORIZON** metaphor in this corpus is structured as Boroditsky (2000) describes; the abstract domains of time and future possibilities are structured according to a common, concrete experience of the horizon. **TIME IS A HORIZON** makes use of the “ego-moving metaphor” in which the speaker (or ego) is understood as moving towards a point in time (contrast with the “time-moving metaphor,” in which a timeline acts as a conveyor belt moving events from the future to the past). The use of the “ego-moving” metaphor spatially organizes time in discrete, stationary events that the speaker moves past as she moves forward (Clark 1973; Fillmore 1971; McTaggart 1908; Traugott, 1978).

As Boroditsky (2000) observes, spatial relational structure can be mapped onto the domain of time, but there is no evidence that spatial metaphors are necessary to think or talk about time. Many people used more literal methods to describe the feasibility of the same future events described by other interviewees using the horizon metaphor. The most frequent method of doing this was to hypothesize about specific periods of time (e.g. ‘human colonization of Mars will not be possible for another 200 or 300 years...’) Using time periods, rather than metaphorization of these possibilities prompted a different kind of discourse and logic from participants. The horizon metaphor remains vague and temporally non-specific, therefore people were not halted in their reflections by mathematical speculations about future time periods. On the other hand, the interviewees who used specific numbers in their projections were more likely to 1) pull their reflections back to terrestrial preoccupations and 2) speculate about specific chains of events.

Take the following examples, which would all retain their meaning if the period of time cited was replaced with a **TIME IS A HORIZON** metaphor. The majority of these examples use container metaphors for time (i.e. in which events happen “inside” a period of time, or time container. For further discussion of container metaphors see Chapter Six).

“Donc, si on a un problème dans 50 ans on sera peut-être toujours pas une espèce multi-planétaire. Et puis, multi-planétaire dans 50 ans si vous voulez, ça sera six types, fin peut-être trois nanas pour peut-être quand même qu’ils puissent s’amuser pendant le vol sur Mars. C’est pas 7 milliards d’humains qui sont en péril sur la Terre et il va falloir résoudre leur problème. Il n’y a pas 7 milliards à mettre, je ne sais pas où... La question c’est qu’on a 50 ans pour pas crever bêtement de l’effet de serre ou je ne sais pas quoi” (Christian, 2ME). V8:6¹⁴⁰

“...Et après 200 ans...C’est de la science fiction, mais c’est le genre de question qui se pose, et des questions intéressantes, justement parce qu’on parle de la fin de notre évolution. Est-ce que ça va continuer?” (Nathalie, 3FN). V8:7¹⁴¹

“...dans 20 ans, dans 30 ans, peut-être même dans 10 ans quand on ira sur une autre planète on risque de détruire certaines choses. Mais c’est obligatoire aussi, quelque part. Mais qu’ils auront la conscience d’arrêter la destruction pour protéger ce qu’il y a à protéger. J’espère” (Marie Rose, 3FN). V8:8¹⁴².

“De notre...avec la technologie qu’on a actuellement. Maintenant uh...*pffft*. Qui sait? Qui sait? Non, ben non...c’est pas...peut-être dans 200, 300 ans. Peut-être. On sait jamais” (Nayla, 2FN). V8:9¹⁴³.

“Ce qu’on va voir dans 20 ou 30 ans, je pense c’est uhhh suivant les actualités, que, sans doute c’est plutôt les chinois qui vont faire une base lunaire, et puis peut-être

“So, if we have a problem in 50 years we still may not be a multi-planetary species. And then, multi-planetary in 50 years if you want, but that will be six guys, maybe 3 gals maybe so that they can still amuse themselves during the flight to Mars. It’s not 7 billion humans who are in peril on Earth and it is necessary to resolve their problem. There are not 7 billions to put I don’t know where... The question is that we have 50 years to die stupidly from the greenhouse effect or I don’t know what else.”

¹⁴¹ “And after 200 years...It’s science fiction, but the kind of question that is posed, and they are interesting questions, exactly because we are talking about the end of our evolution? Will it continue?”

¹⁴² “In 20, in 30 years, maybe even in 10 years when we will go to another planet, we risk to destroy some things. But it’s obligatory too, somehow. But I hope that they will have the conscience to stop the destruction in order to protect what there is to protect. I hope.”

“In our...with the technology we currently have. Now...umm...Who knows? Who knows? No, no...it’s not... maybe in 200, 300 years. Maybe. You never know.”

aussi les États-Unis vont essayer de faire quelque chose, la concurrence va encore aider, encore une fois sur la Terre” (Arthur, 2MNE). V8:10¹⁴⁴.

“À la date 2016 si déjà...dans 100 ans on est arrivé sur la Lune, sur Mars, on a séjourné sur Mars, qui est une planète du système solaire, et qu’on est revenu, ce sera...alors le multi-planétaire, ça supposerait d’aller ailleurs que sur Mars...Il est fou ce type [Elon Musk]” (François, 3MNE). V8:11¹⁴⁵.

“Oui, mais c’est pas dans 500 ans. Je pense que ça sera beaucoup plus tard. Parce que pour l’instant il y a...on n’a pas trouvé de planètes habitables” (Estelle, 3FE). V8:12¹⁴⁶.

When people cited time periods, it prompted them to imagine that time period and what could happen within it, in this case what could happen within that period of time to facilitate or impede human space exploration. People using this numeric method (rather than metaphorical) to imagine future possibilities had a tendency to talk about how humanity has to survive the next X number of years in order to leave the Earth at all. They referenced global catastrophes such as drastic climate change as events that could prevent humanity from dedicating the necessary resources to space programs for large scale exploration. My data suggests that specific numbers (e.g. delineated time periods, time lines, and dates) prompt specific scenarios, most often scenarios related to experiences on Earth.

Metaphorized projections of future possibilities, such as **TIME IS A HORIZON**, do not prompt this specificity and, often, do not prompt a conceptual ‘return to Earth.’ People who use these metaphors are more likely to continue their projections into space and develop discussions of the potential future event in question (e.g. human civilization in space or altered human bodies in space), instead of diverting their attention to questions of imagined timelines on Earth and the events that may occur on those timelines. Imagining a specific timeline seems to encourage

¹⁴⁴ “What we will see in 20 or 30 years, I think...umm...according to the news, that doubtlessly the Chinese will build a lunar base and maybe also the United States will try to do something, competition will again help, once again on Earth.”

¹⁴⁵ “If in 2016 already...in 100 years we are on the Moon, on Mars, we have stayed on Mars, which is a planet in the solar system, and we have come back, that would be...so multi-planetary, that would suppose to go somewhere besides Mars...This guy is crazy.”

¹⁴⁶ “Yes, but not in 500 years. I think that it will be much later. Because for the moment there are not...we haven’t found any habitable planets.”

further specific, concrete projections. On the other hand, abstraction had a tendency to generate further abstraction; to encourage the creation of imaginative connections between domains, rather than a more ‘concrete’ engagement with a single conceptual domain (e.g. a serial discussion of events).

The **TIME IS A HORIZON** metaphor, unlike references to a specific period of time, contains a number of entailments that can influence subsequent arguments and perceptions. To conceive of time, or events in time, as a horizon is to conceive of potential future events and times as ‘real’ and before oneself in a field of vision (albeit possibly at a great distance). This metaphor gives primacy to vision in the observation of reality; it emphasizes the sight of the horizon and the ways in which a horizon divides the field of vision. **TIME IS A HORIZON** operates in conjunction with and reinforces the conceptual metaphor **KNOWLEDGE IS SIGHT** (Andriesson and Van Den Boom 2009; Kövecses 2010). As discussed in the previous chapter, **KNOWLEDGE IS SIGHT** is a pervasive metaphor in French Enlightenment philosophy; so pervasive that it is the source of the name of the philosophical movement (French Enlightenment philosophers are referred to as “the Lights,” “*les lumières*”). In **KNOWLEDGE IS SIGHT**, seeing is equated with empirical knowledge and is a confirmation of existence. People talk about something being possible in the future if we can perceive (see) it ‘on the horizon.’ To be on the horizon means that an event is imminent; not in the past or present (though the possibility is present), nor completely impossible. The embodied experience of the horizon is one of presence and this metaphor implies the presence of the target domain.

Additionally, this metaphor reinforces a linear conception of time in which we can move towards or away from a point in time or an event. In positioning future time as a point towards which the speaker may move, this metaphor attributes agency to the speaker, and none to the event or time in question. Time is conceived of as static, and events within it as static points (again the “ego-moving” metaphor, rather than the “time moving” metaphor). Unlike other metaphors depicting time as an element of the natural environment (e.g. a flowing river, Evans 2004) or a personified entity (e.g. that can ‘stand still,’ ‘drag on,’ or ‘arrive’ *ibid.*), this conception paralyzes time and events within it and attributes all motion to the human speaker.

A final entailment, that is largely if not completely obscured by this conceptual metaphor is that humans cannot reach the horizon. Because of our visual perspective, however long we walk, drive, fly, sail, run or swim towards a horizon, we will never arrive. Again, everyone in this study has embodied experience with horizons that they can observe but never reach. However, the impossibility of attaining terrestrial horizons is not a characteristic that is used in the conceptual metaphor **TIME IS A HORIZON**. This is evidenced by the fact that 1) people who did not believe something will happen negated its presence on the horizon (demonstrating that the unmarked quality of a horizon is that it is present, possible, and reachable). And, 2) people who did believe something is possible and attainable in the future said that it *is* on the horizon. According to a literal, embodied experience of a horizon, this second position would mean that the event in question would never be reached; it would remain perpetually in front of humanity.

When we take it apart, what seems like an evident analogy between an embodied experience bounded by the natural environment on Earth and our experience of boundaries in other domains, makes little sense. The domains compared in this analogy have many salient connections, but the final product of this comparison obscures key characteristics of the source domain that, when taken into account, negate the intended meaning of its translation of the target domain. For something to exist on the horizon it is in reality unattainable. Horizons are not destinations. Time horizons act conceptually as they do geographically (as Clark [1973] would argue); as boundaries between one space (or moment) and another with the horizon line being the event in question that separates the time ‘before’ or ‘behind’ the horizon and the time ‘after’ or ‘ahead’ of it.

TIME IS A HORIZON, and accompanying surface metaphors discussing potential events, is proof that people comprehend unknown extra-terrestrial futures through terrestrial metaphors, specifically metaphors of human terrestrial experience. Interviewees deploy these metaphors even when they are not the most ‘accurate’ or ‘true’ way of framing and understanding information. When imagining the unknown, people did not prioritize the accuracy of the information conveyed, but rather the accuracy of their subjective knowledge based on their embodied experiences.

TIME IS A HORIZON could be understood as a “dead metaphor” (Searle 1979), however, I do not ascribe fully to this concept. Searle identified “dead metaphors” as those metaphorical expressions in which “there has been a genuine change of meaning, so that a word or expression no longer means what it previously did” (Beardsley, quoted in Aagaard-Mogensen 1986, 82). The existence of “dead metaphors” remains contested, with scholars such as Josef Stern (2000) arguing for the importance of interpretation of the speaker in determining the ‘life’ of a metaphor, or George Lakoff’s (1987) assertion that metaphors should be associated with independent mental processes, and its ‘life’ (or conceptual productivity) based off of its presence in everyday life, rather than on speaker’s conventional interpretations of metaphors themselves.

I find Pawelec’s (2006) criticism of the conception of the ‘dead metaphor’ (as well as Lakoff’s [1987] arguments) productive because it presents both ‘live’ and ‘dead’ metaphors as remaining fundamentally metaphorical (instead of morphing into some other semantic category as Searle [1979] suggested). Pawelec (2006, 118-19) identifies functions of both kinds of metaphors, suggesting that ‘live’ metaphors are those which people use to capture original ideas and revelations, whereas conventionalized (rather than ‘dead’) metaphors have become systematic mappings that arise from long processes of symbolic social interaction.

I would argue, like Lakoff (1987), that a speaker’s interpretation of the metaphoricity of a phrase is not the deciding factor in the determination of metaphoricity. I ascribe to Pawelec’s (2006) understanding of metaphors as being more or less conventionalized and contributing to more or less conventionalized ways of thinking the world. He explains this in the following way:

“...a live metaphor (‘one-shot metaphor’ in Lakoff’s terminology) is not about a ‘conceptual transfer’, but about an active reconfiguration of a scene. It is used to guide one’s own thinking (as long as it is not sufficiently crystallised) and the reader’s attention, in order to arrive at a new – more or less unconventional – vision of things. To put it simply, live metaphors are used to apprehend revelations” (Pawelec 2006:120).

From Pawelec’s (2006) perspective, **TIME IS A HORIZON** is a conventionalized metaphor, likely not one used to “apprehend revelations,” but nonetheless an application of a spatial domain of knowledge to a temporal one, resulting in metaphor. Conventionalized

expressions such as this are instances of metaphorical production through generalized cultural knowledge. **TIME IS A HORIZON** is a fixed, prevalent expression in contemporary French, that speakers may or may not consciously interpret as metaphorical. But this expression still promotes a metaphoricized (rather than literal) conception of time and is reinforced by individual embodied experiences.

Embodied experiences reinforce conventionalized metaphors like **TIME IS A HORIZON**, but these metaphors also provide us with an opportunity to observe the interactions between different kinds of motivations in metaphors (i.e. experiential motivations and motivations stemming from generalized cultural knowledge). Many conventionalized metaphors may reference literal meanings that are obscure to contemporary speakers (e.g. “to kick the bucket”/“to die” or “to fall off the wagon”/“to fall back into a habit”). Conventionalized metaphors may make use of embodied source domains from experiences that no longer exist; source domains with literal meanings that speakers may only know through researching the historical origins of these expressions. On the other hand, conventionalized expressions like **TIME IS A HORIZON** are culturally fixed and make use of source domains of embodied experience that remain accessible to speakers.

In the case of **TIME IS A HORIZON** many real elements of the horizon as it is experienced by speakers are obscured in the metaphor (i.e. the fact that speakers have never reached a horizon). People’s embodied experience does not take precedence in motivating the extension of the source domain to the target domain. The fixity of the expression, and people’s generalized cultural knowledge of its conventions (i.e. idiomatic expressions within their linguistic community) are prioritized in the motivation of this metaphor. Interviewees extended the source domain of the horizon in ways that correspond to cultural conventions concerning horizons (that are linguistically fixed). The usage of the **TIME IS A HORIZON** metaphor in this corpus demonstrates a prioritization of motivation of metaphorical conceptions based on convention, rather than empirical experience. This evidence demonstrates the ‘hiding’ or obscuring effects of metaphor, as conventionalized metaphors encourage a prioritization of repetition of conceptual habits rather than novel perception of sensorimotor information. Human

cognition tends towards previous patterns and past knowledge even when these are at odds with our senses and embodied experiences.

8.2 L'ESPACE EST UN/L' HORIZON: SPACE IS A/THE HORIZON

With twenty-two occurrences, the most recurrent horizon metaphor in the corpus is **SPACE IS A HORIZON**. For interviewees, the horizon predominantly represents possibility, progress or geographical and/or intellectual advancement. Because of this, many people made an analogy between horizons of possibility and space.

People often deployed the concept of the horizon both literally and metaphorically. To literally search for geographic 'new horizons' was equated with new psychological or emotional responses or knowledge. People often simultaneously described a geographical horizon and a horizon of possibility or development. These developments may be on a personal, social or planetary scale. For example, Joséphine, a 39 year-old science fiction writer, explained to me:

"Je pense que l'horizon change la nature des gens. On se construit face aux limites de notre géographie, nos animaux, la couleur de notre bout de ciel et l'odeur de la mer, la froideur de notre pluie..." (Joséphine, 1FE). V8:13¹⁴⁷.

She spoke about physical aspects of the environment - animals, colors, smells, and sensations - but she also depicted the horizon as a geographical limit that shapes the "nature" of people as it shapes nature itself (giving visual boundaries to the environment according to human perception). Unlike in V8:3-5, for Joséphine the horizon is an active agent rather than a passive destination. The horizon here is used as a metonymy for the environment in general, evidenced by the detail Joséphine provides as she develops her explanation.

Joséphine also creates an analogy between the horizon and "limits." As the horizon is perceived as a limit in our field of vision, this visual limit is mapped onto limits of all kinds. Again, the horizon operates as a metonymy for the general environment, or possibly more specifically the general "limits of our geography." She talks about the horizon and its influence

"I think that the horizon changes people's natures. We construct ourselves in reference to the limits of our geography, our animals, the color of our piece of sky and the smell of the ocean, the coldness of our rain..."

on people, then develops this further by speaking about geographic limits (of which the literal horizon is one).

Unlike the metaphors in the conception **TIME IS A HORIZON**, in the **SPACE IS A HORIZON** metaphor the horizon is contextually specific. In **TIME IS A HORIZON** surface metaphors, the horizon of time expands before all humanity in the same way. On the contrary, Joséphine points out the contextual specificity of horizons, arguing that different horizons have different effects on people. This is intuitive in discussions concerning space, as our experience of time are more uniform both in our personal experience and in comparison of our experience to others, than are our experiences of spaces. There is a far greater diversity in the way people speak about spaces, and different experiences with them, than there is in their talk about time.

Nathalie, a 65 year-old retiree who had spent her career working for the Ministry of the Interior, described the links between current environmental problems and the exploration of new environments in the following way:

“Je pense que ce qui fait pousser pour chercher des nouveaux horizons, de nouvelles terres, c’était lié à des problèmes...là où on vivait, dans les pays de départ, de même que je crois que l’exploration, en dehors de l’intérêt scientifique de connaissance de repérage de l’univers, la question de la colonisation des autres planètes, elle est, elle sera liée à des problèmes sur Terre...d’exiguïté, de limitation de ressources...” (Nathalie, 3FNE). V8:14¹⁴⁸.

As in V8:11, Nathalie uses horizons metonymically to refer to environments in general. She talks about what pushes people “to look for new horizons” and “new lands.” The use of “horizons” here is less clearly a simultaneous reference to geographic and experiential horizons, but it is clear that Nathalie associates the concept of a new environment with new knowledge. Like Joséphine (V8:13), Nathalie connects the concept of horizons and experiencing different horizons (rather than a monolithic horizon, as in the examples concerning time) to changes in humanity. For Nathalie, horizons and exploring them have a practical value in addition to knowledge. She develops her explanation further by making an analogy between space

¹⁴⁸ “I think that what pushes us to look for new horizons, new worlds, is linked to problems...there where we lived, in the country of origin, in the same way I believe that exploration, beyond the scientific interest of knowledge and understanding the universe, the question of colonizing other planets, it is, it will be linked to problems on Earth...of constraint, lack of space, limited resources...”

exploration and exploration of the Americas, specifically the European colonization of North America. The “push for...new horizons” is motivated by “problems” that can be resolved by finding new spaces and resources.

It is interesting to note how the abstraction of the horizon, particularly as a metonymy for the general environment, simplifies environments, especially in the sense that it depopulates them. The use of the horizon metaphor in Nathalie and Joséphine’s discussions creates a focus on the natural environment and the potential resources Nathalie alludes to are never problematized by the presence of possible owners. Horizons are not populated in these examples, they are abstract lines at a distance. Nevertheless, people described horizons as spaces of potential; new horizons could be populated through human expansion. These abstract, distant lines are rich with practical possibilities.

Many people further abstract the horizon by speaking about it metaphorically, equating the horizon to a domain of infinite possibility and dreams. Margot, a science fiction writer and the person who talked most about this concept, explained that space is “the horizon,” “adventure” and human advancement:

“[L’espace]...c’est à dire vraiment c’est l’horizon, c’est l’aventure, c’est l’être humain qui va plus loin, même avec toutes les difficultés qu’il y a...Et c’est vraiment, c’est l’idée d’étendre l’horizon toujours. D’aller voir plus loin et de se dire que c’est difficile. On arrivera pas tous au bout du voyage, mais que le voyage vaut la peine d’être vécu” (Margot, 1FE). V8:15¹⁴⁹

Margot explicitly deploys the metaphor **SPACE IS THE HORIZON** and develops this metaphor by emphasizing the experience of the distance of the horizon. In this example, the horizon symbolizes what is “further” (“*plus loin*”). Unlike the **TIME IS A HORIZON** metaphors, where the horizon of time is understood as an inevitable destination, Margot describes the horizon as a process of going towards an ever-advancing vision. She equates exploration with the image of “stretching the horizon” further in front of humanity. In this image “stretching the horizon” functions as a metonymy for all exploration.

¹⁴⁹ “[Space]...really means the horizon, adventure, humanity going further, even with all of the difficulties that there are...And it’s really, it’s the idea of always pushing the horizon further. To go further and to say to oneself that it’s hard. That we won’t all reach the end of the journey, but that the journey is worth living.”

As in Josephine's discussion (V8:13), when she proposed that the horizon "changes the nature of people," Margot is also convinced that the horizon of possibility that space represents is crucial to human well-being and progress because geographic horizons "open" us to other people. She continues, explaining why this horizon is so important and the consequences of not having a horizon:

"On a besoin de ce nouvel horizon, parce que si on n'a pas d'horizon, on se replie sur soi-même, on se replie sur des fanatismes, sur les obscurantismes qui reviennent en force de nos jours" (Margot, 1FE). V8:16¹⁵⁰.

Margot contrasts the visual distance of the horizon and experience of forward motion in a geographic space with images of "folding in on one's self" and "folding in" upon "fanaticisms" and "dissimulations." She equates the absence of a horizon with intellectual closure; not simply a 'closing' or 'boxing' in, but "folding" (with further connotations of restriction, tightness, and lack of space). She directly links this "folding" up to ignorance and darkness¹⁵¹. It is striking to me the extent to which Margot's discussion made use of French Revolutionary doctrine and Enlightenment ideology concerning the importance of education and the eradication of ignorance. Margot is the daughter of two professors of math and science, who themselves invest considerable time and resources into volunteer programs for science education in disadvantaged school districts in France and around the world. She expressed strong convictions that education was the answer and that science, particularly space sciences, could excite humanity towards greater intellectual and social pursuits. This rhetoric was prevalent throughout the corpus, not only in my discussion with Margot. People did not place onus of progress on the family unit, on religion or spirituality, or on other social groups. Education, and expanding one's personal 'horizons,' notably for the 'less advantaged' or those perceived as disconnected from the latest in European scientific theory, was the obvious answer to a host of problems for most people, as the source of these problems was ignorance.

¹⁵⁰ "We need this new horizon, because if we do not have a horizon, we fold in on ourselves, we fold in on fanaticisms and on obscurantisms that are back in force these days."

¹⁵¹ "Obscurantisme" in French is a noun that literally refers to the process of "darkening." The suffix "isme" is added to the root "obscure" which means "dark."

As much as people like Margot talked about educating others, it is interesting when looking back at my notes and the transcriptions to see how little they talked about needing to learn themselves. Their own ways of being, and the dominant norms and values of French society, were not questioned. Some people, like Agnès, talked about government corruption, but criticized individual acts, rather than the larger system and ideology of the French government. Others, like Adèle and Christian, openly advocated French “republican values.” Christian spoke at length about how his lower-class family, disconnected from the elite, would never have been able to get him into a top university. For him, the French educational system worked, globally, as it allowed access to knowledge (and French high culture) to anyone who could work ‘hard enough’ and get high enough scores on national exams. This system was not only praised, in some cases, Margot being an extreme, people talked about the necessity of spreading this system of universal education, and the content of its curriculum, to other corners of the globe. On occasion, this expansion was in an intention to share and collaborate, as when people discussed ESA partnerships with international observatories. Nevertheless, the majority of these discussions centered around spreading European scientific knowledge not only in order to educate, but to ‘open new horizons’ for those existing outside of the Hexagon.

Contrary to the horizon found in nature, the conceptual or social horizon that people reference (e.g. Christian and Madeleine’s statements above) is a horizon most people described as being under human control. Humans have the power to “give” (“*il faut donner un autre horizon*,” Margot, 1FE) horizons, as well as advance towards them. Many consider the capacity to ‘open horizons’ (whether their own or the horizons of other people) a responsibility because, as horizons are equated with advancement, a lack of horizons suggests stagnation or worse.

This discourse is deeply colored by an assumption that humans can cultivate the natural environment and other human beings. One can sense the shockwaves of colonialism resonating in these discussions of ‘opening’ people’s horizons, whether in France or abroad. These discussions reveal an expansionist perspective, in which perpetual ‘forward’ motion and seeking novelty are valued and staying put is understood as engendering ignorance. As I read through the transcriptions and thought about my interviewees, I wondered what was so wrong with sitting still and hanging out? This idea of plunging ceaselessly into the abyss of the unknown in order to

progress knowledge was coming from the capital of the culture with among the shortest work weeks and praised as the “champions of the lunch hour” (Bucco 2019); from people who self-reportedly like to hang out, take time, and *profiter* (“enjoy”) their daily lives. These were the same people, in many cases, who themselves were averse to engaging in this kind of exploration and adventure, but who continued to praise others who did. My interviewees spent hours with me, sipping wine, smoking, brooding over coffee, talking about how much we needed to preserve our life on this planet, while often romanticizing vast adventures beyond it.

Ne faut-il pas cultiver notre jardin? (“Should we not cultivate our garden?”), as Voltaire (1759, Chapitre 30) put it? There is a tension in the corpus between a romanticization of space travel and a feeling of responsibility or connection to the Earth. Most everyone I spoke with expressed a strong preoccupation with troubles on this planet, but at the same time, it was rare for a person to be completely opposed to exploring the stars. People’s perspectives were pulled both inwards and outwards, and the horizon was one of the principal metaphors they used to express the boundary between these two centers of interest. I will explore other ways people expressed this tension, especially concentrating on a connection to and responsibility for the Earth, in Chapter Ten.

8.3 New Horizons: TERRITORY IS KNOWLEDGE

As demonstrated above, the horizon metaphor is predominantly linked to conceptions of exploration and discovery (both geographic and intellectual). This metaphor is often used in conjunction with larger analogies between space exploration and large-scale exploratory projects on Earth (i.e. maritime exploration and the conquest of the New World). Space in this conception functions as a distant territory “on the horizon.” The extra-terrestrial “frontier,” like frontiers that have preceded it is perceived by many to be a ‘natural’ extension of human exploration and expansion.

Many people argued that humans possess an inherent exploratory drive and this opinion was often linked to their insistence that horizons are necessary. For these interviewees, horizons

represent human “ideals”¹⁵² and we must move towards them. People describe this advancement in geographical, cultural, intellectual and technological terms. “Going towards the horizon” implies that humans ‘progress’ in many ways and that the expansion of human knowledge can be equated with the expansion of human discovery (or control) of territory. The conceptual metaphor **TERRITORY IS KNOWLEDGE** is common in space advocacy discourse (e.g. J.F. Kennedy’s 1962 call to pioneer the new frontier of space, [Holland 2016] or Arendt’s [2007] discussion of the limits of territory and the limits to man’s search for knowledge). I documented this conceptual metaphor at the Mars Desert Research Station (Black 2018) and observed similar implications of the necessity of human empirical engagement with territory as well as how this metaphor obscures issues of proprietorship and what knowledge humans can ‘know.’ The **TERRITORY IS KNOWLEDGE** conceptual metaphor connotes advancement or ‘progress,’ and because of this people are largely positive (or neutral) concerning territorial advancement and movement towards horizons. No one expressed a negative opinion of horizons. On the contrary, interviewees repeatedly praised “new” and “further” horizons.

This positive, romanticized vision of the horizon is encapsulated in the final example of the **SPACE IS A HORIZON** metaphor that I will discuss: *New Horizons*. *New Horizons* is an interplanetary space probe, part of NASA’s “New Frontiers” program (2002-2022). It was launched in 2006 to capture images of Pluto and then continue into the Kuiper Belt. Joseph, an astronomer brought up this probe as an example of how important it is to strategize the timing of probe launches:

“Auquel cas on va faire une sonde qui va doubler la première et arriver plus vite. Donc, ils ont bien joué le coup, ils ont envoyé au bon moment. Parce que depuis que *New Horizons* a été envoyé et est arrivé au niveau de Pluton, en fait,...depuis on peut

¹⁵² “Il faut donner un autre horizon. Il faut donner un autre idéal. Et l’espace aussi c’est ça. C’est quelque chose qui nous permet de rêver un autre idéal mais un idéal qui est super concret et qu’on peut emmener dans les maternelles des coins super pourris.” (“We have to give another horizon. We have to give another ideal. And space is also that. It’s something that permits us to dream of another ideal, but an ideal that is really concrete and that we can take into pre-schools in super rotten areas.”) (“Margot,” 1FE)

pas dire qu'on enverrait une sonde beaucoup, beaucoup plus vite..." (Joseph, 2ME).
V8:17¹⁵³.

He explains how launches must be scheduled with the creation or refinement of future technologies in mind. If we launch a probe and shortly thereafter there is a major technological advancement, the next probe launched using this technology is likely to pass the first, rendering it obsolete. The name *New Horizons* issues from the same conception used by other participants: that of the horizon as a place of possibility or progress and of the desire to find 'new horizons' in order to open new possibilities to humanity. *New Horizons* represents a literal, physical effort to perceive new horizons in outer space, as well as the symbolism of the horizon as advancement. It also seems to be an example of popular discourse and conceptions being appropriated by expert systems of knowledge. This metaphor is not only prevalent in interviewees' conceptions, whether experts or not, but in larger conceptions of exploration in the Western world, particularly space exploration.

Space probes do not always carry symbolic metaphors as names. Many are named after scientists (e.g. Kepler and Galileo) or descriptively named according to their mission (e.g. Solar Dynamics Observatory and Mars Global Surveyor). The name of the *New Horizons* probe incarnates a hope and goal beyond the accomplishment of a single mission. Its primary mission, a Pluto fly-by, was successful. But, as the probe is equipped to achieve the escape velocity necessary to leave the solar system, it is intended to inspect one or more objects in the Kuiper Belt in the next decade (NASA 2015; Roston 2015). *New Horizons* is positioned to live up to its name, providing humanity with glimpses into reaches of space we have never explored.

This explicit link between new knowledge and new territory is pervasive across the interviews. It seems that the **TERRITORY IS KNOWLEDGE** metaphor used here is at odds with critiques interviewees provided of other expansionist perspectives, notably political policies of the United States. On a micro-level, most people I spoke with were opposed to other forms of

¹⁵³ "In which case we will construct a probe that will go much faster and go beyond the first one we sent and arrive more quickly. So they played their hand well, they sent it at the right moment. Because since *New Horizons* was launched and arrived near Pluto, in fact, since then we can't really say that we could send a probe much, much faster."

human expansion and spread. For example, Leon (3MNE), an intellectual property attorney, spoke apocalyptically about the ‘end of Europe’ occurring because of a massive influx of immigration from the developing world in the decades to come. Others spoke to me critically about United States foreign policy and intervention in countries like Iraq. All forms of expansion were not perceived positively, and some people were reticent or downright negative concerning human expansion into space. However, it was more likely that people would speak positively about projects for human space exploration, than about immigration in France or other forms of terrestrial human spread.

People were able to populate the blank canvas of space with more possibilities than they were able to attribute to their own country or to global politics and the novelty and potential of the unknown of space were part of what made it attractive. To return to the example of the space probe *New Horizons*, *Current Horizons* or *Old Horizons* does not encapsulate the dream of space articulated by interviewees, nor an ideology of ‘advancement’ and progress based on acquiring knowledge through physical engagement with a territory. I have already linked this expansionist ideology to French colonial history, but I think it is also productive to link it to post-industrial capitalism and a consumerist culture in which novelty is highly valued. Whether it be fashion, food, films or science, new discoveries, new trends and new models fuel industries across society in contexts like contemporary France. In my discussions with participants, they too placed significant value on a constant progression towards the new, rather than a continued reflection on the past and present.

In addition to this, all of these discussions of pushing towards further horizons emphasize the value of novelty and not only of intellectual, but physical contact with that novelty, whether it be territories, resources or other forms of life. We can return to Simon’s desire to “touch” the “door of the stars” and his implication of the need to open it and go beyond (“*au-delà*”) both this planet and human desires. Though the desire for knowledge is linked to Enlightenment values, as discussed, sight is the sense most frequently associated with the acquisition of knowledge. It seems like this desire for physical contact is related to something else. Why do we need to “touch” the door of the stars, and not only see it; to hear the music of the spheres, without going towards it? What is the siren song that pulls my interviewees’ imaginations so far from the Earth,

often with a moral impulse towards distant horizons that represent ‘progress’? The convictions expressed by many, that it was necessary to undergo great sacrifice to extend humanity beyond its current ‘horizon’ reflect not only an orientation of their imagination based on source domains in their embodied experience, but a specific comprehension of humanity’s nature and purpose.

8.4 Conclusion

Not only is space a positive goal, as a horizon, many interviewees talked about it being a ‘natural’ point in human progression. Horizons are part of the natural world, not artificial constructs. As discussed above, people argued that curiosity about and exploration of the natural world (often described as movement towards the horizon) was inherent to human beings. Take for example the following argument from Marie, a common argument among expert and non-expert participants alike:

“On doit être multi planétaire parce qu’on est une espèce curieuse. Et on veut savoir ce qu’il y a au delà de l’arbre où il y avait des fruits, il y’en a peut-être de l’autre côté, qu’on connaît pas. Voilà, et puis surtout il y a plein d’amis qu’on connaît pas encore” (Marie, 2FE). V8:18¹⁵⁴

People consider curiosity to be an inherent human quality that has spurred us to explore much of this planet and to aspire beyond it. People describe the desire ‘to see further,’ look ‘beyond,’ or ‘to know what’s on the other side of the horizon’ as natural human motivations. Even interviewees with negative visions of human expansion and colonization often cited the ‘naturalness’ of this behavior in humans (though they may characterize it as destructive or ‘violent’).

Among the metaphors people used to describe space and life in space, **SPACE IS A HORIZON** is one of the most positive. The horizon represents a point towards which we advance and this act of advancing in a territory is equated to social, intellectual and technological progress. In the case of space exploration, this conception entails a positive value judgement

¹⁵⁴ “We must be multi-planetary because we are a curious species. And we want to know what there is beyond the tree where there was fruit, maybe there is more on the other side that we don’t know about. So, there you have it, and then more especially there are lots of friends we haven’t made yet.”

concerning the possibility and desirability of human projects in space. As people positively viewed horizons, if **SPACE IS A HORIZON**, space is positive, and a point towards which it would benefit humanity to advance. People used the source domain of the horizon to develop different conceptions of space, time, possibility and human nature. Though these metaphors of expansion and spread were common, conceptions of expansive geographical and intellectual horizons are in stark contrast to the most prevalent metaphors for describing life in space: container metaphors of physical, emotional and social constraint. Space, and the possibilities it holds, can be conceived of as expansive, infinite. However, as I will demonstrate in the next chapter, the moment it comes to imagining humans in space, the expanse of space is negated by the necessity for humans to remain enclosed in a protective matrix when attempting to exist in perilous extra-terrestrial environments.

Vignette 9: “Putain, c’est ça? C’est ça ma vie?”

(Male, non-expert, 31 years old)

For the first time in ten years, I found myself living in the same city with a dear friend of mine from the Charente-Maritime. During my fieldwork, he moved to Paris to take a job as an editor of non-fiction novels. When I told him about my project, he volunteered to contribute his own imaginations. One evening as we sat around coffee and my Sony recorder, he talked to me for over two hours about his imagination, or what he considered a lack thereof, of space. Not a science fiction fan, nor a proponent of human space flight or colonization, he still got visibly excited as he described an increasingly detailed narrative about his potential use on a human mission to another planet. He wanted to serve as the archivist and documentarian.

When it came to deciding what he would take to space in his kilo of personal effects, he got frustrated with the question. “C’est chaud. C’est vraiment chaud. Moi, j’ai besoin de lire des trucs. Mais, oh putain, c’est lourd.” A single kilogram posed him a major problem that had been irrelevant to many participants, as he explained:

“J’ai un gros problème avec les livres...c’est que... je les accumule. Donc, ça je pourrais pas le faire. Mécaniquement, il y a pas de librairie. Moi je serais obligé de faire un travail là-dessus, en tout cas, m’y préparer, parce que je sais que c’est pas raisonnable le rapport que j’ai aux livres.”

“Donc, là qu’est-ce qu’il faudrait que je fasse? Donc, il faut que je repense d’abord mon rapport aux livres et ensuite à la lecture. Probablement, j’emmènerais une liseuse avec beaucoup de textes dedans. Je ne sais pas comment je les choisirais puisqu’on a pas accès à tout ni rien. Je ne sais pas, je me trouverais une solution. Je mettrais un maximum de textes en fait.”

“Donc, je prendrais ça et je prendrais sûrement un répertoire de textes que j’ai dans l’appareil, parce que le problème avec ces machines c’est en fait que ça n’existe pas. T’as pas accès. Je te parle de centaines de volumes tu vois?”

“Je pense qu’il faut....Et en plus moi je m’en fous: il faut arrêter de faire comme si c’était pareil. C’est pas la même chose d’avoir une page avec...que tu peux défiler comme ça entre tes doigts. Que d’avoir des listes où il y a dix mots par page et tu dois les faire défiler dans l’ordre, alors que les pages tu peux les prendre dans le désordre. Tu peux aller directement à la fin. Alors que souvent sur les liseuses non, tu es obligé de les faire défiler dans l’ordre.”

“C’est très nul. C’est vraiment pourri. Et en plus la notion de page n’existe plus, donc tu lis ton livre tu es à 50%, 58%... C’est vraiment. C’est chaud, mais chaud quoi.”

Whereas most people quickly told me that they would bring some sort of digital device and hard drives full of books, Jean described his distaste for these objects and his self-reported ‘unhealthy relationship’ with the

physicality of pages and books. After a bit more huff, he resigned himself to bring a device. But he did not give up the idea of having a book with pages to turn.

“Ou alors, je prend un gros livre. Mais un seul. Et est-ce que tu prends la Bible ou Moby Dick ? Tu vois ce que je veux dire?”

“Après, comme effets personnels j’en sais rien. J’imagine que je prendrais quand même ce genre d’objet avec beaucoup de contenance. Je vais avoir besoin de musique. Alors, est ce que ça fait partie, est ce que l’équipage à le droit d’avoir la musique? C’est pas matériel, hein?”

“J’imagine que je capitaliserais là-dessus, parce que avec ma psychologie d’accumulateur, j’apporterais quelque chose de dématérialisé rempli au maximum. Et après je ne crois pas avoir d’objets...comme ça que je trimballe avec moi. Fin, j’en apporte qui sont toujours lié au lieu.”

“Il faudrait que j’aie un iPad en fait. Il faudrait que j’aie un iPad sur lequel je puisse créer des dossiers. Et me faire des listes, comme j’aime bien faire des listes, que je puisse tenir mon journal, tu vois avec cet objet je peux répondre à pas mal de besoins.”

He then stopped to picture his imaginary stack of proposed objects and estimate their weight.

“Mais, tu vois avec un Pad et un disque on est au kilo. Putain, c’est tout, c’est ça? C’est ça ma vie?”

Chapter 9: LIFE IN SPACE IS LIFE IN A CONTAINER

In the preceding chapter, I analyzed horizon metaphors in the corpus and how they function to reinforce positive notions of space and human advancement. Interviewees talked about horizons as soliciting exploration. They argued that to attain the horizon, to go further, it is necessary to travel and explore. Travel is a topic in the questionnaire and everyone spoke to me about travel on Earth as well as distant journeys in space and time. When discussing space travel, people recurrently brought up the idea of constraint. They described this constraint in reference to physical spaces, such as being locked in a small space and having no room to move around and in reference to other forms of constraint, such as altered gravity and limited supplies.

The preceding vignette provides an excellent example of this preoccupation when it comes to being limited in what one can take to space. Jean was repeatedly frustrated by the limits of what he could take in material form to space especially as he, unlike many other participants, expressed a marked disgust with digital readers in all forms. The physicality of books and the experience of handling them - being able to flip through them in a disorderly fashion or feel in your hand how much of the book has been read - was important in how Jean understood his life and imagined his life in an unknown environment. In his description, Jean combined his generalized knowledge about the size of spaceships and capsules with his personal memories of his physical experience, enabling him to describe a situation he has never experienced.

People used their generalized cultural knowledge about space, or “interpretative repertoires” (“threads of sense-making that work through familiar, tropes, metaphors and formulations”) as well as physical experience, to make sense of outer space (Wetherell 2012, 12). Sense-making about space was emotionally charged with and influenced by terrestrial embodied experiences of constraint, lack, fear, loneliness and danger. When people talked about space, common tropes about the dangers of space, and metaphors about being contained “within” shuttles, ships or stations (as we will see below, frequently referred to as “cans,” “boxes” and “crates”) informed their representations and whether or not they considered a potential future viable or desirable. As Wetherell (2012,12) argues, it is in this way “particular emotional subjects are repeatedly materialized.” Largely, people expressed either 1) fear, doubt, distrust and

disinterest in space exploration or, on the contrary, 2) awe, fascination and pride in space exploration. Both of these affective positions are informed by people's positioning within high modernity and the potential for radical doubt and distrust of institutions, or the potential for trust in expert discourse and a perception of science as positive and effective (Giddens 1991), or an unproblematic "vanguard of progress" (Lupton 2013, 15-16).

Though aspects of space travel were perceived positively by respondents (e.g. scientific discovery at the ISS), all participants still deployed a discourse of risk concerning the viability and desirability of space exploration. Evaluating risks and how they could be avoided was central in my interviewees' discussions. It is interesting to compare my interviewees' conceptions of risk with Lupton's (2013) discussion of how people in medieval France handled danger and fear. The beliefs and practices she describes - from tabooed places, amulets and beliefs in a vengeful God and evil spirits - are hardly shared by my French interviewees centuries later. Lupton (2013, 9) argues that this is because of a shift in the perception of risk and the self, saying: "In contemporary Western societies, where control over one's life has become increasingly viewed as important, the concept of 'risk' is now widely used to explain deviations from the norm...and frightening events. This concept assumes human responsibility and that 'something can be done' to prevent misfortune."

As I will demonstrate in the following chapter, conceptions of the risk of space greatly informed how people imagined space and human life in space. The prevalence of the metaphor **LIFE IN SPACE IS LIFE IN A CONTAINER** is evidence of the predominance of conceptions of danger in people's discussions. The strategies people described to mitigate the risks of space resonate with Lupton's (2013, 12) description of risk as "always becoming" and transitory." She cites the work of Rigakos and Law (2009, 80, cited in Lupton 2013, 12): "A risk is not a phenomenon that already exists; it is a phenomenon that may happen some time in the future... further risk is always a normative statement of morality because it incorporates the notion that it may involve harm to someone or something."

Rigakos and Law's (2009) argument about the normative nature of risk evaluation and the moral judgements they belie is evident in my corpus. Interviewees generally prioritized human life over all other considerations, even going so far as to specify what kind of human life needed

to be preserved and reproduced, and this priority engendered judgements about space travel being (im)possible. This prioritization of human life also fueled a number of conceptions about the Earth, that I will discuss further in Chapter Ten. Among these was a moral concern that projects for space exploration “wasted” or wrongfully diverted resources on Earth that should be used to address terrestrial problems. Some people briefly discussed forms of risk unrelated to human life, including contamination of alien planets or the destruction of other biospheres or worlds. However, these discussions were rare and most people assumed that humans would not take adequate risk prevention precautions in these scenarios.

Take, for example, Adèle’s discussion below, in which she describes the risks of “all sorts of exchange.” It is interesting to note that she discusses risks with both positive and negative outcomes, transgressing the current view that people generally talk about risk to “relate only negative or undesirable outcomes” (Lupton 2013, 12; Boholm 2012).

“Alors, bon, je pense qu’on va devoir parler un jour des mesures de précaution. Dans toute échange il y a contagion. Un échange intellectuel. Un échange physique. Quelque part...à partir, si j’ose dire, à partir du moment où des fluides se mélangent *rire* on peut avoir des échanges positifs et on peut aussi avoir des échanges négatifs. Il peut y avoir des maladies transmises, des idées, enfin bon. Mais il peut avoir la contagion dans l’autre sens aussi, vers du bon.

Donc, moi je suis...je comprends que les gens restent enfermés chez eux. Quand je lisais par exemple que Michael Jackson était enfermé dans sa chambre pour éviter des contagions avec des gens qui peuvent être malade etc.. Pour moi c’est un signe de folie profonde, mais enfin bon, à la limite pourquoi pas? Si c’est un choix de vie. Mais moi, non, je suis incapable de faire ça. Je suis ouverte. Alors, je n’aime pas qu’on vienne m’emmerder dans ma sphère privée. Ça c’est autre chose. Mais, bon, il y a des règles de courtoisie, de vie en société. Moi, je respecte. Si les autres les respectent aussi, c’est bien quoi.

C’est ça. C’est des échanges qui ne peuvent être que constructifs en gardent tout de même à l’esprit, à propos de la conquête spatiale, qu’il faut un respect profond de l’autre et du vivant. Et puis il faut aussi la toute petite part de méfiance qui...ça c’est l’instinct de survie. C’est la protection en fait. On va pas non plus...moi, des fois dans les films de science fiction je suis absolument horrifiée en les voyant enlever leurs casques tout de suite, toucher tout autour d’eux, etc.. Je dis, ‘Oh, oh, oh les gars, la contagion. La contagion.’

Vous êtes enfin...c'est comme ça qu'on a tué les Mayas, etc.. On leur emmène la rougeole ou la rubéole, je ne sais pas quoi. Fin, les conquistadors où on a emmené plein de merde en Amérique du sud. Et...mais d'un autre côté on en ramène aussi, hein? On va des fois ailleurs et puis on peut ramener aussi, fin rapporter aussi des choses qui sont négatives. Ça c'est les risques de la vie.

Moi, personnellement je préfère prendre les risques plutôt que de rester repliée sur moi-même, voilà” (Adèle, 3FE). V9:1¹⁵⁵

There is a lot to unpack in these few paragraphs and some of the elements, such as the analogy between space colonization and European colonization of the Americas, are discussed in further detail in Chapter Five. In terms of risk, Adèle concentrates on a conception of contagion in which exchanges can have good or bad results for both parties. She talks about her “horror” when astronauts do not respect contamination protocols in science fiction films and links this to the contamination of ancient peoples through contact with Spanish conquistadors. She concludes with a value judgement about how it is better to “take risks” than to rest “closed in on [your]self.” Though she cites disease, contagion and historical precedents of widespread death due to epidemic, she seems to imagine herself as the crewman who does not take off his helmet. Considerable risks exist, but she, in listing them, takes a certain control over them (see Umberto

¹⁵⁵ “Okay, I think we are going to have to talk about precautionary measures. In every exchange there is contagion. An intellectual exchange. A physical exchange. In a way...from the moment, if I dare say, from the moment fluids mix *laughs* we can have positive and we can also have negative exchanges. There can be sickness transmitted, ideas, okay. But, you can have, you can have contagion in the other direction, towards the good.

So, I understand how people can stay locked up inside their homes. When I read, for example, about how Michael Jackson was locked up in his house to avoid contagion from people who may be sick, etc.. For me, it's a sign of profound insanity, but, well, fine, why not? If it's a life choice. But me, no, I would be incapable of doing that. I am open. I don't like it when someone comes and annoys me in my private sphere. But that's something else. There are rules of courtesy, of social life. I respect them. If others respect them too, all if well.

Those are exchanges that can be nothing but constructive, keeping in mind the subject of the space conquest, that it is necessary to have a profound respect for others and for living things. And it's also necessary to have a little bit of distrust. That's the survival instinct. That's protection. We're not going to...me, sometimes in science fiction films I am absolutely horrified when I see them take off their helmets immediately and start touching everything around them, etc.. I say, “Oh, oh, you guys, contagion. Contagion!”

It's like that that we killed the Mayas, etc.. We brought them the measles or rubella, I don't remember which. The conquistadors brought a bunch of shit into South America. And...but on the other hand, we bring stuff back too. Sometimes we go other places and we can bring things back, too, bring negative things back. Those are the risks of life.

But, personally, I prefer to take risks than to stay closed up on myself.”

Eco's [Beyer and Gorris 2009] discussion of the power of the list in Section 9.4) and is able to plan precautionary measures.

Adèle's live-and-let-live(die) attitude towards the risks of space travel was not shared by the majority of other interviewees. The word risk is used in its noun ("*une risque*"), verb ("*risquer*") or adjective form ("*risqué*") thirty-five times in the corpus. I also performed a key word review of the thirty-five occurrences of the word "*la chance*" ("chance" or "luck"), as this word can refer to the 'chance of X occurring,' and therefore be indicative of risk discourse. These usages primarily referred to positive outcomes or to luck (23 occurrences), with twelve instances referencing dangers or a lack of luck. I also performed a key word review for words that could be indicative of positive outcomes to determine counter-examples to the risk discourse in the corpus. While there were seven instances of the word "*sécurité*" ("security") all of them were in reference to "*précautions de sécurité*" ("security precautions"), "*mesures de sécurité*" ("security measures"), or efforts to "*maîtriser*" or "*assurer la sécurité*" ("to master" or "ensure security"), and therefore were discussions of risk, rather than security. Out of curiosity, I compared the presence of discussions of problems and solutions, to see if the use of these words correlated to the predominance of risk discourse in the corpus. With 193 references to "*problème(s)*" "problem(s)") and twenty-five references to "*solution(s)*" ("solution(s)"), interviewees clearly showed a preoccupation with dangers, threats and how to manage them.

The preoccupation with risks and dangers in space, and how individuals, space programs or governments can prevent these risks, among my respondents lines up well to past research concerning the prevalence of risk discourse among the educated, middle class (e.g. Stallings 1990). Overall, interviewees expressed agreement with discourses about self-control and personal development. They also espoused strong opinions about human control of other systems, namely the Earth and human responsibility not only for humanity, but for the entire planet. As discussed in Chapter Four, only two interviewees felt that spiritual evolution was necessary to human progress and risk containment. Most participants expressed the opinion that progress was dependent on scientific exploration and rational thought. This perspective is in accordance with Lupton's (2013, 11) argument that "[m]odernity depends on the notion emerging in the seventeenth-century Enlightenment that the key to human progress and social order is

objective knowledge of the world through scientific exploration and rational thinking.” People talked to me about scientific calculations, measurements and theories. They talked about humans harnessing new forms of energy and terraforming distant worlds. Though these projects posed substantial risks, people told me that science allowed us to manage these risks. For many, it was not a question of whether or not humanity could explore the cosmos, but whether they should (or whether this exploration should be a priority in the 21st century).

Reddy (1996, 237) explains that “[m]oderns had eliminated genuine indeterminacy, or ‘uncertainty,’ by inventing ‘risk.’ They had learned to transform a radically indeterminate cosmos into a manageable one, through the myth of calculability.” The modern conception of risk Reddy describes and its Enlightenment heritage pervades and reinforces metaphors in my corpus. As discussed in the preceding chapter, many metaphors in the corpus (e.g. horizon metaphors), reflect values inherent to the French Enlightenment, including the importance attributed to exploration and extending knowledge and the importance of sight in comprehensions of knowledge and understanding (e.g. being able to “see” something on the “horizon” of time). The dominant structural metaphors in the corpus (e.g. expressions describing humans enclosed in domes and bell jars to assure their survival) also reflect a confidence in science and well-developed interpretative repertoires for understanding human space exploration in its current state. Unlike the orientational metaphors in the corpus, that often oriented human knowledge and abstract domains such as time, these structural metaphors are more informed by human bodies, and people’s ideas of comfort, necessity and physical limitations.

Participants most frequently represented the notion of constraint in their conversation by deploying one of the structural metaphors: **LIFE IN SPACE IS LIFE IN A CONTAINER**, whether that container be a “bubble,” “jar” or “box.” They described human bodies in space as being “in” containers. The source domain for this metaphor is the experience of containers, in which an object or substance (the ‘content’) is “inside” or “enclosed by” another object conceived for holding things (the ‘container.’ E.g. a box, crate or bubble). When deploying this structural metaphor, people spoke almost exclusively of containers that were of a manipulable human size (e.g. boxes, not shipping crates) and tended to speak of containers that reflected a lack of space (i.e. “sardine cans”).

9.1 Imagination as Embodied and Cultural: Arriving at the Unknown Via the Known

All of my research interlocutors possessed a basic knowledge of outer space as an environment, so they knew that it was necessary for humans in space to be contained within a protective matrix to ensure their survival. In addition to human survival, people also knew that materials and supplies would have to be encased in a pressurized ship to be safely transported beyond the Earth. It seems logical that this knowledge would prompt speakers to use ideas about containment and containers in their descriptions. Though they did not always use the exact same expressions, the majority of interviewees did rely on the same handful of containers in their metaphorization of constraint. In general, people used metaphors of cans and boxes more frequently when referring to travel or time spent in space, and deployed images of bubbles and bells (or bell jars) more often when discussing human habitats in space, especially on planets and moons.

This preference for cans to discuss spaceship-containers and bubbles to discuss habitat-containers is an extension of a primary source domain of knowledge, embodied experience with these containers, and interviewees' representations of real and imagined spaceships and habitats. As we will see in the following discussion, the source domains in these container metaphors are common objects, often the prototypes of their semantic category (e.g. a standard tin can rather than an industrial sized can or other form of food packaging). People most frequently talked about containers that they had experience with and never cited less common (though potentially more analogical) containers like freight containers. Additionally, the containers people referenced possessed a number of physical correlations with the spaceships or habitats participants discussed. Spaceships, both in reality and fiction, are not usually round like bubbles or vases, but rather long and 'box-like.' The conception of a spaceship parallels that of a box as they have lids or seals that close up; through which people can put things or take them out. Spaceships must be sealed up tightly and have strong hulls, typically in metal (encouraging the 'tin can' analogy) to protect their contents (e.g. from debris hurtling through space). These

characteristics of spaceships correspond more closely to conceptions of cans and boxes than to bubbles or bell jars.

Conversely, depictions of human colonies in space, be they from science or science fiction, frequently show domes or other rounded structures and forms of protection. These representations inform participants' metaphors through cultural knowledge and many participants couple this generalized cultural knowledge with discussions of their personal experiences within domes or 'bubbles' (e.g. in amusement parks, as in Charlotte's comments in V9:6 below). Depictions of rounded habitats or structures positioned under a large half-circle on a planet's surface correspond well to the conception of the bubble and bell jar. The fact that these protective domes also ensure a breathable environment makes them "oxygen bubbles" of sorts, further reinforcing the parallel between space habitats and bubbles.

People use both factual and fictional representations to conceive of the unknown of outer space. As discussed in Chapter Five, these representations serve to nourish particular models of outer space that participants have internalized. Realistic representations of space, such as those distributed by NASA and ESA, focus primarily on 1) physical or astronomical phenomena and "spacescapes" (e.g. nebula, planets, stars) and 2) humans and human artefacts in space (e.g. videos of astronauts at the ISS, images of telescopes, satellites and rovers). These images of the 'real' experience of space depict the current conditions of space travel (see the seating arrangements on the rockets that take astronauts to the ISS). These representations show small spaces that appear jam-packed with equipment and human bodies. Images from the ISS show cables, wires, computers and other equipment attached to every centimeter of free space on the station's walls which, in a zero-g environment, include the 'floor' and 'ceiling.'

The current, constrained conditions of space travel are also reproduced in imaginary representations of space. Present-day, past and future space travels are depicted in cultural texts that range from the scientific data discussed above, to products such as films, television series, artwork and comic books. As I discussed in Chapter Four, cultural texts are not only written, "the entire place and space are...readable texts" (Malley and Hawkins 2012, 56). Cultural texts may be artefacts or historic events as well as fictional creations. For example, photos are both images as well as cultural texts, as a picture "possesses cultural information beyond the picture

itself” (ibid). Therefore, *Tintin On the Moon* is one form of cultural text depicting a certain representation of space, as are the photographs of Neil Armstrong and Buzz Aldrin planting the American flag on the Moon, real spacesuits and spacesuit costumes.

Fictional depictions of humanity in space, especially in distant futures (and more rarely in narratives set “a long time ago”) often show people in building-sized structures, walking freely along boulevards; entire cities are depicted under protective domes (e.g. *Interstellar*, *The Expanse*). Many people mentioned the orbiting space station in *2001: A Space Odyssey*, as well as sweeping shots of massive space ships with humans mulling about behind their porthole windows (e.g. Marie’s passionate discussion of the opening sequence of *Star Trek The Motion Picture*). These representations feed people’s imagination and understanding of what life in outer space could be for humans. People cite these depictions of large-scale human colonies and societies in space in their discussions. However, interviewees talked less about these cultural representations of large-scale human space exploration and colonization than about smaller and more personal scales of existence; about bodies and small containers that hold them.

When talking about space, interviewees’ discussions were heavily influenced by realistic representations of space; they spoke considerably less, if at all, about ‘fantastic’ depictions of space or those that portray existence in space as something far-removed from present reality. This may be influenced by the fact that a little under half of the interviewees were not self-reported science fiction fans. Participants without an interest in science fiction were generally less exposed to speculative (or purely fantastic) representations of humans and human societies in space and, therefore, did not have this generalized cultural knowledge to draw upon. On the other hand, an interest in science fiction and expertise (which always overlapped in this data set) was strongly correlated to interviewees’ ability to and interest in developing their responses, especially for question #2 (concerning multi-planetary human civilizations). These participants described numerous strategies for large-scale human colonization beyond the Earth (e.g. multi-generational space ships, lunar or Martian colonies).

Whether discussing realistic or more ‘fantastic’ imaginations of humanity in space, experts and non-experts alike, science fiction fans and not, kept referring to the constraints posed by life in space and to images of “bubbles” and “cans”. This imagination of constraint and lack

of space is interesting because it is coupled with a contrary imagination of an expansion of humanity across the cosmos. On the micro, or individual level, people imagined space explorers in claustrophobic situations in order to attain infinite space on a macro level. Participants paired the conception of human beings as being compressed into “cans” in order to spread humanity throughout the universe with the conception of ‘infinite’ ‘new horizons.’ Realizing this contradiction, Camille, a 44 year-old yoga instructor, laughed and commented, “*Le manque d’espace dans l’espace!*” (“The lack of space in space!”)

9.2 No Space In Space: Cans, Boxes, Bubbles and Bell Jars

All of these container metaphors - be they cans, boxes or bell jars - are motivated by the cultural models discussed above as well as the experience of being enclosed in an object conceived for holding; in an environment where humans can survive against a “dangerous” or “hostile” exterior space. Most people linked the necessity for “bubbles” and “cans” to scientific data reporting no known planets with both oxygen and water. Below I will discuss a series of examples in which participants argue that “because there are no environments with breathable atmospheres for humans beyond the Earth,” human life in space will occur in a bubble.

Generalized cultural knowledge about the physical environment of space informs the way people create representations of this environment. However, when people talk about these representations they tend to channel this cultural knowledge through analogies and metaphors with source domains of knowledge in their everyday lives. People did talk about ‘traveling in a spaceship,’ but they were just as likely to replace the term “spaceship” with “sardine can,” “tin can,” and “soap box.”

The recurrent use of the structural metaphor **LIFE IN SPACE IS LIFE IN A CONTAINER** demonstrates how knowledge, even when detached from individual embodied experience (as is the case for all of my interviewees’ knowledge about outer space), continues to be shaped and reinforced by other, previous embodied experiences, especially prototypical experiences. People possessed information about space and paired this disembodied knowledge to embodied models, most often to those embodied models with which they have the most experience. The embodied

models they deployed to understand their textbook knowledge of space, in part, functioned in order to allow them to apply real-world experience they possessed to this unknown domain of experience. They spoke declaratively to me about spaceships (e.g. stating facts and figures), but often narratively they talked about “putting people into cans” or having to survive in a “box” for months or years.

It seems like people’s capacity to know the unknown, or to comprehend it, is therefore bound, in all cases, be it textbook or experiential knowledge, by generalized cultural knowledge and embodied models. It is no surprise that people always imagine people in space inside of containers, as people know that there is no breathable atmosphere on the Moon, or Mars, etc.. The structural metaphor **LIFE IN SPACE IS LIFE IN A CONTAINER** is not unexpected given this knowledge, neither are the conceptions and representations of habitats under domes that we see in space sciences and science fiction.

These representations seem to be fixed, especially insofar as the information people possess about space is limited, and this knowledge seems to limit their representations. The metaphors used by participants are not novel ways of speaking, but fixed expressions in Standard French. Similarly, the vast majority of participants referenced basic, fixed cultural knowledge concerning space sciences and human space colonization (e.g. the vacuum in space; the length of the journey between the Earth and Mars). They have internalized both cultural knowledge about space as well as prototypical embodied experiences, and the limits of both of these forms of knowledge in turn shapes the limits of how they can ‘imagine’ or create a representation of a future in space. Their imagination, or capacity for representation, is delineated sharply into cultural and experiential categories for which there are readily available, well-entrenched cognitive models.

For example, the danger of space, and the metaphorical conception that a **DANGEROUS ENVIRONMENT IS A HOSTILE ACTOR**, are common conceptions that pervaded my interviews. As discussed in Chapter Two, the majority of interviewees did not describe relations of kinship or intimacy with the cosmos. When they discussed space, their descriptions were based on an understanding of space as distant, alien and dangerous. People did describe space as “magnificent,” “beautiful,” and “infinite.” However, outer space was dominantly personified as

being “hostile;” that humans must “tolerate” and “resist” (“*tolérer*” and “*résister*”) space and its dangers. Instead of discussions of astral travel or cosmic kin, people talked about enclosure in space shuttles and protective gear. Rarely would a participant mention a spacewalk or exiting the space capsule or habitat. Most people, if they were excited at all about the prospect of going to space, were content to observe space from the oxygenated side of reinforced windows.

Nayla, a 28 year-old female non-expert and contortionist, was the only person to talk about being outside of a spaceship in open space. She told me that, second only to dying on stage, she would like to die in space. She described this space death as one in which she was detached completely and floated “forever,” encased in a space suit. She did not talk about how dying on stage would likely be sudden and rapid, whereas death in space would likely be lengthy, painful and possibly even plagued by anguish or other troubling emotional experiences. As a performer, a death on stage was the ultimate way to die for her. However, the space death seemed to represent her death of personal, rather than professional preference. It is worth noting that Nayla had studied astrophysics at a Ph.D. level before she quit her studies to become a full-time performer. This makes her an expert ‘of sorts,’ however, I did not classify her as such because she had no professional experience in this domain (as she quit her studies before being employed in astrophysics). I joked with her that she had “run off to join the circus” and she laughed and said that she had just run off to join “another circus.”

Like Nayla, people tended to link interactions with the ‘hostile’ environment of space with the concept of death. While a few people talked about “infinite space” and galactic wonders, everyone talked about how deadly space was to human beings. For expert and non-expert participants, human mortality was key in their depictions of space. Interviewees described many topics related to humanity in space through a framework of the hostility of space. For example, people cited the danger of space to human life when they talked about their own interest in space and whether or not they consider space to be a sensible site for future investment.

When imagining space as a deadly environment, people used metaphorical conceptions to describe the containers that protect humans from this environment as well as metaphorical conceptions for understanding the environment of space itself. They created representations of space by finding parallels between this unfamiliar environment and familiar terrestrial

environments. People in this study commonly used metaphorical conceptions of **SPACE IS A DESERT** and **SPACE IS THE SEA**. **SPACE IS A DESERT** metaphors use the apparent “lifelessness” humans perceive in the universe and lack of liquid water on other known planets, and extend this emptiness and peril to all space. **SPACE IS THE SEA** is used to highlight the dangers of space and space travel (e.g. comparing it to perilous sea voyages), but is also deployed with positive connotations to develop analogies between exploration and discovery in space and similar past maritime exploration on Earth.

Though these macro-level analogies concerning environments in space are present in the corpus, when participants imagine human life in space they most often describe representations on a micro-scale. Interviewees imagine individual, physical experiences and sensations and intimate, proximal encounters with others and structures/environments in space. Rather than describing expansive human civilizations, spacescapes or futuristic domed cities, people described bodies stuffed into small spaces, a lack of oxygen, a need to “*prendre l’air*” (“take some air”), or “*sortir souffler*” (literally translated as to “go outside to breathe,” but means “to take a break”). Four of the interview questions provide explicit prompts for imagining bodies in space (#3, #4, #6 and #9). However, this preoccupation with human bodies in space extends beyond descriptions of their own bodies when asked if they would go to space, or the bodies of hypothetical extra-terrestrial humans. Throughout the interviews, people referenced physical experiences (e.g. eating¹⁵⁶, defecating, sleeping, having coffee, seeing friends, smoking, moving around, or lack thereof). When people used container metaphors, it was often in cases where the focus was on the (human) content of the containers, rather than the container itself (which was frequently dismissed without further description after being defined as a “can” or “box”). They concentrated on how humans would experience these containers in space. Evidence of this is in the use of adjectives to describe spaceships that are relative to humanity (i.e. “claustrophobic,” “constrained”), rather than objective observations on the specs of the vessel.

9.3 HUMANS ARE OBJECTS (in Containers)

¹⁵⁶ A lack of decent food was the most recurrent of these comments, made by fifteen participants.

When people described space containers, they developed discussions about the contents of these “boxes” and “cans.” In most cases, people objectified the contents of a container, as was almost exclusively the case when people talked about humans being “put” into space craft. People talked about astronauts and other people as being “crammed into” ships, “sent into” space or “confined” under domes. In these descriptions, humans in space lost their agency, most notably the control of their bodies, in terms of freedom of movement as well as many normal physical functions (e.g. muscle mass, bone density and blood circulation).

Outside of their container, people described humans as lacking agency to react and survive. Several interviewees talked about how space was not “our element” and described how humans cannot do anything in space without significant technological mediation. People linked this lack of agency beyond the container with a will to control the container itself. The lack of control over an exterior environment personified as hostile, necessitates an extreme control of the interior of the container. The conception of the bubble, box, dome, and bell jar all emphasize this element of interior control. Interviewees often describe these environments in terms of oxygen management; saying that it would be obligatory to live in “*des capsules où on recrée l’atmosphère qu’on peut respirer*¹⁵⁷” (Joseph, 2ME); that would “*permettre une petite zone de vie*¹⁵⁸” (Charlotte, 1FNE). Bubbles, domes and bell jars are not natural environments in which things ‘take their course,’ but artificial environments that humans must monitor and maintain. Take the following descriptions people gave me of the “bubble:”

“Donc, c’est pareil. Qu’est que c’est que la vie? Ben, c’est beaucoup d’infrastructure. Il faut forcément qu’il y ait de l’oxygène... créer un dôme. Donc, soit bon, c’est de l’ingénierie clairement. Probablement une menace permanente, j’en sais rien peut être au fil du temps on apprend à maîtriser ça, mais, tu vois, ça veut dire qu’il faut quand même produire de l’oxygène, protéger notre bulle, tu vois, fin, c’est quand même un petit peu... C’est pas la survie en permanence, mais...” (Jean, 1MNE).
V9:2¹⁵⁹

¹⁵⁷ “Capsules where we would create the atmosphere that we can breathe.”

¹⁵⁸ “Permit a small zone of life”

¹⁵⁹ “So it’s the same. What is life? Well, it’s a lot of infrastructure. Obviously we will need oxygen...to create a dome. So, it’s clearly a question of engineering. Probably a permanent threat, I don’t really know, maybe as time goes on we’ll figure out how to control it, but, you see, we’d still have to produce oxygen, protect our bubble, you see? I mean, it’s a little...it’s not a permanent state of survival, but...”

“[Des colons sur une autre planète]...qui vivraient dans des sortes de grosses bulles parce que...dans des gros cocons pour pouvoir garantir une atmosphère un peu près humaine, fin, terrestre, avec de l’air” (Olivier, 1MNE). V9:3¹⁶⁰

“C’est à dire dans des conditions de vie recréées artificiellement, dans des bulles, actuellement fin, dans les, et probablement pendant quelques siècles, dans des conditions très contraintes, très enfermées” (Nathalie, 3FNE). V9:4¹⁶¹

“Très contrainte par l’environnement. Vraisemblablement on ne peut pas vivre dans une atmosphère éventuelle, donc il faudra toujours être en scaphandre dans des résidences fermées sous des bulles ou... Parce qu’à notre connaissance il n’y a aucune planète vivable directement. Donc, je vois ça, côté claustrophobe...toujours sous cloche” (Valérie, 3FNE). V9:5¹⁶²

Jean’s arguments in the first example demonstrate the centrality of human structuring and control of the “bubble” or dome and he more or less equates this to a “permanent state of survival” in which human beings would have to constantly produce the essentials for their existence and protect this mode of production. We notice that Jean’s depiction uses a mechanical lexical field, whereas Olivier’s extension of his description of the “bubble” uses the more organic, nurturing term of “cocoon.” (Bubbles do not give life, whereas cocoons do.) He is the only participant to use this particular metaphor (Adèle does discuss spaceships that are biological organisms that she included in a few of her novels. But, in her depictions these ships are comparable to whales, rather than cocoons.) The three other examples above focus on the artificiality of potential living conditions in space; Olivier makes a rare reference to biological structures and beings. In each of the representations, people talk about a conception of constraint or lack of space (albeit possibly cozy and comfortable in Oliver’s image of the “cocoon”), sometimes providing subjective judgements and emotional responses in describing them as “enclosed” or “claustrophobic.”

¹⁶⁰ “Colonists on another planet]...would live in sort of big bubbles because...in big cocoons in order to guarantee a human, well, terrestrial atmosphere, with air.”

¹⁶¹ “I mean in living conditions that are re-created artificially, in bubbles, currently, well, and probably for several centuries, in very constrained and very enclosed conditions.”

¹⁶² “Very constrained by the environment. It seems that we will not be able to live in an eventual atmosphere, so we will always have to be in spacesuits, in habitats enclosed in bubbles or...Because to our knowledge there is no directly habitable planet. So, I see that, from a claustrophobic perspective...always under a bell jar.”

Nine participants also developed the “bubble” or “dome” metaphor in greater detail creating explicit analogies between human habitats in space and terrestrial spaces and objects. All of these people, with the exception of a planetary geologist, were non-experts, four women and four men, covering the three age groups. The following examples make analogies between the imagination of habitats in space, and embodied experiences with other environments (i.e. amusement parks, the city of Paris, and snow globes):

“Il faudrait probablement reconstruire une sorte de bulle qui permettrait un peu...tu vois, comme dans certains parcs d’attraction, où tu as une bulle au-dessus pour pouvoir permettre une petite zone de vie.

Je dirais plutôt les petites communautés, parce qu’au niveau de la bulle, c’est vrai que j’ai du mal à imaginer une bulle tellement grande qu’elle soit par exemple de la taille de Paris. J’imagine peut être soit des bulles qui fassent peut être quelques kilomètres carrés, parce que c’est ce que j’imagine dans certains parcs d’attraction, voilà. Et...qui feraient finalement des villages. Des villages qui seraient parfois en communication les uns avec les autres, mais qui seraient auto-gérés. Qui devraient gérer leurs propres ressources. Parce que c’est difficile aussi d’imaginer une sorte de gouvernement au-dessus de ces villages pour distribuer les ressources entre les villages” (Charlotte, 1FNE). V9:6¹⁶³

“Parce qu’en plus ils vont vivre dans des globes. Comme des bulles quoi, comme des bulles de Noël. *rire*” (Arthur, 2MNE). V9:7¹⁶⁴

I find these examples fascinating because they are directly informed by the speakers’ experiences of objects and places. In the first example, Charlotte creates a simile between the embodied experience of enclosed domes in amusement parks and the potential experience of human habitats. She later goes on to describe space habitats, this time citing the size of the city

¹⁶³ “It will probably be necessary to reconstruct a sort of bubble that would permit a little...you see, like in certain amusement parks, where you have a bubble above to permit a little zone of life.

I would say small communities, because when you think about the bubble, it’s true that I have a hard time imagining a bubble so big it would be the size of Paris, for example. I imagine maybe either bubbles that are a few square kilometers, because that’s what I imagine in some amusement parks, voilà. And...that would eventually become village. Villages that would sometimes be in contact with each other, but that would be self-sufficient. That would have to manage their own resources. Because it is also difficult to imagine a government above these villages that would distribute resources between them.”

¹⁶⁴ “Because they are going to live in globes. Like bubbles, like snow globes. *laugh*”

of Paris and her difficulty in imagining an analogous metropolis in “a bubble.” In the third example, Arthur creates a simile using a snow globe; an everyday object that is a micro-representation of enclosing spaces and objects in domes. In these instances, Charlotte and Arthur used experiences from their own lives to frame their ways of imagining an unknown experience. Generalized cultural texts, especially scientific ones, do not frequently use the city of Paris or amusement parks as points of reference when describing space. Nevertheless, in their discussions, people used these familiar places, whether or not they lined up more or less ‘accurately’ to factual representations of outer space. General cultural knowledge only partially informs people’s representations of the unknowns of space. Without needing to take recourse to their personal experience (i.e. of the size of Paris), people still applied their direct experience to the target domain of knowledge. Most importantly, people did this even when the application of their direct experience compromised the accuracy of their representation. Embodied experience always remained an important tool in analogy-building.

I also find it interesting that, in the Paris example, Charlotte attests to her difficulty in imagining a “bubble the size of Paris.” When people talked about containers, they referenced small containers. Their descriptions of human space colonization using small-container metaphors then predisposed these representations to conceptions of constraint. In this way, these metaphors did much to reinforce pre-existing conceptions of constraint in space that participants already possess. This example demonstrates how imagining these containers as large is not the ‘logical’ step for participants (i.e., big containers are the marked category), even though participants all have experience in large terrestrial structure-containers (e.g. arenas, “the [Garnier] Opéra,” airports and stadiums).

Participants often reflected a conception of space shuttles and space suits as individual, rather than collective spaces. Discussions of space suits were less developed than those of space ships and spacesuits always remained a personal, not shared space¹⁶⁵. Space ships were often depicted as solitary, personal spaces where people imagined themselves as isolated from others and confined (as in a space suit). Even when a spaceship was depicted as holding more than one

¹⁶⁵ This perception was validated by events at the ISS during April 2019, in which a female astronaut was excluded from a space walk for lack of a spacesuit in her size (Schwartz 2019). Spacesuits are not interchangeable and cannot be used by everyone; they are not only individual, but tailored individual spaces.

person, constraint, tightness, lack of space and confined quarters were emphasized. Conceptions of isolation and confinement in space reinforce one another, but even in cases where humans could share the same space in space (e.g. the ISS), these collective spaces remain uncomfortably cramped, to the point that some participants described such an existence as “no life at all” (“*ce n’est pas une vie*”).

In addition to the bubble, people reinforce the conception of confinement using other closed containers, in particular boxes, domes, cases and crates:

“Parce que c’est compliqué de faire vivre des hommes, ou n’importe quel être vivant dans des boîtes, hein, pendant très longtemps” (Arthur, 2MNE). V9:8¹⁶⁶.

“Essayer de reproduire les mêmes conditions de vie dans un endroit hostile où que tu sois obligé d’être dans un espèce de vase clos, sans pouvoir être à l’air libre, c’est pas pareil quoi.... Sous un...sous un...sous un...si c’est hostile en termes de qualité d’air ou de possibilité de respirer, donc je verrais sous un dome sous protection” (Éric, 2MNE). V9:9¹⁶⁷

“Ils seront enfermés dans leur boîte, euh, bon. Et puis ils arriveront sur Mars et ils auront de nouveau du travail!” (François, 3MNE). V9:10¹⁶⁸.

“...pour que la structure survive dans une caisse à savon pendant 500 ans enfermés pendant des générations, la structure sociale est aussi importante que le fonctionnement de recyclage et tout ça. Si les mecs se tuent tous, ils crèvent tous, ben la machine peut survivre, mais il n’y aura personne dedans. Super!” (Christian, 2ME). V9:11¹⁶⁹

These examples demonstrate the prevalence of container metaphors in both non-expert and expert discourse (the final example is from an interview with an astrophysicist). Having significant exposure to expert jargon and terminology for human space exploration

“Because it’s complicated to have people live, or any living being, in cans for a long time.”

¹⁶⁷ “To try and reproduce the same living conditions in a hostile place where you are obligated to be in a kind of closed cup, without being able to be in the open air, it’s not the same...Under a...under a...under a...if it’s hostile in terms of air quality or the possibility of breathing, so I see it under a protective dome.”

¹⁶⁸ “They will be enclosed in their can, okay. And then they will arrive on Mars and they will have more work!”

¹⁶⁹ “So that the structure is able to survive in a soap box for 500 years, enclosed for generations, the social structure is just as important of the function of the recycling and all of that. If they all kill each other, they all die, well, the machine can survive, but there won’t be anyone inside. Super!”

does not preclude the use of container metaphors when describing human life in space. The knowledge of the specific vocabulary of space sciences does not take precedent over experiences of boxes and cans and the resemblances between these source domains of knowledge and spaceships and habitats.

Even experts did not typically use the extensive, technical vocabulary for spacecraft and habitats during our interviews. Technical spacecraft and rocket terminology is part of a specialized discourse informed by a number of disciplines, including aeronautics, physics, rocketry and, of course, astronautics itself. The more common ‘literal’ terminology for referring to spacefaring vessels is itself analogical to maritime travel (e.g. space ‘ships’ with crew ‘cabins’). These are typically the terms used to discuss astronautic topics with the general public, rather than a) technical spacecraft terminology (e.g. calling the ISS Shuttle Remote Manipulator System the “space arm”), or b) colloquial expressions for these spacecraft. In interviews, it was this latter category that people used most in their representations of space. They referred to objects that resemble spacecraft and habitats, more than to ‘spacecraft’ or ‘habitats’ in literal terms. Embodied experiences of boxes and bubbles and their similarities to spaceships and domed habitats were prioritized over general cultural knowledge and expert knowledge in people’s discussions.

These experiential similarities in interviewees’ representations are largely connected to realistic representations of current conditions of human space travel and do little to project a significant development in strategies or technologies in human space travel. It is interesting to notice that people imagined more significant change when describing human bodies in the future than human technologies in the future. Participants were more likely to imagine major changes to bodies in space (or human manipulation of the body to make it more adapted to space, e.g. gene therapy) than they were to imagine major changes in the technologies humans would use in space. For interviewees, the technology for human space travel was more fixed than human biology in space.

As discussed here and in Chapter Six, the majority of participants imagined human infrastructure and technology in the future to be relatively similar to its current state (unless there are major breakthroughs in energy, for example). For some this may be the result of modelling

on older, often prototypical space programs (i.e. François' [3MNE] arguments about the model of the Apollo program), rather than considering current innovations in human space exploration and recent projections for space ships and human habitats. Other participants, like Antony (2MNE), Arthur (2MNE) and Christian (2ME) doubt the feasibility of these projects given our current resources (e.g. Christian's discussion of setting up human colonies beyond the Earth¹⁷⁰) and reinforce other conceptions of impossibility based on present challenges (rather than imagining possible scenarios where these challenges have been met). For others, this lack of imagination of progress can be linked to an opinion that these projects are undesirable and a focus on why they *should* not happen, instead of how they *could*.

Take, for example, the following conversation I had with Estelle and Pauline (76 and 80 years old, FNE), who volunteered to be interviewed when I visited their craft group on a brisk February afternoon:

PI: Comment vous voyez la civilisation humaine multi-planétaire?

Pauline: Moi, j'imagine même pas. Non. Non. Non. Non. On a déjà du mal à aller dans un autre pays, alors là je vois pas dans l'espace.

Estelle: Oui, c'est surtout de se protéger de la radiation. Parce que c'est le principal inconvenient, si on est sur place et on n'est pas protégé des radiations alors il faudra trouver des stations.

Pauline: Voilà et oui, ça je crois pas qu'on le verra demain.

Estelle: Non, c'est quasiment impossible.

¹⁷⁰ "Donc, la sauvegarde de l'espèce humain sur une autre planète, parce que ça serait dangereux. C'est juste pas possible. C'est ridiculement en dehors de nos moyens. On sait même pas envoyer des humains sur Mars et les ramener vivant. Pas les envoyer. Donc, uh, on parle de 6 types dans l'ISS. On parle pas d'une station orbitale comme dans *Elysium* à 6, 7 milliards de personnes, tu vois.

Donc, le coup de "il faut devenir multi-planétaire." Oui, **pourquoi pas?** S'il y a eu...s'il y avait, uhhh mettons même 100 mille ou 200 mille humains sur Mars, dans une énorme base martienne vachement bien et qui tourneront, un peu près rond, et qui est un peu près indépendant de la Terre, et que l'humanité est un peu près ravagée parce qu'il y a une énorme météorite, comme celle des dinosaures qui tombe comme ça sur leurs gueules sur Terre et donc il y a encore 100,000 humains sur Mars. On peut dire, "Ah, c'est bon qu'on était sur Mars." Ouais, mais le problème c'est que pour mettre 100,000 humains sur Mars, ça va pas être tout de suite.

On sait pas mettre trois. Et quand on en aura mis trois, ils vont revenir. Quand on va mettre 10 ou 15 qui vivent tout le temps, ça va pas être facile. Je crois même pas faire une colonie." (Christian, 2ME). Translation in Appendix IX.

Pauline: Mais bien sur. C'est difficile de pronostiquer.

Estelle: Est-ce que les hommes ne se seront pas auto-détruits sur Terre avec la pollution, avec la surpopulation aussi...

Pauline: Ben, fin, quand même, admettons, il y a quand même des endroits sur Terre où on pourrait habiter à ce moment-là. Voilà. Parce que plutôt que d'aller...

Estelle: ...dans des planètes...

Pauline: ...sur les planètes où il y a jamais de suite, parce que tout ce qu'il y a eu jusqu'à présent, ça n'a jamais aboutit.

Estelle: Et puis il y a des contingences, il faut de l'air pour respirer, il faut de l'eau pour se nourrir et pour faire planter des choses, on peut planter en serre, mais ça paraît...dans 500 ans honnêtement ça paraît très utopique. C'est vrai que la science avance vite, mais, tout de même.

Pauline: Ce côté-là c'est limité...

Estelle: C'est limité par les capacités de l'homme.

Pauline: Parce que moi, ce pauvre monsieur que je voyais là dans son...

Estelle: Dans son scaphandre...

Pauline: Qu'ils ont mis un quart d'heure à enlever sa combinaison. *rire* Oui! Oui!
Non, c'est...Bon j'avoue franchement que là, j'ai pas d'espoir de ce côté-là.
(V9:12¹⁷¹)

Estelle and Pauline argued that projects for human colonization and exploration are currently impossible, and likely to remain so in the distant future. Pauline found the prospect laughable, when considering the effort and equipment required for contemporary astronauts to do research in space. However, these women identified the source of this impossibility not only as being linked to the dangers of space, but also to the shortcomings of human beings.

¹⁷¹ Translation in Appendix IX

Many expert participants (e.g. Joseph [2ME], Jules [3ME], Jean Denis [3ME]) would similarly argue that the breakthroughs necessary to advance space exploration are more psychological, than scientific. Participants spoke at length about the role of human factors in these projects, in terms of human weaknesses, physically and socially, but also human attitudes and priorities. Christian (2ME), who considered exploration possible and desirable, but full-scale colonization largely unfeasible, explained this in the following way:

“Quand je dis que je ne la vois pas, ça veut dire que je réalise à quel point ça sera difficile pour l’humanité d’essayer, surtout pour aller hors du système solaire...tu m’aurais posé la question quand j’avais 15 ans, par exemple, j’aurais dit, ‘Oui! Des vaisseaux spatiaux, des villes extra- des villes orbitales!’ Fin des trucs extraordinaires, voir de la fiction et notamment dans les films de science fiction.”

“Maintenant que - j’ai toujours ces images en tête - mais je sais à quel point elles sont lointaines. Elles ne sont pas impossibles...Il n’y a pas impossibilité. Donc, il y a des choses qui sont pensables, on peut les penser, ça veut dire qu’on peut les imaginer et c’est pas indigne de les imaginer.”

“C’est pensable, et c’est même pensable scientifiquement. C’est à dire, on peut essayer de fixer une sorte de cahier des charges pour ce qu’il faudrait faire. Et quelles étapes il faudra franchir pour arriver à faire telle ou telle chose. C’est donc pensable, mais la road map, la feuille de route est tellement exigeante que ça va pas être pour tout de suite. Donc, du coup, pour l’instant je les imagine, mais en ayant toujours en tête, fin, je l’imagine un peu comme on le voit dans la SF. Un peu, disons sexy, imaginatif, des belles images, un peu...un peu merveilleux aussi, de la même façon. Mais, je sais à quel point ça serait très difficile d’atteindre ça, pour de raisons techniques et pas pour des raisons scientifiques, hein. C’est pas...on ne manque pas de science. C’est qu’il manque c’est des éléments techniques et, surtout fondamentalement notre capacité à maîtriser une grande quantité d’énergie et de matière. L’humanité maîtrise déjà beaucoup d’énergie et de matière, on le voit, parce qu’elle est un acteur tectonique, elle est un acteur à l’échelle de la Terre. Elle modifie le climat de la Terre. Ça veut dire, c’est pas un acteur insignifiant... c’est donc...l’humanité est une force de la Nature, mais encore très loin de l’échelle qu’elle doit atteindre si elle veut un jour semer sur d’autres planètes dans le système solaire, sur des planètes qui sont inhabitables pour les humains, donc il y a des techniques compliqués et des planètes où c’est directement habitable pour les humains, autour d’autres étoiles pour le coup il y a pas d’effort à faire pour rendre la

planète habitable, mais il y a un effort à faire pour y aller et là, là c'est très, très dur aussi" (Christian, 2ME). V9:13¹⁷²

Christian talks about humanity needing to become a greater "force of Nature" in order to control the resources necessary for long-term space travel and colonization. Outer space poses challenges not only in its dangers to human life, but in the fact that humans are not yet 'big enough' to tackle it. Christian's arguments remain largely material, whereas expert participant Jean-Denis (3ME) and non-expert participant Christine (2FNE) argued in terms of human psychological and spiritual limits. Space is not only dangerous and contains all manner of 'unknown unknowns,' people relate this danger specifically to the weakness of the human species. While many people argued that humans were not 'made for' space (or that space is 'alien' and 'removed' from humanity, as will be explored in Chapter 10), for a number of others it was not that humans were not 'made for' space (in fact, participants like Margot [1FE] were adamant that humans should go to space), but that humans were as of yet too weak or (spiritually/psychologically) stunted to face this territory and meet its challenges.

This ambient ideology of human weakness, or insufficiency to meet the challenges of space, may be connected to the fact that people tended to speak in much greater detail and length about physical changes in human bodies (e.g. skin, absorption of radiation, reproduction of DNA) than they did about technological changes. Examples of people discussing radical technological changes are rare. Adèle (3FE), Jean Denis (3ME) and Christine (2FNE) talk about radical changes in space technology, but most interviewees did not discuss wide divergences from current technological realities. Expert space scientists Christian (2ME) and Joseph (2ME) described the feasibility of space projects according to current technology or speculative technologies based closely upon extant models. Other expert participants, such as Marie (2FE) and Margot (1FE) argued that human space travel was feasible and necessary and did not talk about radically different technologies or practices, but focused more on analogies between future space travel and past human exploration on Earth.

¹⁷² Translation in Appendix IX

On the other hand, ten of thirty non-expert participants specifically discussed radical changes to extra-terrestrial human bodies. This third of the non-expert participant pool was further augmented by two detailed discussions from female experts (Adèle and Marie) concerning biological and technological changes to human bodies in space. Thirteen people talked about radical changes to human bodies, versus three who discussed these kinds of technological changes. This may be because people possess more information about human bodies (both through generalized cultural knowledge and embodied experience) than they do about space sciences, infrastructure and modes of transport beyond the Earth or because they perceive human bodies and psychology as being more problematic to spaceflight than the technologies humans have conceived for spaceflight.

People's preoccupation with human bodies in space is exemplified in the predominance of container metaphors in their discussions. Among all possible experiences for human beings in space - seeing other planets, the experience of zero gravity, witnessing the Earth from 'above' - interviewees spoke most about the experience of being enclosed in a small container. All participants possess a number of more closely-related domains of knowledge with which to discuss this subject and create analogies to express their imaginations of life or travel in and to space. Why then would they create metaphors and analogies between everyday containers rather than using more closely related experiences as source domains for analogy, such as air travel?

9.4 “Floating in a tin can”: Categorization and Prototypes

Long trips, including plane trips within the terrestrial atmosphere, were mentioned by interviewees. “*Avion*” (“airplane”) (in reference or analogy to human existence in space, and not in reference to “test pilots” or fighter planes, etc.) appears 20 times in the corpus, compared to everyday containers used in participant metaphors (such as “*boite*,” “*bulle*,” “*caisse*,” “*cloche*,” “*dome*”) that appear 29 times in the corpus. The distribution is as follows:

“*boite*” (“box”) (4x)

“*bulle*” (“bubble”) (17x)

“*caisse*” (“crate”) (1x)

“*sous cloche*” (“under a dome/bell jar”)(2x)

“*dome*” (“dome”) (5x)

Analogies such as François’ (3MNE) comment that being in a spaceship is “*comme se retrouver dans un gros avion*” (“like finding yourself in a big airplane”) are rare in the corpus. People did not talk about how being in a spaceship or habitat would be like being on a train, plane or other mode of transportation. Though air travel continues to be key in modelling projects for human spaceships, travel was not the most salient characteristic in participant metaphors. Constraint was more dominant.

The preponderance of constraint in participants’ depiction of space is evident in that, while people did create analogies between air **travel** and space **travel**, rarely did they make parallels, nor create analogies or metaphors between **airplanes** and **spaceships**. Why would it be more logical, or more cognitively rapid, for people to imagine boxes and bubbles rather than more analogous existing modes of transportation, notably airplanes? The majority of interviewees have personal experience with air travel, and all of them have a generalized cultural knowledge of traveling in airplanes. Nonetheless, it remains that they have more experience with containers: filling containers, overflowing a container, to themselves feel enclosed, “*coincé comme une sardine*” (“squeezed like a sardine”). Even an expert participant, an astrophysicist and planetary astronomer, more quickly and consistently made reference to a “soap box” when describing space ships, rather than an airplane or other more closely related category of analogy.

This sort of imagery can be considered prototypical, not only in the factXfiction of representations of outer space, but also in everyday experience. Eleanor Rosch (1973), in her extensive research on cognition and language, proposes the existence of prototypes in conceptual categorization. A prototype is a cognitive reference point used to establish the ‘center’ of a category, in other words, the proto-image of all representatives of the meaning of a word or category. A prototype will be a “good example” of a category.

Rosch’s initial studies (1973, 1975a, 1975b, 1977, 1978) concentrate on natural categories in the perception of color and form. However, she states that “other semantic categories, although unlikely to possess a natural prototype, may well have artificial prototypes; ...there is evidence that semantic categories are learned and processed in a manner more similar

to that of color or form than to that of artificial categories” (Rosch 1973, 349). She argues that these perceptual influences, whether or not they be from natural categories and prototypes (e.g. color categories and natural prototypes arising from the structure of the human eye and its color cones), structure categories of perception.

Extensive evidence of Rosch’s arguments has been produced in the forty years following the publication of “Natural Categories” (1973) (e.g. Medin, Altom, and Murphy 1984; Nelson 1996). There has also been considerable refinement and debate concerning prototype theory. The single-prototype theoretical models that became important in the 1980s, following Rosch’s major publications, gave way to exemplar-based models¹⁷³ in the 1990s (e.g. Barsalou, Huttenlocher and Lamberts 1998; Nosofsky 1988; Smith and Zarate 1990; Stich 1992), which were then followed by hybrid models in which researchers sought to take advantage of both prototype and exemplar models (Voorspoels, Vanpaemel and Storms 2008; Eysenck and Brysbaert 2018). An example of this hybrid research is Smith and Minda’s (2002) study on dot-pattern category learning. “Dot-pattern” and “dot-distortion” tests have been widely used since the 1970s to determine influences in human categorization and perception. Basically, participants are ‘trained’ using a series of exemplars, i.e., A rounded burst of dots on the screen is Category A, while a linear collection of dots is Category B. After training with a series of exemplars, participants are shown novel dot-patterns and asked to classify them according to different categories. Smith and Minda’s (2002, 801) goal in their dot-pattern experiment was to test the influence of both prototypes and exemplars and determine “which representation(s) control(s) categorization.” They concluded that participants used more prototypes in their learning than exemplars (though they did make use of both types of information, as confirmed by Molesworth, Bowler, and Hampton 2005).

Cognitive linguistics tends to subscribe to both prototype and exemplar models and both models demonstrate the biological bases for many human categories and the importance of cognitive categories in human thought and language. Cognition is a constant comparative

¹⁷³ Rather than arguing that categorization is based on matching stimuli with an abstracted, ‘center’ of a category, exemplar models argue that stimuli are categorized by comparing them to the other exemplars (examples) of a category. If a stimulus shares enough similarities with these other exemplars (rather than with one central, prototype) then the stimulus will be categorized as such.

process between what is perceived and the structured categories of previously perceived stimuli, an analogy between the new and the known. Because human cognition is largely a “best-match patterning system” (Ramachandran 2011) prototypes operate as the ‘best match’ so that humans can compare perceptual information to the central member of a category in order to quickly organize and react to stimuli. The prototypes interviewees use in their metaphorical constructions permit them to succinctly box up unknown input into a package that they know intimately. These metaphors permit people to get an immediate handle on mysterious or confusing input that allows them to begin manipulating it at a primary, or basic level of categorization. Having little to no information about a target domain of knowledge obligates participants to conceptualize it on this basic-level and seems to encourage a categorization based on other knowledge at this level.

In his 1987 book, *Women, Fire and Dangerous Things* George Lakoff insists on the influence of semantic categories in the structure of human thought and behavior. Lakoff’s arguments stem from cognitive semantics (Langacker 1987) and concentrate on how linguistic categories are shaped by the ways human perceptual systems, and subsequently our linguistic categories parcel reality in our daily lives. Though these categories are informed by universal human physiology, they are highly culturally informed.

To illustrate this argument, Lakoff cites “The Analytical Language of John Wilkins,” an essay written in 1942 by Jorge Luis Borges. In this essay, the narrator explains a supposedly ancient, Chinese system of taxonomy found in a dictionary entitled the “Celestial Emporium of Benevolent Knowledge.” This taxonomy divides all animal life into 14 categories:

- Those that belong to the emperor
- Embalmed ones
- Those that are trained
- Suckling pigs
- Mermaids (or Sirens)
- Fabulous ones
- Stray dogs
- Those that are included in this classification
- Those that tremble as if they were mad
- Innumerable ones

- Those drawn with a very fine camel hair brush
- *Et cetera*
- Those that have just broken the flower vase
- Those that, at a distance, resemble flies

This taxonomy is a categorization of the world based on cultural categories that are significant or useful within the cultural group and environment in which they are found. These categories frame experiences with animals in particular ways, impose a cultural order on perceptual information, and, it follows, on the form of reality itself for those who use of these categories. Michel Foucault (1994, XVI), in the preface to *The Order of Things*, describes his reaction to reading this passage from Borges, “laughter that shattered, as I read the passage, all the familiar landmarks of thought - *our* thought, the thought that bears the stamp of our age and our geography - breaking up all the ordered surfaces and all the planes with which we are accustomed to tame the wild profusion of existing things.” Borges is poking fun at how we organize the world according to our concepts and cultural realities and this caricature of cognition tickled Foucault. Borges brings to the fore the importance, as Foucault’s notes, of “the stamp” of context, cultural and personal experience on our way of understanding and reacting to the world. Borges’ list seems silly, but in being silly it allows for a reflection on how our own cultural groups categorize the world around them according to human scale and to the needs and desires of a particular community.

One of my favorite parts of Foucault’s comments is his remark about “tam[ing] the wild profusion of existing things.” Language, as Borges and Foucault emphasize, is a key method for domesticating the unruly and unknown. Conceptual categories based off previous experience are essential to this linguistic process. In a 2009 interview with *Der Spiegel*, Umberto Eco made a similar argument:

What does culture want? To make infinity comprehensible. And how, as a human being, does one face infinity? How does one attempt to grasp the incomprehensible? Through lists, through catalogs, through collections in museums and through encyclopedias and dictionaries... We have always been fascinated by infinite space, by the endless stars and by galaxies upon galaxies. How does a person feel when looking at the sky? He thinks that he doesn't have enough tongues to describe what he sees. Nevertheless, people have never stopping describing the sky, simply listing

what they see. Lovers are in the same position. They experience a deficiency of language, a lack of words to express their feelings. But do lovers ever stop trying to do so? They create lists: Your eyes are so beautiful, and so is your mouth, and your collarbone. One could go into great detail (Beyer and Gorris 2009).

For Eco, the taming of the unknown and the infinite, in large part through linguistic processes, is the primary goal of all human culture. He talks about how our limit to describe and express our experience, “the topos of the inexpressible,” parallels our limit of mortality. “We make lists because we do not want to die,” Eco suggests (Beyer and Gorris 2009). Part of the “wild profusion” Foucault refers to is our death; we categorize and impose order of our own, embodied design to control and to attempt to escape our natural life cycle.

Categorization permits us this illusion of “mak[ing] infinity comprehensible” in that it allows us to ‘know’ the unknown by analogizing it to similar experiences. Through categorization, we parcel the world into human-sized chunks (e.g. these things are mermaids, these other things are stray dogs). Though this cognitive method is universal to humans, as Borges demonstrates, these comprehensions remain highly motivated by the community of linguistic practice and their shared categories of reality. The words and categories we use to “break up the ordered surfaces and...planes” of existence are already based off of our existence and do much to constitute the future of that existence. Murphy (2016, 1038) reminds us that, “concepts not only contain knowledge of the world, they are also formed and processed in the light of our other knowledge.” For example, we learn concepts that are consistent with our knowledge faster than we do arbitrary concepts (Murphy and Allopenna 1994). When constructing concepts without feedback, we discover the category structure if the concept’s properties go together in a way that fits our expectations (Spalding and Murphy 1996). We learn many more of a concept’s properties when they are related to a consistent theme than if they are not (Hoffman, Harris and Murphy 2008).

When people imagine unknown experiences for which they have no direct perceptual information (i.e. embodied experience), embodied and cultural categories remain just as active as when they talk about perceived sensorimotor input. In addition to this, their central examples, or prototypes often seem more dominant in descriptions of unknown experience than in descriptions

of lived experience or familiar topics. There is an insistence throughout the corpus- across gender, age, levels of education and expertise - to use the same handful of images when describing imagined scenarios in space, particularly that of humanity in space. These are prototypical representations people associate with a limited number of basic-level experiences and they are common to the entire participant group.

When describing other aspects of life, politics, travel, etc., interviewees continued to use metaphors as frequently as when describing the unknown, but the source domains they used exhibited more variety in discussion of the known than in their discussions of human life in space. Metaphor pervaded all of our discussions, but the metaphors people used to talk about known phenomena and personal experiences were more varied than metaphors used to describe the unknown of outer space. Talking about the unknown seemed to prompt for the use of a more limited range of basic-level experiences when creating analogies. I argue that this is, in part, because of the more limited sensorimotor and cultural input my interviewees possessed. It seems logical that the more experiential and cultural knowledge we have of a domain of knowledge, the richer and more intricate our metaphors can become. People's discussion of outer space in the corpus were sometimes shockingly similar; people across the participant pool made use of the same handful of metaphors to describe the unknown of space. On the contrary, when interviewees spoke to me about other everyday experiences (e.g. their jobs, families, meals; experiences that were common across the participant pool), their metaphors were more varied. In my data, limited knowledge of the source domain, coupled with well-anchored cultural models, resulted in a more homogenized discourse within a community of linguistic practice, i.e. a tendency across the corpus for interviewees to repeat the same expressions when talking about space. While my interlocutors' talk about everyday life did share fixed French expressions, overall, they made use of a wider variety of source domains of experience to fuel their discussion of daily life than they did when discussing outer space. Compare the varied examples I discuss below, with the more repetitive, fixed discourse concerning space that I have been analyzing from the corpus.

In forty interviews I was exposed to numerous fixed metaphors in Standard French. People might talk about "*le fil du temps*" ("the thread of time"), things that "*éveille les idées dans*

[leurs] têtes” (“awaken ideas in their minds”), or “une poignée” (“a handful”) of clothes, people, ideas or other objects that could not literally be held by the ‘handful.’ There were also a variety of fixed expressions that were unique to one person. For example, Marie’s (2FE) discussion of the actors in the television series *The Expanse*, “*C’est très bien joué, mais le problème c’est qu’ils ont un charisme d’huitre*” (“It’s well acted, but the problem is they have the charisma of an oyster”) and George’s (2ME) discussion of a “chaotic future” as a “gigantic tree of possibilities” (“*Je ne sais pas, pour moi l’avenir a toujours été chaotique, uhhh....et donc, on est dans un arbre des possibles gigantesque,*” “I don’t know, for me the future has always been chaotic, ummm...and therefore, we’re in a gigantic tree of possibilities”). Both of these expressions, like so many others, I would hear only once in hours of interviews. People could get particularly poetic when they wanted to, as when Christian explained to me one of his favorite sensations:

“Tu es dans la ville, au milieu de l’agitation....Il pleut très fort, et toi tu as justement un parapluie....T’es dans Paris.....tu marches sur les eaux....Tu flottes, tu marches sur les eaux. À Paris ça arrive” (Christian, 2ME). V9:14¹⁷⁴

He talks about floating in the city, walking on water, while the rain pours down and people run in all directions to avoid it. I would experience precisely this moment with him several months later, during a walk around the Tuileries after a springtime lunch. As we sidestepped tourists through the Louvre courtyard, rain suddenly began pouring down. Everyone ran for the shelter of the palace’s stone overhang and he pulled his black umbrella from his backpack with a smile. The courtyard emptied out; an empty so rare to see in Paris that it took my breath away. He had perfectly described this sensation in our previous discussion: the floating, the perfection of an umbrella in a sudden storm.

“Trees of possibility,” the personification of oysters, and describing a euphoric experience as “floating” are not novel ways of speaking. Everyone used these kinds of fixed metaphors in their representations of different experiences, but it was uncommon for different people to make use of the same source domains when describing experiences, even if they were

¹⁷⁴ “You are in the city, in the middle of the agitation...It’s raining really hard and you have an umbrella...You’re in Paris...you’re walking on the water. You float...you walk on the water. In Paris, this happens.”

similar (or identical) experiences (e.g. those of the weather, their friends, their work). For example, when talking about their writing, two expert participants developed very different discussions with differing source domains. Margot (1FE) explained to me how travel nourishes her writing, “*Mais, ce que j’écris est beaucoup nourri par les voyages que j’ai pu faire. Donc, pour moi, c’est toujours un plus de pouvoir voyager, y compris en tant qu’auteur aussi. Ça fait juste partie de ce qui me pousse.*” (“But, what I write is very much nourished by trips I have taken. So, for me, it’s always a plus to be able to travel, as an author, too. It’s part of what pushes me.”) She used metaphors of **JOURNEYS ARE FOOD** and **EXPERIENCES ARE ACTORS** (traveling “pushes” her).

When discussing his creative process, Jean-Denis (3ME) told me that he could not write at night, but wrote on a daytime schedule like a “*fonctionnaire*” (“a government employee”). “*La nuit tout est glauque, tout se passe. J’ai l’impression d’être dans un cauchemar quand j’écris la nuit. J’ai l’impression que c’est environné de présences hostiles. C’est un silence particulier, c’est épais je trouve. C’est lourd*” (“The night is morbid, everything happens. I feel like I’m in a nightmare when I write at night. I feel like it’s surrounded by hostile presences. It’s a special silence, I find it thick. It’s heavy”). Discussing their personal experiences, with which they have extensive, intimate knowledge, it is no surprise that these two authors used different metaphors to describe the experience of writing. Extensive knowledge permits them to create more detailed comparisons, which subsequently permits them construct richer representations and comprehensions.

This was often the opposite of what occurred when people talked about space. Metaphors about spaceships and habitats rarely issued from novel source domains (e.g. snowglobes) but repeated the same source domains. Discussions of outer space were more fixed and repetitive across interviews. As these were individual interviews, there was no priming for the repetition of certain expressions from other interviewees. Interviewees independently used the source domains of cans, boxes and domes across the data.

This seems evident to say, but the implications of this are far-reaching. Limited knowledge of a target domain (in this study, life in outer space) provides speakers with limited characteristics with which to identify patterns and build analogies and metaphors. This in turn

limits the categories of comparisons people can deploy, and the depth of understanding they can develop about unknown target domains. Applying prototypes in initial perception and categorization is cognitively efficient, but to remain on the level of prototypical categorization is detrimental to more complex understandings and representations. This is the danger of oversimplification in discourse; of filing away entire swathes of experience in generalized categories corresponding to prototypes, or caricatures.

My research interlocuteurs prioritized basic-level sensorimotor experiences (i.e. of constraint) over literal terms and more directly analogical terms (i.e. plane) that could be used to describe the same objects and experiences. Instead of using the word “space ship,” a term for space transport that is found in countless cultural texts concerning space (e.g. from NASA and other scientific sources, to literature, film and games) that they all were exposed to, participants deployed source domains of specific containers, on occasion even creating new metaphors (e.g. “*la bulle de Noël*”). How they imagined their bodies might feel was of greater priority to them in their discourse than the semantic or factual accuracy of their statements.

This prioritization of the corporal did seem to depend on what kind of statements people were making. Participants used the term “space ship” in various forms (e.g. “*vaisseau spatial*,” “*vaisseau interstellaire*”) 87 times in the corpus. The use of these literal terms is more prevalent than metaphorical ones, but these uses are found predominantly in descriptions of images from science and science fiction or in reference to scientific probability (e.g. finding a source of energy to power a space ship for interstellar travel). People had a greater tendency to substitute “space ship” for an analogical or metaphorical term (e.g. to travel in “sardine cans”) when producing narratives about potential scenarios in space. This use of metaphor seems to be motivated, in part, by the perspective taken upon the phenomenon in question. When repeating scientific facts or describing images of space travel they have physically seen, my interlocutors are more likely to use the terms from these textual sources. No participants spoke, for example, of scientific estimates for sending “sardine cans” into space.

On the contrary, when imagining space ships, especially human interactions with space ships, people’s language became more metaphorical. In discussions of human interactions with space craft, the term “spaceship” was replaced by “box,” “can” and “crate.” Describing literal

characteristics of an object seems to motivate literal terminologies, whereas once participants put this object into action, into a context or scenario, the boundaries of the category become more fuzzy, interchangeable with other terms in order to emphasize other salient characteristics. To describe a spaceship as a box is to describe it from the perspective of a human actor, in particular with the assumption of other human actors (or oneself) within the space ship. The "tin can" spacecraft is not conceptually distant, nor disembodied, but proximal. These metaphorical representations of spacecraft are linked to terrestrial, embodied experiences and sensations and people deploy them as active nouns in phrases. (E.g. space ships "enclose," "restrain," and "hold" people).

There is another particularity in the shift from literal language to metaphorical production in the discourse of participants that is motivated by the kinds of categories they use. The metaphors of bubbles and boxes discussed in this chapter can be motivated by generalized cultural knowledge or embodied experiences with these objects and function as prototypes for categories. The categories, in this case, are often semantic (e.g. spaceships), but are more predominantly conceptual (e.g. what it would be like to be in a spaceship). If "spaceship" is the target domain of knowledge, the prototype for "spaceship" is not a can or a small box. The cognitive prototype of the category "spaceships" would be a NASA shuttle, or spaceships from popular images and films. Boxes and cans are prototypes for the conception of constraint, which is what participants are describing when describing humans in spaceships. The prototypes in these metaphors are not direct analogies between salient characteristics of objects, but of experiences, sensations and conceptions.

The salient characteristics in metaphors describing the target domain of human space travel using the source domains of small containers are not the material characteristics of these containers, nor a correspondence in size or function. The salient characteristic between the spaceship and the box is the sensation of being "boxed in." This characteristic is more prevalent in participant discourse than any other conception of spaceships and human interactions with them. It is an embodied category that is being expressed, not only of one stimuli, but of a gestalt of being enclosed within a space, unable to go out and "get some air" or smoke a cigarette. (As

Marie [2FE] explained, “*Je peux pas fumer dans une station spatiale. Et je ne peux pas sortir fumer sur le balcon*¹⁷⁵.”)

To what extent are these conceptual categories artificial? This question necessitates further research, however I would hypothesize that many of the conceptual categories participants talk about are natural categories, motivated by human physiology. The source domains in the metaphors discussed are physical objects that are deployed to describe physical experiences and sensations. These are not lived physical experiences like visual perception of colors (Berlin and Kay 1969) or shapes (Rosch 1978), but imagined sensory experiences, the comprehension of which remains informed by biological and perceptual factors (e.g. touch, sound, motion, Up/Down orientations).

In all cases the conception of constraint is central to participant imaginations of human experience in space. However fascinating other potential experiences may be, it is essential to sustain extreme physical constraints in order to live them. These constraints were one of the primary reasons participants lacked a desire to travel to space. Though it may interest them to see the Earth from above, or to see an alien landscape, in “*les conditions actuelles*” (“current conditions”), most participants were unwilling to be space travelers, or to even imagine being one.

9.5 LIFE IN SPACE IS LIFE IN A CONTAINER

It is not only their personal space travel that is put into question or negated by the metaphor **LIFE IN SPACE IS LIFE IN A CONTAINER**, but also the project of human colonization in space. Many participants contested that life in an enclosed space is not a life at all (e.g. “*Ce n’est pas une vie*”/“It’s not a life”), others argued that humans would go crazy if enclosed for too long. So long as **LIFE IN SPACE IS LIFE IN A CONTAINER**, the majority of participants do not perceive it as a sustainable, or desirable project.

The conceptual metaphor **LIFE IN SPACE IS LIFE IN A CONTAINER** has implications for future human projects in space and is founded in realities of present and past space programs

¹⁷⁵ “I can’t smoke in a space station. And I can’t go out on the balcony to smoke.”

and generalized cultural knowledge concerning historical and fictive space travel. The vastness of the experience proposed is encapsulated cleanly in a few common experiences and objects. In the conceptual metaphor of life in the bubble, and in the surface metaphors in which this conception is manifested, everyday experience, in particular prototypical experience, takes priority over source domains of experience more closely linked to the target domain, even over generalized cultural knowledge concerning potential forms of this projected experience (for example, the use of more literal terms such as “habitat” or “spaceship” instead of “*bulle de Noël*” [“a snow globe”] and “*caisse de savon*¹⁷⁶” [“soapbox”]).

One implication of this finding is that it seems individuals comprehend and imagine even that which is distant, alien, unknown or Other, in terms of their own experiences, surroundings, categories and the central examples within those categories. In this case, people mapped observations and reports of life in a space shuttle or in the ISS on what they know of objects close to home, like boxes. The more unknown the target domain of knowledge is, the more personal and prototypical analogies become in order to facilitate comprehension. When presented with unknown categories, participants return to basic-level knowledge. What is interesting is that this basic-level knowledge is often not within the domain being discussed (e.g. air travel or scientific representations of space colonies), but issues from people’s everyday lives. When imagining space, interviewees used generalized cultural texts to discuss possibilities and predictions, but when describing what space is like, they took recourse to their own bodies and everyday physical experiences.

A strong example of this in the corpus is Antony (2MNE), who created an extended analogy between leaving his house to take a walk and leaving the Earth.

“Le premier truc qui me vient c’est que je prends une bouteille d’eau. Je prends une bouteille d’eau. Je prends mon sac à dos, là-dedans je mets une bouteille d’eau. Je fais quoi, franchement, j’imagine que je pars. Je vais me promener...

Je prends une bouteille d’eau, je prends des barres de céréales...je prends une serviette. De quoi se...de quoi se laver, allez mon savon, mon savon et puis.

¹⁷⁶ In French slang a “soapbox” can also refer to an old, broken-down car. A car can also be called “*une caisse*” (“crate”), again this usage typically refers to a used, or broken-down car.

Allez, je pars à Koh Lanta, Koh Lanta¹⁷⁷. Je pars, je prends une brosse à dents, un savon, une serviette, une bouteille d'eau. De quoi me changer au moins une fois. Franchement...." (Antony, 2MNE). V9:15¹⁷⁸

Antony does an inventory in his mind of the objects he takes with him when he goes for a walk. He extends his analogy further by citing a popular French reality television program, *Koh Lanta*, that takes place on a deserted island. The deserted island analogy for going to space was used by two other interviewees when imagining what they would take to space (e.g. "*C'est un peu la question, 'Si tu étais sur une île déserte qu'est ce que tu emporterais avec toi?'*" ("It's a bit the question, 'if you were on a deserted island what would you bring with you?'" (Olivier, 1MNE). However, these two did not develop this analogy as far or through the same walk-through process of imagination and stream of consciousness speech.

My arguments here are not concerned with whether what a person responded is their "true" answer, or remains their answer were I to question them again one year later. I am interested in the process they go through when they create analogies, especially the source domains of these analogies and how they frame their understanding of the target domain. When asked what they would take to space, interviewees did not have well-constructed, precise answers, nor did they respond, "Oh yes, I have previously considered this, and decided that..." They applied their knowledge and experience of a similar situation to a formerly not, or little considered question. In this case, when Antony did so, he used a basic experience of leaving his **home** to develop an understanding of leaving his **home planet**.

When people talked about existence in space, they attempted to understand this experience through their bodies and personal experience, rather than trying to more objectively or 'sterilely' understand these potential experiences. This understanding did not predominantly issue from their academic knowledge of the subject, or lack thereof. As in the example above,

¹⁷⁷ French reality TV show

"The first thing that comes to mind is that I would take a bottle of water, a bottle of water. I take my backpack, inside I put a bottle of water. What do I do, really, I imagine that I am leaving. I am going to take a walk... I take a bottle of water, I take some cereal bars...I take a towel. What I would need...what I would need to wash up, okay my soap, my soap and then...Okay, I am off to Koh Lanta, Koh Lanta. I am leaving, I take a toothbrush, a soap, a towel, a bottle of water. At least one change of clothes. Frankly..."

their conceptualization issues from source domains of knowledge that are essentially unrelated, but linked conceptually through basic physical experiences, sensations and emotions.

The extraction of elements of the experience that participants do not find as important to emphasize is part of what makes metaphors such rich sources of discursive information. When people mobilize metaphors, such as “*la caisse de savon*,” they are putting the considerations they find important to the forefront and leaving all others unspoken. Analysis of these metaphors provides rich information concerning 1) what participants consider salient to a topic of discussion, 2) what kinds of experience or knowledge are most frequently used to create novel comprehension and 3) how these metaphors are likely to prime further comprehension. In the next chapter, I will explore these implications in individual comprehension and speech, as well as in public discourse.

Vignette 10: “Un peu comme un marin en mer”

(Female, non-expert, 51 years old)

Véronique worked as a physical therapist in the suburbs, but came into the city on her days off when there was nice weather. Her short hair hugged her round face and a pair of quick, dark eyes behind thick-rimmed glasses. When I spoke to her over the phone to set up our interview, she said she enjoyed Montmartre, and would be passing through the next Friday afternoon. She later confided that she liked not living in Paris, but still having easy access to the city. I met her for a coffee in the sunshine on a patio in the rue des Abbesses, where we made small talk about her work, recycling and pollution in the city and how much we both enjoyed traveling. Then I began to ask her my “weird questions,” as her friend who had put her in contact with me had described the interview.

“Un kilo?” she repeated when I asked what she would bring with her into space. “C’est pas beaucoup ça. Un kilo, ça fait peu. Des bouquins, je crois.”

I followed-up with a distinction many people had made, “Paper books?”

“Ouais. Ou en tablette,” she responded. “Peu importe, de la littérature. De tout. Des romans. Un dictionnaire. Très important un dictionnaire. Parce que c’est...c’est... la première étape de la curiosité, elle est là. Moi, je suis tout le temps en train de me poser des questions, ‘Ah, ce mot-là, d’où il vient?’ Voilà, quoi.”

She paused briefly before continuing, “Allez quoi d’autre, je ne sais pas. Une boîte de confit de canard.” A giggle escaped when she mentioned the confit, and she continued, “Des petits plaisirs. Un peu comme un marin en mer, quoi. Tu pars trois mois sur un bateau, tu amènes de quoi te faire plaisir un peu. C’est pareil.”

Véronique was one of only a handful of people to create her initial analogies between spaceflight and maritime travel on Earth. She didn’t use this analogy when talking about space ships themselves, or the vast reaches of space to be travelled. This analogy appeared in her discussion when she analogized terrestrial, embodied experience with potential embodied experiences in space.

I found it interesting how her discussion demonstrated the ontological power of analogy. She started by saying “a little like a sailor at sea” and then developed this analogy with a few other elements of comparison she considered important. Leaving for three months on a boat, taking little pleasures with you - her simple “X is like Y” analogy became a miniature narrative. Then it was not only that maritime was “like” space travel; she suddenly equated them as being “the same.” When imagining what she would bring on this kind of journey, she developed a conception in which space travel would be the same as maritime travel. She imagined what would be necessary for her - digitalized novels and a dictionary, as well as a little

pleasure (a can of duck confit) if she were to find herself in the position of a 'star sailor.'

Chapter 10: Ontological Metaphors and (Extra)Terrestrial Ontologies

“I know how it sounds, but, believe me,
if you can imagine it, it’s possible.”
(Peter Bishop, *Fringe*, S2:E21)

One of the things that I found most surprising as I collected data was how much these interviews about space were composed of discussions about the Earth and humanity. Looking back on the data and the theory informing this study, this makes sense. Participants have extensive experience with the Earth and human beings as well as strong, personal convictions concerning them. In addition to the fact that the Earth and people are important to interviewees, the questionnaire proposes scenarios of leaving both behind. In the interviews, the absence of the Earth and humanity in space was often a key characteristic of space. If there was a human presence in space, people most often talked about it as human life that exists in the absence of Earth and most of the human species. Many people talked about the “infiniteness” of space, but they imagined it as an infinite void. Intellectually, the majority of people I spoke with knew that space is not empty, however this emptiness, isolation and absence of everything familiar remained a central characteristic of space in most people’s conceptions.

People described the emptiness of space in a number of ways, though these descriptions remained pre-dominantly egocentric. Interviewees evoked this emptiness by talking about being away from the Earth, the activities they enjoyed and the people, objects and experiences that populate their daily lives. Even if humanity were to colonize space, space remained empty of ‘humans’ as most people considered that humans existing in space would no longer be ‘human.’ People repeatedly returned to discussions of human ontology. Having participants imagine humans in a vastly different environment often prompted them to discuss the boundary between the human and what is no longer human. This boundary was discussed as being physical, psychological and cultural.

First of all, much of what people conceived of as being a ‘human life’ (and one worth living) was informed not only by basic physiological needs of human bodies, but by cultural needs of French bodies and minds. When I asked people what they miss about the Earth, they often described experiences of France and Europe. They spoke about missing the variation of landscapes (a variation that is easy to access in the environmental diversity of the Hexagon); about ‘good meals’ and ‘good wine;’ about being able to see their friends and family and walk around cities, stopping in cafés or to chat with acquaintances. Participants did not describe human life as austere, or research or work-based. For them, life was predominantly about pleasure. Food is an excellent example of this, as most participants understand that food was and would be available to humans in space (whether by taking it along in dehydrated form or cultivating it locally). However, people did not imagine space food as being as varied or pleasurable as food in France and the lack of French cuisine and the French social style of consuming a meal (spending hours discussing and eating with other people) made people question if human life in space would be a life worth living.

People connected changes in diet to other physical changes that would result from living beyond the Earth: including different gravity, amounts of sunlight and length or existence of lunar cycles. They argued that humans may be taller with lighter bones on a planet with less gravity than Earth, or shorter and stockier on a planet with a greater gravitational pull. They may become paler or darker in complexion depending on the amount of sunlight they receive. Their circadian rhythms would shift according to day/night cycle on a planet or space station. Their bodies would be altered because of the difference in nutrients and toxins consumed. A few people, including a nurse and science fiction fan, argued that gene therapies could alter human genes to better support the conditions of outer space: altering skin, bone structure, oxygen and nutritional needs as well or changing human DNA to better withstand radiation and cosmic rays.

Others went further and imagined races of ‘space humans’ that had adapted or evolved within extra-terrestrial environments in more pronounced ways (e.g. a race of people that lived perpetually in orbit in zero gravity and had become more radially symmetrical, with only arms and hands, as legs and feet were useless if one’s existence were spent floating). A few people talked about transhuman conceptions of humanity beyond the Earth, in which robotics and other

technologies are implanted into human bodies to make them more adaptive to extra-terrestrial environments. Many people connected transhumanist representations to projects for space exploration, yet, rather than discuss and describe these imaginations, they were quick to reject them. There was a greater interest in describing biological modifications to humanity than technological ones and people discussed biological modifications more positively or neutrally.

Participants spoke most about psychological effects of and adaptations to space travel. As discussed in previous chapters, constraint, isolation and obligatory togetherness were the primary preoccupations of participants. Most people thought that these conditions would drive humans ‘crazy;’ would cause them to kill themselves or their fellow crew members, to become depressed, anxious and unwell. The need for space, movement and the ability to have elective contact with other human beings were central to the psychological needs people described. Expert participants, especially scientists, argued that these human factors were much more problematic than technological ones when designing missions to space or plans for colonization. Interviewees expressed an overall opinion that human bodies could be pushed further than human minds.

People also felt that separation from Earth would be a serious psychological hindrance. They talked about no longer being able to engage with terrestrial environments, especially oceans and cities. Others discussed what it would be like to be so far from the Earth that the sky was completely different: to not be able to see, or barely be able to see the Earth in the sky; to not have the same constellations; to not have the same moon (but possibly multiple moons, or none at all). Take the following examples, all of which come from men aged 40-59 and three of which are from expert participants.

“Mais quand on est dans une station spatiale, on voit la Terre. Et quand on va sur Mars, ou on va vers Mars, ben la Terre c’est une tête d’épingle. Maintenant, c’est pas l’état d’esprit des conquérants qui allaient à ce nouveau monde dans des coquilles de noix, uhhhh bon on va y aller. Go, quoi. Déjà, il va y avoir un problème psychologique pour couper le cordon” (Simon, 2ME). V10:1¹⁷⁹

¹⁷⁹ “But when you’re in a space station, you see the Earth. And when we go to Mars, or go towards Mars, well the Earth is a pinhead. Now, it’s not the mentality of conquerers who went to that new world in wooden shells, okay we’re going to go. Go, you know. Already, there is a going to be a psychological problem in cutting the cord.”

“Il ne serait-ce que voir la Terre depuis l’espace, par exemple. Pas nécessairement que d’aller sur un point X, mais effectivement de voir cette petite balle de bleu là. Ça doit être...le soleil...voir les étoiles...d’un seul coup. Ça doit être magique quoi” (Martin, 2MNE). V10:2¹⁸⁰

“Ce qui me fascine...c’est les problèmes psychologiques. C’est à dire, jusqu’au présent où que soit allé l’homme, il a toujours vu, il a toujours su (re)connaître son monde. Déjà si on va sur Mars, il peut voir la Terre, mais c’est un point lumineux. C’est comme Mars, pour nous, c’est un petit point. Si on a une bonne vue, on voit qu’il est un peu rouge...C’est à l’opposé donc que je ne sais pas comment un humain vit ça” (Joseph, 2ME). V10:3¹⁸¹

“PAF! t’es sur la Lune, tu lèves la tête t’as la Terre dans le ciel. Et la Terre vue de la Lune elle est 4 fois plus grande que la Lune vue de la Terre. La Terre est plus grosse que la Lune. C’est un machin comme ça, bleu un peu brillant” (Christian, 2ME). V10:4¹⁸²

Not being able to *see* the Earth was a common comment people made when discussing psychological challenges and changes. Seeing the Earth from space was also one of the more common experiences interviewees said would interest them if they could go to space (as Martin mentions in V10:2). People repeatedly talked about physical, or at least visual contact with the Earth and there was an accompanying preoccupation with a human cleavage from Earth (“to cut the cord,” as Simon said), which often led to explicit discussions of humanity as being ‘made for’ or intimately connected to the planet.

Cultural changes were also cited, however these were the least likely effects for participants to link to a shift in humanity past the boundary of what they considered ‘human.’ New social structures and forms of religion and spirituality were cultural forms that many participants felt would not only ‘organically’ adapt to life in space, but that must necessarily

¹⁸⁰ “Just to see the Earth from space, for example. Not necessarily to go to point X, but to see that little blue ball. That must be...the sun...to see the stars...all at the same time. That must be magical, you know.”

¹⁸¹ “What fascinates me are the psychological problems. I mean, until the present day, wherever mankind went, he always saw, he always knew how to recognize his world. Already if we go to Mars, he can see the Earth, but it’s a tiny speck. It’s like Mars, for us it’s a little dot. If we have good sight, we see that it’s a little red...It’s the opposite so I don’t know how a human could live through that.”

¹⁸² “Boom!” You’re on the moon, you lift your head and the Earth is in the sky. And the Earth seen from the Moon is four times larger than the Moon as seen from Earth. The Earth is bigger than the Moon. It’s a thing like that, blue and a little shiny.”

change to accommodate humanity beyond the Earth. I thought Olivier (1MNE) described this beautifully:

“Rien que la religion. Enfin, ‘Dieu créa la Terre,’ fin il y a quand même...tout tourne autour de la Terre. Et puis pendant longtemps la Terre a été le centre du monde, le soleil qui tournait autour de la Terre. Tout est quand même...qu’est-ce-que tout ça voudrait dire? Ça serait un renversement des valeurs. Donc ça serait peut-être le problème principal” (Olivier, 1MNE). V10:5¹⁸³

Many other people also considered this “reversal” or upheaval of values to be inherent to human space exploration and colonization, whether it occurred organically, or was instituted artificially. Below Christian, Arthur and Édouard describe three scenarios through which humanity might come to live under different social systems.

“Donc, dans ce cas-là, il faut imaginer des organisations sociales qui vont être très différentes. Les imaginer c’est pas très difficile, mais ce qui est difficile c’est de les mettre en place.

On pourra imaginer, par exemple, ce qui conviendrait comme organisation sociale dans un vaisseau multi-générationnel c’est peut-être pas le truc disons à la Galactica. Est-ce qu’il y a un chef, des sous chefs, etc.? Ça peut-être un truc plus, uhuh, plus désorganisé, plus cette idée entre guillemets à la mode des chasseurs-cueilleurs de l’Amazonie et qu’un vaisseau génération qui a des chances d’aboutir, ça peut être non pas une structure interne très techno, mais structure interne tropicale humide, avec plein de machines qui gèrent des trucs. Des espèces de divinités, des choses qui se passent pour des divinités qui incitent les personnes qui sont dedans à faire des choses, mais qui sont en fait appuyer sur le bouton au bon moment et que ces gens dedans vivent exactement leur vie dans une tropicale humide qui fait 50 kilomètres

¹⁸³ “If only religion. I mean, ‘God created the Earth,’ there is all the same...everything revolves around the Earth. And then, for a long time the Earth was the center of the world, the sun went around the Earth. Everything is still... what does that mean? It would be a reversal of values. So, that might be the main problem.”

carrés, ce qui est la surface interne d'un énorme vaisseau génération. Et qu'ils vivent comme ils vivent dans l'Amazonie, on leur n'a pas dit" (Christian, 2ME). V10:6¹⁸⁴

"C'est ça qui pose problème et je pense qu'il faut arriver à une certaine philosophie de vie qui fera un entraînement, et qui fera partie du stage d'entraînement et qui prendra, qui prend des années parce qu'il faudra complètement modifier la mentalité humaine. Fin, pas que ça soit déjà pas fait dans certains domaines, je pense en particulier au bouddhisme.

Pas dans la religion mais dans la philosophie. Oui, on prend l'exemple du Dalai Lama, le dernier hein, qui a eu l'intelligence d'avoir un esprit scientifique et d'essayer de transformer pas le bouddhisme, pas seulement dans son aspect religieux, mais dans son aspect philosophique. Et je pense qu'avec cette philosophie-là, si elle est enseignée de façon suffisamment profonde, avec des pratiques assez régulières, donc un système un petit peu religieux. Un système de pratiques régulières qui seraient un petit peu comme une psychothérapie qui serait pratiquée tous les jours avec un système un peu chinois comme on a vu avec Mao avec des contraintes journalières, par exemple de sport ou d'union qui permettrait aussi à la population qui voyagerait dans l'espace de rester unie tout le temps, vers un objectif commun" (Arthur, 2MNE). V10:7¹⁸⁵

"J'imagine qu'au cours des générations il y aura des mutations qui se produiront. Peut-être pas des mutations physiques, mais des mutations psychiques, fin dans l'évolution de la mentalité, des relations sociales et puis peut être à terme

¹⁸⁴ "In that case, it is necessary to imagine that social organization will be very different. To imagine this isn't that difficult, but it is difficult to put it into action.

We can imagine, for example, what social organization might work in a multi-generational vessel, it's maybe not something like, shall we see, *Galactica* [referring to the television program *Battlestar Galactica*]. Is there a chief? Lesser chiefs, etc.? It could be something less organized, more the idea of models à la hunter and gatherers in the Amazon and that a multi-generational vessel that has a chance of success, it's maybe not a very technological internal structure, but a humid, tropical internal structure, with a bunch of machines that manage things. Some sort of divinities, something that could function as a divinity that would incite people to do things, but that are actually just pushed by a button at the right moment and all the people inside live their lives in a humid, tropical environment that is 50 square meters, which is at the interior of an enormous multi-generational vessel. And they live as if they were living in the Amazon. No one told them."

¹⁸⁵ "That's the problem and I think that we would have to have a life philosophy that would train people, and that would be part of their training, that would, that would take years because we would need to completely modify the human mentality. I mean, it's not like we haven't already done this in certain domains. I think especially about Buddhism.

Not as a religion, but as a philosophy. Yes, we can take for example the Dali Lama, the last one, who was smart enough to have a scientific spirit and to try and transform Buddhism, not only in its religious aspects, but in its philosophy. And I think that with that philosophy, if it is taught profoundly enough, with regular actions, so a system a little bit religious. A system of regular practices that would be a little bit like psychotherapy that would be practiced daily with a system a little bit Chinese like we saw with Mao, with everyday constraints, for example, team sports that would allow for the space voyagers to remain united towards a common goal."

effectivement une évolution aussi, en fonction des conditions de vie, de climat, je ne sais pas...” (Édouard, 3MNE). V10:8¹⁸⁶

These men imagine humanity in space in the long-term, but their proposals for accomplishing this socially are very different. Christian describes the establishment of social control within a spaceship from the outset, in which humans would be unaware of their real condition and would be encouraged and dissuaded from behaviors by false, push-button deities. Similarly, Arthur argues that a new social system and philosophy would be necessary from the beginning, even integrated into training of astronauts and colonists. Rather than creating mechanical false gods, Arthur describes a social philosophy similar to forms of communism that would encourage unity among small groups in space. Édouard takes the most hands-off approach, describing a physical and psychic human evolution, without the need for artificial social control. Whatever the case, all three men felt that new social models would need to accompany humanity into space.

Not all people associated positive or productive sociocultural changes with human space exploration. Charlotte, a young marketing consultant with a background in social science, painted a different picture when describing human societies in space.

“Je pense que sur le plan social et cultural ça va être énorme, une regression énorme, et que...ça serait plus une situation de conflit. Si, justement on est obligé, on quitte la Terre, pas par désire mais par obligation, et qu’ils se retrouvent sur des multiples communautés qui survivent péniblement, je pense que les relations seront moins bonnes que les cultures seront moins florissantes...et donc je pense qu’il y aura une énorme perte en qualité de vie y compris sur le plan de la stimulation intellectuelle, culturelle et sociale” (Charlotte, 1FNE). V10:9¹⁸⁷

¹⁸⁶ “I imagine that over the generations certain mutations would occur. Maybe not physical mutations, but psychic mutations, I mean, in the evolution of the mentality, social relations, and maybe, over time, an evolution too, according to the living conditions, climate, I don’t know...”

¹⁸⁷ “I think that socially and culturally it will be an enormous, an enormous regression and that it will probably be more of a situation of conflict. If we are obligated, if we have to leave the Earth, not because we want to, but because we must, and people find themselves in a handful of communities trying with great difficulty to survive, I think that relationships will be worse and that cultures will flourish less...and so I think that there will be an enormous loss in quality of life, including in terms of intellectual, cultural and social stimulation.”

Instead of evolution, Charlotte describes regression. She spoke at length on this regression, depicting human societies in space as disjointed, battling for resources and returning to tribalistic behaviors. This comprehension seemed to be based on a vision of ‘human progress’ in which “intellectual, cultural and social stimulation” were connected to a wealth of resources and a lack of struggle. She argued that, constantly at war with each other or with their environment, human groups would be unable to create art and engage in large-scale collaborative projects. The disparity between her comments and those of Christian and Édouard (V10:6 and V10:8) reflects an ambient tension in the corpus between a prioritization of exploration, new territories and new knowledge (no matter the cost, even if at great difficulty) and a prioritization of human florescence on Earth. Charlotte did not imagine human civilization as positively changing in the rugged environment and lifestyle of space colonization, whereas Christian entertained the usefulness of deceiving generations of humans entrapped in a spaceship in order to send humanity further into the stars. A handful of people seemed to be more compelled to plunge to the depths of the known and refine it. Nonetheless, most interviewees opted to go wide, to extend the known and to make it as expansive as possible.

Though these tensions between models of refining Earth and exploring the cosmos pervaded the interviews, by and large, cultural and/or social change was the domain of human experience that people most linked with positive changes, that may prompt humanity to ‘grow’ or ‘develop’ ‘beyond’ its current, violent state. People described both utopian and dystopian visions of humanity in space (many people subscribing to the possibility of both significant positive change and significant problems and loss). Whereas discussions of physical changes to humanity were most linked to dystopian visions (e.g. transhumanism), people primarily linked cultural changes to utopian visions: of humanity moving beyond its social differences; of uniting under a common goal; of better understanding the human place and purpose in the multiverse. In one of the more esoteric and utopian discussions on the topic I would have, Christine explained to me that humans could only succeed in space “*lorsque nous évoluerons plus sur le plan spirituel que matériel et que nous serons plus en harmonie avec la nature, donc avec le cosmos, et lorsque notre cerveau se sera encore plus développé*” (“when we evolve further spiritually, not materially, and when we are more in harmony with nature, therefore the cosmos, and when our

minds will be more developed”) (Christine, 2FNE). Christine was not talking about a biological evolution, or technological advancement, but greater spiritual awareness that would allow us to be in “harmony” with the cosmos. She does not ascribe a particular role to the cosmos, or nature (as other human groups have at different times, e.g. Young’s [1987] discussion of the kinship structures some North American indigenous tribes attribute to the cosmos). Unlike the majority of other interviewees, Christine gave priority to humanity’s spiritual condition, over its biological or technological circumstances, when imagining successful human futures in space.

Most people did not talk about the kind of spiritual awareness Christine found important, but physical and psychological changes were considered by most as a given. Among all adaptations for humanity in space, cultural changes were conceived as being the most difficult to achieve. Participants frequently discussed what I will call the natureXculture of the human when constructing their ontology of humanity. Some participants cited wars, violence and explorationXcolonization as part of human ‘nature,’ whereas others possessed a diametrically opposed view of human strife as being caused by our limited cultural understandings, understandings that can be altered in order to improve our interactions and societies. Exploration, curiosity and a drive for discovery were predominantly understood as ‘natural’ human characteristics that were positively viewed. However, the extent to which this curiosity was linked to war, exploitation and domination varied. Participants possessed heterogenous opinions about whether humans could be curious, but kind, or were essentially curious, but killers. Whatever their opinion, it was human natureXculture that they described as the most difficult to change.

Operating within this logic of destructive responses to social difference, several people talked about future generations of humans (without questioning their ‘humanity’ as such) born beyond the Earth. Though human, once they possessed another culture and another history people envisaged a strong possibility of their desire for independence from the Earth. Many participants based their imagination on analogies with former British colonies, particularly the United States. They talked about Martian colonies rising up for their independence from the Earth or space stations going AWOL¹⁸⁸.

¹⁸⁸ Absent Without Leave

As people talked to me about outer space, they developed arguments in which space was simply a context for human activity and change. Space was a scene upon which human history could play itself out; upon which the drama between humanity and its home planet was occurring. Because of the sheer mass of the interview data and the purview of my thesis, I will not be able to address all of the data on this theme. In thirty-three hours of recordings, I had forty more or less unique takes on how the drama of humanity's relationship with the Earth may unfold. However, amidst the particularities of individual opinions, there were several conceptions that remained pervasive across the interviews. I have chosen to discuss the two dominant ontological metaphors for humanity and Earth in the corpus. They are: **EARTH IS AN ACTOR** and **HUMANITY IS MADE FOR EARTH**.

As discussed in the introduction to Chapter Six, ontological metaphors are metaphors in which the target domain is conceptualized as an entity or a substance. Personifications of all kinds fall into this category, such as the metaphor I analyze below **EARTH IS A DAMSEL IN DISTRESS**. Ontological metaphors are the category of metaphor that most directly asserts that the target domain *is* the source domain. Rhetorically, ontological metaphors are explicit declarations. To contrast with an example from this data set, the structural container metaphor "sardine can" to refer to a spacecraft (E.g. "The astronauts were stuck in their sardine can") and the ontological metaphor "The spaceship is a sardine can" have different declarative weight. As previously discussed, types of metaphors (structural, orientational, ontological) can overlap and these metaphors all require a comprehension of one domain of knowledge in terms of another. Nonetheless, the structural metaphor more actively modifies the noun through the description of individual characteristics of the spaceship, rather than asserting that the spaceship is another entity altogether. In ontological metaphors, the target domain *becomes* the source domain, rather than being described as being *like* the source domain.

I do not assert that ontological metaphors do more to cognitively inform participant conceptions or behaviors. However, these metaphors seem to more directly communicate people's beliefs and conceptions. Ontological metaphors assert the existence of a thing as such, rather than making connections or comparisons between two domains. We must keep in mind that metaphorical categories overlap, and the overlapping of ontological metaphors with other

types of metaphors is part of what makes these conceptual metaphors so powerful. **EARTH IS A CONTAINER** is both a structural metaphor, in which the structure of a container is mapped onto Earth in a variety of ways, but it is also an ontological metaphor, in which the Earth is conceived of *as* another entity (and not simply sharing certain structural characteristics with this entity).

In this chapter I will analyze the ontological metaphors **EARTH IS AN ACTOR** and **HUMANITY IS MADE FOR EARTH** and discuss the ontologies these conceptions reinforce, as well as their implications. I will finish the chapter with a discussion of basic-level knowledge in creating these conceptions and the role of this knowledge, in conjunction with metaphor, of parceling the world into human-sized chunks.

10.1 EARTH IS A (HUMAN) ACTOR (Damsel In Distress or Autonomous Entity)

My interviewees largely expressed an opinion that the Earth (“*la Terre*,” a feminine noun in French) is in a state of more or less grave danger. Their discussions solidly situated them within the environmental discourse of the 21st century: concerns over climate change, damage and destruction of biospheres, fears for the loss of keystone species such as bees. People did not talk to me about saving the whales, panda bears or bengal tigers, but about the survival of humanity. All forty people I spoke with evaluated climate change phenomena as very real and very dangerous. They spoke to me about rising sea levels and temperatures and how these would affect population movements, water and food shortages and the spread of disease. Christian (2ME) spoke to me at length about climate change, explaining at one point that he had told his wife they would never buy a retirement home in the south of France because average annual temperatures in those regions were expected to climb to about 45 degrees celsius. In the same discussion, he berated the folly of climate change skeptacists, namely in the United States, and the catastrophic consequences of government inaction, or retrograde action. It may be important to recall that my interviews occurred from late 2016 to mid-2017, overlapping with the election and the first months of Donald Trump’s presidency in the United States. The appointment of Scott Pruitt, former Attorney General of Oklahoma and self-described “leading advocate against

the Environmental Protection Agency's activist agenda" (State of Oklahoma 2019), as Administrator of the Environmental Protection Agency was among the many polemics related to this presidency that appalled many interviewees.

Global climate change and its myriad manifestations are widely accepted as fact in France and were universally accepted as fact by the participants of my study. Never over the years of my fieldwork in Paris did I hear anyone seriously question the veracity of climate change science. Though not the most eco-friendly urban area, ecological awareness, sustainability and ethical capitalism are part of everyday discourse in the city. Whether shoppers carry canvas bags from the supermarket chain Carrefour with "*Ensemble pour la vie - Du jetable au durable*" ("Together for life - from disposable to durable") printed on them, shop at one of the city's zero-packaging stores, or just pass by the *Salon vivre autrement* ("Salon for alternative living") posters in the metro, messages about environmental consciousness are pervasive. Paris, being the centralized hub of higher education in France, is also home to major research centers and projects concerning the environment (e.g. Climate KIC; the Climate Change Project at the American University in Paris) as well as organizations and foundations engaged in research and public awareness (e.g. Fondation Goodplanet, <https://www.goodplanet.org/fr/>). To express doubt concerning global climate change, certainly among the people I interviewed, would be socially unacceptable.

People's imaginations about space were highly influenced by their generalized cultural knowledge of the Earth and their discussions were populated with elements from current environmental discourse present in the city. Their discussions tended to focus on human action upon the planet, typically described as destructive, and the danger humans posed to the planet and themselves. Their opinions were in no way homogenous concerning the extent of this danger, humans' abilities to curtail or manage this danger, or the Earth's abilities to rid itself of its problems and continue existing. But none of the forty participants expressed the sentiment that the Earth was in top condition. Metaphors for describing Earth's 'condition' abound, as participants imagined the Earth's problems as sicknesses, burdens, or natural systems as objects that could be broken. Take the following examples:

“Donc, commençons déjà par polluer moins, trier nos déchets...non, tu vois, pas pomper la Terre de ses ressources, juste penser un peu à l’avenir en termes d’écologie et ensuite on verra pour les autres planètes” (Estelle, 3FNE). V10:10¹⁸⁹

“L’humanité sur Terre est très mal partie. Donc, si on veut la sauver, il y aurait urgence à coloniser d’autres planètes, mais que j’ai l’impression que c’est un peu incompatible les délais et la Terre qui est mal en point. C’est triste mais je suis très pessimiste” (Valérie, 3FNE). V10:11¹⁹⁰

“Parce que justement la Terre est malade, parce que l’humanité est malade. Et qu’elle a besoin de guérison” (George, 2MNE). V10:12¹⁹¹

“Donc, cette idée que, voilà, on a fait le tour [de la Terre]. C’est superbe, c’est bien. Non seulement on a fait le tour, mais on est en train maintenant d’un peu tout casser” (Joseph, 2ME). V10:13¹⁹²

These excerpts - in which the Earth is “sick,” “pumped of its resources,” or “broken” - attest to how participant imaginations of Earth are strongly marked by characteristics of vulnerability. In some conceptions, the Earth is vulnerable to human violence (e.g. “*pas pomper la Terre de ses ressources*” “*on est en train..d’un peu tout casser*”) and in others Earth’s “sickness” is described in more neutral terms that do less to attribute fault to an aggressor (e.g. humanity). In the latter case, people often parallel humanity’s condition to that of the planet, a conception of the human that I will discuss in Section 10.2.

People’s descriptions of the Earth’s condition are also peppered with the language of preservation or “saving” the Earth. This conception attributes agency and control to human beings over the planet and makes the care of the planet a human task somewhat *à la Adam* and the garden of Eden. In V10:11, Valérie uses the phrase “to save her” when discussing the Earth’s

¹⁸⁹ “Already, let’s start by polluting less, recycling, no, you know, not pump the Earth of its resources, just think a bit about the future in terms of ecology and then we’ll see for other planets.”

¹⁹⁰ “Humanity on Earth is not off to a good start. So if we want to save [humanity], it will be urgent to colonize other planets, but it’s my impression that this is a bit incompatible with the timeline and the Earth that isn’t doing so well. It’s sad, but I am very pessimistic.”

¹⁹¹ “Because, exactly, the Earth is sick, because humanity is sick. And she needs healing.”

¹⁹² “So, it’s this idea that, voilà, we’ve seen it all. It’s superb. It’s great. Not only have we seen it all, but now we’re breaking it all.”

future, the attribution of the role of “saviour” to humanity is manifested in several variations in the data. For example:

HUMANITY IS EARTH’S MANAGER (“gérer la Terre”)

“Et le paradoxe, c’est que ces projets là on les réalise alors que celui qui nous concerne le plus, gérer la Terre...on n’est pas très bon” (Bernard, 3MNE). V10:14¹⁹³

“Quelque soit les progrès techniques...on n’a pas les moyens et ça sera pas la priorité. Par contre, l’exploration du système solaire, oui on va...ça sera fait probablement. Mais, la priorité humaine ça sera la gestion de notre planète” (Jules, 3ME). V10:15¹⁹⁴

HUMANITY IS EARTH’S HELPER (“aider la Terre”)

“Non, mais je pense que le tourisme de l’espace, de la façon qu’il est fait actuellement, c’est...c’est de plus inécologique et c’est dépenser une somme d’argent énorme alors qu’on pourrait faire, fin développer, ben déjà, aider la planète Terre à assouvir quelque chose qui...ouais, fin je trouve ça débile” (Nayla, 1FNE). V10:16¹⁹⁵

“la façon de la [Terre] préserver ça sera aussi d’aller ailleurs pour la laisser respirer un peu plus” (Arthur, 2MNE). V10:17¹⁹⁶

HUMANITY IS EARTH’S KEEPER (“garder notre Terre”)

“Donc, je me dis, ‘non, il faut la garder cette Terre.’ Pas partir. Garder la nôtre. Garder notre Terre, mais la conserver quoi. La conserver, parce qu’on la conserve pas. On la détruit” (Antony, 2MNE). V10:18¹⁹⁷

¹⁹³ “And the paradox is that those kinds of projects we complete, but the ones that should be our biggest concerns, how to manage the Earth, we’re not very good with.”

¹⁹⁴ “Whatever the technical progress may be, we do not have the means and it will not be the priority. However, the exploration of the solar system, yes, we will...that will most likely happen. But the human priority will be the management of our planet.”

¹⁹⁵ “No, but I don’t think that space tourism, the way it is done now, it’s...it’s terribly inecological and to spend an enormous amount of money when we could, develop...already just to help the Earth to assuage something that...I just find it so dumb.”

¹⁹⁶ “The way to preserve the Earth would also be to let her breathe a bit more.”

¹⁹⁷ “So, I tell myself, ‘No, we need to keep this Earth.’ Not leave. To keep our own. Keep our Earth, but preserve it, you know. Preserve it, because we do not preserve it. We destroy it.”

In each of these examples the Earth functions grammatically as the object to the action taken by the noun (humanity). Interviewees talked about how humans need to be “concerned” about managing the Earth; interested in “helping the Earth” and “assuaging” its pain; and must recognize the necessity of “keeping” and “conserving” an Earth that is considered a human possession (“*notre Terre*”). The Earth is personified in the second example, appropriately enough as **HUMANITY IS EARTH’S HELPER** necessitates that the Earth is an actor that can be helped.

These discussions speak volumes about how people construct the role they give themselves and humanity as keepers, guardians, enablers, etc., of Earth. We are directly in the Anthropocene paradigm: humans shape the Earth. While some people may care less, or deny this, my interviewees generally expressed a feeling that humanity is responsible for the Earth now that it has ‘tamed’ it. It is *our* Earth to care for. An important entailment of this in my corpus is that in this care-taking humans decide what is best for Earth, rather than letting nature ‘run its course.’ Thinking about this data, a French anthropologist reminded me that my interviewees’ perceived relationship between humanity and the Earth was in many ways like the story of the Little Prince and the Fox in Saint-Exupéry’s classic novel *Le Petit Prince*. “*Les hommes ont oublié cette vérité, dit le renard. Mais tu ne dois pas l’oublier. Tu deviens responsable pour toujours de ce que tu as apprivoisé*” (“Mankind has forgotten this truth, said the fox. But you cannot forget it. You become forever responsible for what you tame”) (Saint Exupéry 1943). In the novel, the Little Prince learns from the fox he tamed, but leaves the fox behind to explore other planets. Given my interviewees’ perceptions of alternative planets capable of sustaining human life in the universe, the potential outcome of human *apprivoisement* of the Earth, or lack thereof, is considerably more dramatic. For most people caring for Earth was not enough; Earth needed to be rescued.

In a June 2018 *New York Times* OpEd piece, Dr. Adam Frank, discusses the problematic nature of the metaphor ‘saving the Earth.’ Frank is an astrophysicist who argues that “creating a long-term sustainable version of civilization in the Anthropocene raises a new and profound set of questions that remain hidden to us when we stay fixated on saving the Earth” (Frank 2018). He goes on to explain in detail how the discourse of ‘saving the Earth’ (“as if it were a little bunny in need of help”) obscures the reality of our planet, its history and human responsibility

(and expendability). The Earth preceded us and the Earth will outlast us. These scientific facts about the Earth do not necessarily reflect human interests, whereas metaphors like that of ‘saving the Earth’ reflect much about human preoccupations with the planet (and keeping it in a state in which it can sustain human life). Rather than the metaphor of the animal in distress, Frank prefers a personification coined by biologist Lynn Margulis (1995): “Gaia is a tough bitch.”

People personify the Earth in expressions where humanity is less implicated in “saving” it, particularly in cases where the human population is conceived as accessory, or as a danger to the Earth. For example, Nayla and Charlie describe the Earth as being “unable to accept” (which literally translates from the French as “unable to support”) an exponentially growing human population or as being “unable to hold up” in the event of a population explosion.

“C’est clair que la Terre, elle va pas pouvoir accepter une population qui croit de...à la vitesse où elle croit actuellement” (Nayla, 1FNE). V10:19¹⁹⁸

“Le problème de devoir vivre sur une autre planète se poserait si jamais vraiment il y a une explosion de la population et que la Terre ne peut plus tenir” (Charlie, 1MNE). V10:20¹⁹⁹

The more humanity is conceptually removed as a ‘manager’ or a danger to the Earth, the greater agency the Earth possesses in people’s representations. Many describe the Earth as not only active, but autonomous. The representation of an autonomous Earth is especially found in expert discourse, such as in the Marie and Jules’ discussions in which the Earth acts of its own accord regardless of humanity:

“Je me rappelle que pour le projet de Mars One, il y a eu énormément d’hurlements sur le thème, ‘Mais la Terre, il faut s’occuper des gens sur la Terre, etc., etc., etc.’ Et les gens comme moi disaient mais, “C’est s’occuper des gens sur Terre de s’occuper

¹⁹⁸ “It’s clear that the Earth is not going to be able to accept a population that grows at the speed that it is currently growing.”

¹⁹⁹ “The problem with having to go live on another planet would only pose itself if there was an explosion here and the Earth could not longer support it.”

de Mars One. Parce qu'il y a un moment où la Terre va nous filer sous les doigts et c'est ce que vous êtes en train de faire..." (Marie, 2FE). V10:21²⁰⁰

"Je pense que de gré ou de force, si l'humanité veut survivre sur une Terre qui se transforme plus vite que prévu, il va falloir que de gré ou de force l'espèce humaine s'adapte génétiquement à des conditions de plus difficiles" (Jules, 3ME) V10:22²⁰¹

Non-expert discourse also contained personifications of the Earth in which Earth is independent of human intention and destruction.

"Bien sur c'est une nécessité parce que la Terre maintenant elle est surpeuplée, et en même temps les animaux, les gros animaux, les grands mammifères commencent à ne plus avoir de place donc la disparition des espèces. Mais, il faut pas vraiment [aller dans l'espace]. Je pense que la Terre se réglera par elle même... Je pense que la Terre est assez forte et assez autonome elle même pour se réguler et pour provoquer un cataclysme quelconque pour tuer les hommes" (Camille, 2FNE). V10:23²⁰²

People link humanity to Earth, especially when they are speaking about a topic from a terrestrial perspective (i.e. Earth's condition, the planet's future, dangers to the planet and the planet's (in)capacity to regulate them). However, there is a shift in the link between humanity and Earth when people speak from a perspective prioritizing humanity (i.e. the human condition, the future of humanity, dangers to humanity and our ability to regulate them). For most interviewees, the Earth can continue to exist without humanity but not vice versa. The ontology of the human is fundamentally linked to the Earth and to break this link would result in the destruction of humanity, whether through its extinction, or its profound evolution into something extra-terrestrial.

²⁰⁰ "I remember that for the Mars One project, there was an enormous amount of backlash on the theme, 'But Earth, we need to occupy people on Earth, etc., etc., etc.' And people like me said, 'It is to occupy people on Earth to occupy ourselves with Mars One. Because there is a moment when the Earth will slip through our fingers and it's what you're in the process of making happen...'"

²⁰¹ "I think that, by will or by force, if humanity wants to survive on an Earth that is transforming more quickly than we planned, it will be necessary, by will or by force, for the human species to genetically adapt to more difficult conditions."

²⁰² "Of course it's necessary, now that the Earth is overpopulated, and at the same time the animals, the large mammals, are beginning to no longer have enough space, so it leads to the extinction of species. But, it's not really necessary [to go to space]. I think that the Earth will regulate itself... I think that the Earth is strong enough and autonomous enough to regulate itself and to provoke some kind of catastrophe to kill off humans."

10.2 HUMANITY IS MADE FOR EARTH

Though the research questionnaire asked about outer space, instead of talking primarily about outer space, interviewees talked primarily about people. As I noticed this pattern in the metaphors deployed in the interviews, I noted the dominant lexical units people used to discuss humans and Earth and compared them to the most frequent terms used to discuss space and extra-terrestrials (extra-terrestrial ‘humanoids’ included). Tables 10.1 and 10.2 (Appendix VIII) show the frequency of terms referring to humanity and Earth (10.1) and for the non-human and space (10.2). These lists are not comprehensive but map the most prevalent patterns of themes in the data. For example, participants refer to the Earth in a variety of ways (e.g. “*notre vaisseau*” or “*cette petite balle bleue*”).

Table 10.3 (Appendix VIII) charts the frequency of these themes and key words in the interview questionnaire. The questionnaire almost equally distributes the key words it uses into the themes of 1) Space, 2) Earth (always with the modifier “beyond the...”), and 3) the Human. The use of the concept of Earth in the questionnaire is a euphemism for space in three of the four instances, in other words, rather than saying ‘space,’ the questionnaire prompts for talk about not being on Earth. Only one question refers to Earth itself but encourages participants to imagine its absence (Question 8 “What would you miss about Earth if you had to leave tomorrow?”). In all uses of the key word “Earth” one could argue that the focus could be more on Earth (and an absence *from Earth*) rather than on space (or a presence *in space*). Semantically, I argue that the questionnaire focuses on “outer space” (with ten references to space) and inserts the human into the conceptual domain of space seven times (with five references to humanity and two references to the interviewee herself going to space).

When people discussed these themes they focused roughly five times more on humanity. They discussed humans more often than non-humans (561:100); they talked about space slightly more than they talked about Earth (663:612), however discussions of Earth dominated those of specific places beyond the Earth (e.g. Mars, the Moon) (561:153). These are not comprehensive calculations of every occurrence of these themes in the data but tracking the use of these key

words provides us with a strong trace of the tendencies within the data (as suggested by Williams 1985). Williams (1985, 15) defines keywords as “significant, binding words in certain activities and their interpretation...significant, indicative words in certain forms of thought.”

Keywords are both culture and discourse specific, corresponding to the norms and taboos of a community of linguistic practice as well as to the discursive registers people use. The key words people used in my research interviews reflect the “knowledge environment” (Giddens 1991) of the middle class in 21st century Paris (e.g. interviewees used scientific discourse as well as popular representations from the radio, television, internet and films). I think this anthropocentric and terracentric discourse also connects to the macro-level knowledge environment of humanity and human preoccupations with our own ability to thrive. People’s speech was inhabited by the characters and interpretative repertoires (Wetherell 2012) of France (e.g. Thomas Pesquet, Tintin), but I believe the centrality of Earth and humanity in their discussions would be reproduced in any number of contexts. Being in France and speaking French shaped the ways people talk about and understand more universal human desires and fears. Thinking about the Earth as a cradle (“*le berceau de l’humanité*”) or as a family member (Young 1987) are both anthropocentric conceptions, in which the Earth is described based on its relation to humanity. But, the key words (e.g. cradle or mother) in these conceptions significantly alter the meanings of this relationship and its possibilities. The key words in a community reflect what is significant within that community. For example, in the case of my French interlocutors, human, scientific power is a recurrent theme. When using certain keywords, people made “particular formations of meaning - ways not only of discussing but at another level of seeing many...experiences” (Williams 1985, 15.) Though my research questionnaire focused on space, interviewees tended to concentrate on the human and the terrestrial. Their repeated use of certain keywords such as “*Terre*,” “*terrestre*” and “*humain*” serve as evidence of the conceptual importance of terrestrial experience in their extra-terrestrial imagination.

Defining humanity became central in the interviews. People lengthily discussed what they considered inhuman, the minimum requirements for human life and what changes could transform a ‘human’ into something else. Question 6 directly elicits the topic of human change (“Do you think humans who live beyond the Earth will remain the same as terrestrial humans?”),

but people discussed the bare minimum for human existence, physically, socially and emotionally, in response to almost all of the questions. They expressed the opinion that space travel and colonization, confinement and isolation pushed humans to the brink of their capacities. In the short and long term, many questioned whether a life without sociability, good food, and diverse natural landscapes would really be a ‘human’ life worth living. Many interviewees could not conceive of a humanity that remained ‘human’ as we know it without living on an earth-like planet: oceans, skies, light, biodiversity and the capacity to produce art, socialize with others and explore.

Participants’ definitions of the human and the bare minimum to ensure human existence shared many commonalities. Among them were liberty of movement, ability to engage with other humans, ability to eat, drink, sleep and defecate, opportunities to discover novelty and capacity to change (‘grow,’ ‘develop,’ ‘open,’ ‘expand,’ ‘go further,’ etc.). Human beings could not be locked up, left alone or left completely unstimulated physically and intellectually for long periods of time. Freedom of movement was key in most discussions, as space travel was predominantly imagined as confining and because life in space required constant technological and material mediation. For many, this motif appeared in descriptions of being able to “go outside and breathe” or to wander through a city or other landscape, to exist spontaneously, without constant, conscious programming, life support and infrastructure.

I found that one of the most fascinating places the theme of the ‘bare minimum for human life’ played out was in responses to Question 7, “Currently, astronauts on the ISS have the right to bring one kilogram of personal effects on board. If you were leaving, what would you take with you in your kilo?” In Table 10:4 below I have synthesized the most frequent responses to this question.

Table 10:4: Question 7 “Actuellement, les astronautes sur l’ISS ont droit à un kilo d’effets personnels. Si tu partais, qu’est-ce que tu emmènerais avec toi dans ton kilo?”

Object Cited	Books (digital)	Music	Photos	Books (Physical)	Food	Clothing
Percentage of People to Cite Object	45 %	40 %	25 %	23 %	20 % (of this 63% wine or liquor)	18 %
	Films	Tooth brush	Beauty Products	Tobacco: Rolling tobacco, cigarettes, electronic cigarettes	Other	
	15 %	10 %	10 %	8 %	38 %	

When participants asked for clarification to this question, I would respond that they could imagine they were leaving permanently, but in a context such as the ISS or another well-equipped mission, where their “survival was assured.” Therefore, lodging, food, water, and other basic necessities would be provided for and they only needed to concentrate on personal items in their kilogram. This question was one for which participants often had the longest initial response times (with pauses to reflect: “umm,” “uhhh,” halted start, etc.) and often spent a considerable amount of time responding in full. The vignettes that have preceded each chapter give a deeper look into the particularities of these responses; people’s difficulties and facilities when answering and justifying their choices.

Question 7 is one of two in the questionnaire to directly ask interviewees about what is personally important to them (the other question to do so being Question 8, “If you were to leave the Earth what would you miss?”). Question 7 is particularly informative as I ask people about what they would take in a kilogram, implying material objects. This allows people to talk about what type and forms of property are important to them; to talk about their tastes, what is ‘good’ and what is ‘necessary’ or ‘desirable’ in their everyday lives. How people responded to this question is deeply linked to what Bourdieu (1996) called habitus and the way cultural capital is “objectified in forms of property” (cited in Wetherell 2012, 108).

Habitus are generative principles of distinct and distinctive practices - what the worker eats, and especially the way he eats it, the sport he practices and the way he practices it, his political opinions and the way he expresses them are systemically different from the industrial owner's corresponding activities. But habitus are also classification schemes, principles of classification, principles of vision and division, different tastes. They make distinctions between what is good and bad, between what is right and what is wrong, between what is distinguished and what is vulgar, and so forth, but the distinctions are not identical. Thus, for instance, the same behavior or even the same good can appear distinguished to one person, pretentious to someone else, and cheap and showy to yet another (Bourdieu 1996, 17).

In the interview responses, the habitus of the French middle class, and the principles of classification it encourages, are apparent. The forms of property people chose to take with them shed light on the social groups to which interviewees belong. One of the most glaring examples in this in the research corpus is interviewees recurrent choice to bring books with them to space. Sixty-eight percent of participants cited books as something they would bring in their kilogram. Books were an obvious choice of pastime (especially considering the average readership of the French population, as discussed in Chapter Three) and it seemed that a top priority for everyone was to not get too bored in space. However, people also cited other reasons for wanting books with them. Many talked about how books represented a contact with humanity and human cultures. For example, Charlotte (1FNE) explained that she would bring one book in each of the languages she spoke, in order to keep contact with those languages. Gigi (1FNE) wanted to bring books about space so that she could better understand what she was experiencing. Finally, Véronique (3FNE) talked about bringing a dictionary because the dictionary is “very important” as it is the “first step in curiosity.” Books represented far more than simply “*de quoi lire*” (“something to read”), but, with music, films and images, were a primary method to maintain a connection to other humans and human knowledge.

To re-use Bourdieu's terms, the majority of interviewees considered books to be ‘good,’ ‘right’ or ‘distinguished.’ French consumption of literature is widespread and reading is considered to be a positive and cultivated pastime. In the educated middle class, reading and owning books is a form of distinction and the fact that 27 of 40 participants cited books as an

essential item in their kilo attests to the continuing importance of literacy in people's conceptions of daily life, pastimes and personal development. Many people talked about taking books to further their learning (e.g. Marie's desire to learn Japanese, Gigi's interest in taking books about space) or to preserve their knowledge (e.g. Charlotte's desire to bring a novel in each language that she had learned). Books were believed to have intrinsic value (see Véronique's comment above about the dictionary as "the first step in curiosity") and as useful for preserving knowledge and for entertainment.

It was common for people to talk about bringing a book they could re-read over and over. This may have been a more obvious answer decades ago before digitalized media. However, in 2016, this answer was often associated with a desire for paper books, as interviewees understood they could not bring many physical books in a kilogram. This shows an attachment for the traditional concept of the book, as a bound, physical object; a sentimentality for an object that has been important to French culture for centuries. Granted, some people did not care about having a paper book, they just wanted a hard drive full of as many things to read as possible. However, eight people insisted on having a paper book, like Lucas (2MNE) who responded that he would bring "*Une bouteille de scotch. Un livre. Un vrai livre. Appel à la matière. Je pense que je prendrais l'Iliade pour le relire et le relire encore et encore*" ("A bottle of scotch. A book. A real book. A call to matter. I think I'd bring the *Iliad* to read it and re-read it over and over.").

Re-reading implies that people believe that books continue to have value after they have been read; that re-reading brings new information, or at least new stimulus. The emotions evoked by books and the lessons they contain are not used up after one reading but can be accessed over and again. For many people, the same story was seen as valuable, or even necessary, throughout time (e.g. Madeleine's [1FNE] need to bring Bertrand Russell and Bernard's [3MNE] desire to bring *The Message in the Bottle* by Walker Percy).

The interviewees to bring books were almost evenly divided by gender (14 female, 13 male), with slightly more female non-experts choosing books than male non-experts (11:9) and one more male expert choosing books than female experts (4:3). It is interesting to note that the choice of books is essentially as evenly distributed among experts as among non-expert participants (with 7 of 10 expert participants choosing to bring books, or 70%, and 20 of 30 non-

experts choosing books 67%). I find this interesting as 70% of the expert pool were writers, which would imply literature is important to them, yet the importance of literature was almost equally distributed among non-expert readers as among expert writers.

I will remind readers that interviewees' level of education ranged from high school graduates to multiple Ph.Ds; nine of the ten expert participants had a Masters or Doctoral degree and 25 of the 30 non-expert participants had a Bachelor's degree or a BAC+3. The choice of books therefore largely communicates middle to upper-middle class values in French urban society, or a middle to upper-middle class comprehension of how the self should be presented (Bourdieu 1979; Goffman 1956). It remains unclear whether or not, especially for those twenty people who did not cite a particular book, responding 'books' was simply considered the socially correct answer; an answer that allowed them to present themselves in a positive light in front of a foreign researcher. If this is the case, this behavior is fully in line with Bourdieu's (1979) observations concerning people's articulation of taste based on social class, as well as how the tastes of the dominant social class tend to dominate over other tastes (e.g. even if one preferred to bring video games, this is not perceived as a suitable taste to present to an academic). Recently, when speaking about my research with a British friend, he laughed and said, "Of course they say books. No one is going to tell you they want to bring along a kilo of pornography!"

Most people tried to respond to me seriously, genuinely considering the questions and trying to imagine the scenarios I suggested in the questionnaire. These answers reflect the values of their social group both in what is discussed (e.g. books, music and films) and what is not discussed (e.g. personal items, pornography or other taboo items). The idiosyncratic, sentimental items people brought up are discussed below, but sentimentality was not nearly as widely distributed as practicality about passing time. I do not think this is because the French are unsentimental, I think it has much to do with what is considered socially acceptable in conversations with strangers. Unveiling personal information and anecdotes often required social proximity to interviewees (i.e. people who were friends, colleagues or neighbors) or considerable time in an interview (e.g. the 2+ hours I passed with Adèle on the phone). Question 7 elicited

personal information in a way other questions did not, and it may be that interviewees provided what they considered was a neutral, ‘normal’ answer rather than their true preferences.

Exceptions to the rule of ‘books’ in the corpus provide a contrast that allows us to further demarcate these lines of ‘right’ and ‘wrong,’ and ‘tasteful’ and ‘vulgar’ present in my participants’ speech. One of the most noticeably different responses to Question 7 can be seen in the vignette preceding Chapter Eleven. Simon (2ME, graphic designer) answered Question 7, without hesitation: “Condoms.” One of the fascinating things about his response, that many other participants would have likely considered taboo or inappropriate in conversation with a female doctoral student, is that he self-policed his comments, frequently saying, “You can’t include that in your thesis.” The scientific nature of my inquiry and the fact that my study itself would become a book, influenced the way people talked to me. This is readily apparent in the ways they discussed their personal preferences, but equally prevalent in the way they talked about more generalized phenomena, like climate change or sending humans to space.

Simon was one of the people who did not choose books in his kilogram (though he revised his decision about only bringing condoms). Simon is middle-class with a BAC+3 education, however his general presentation of self differed considerably from that of many of the other interviewees. He was loud and energetic, with little hint of reserve. He made jokes, was vulgar and laughed and teased me. I did not know Simon and met him at the National Science Fiction Convention in 2016. It may have contributed to his boisterous behavior that our interview took place in a room set up as a temporary gallery for his work during the convention. He was in his element, a performer amidst scenery he had painted himself. He played music on his iPhone during our interview, moving to the rhythms of rock and roll, punk and ambient sounds. He presented himself as a rock and roll kind of character, rebellious, independent and creative and his responses often evoked the same tone as the music and his brightly colored t-shirt and tennis shoes.

After books, interviewees most frequently talked about bringing music, photos (especially of loved ones and places on Earth) and films. These responses seemed strongly influenced by the ability to bring vast amounts of digitalized works in a small amount of space. Twenty participants said that they would bring an external hard drive packed with literature,

music and films. These works typically spanned from the past three hundred years of human culture, however three people talked about bringing recordings of nature sounds so that they could share with others what the Earth sounded like.

After digitalized materials, and paper books (as some interviewees could not shake their desire “for the contact with paper,” like Jean [1MNE], or were worried about what they would do if their computer broke down), the second most frequently cited material object was food. Wine, whiskey, water, cookies and *confit de canard* were all deemed necessary by at least one person. These responses, like books, are symptomatic of a particular social group and the tastes encouraged by this group. I found it particularly interesting that two out of three mentions of wine refer to specific wines, namely those that are lauded as being ‘good’ and function as signs of ‘distinction.’ It is very French to bring a bottle of Chateauneuf du Pape to space. But it is more particularly very French middle and upper class; referencing luxury goods associated with the upper class and general ‘good taste’ and knowledgeability about wine. The food and drink people talked about reflected comfort items in some cases (e.g. cookies and duck confit) as well as items people considered were ‘nice’ or for ‘special occasions’ (like Marie’s reasoning behind bringing a nice bottle of whiskey so that she could have a glass every time she finished writing a text, a practice she holds dear here on Earth). These comforts and luxuries reflect commonly held values concerning what is ‘good’ and ‘acceptable’ foods (and were a method of combatting what most people thought was one of the worst aspects of living in space - dehydrated, unvaried diets).

While the mention of food and alcohol did not necessarily surprise me considering the gastronomic context of the research, the appearance of toothbrushes in many participants’ lists did. Toothbrushes are very personal and territorial. Having one’s own toothbrush was absolutely essential for 10% of participants or was a basic essential that seemed logical to take along when leaving home. Responses about toiletries reflected the most gendered division in this data; the toothbrush was a more typical response of male participants, whereas an equal percentage of female participants cited beauty or other hygiene products (e.g. mascara, lotion, hairbrush). Finally, at 8% of respondents, almost as many people thought about bringing cigarettes as they did a toothbrush. I loved Olivier’s reflection on this choice, “Do I bring a pack of cigarettes? There may be 20 moments when I really need a smoke...”

In addition to these recurrent categories of items, people discussed a number of more personal, idiosyncratic items they would include in their kilogram. If we were to board my forty research participants onto a space shuttle to leave the Earth, this is the list of things we would need to take with us (though, I am certain it amounts to more than 40 kilograms):

Food and drink:

- 1 bottle Lagavulin whiskey, 30 years
- 1 bottle scotch
- 3 bottles of wine (1 Chateauneuf du Pape, 1 Bourgogne)
- 1 bottle of water
- 1 box of cookies
- 1 can confit de canard

Other:

- 1 - Agenda
- 1 - Binoculars, one pair
- 1 - Box of memories (ticket stubs, photos, etc.)
- 1 - Box of locks of hair from loved ones
- 1 - Condoms, one box
- 1 - Dirt, 1 kilogram
- 2 - Dog, cat or robot “for interaction”
- 1 - Eraser²⁰³
- 1 - Evening gown
- 1 - Glasses, one pair
- 2 - Musical instruments “to learn up there”
- 4 - Notebooks and sets of markers and/or pencils
- 1 - “nounours” (stuffed animal)
- 1 - Marijuana, 900 grams
- 1 - Pillow
- 1 - Porte-bonheur
- 1 - Rock, shell, etc.
- 1 - Set of house keys

²⁰³ Louise (1FNE) was the only person to talk about bringing an eraser:

“Et puis de quoi écrire. Alors, léger...je ne peux pas en prendre beaucoup. Alors, un crayon, du papier avec une gomme. Comme ça je peux écrire et effacer, écrire et effacer, et recommencer jusqu’est ce que ça soit parfait.

Primary Investigator: “Perd pas la gomme!”

“And then something to write with. So, light...I can’t take a lot. So, a pencil, some paper and an eraser. That way I can write and erase and write and erase until it’s perfect.”

PI: “Don’t lose the eraser!”

- 2 - Socks, two pairs
- 1 - Snake ring from fiancé
- 1 - Sunglasses, one pair
- 1 - Video game console

The majority of the miscellaneous items participants chose to take to space are sentimental, and seem to be chosen to mitigate solitude and loneliness. A number of the items are either proofs of other human beings or proofs of the Earth itself (e.g. photos, locks of hair, rocks and dirt). Other than these proofs of life and proofs of the past, people chose objects that would permit them to express themselves, to learn or to develop a capacity (i.e. photography equipment, a musical instrument). Interviewees' choices reflect an imagined context where they will be isolated and constrained; potentially cut off from other humans and forms of activity that require more space than a chair. Chapters Six and Nine discussed structural metaphors and their dominant forms in the corpus. These metaphors of constraint correspond to the larger narratives of constraint and isolation that participants developed. No one talked about bringing seeds for planting, materials to sew or tools for construction. These kinds of items are typical of 'colonizers' who seek to establish a new life and create a new world. Arguably, people may have considered these items included 'in their survival,' however, some still mentioned items that could have equally been considered as included (i.e. socks and toothbrushes). People may have found these kinds of items useless, but what interviewees did *not* choose to take says much about their imagination of going to space. Some people did talk about growing food in space or cited films like *The Martian* (2015) (in the film the protagonist survives on Mars because of his ingenious potato planting operation). However, like the generally egocentric discussions we had about humans in space, people talked to me about *their* possibilities and preferences, often without imagining themselves as a part of a larger group.

The items people chose to take to space (and those they did not) are strong evidence of how they imagine existing in space. Some people, like Christian (2ME) and François (3MNE), explained to me how every moment of an astronaut's life before and during a shuttle voyage is planned and controlled. Nonetheless, most people did not imagine being in space this way. They chose to bring pastimes with them; distractions; 'something to do' that takes up very little space.

It was almost as if they were going on a long plane ride, though it was rare for anyone to make this parallel. Largely, they did not imagine themselves as being busy: working, researching or maintaining the shuttle or habitat. They wanted something to read, to listen to, to watch, with a few exceptions for creative activities like writing, drawing or playing music. These choices seemed to be motivated by a desire to avoid boredom more than anything else. Most participants brought materials that they could consume passively, reflecting the larger trend in the digitalized world of people spending hours looking at the screens of their myriad devices (e.g. televisions, cell phones, computers, tablets). People talked about bringing their favorite books and movies to watch, about needing massive amounts of reading material and music to ‘last their lives.’ It was rare for someone to talk about wanting to document their new life in the unknown (e.g. Jean’s desire to archive the space mission) or pursuing new projects or research. Instead, most interviewees wanted to pass the time re-reading books they already knew, re-listening to their old favorite songs and re-watching their favorite series and movies.

The kilogram limit obviously constrains what kind of things people can bring, but no one brought cards, or dice. The imagination of a solitary existence in space permeates participant responses. Almost everything they chose to bring with them connects them to human cultures - books, film, music, photos - but does not necessarily connect them to other people. Again, I find this to be a troubling parallel to how people increasingly exist on this planet. People wanted to bring with them a maximum amount of data, of information (e.g. Léon’s [3MNE] response that he would bring a computer with him so that he would be “*relié à toutes les bases de données qu’on pourra lire. Tout ce que je veux. Toutes les bibliothèques, LegiFrance, tout, tout, tout ce dont j’ai besoin*” (“connected to all the data bases available. Everything I want. All the libraries. LegiFrance, everything, everything, everything that I need”). They imagined themselves holed up in a tiny space craft in front of a screen with access to all possible information, but without connection to other people.

Moreover, several interviewees talked about not wanting anything to remind them of the past and the people they had left behind. For example, Jean (1MNE) decided that he would not want to bring photos or other keepsakes that would remind him of his past, terrestrial existence. It was assumed by most that they would leave all (or the vast majority) of other humans behind,

so their past connections would be lost. Coupled with this, was the imagination of isolation and solitude in space. Participants concentrated on their bodies, their loved ones, their experiences. They did not imagine the presence of others, but their absence. Other humans were not part of my interviewees' dominant imagination of space. In these egocentric imaginations, it seemed difficult for people to imagine the experiences of others, or their presence.

Whereas humanity and space are antithetical in the imaginations of participants, humanity and the Earth are a synthesis. People described the basis of humanity as being connected to terrestrial ways of life and conditions; not only in terms of oxygen, water and gravity, but in terms of terrestrial landscapes, diversity and experiences. To 'really' live, and to live a good life was only plausible on Earth or an Earth-like planet. To live otherwise was considered implausible, impossible and, eventually, if life was possible, no longer human. People inextricably linked a good life, a human life, to Earth.

People were comfortable expressing their opinions about human life, whereas they often protested that they did not know about space or could not 'project' themselves into an imagination of life beyond Earth. Interviewees had no problem describing terrestrial imaginations of humanity. They claimed to know about humanity and made a number of arguments about the basis of humanity, its minimum needs and what humanity is "made for" (*"fait pour"*). For most everyone, humanity was "made for" Earth. This metaphor makes humanity a product of nature (or 'Life' itself) and this product is intended for one "little blue ball."²⁰⁴

People use the expression "made for" in a variety of different contexts. Sometimes they claimed they were not "made for" certain activities (e.g. studying law) or climates. Nonetheless, this metaphor predominantly occurred in discussions of what humans are "made for" as a species. Rather than directly discussing human evolution and adaptation, people more frequently used the the metaphorical expression to be "made for" to express something akin to co-evolutionary symbiosis. Being "made for" the Earth means not being made for any other context,

²⁰⁴ "Il ne se reste que voir la Terre depuis l'espace, par exemple. Pas nécessairement que d'aller sur un point X, mais effectivement de voir cette petite balle de bleu là. Ça doit être...le soleil...voir les étoiles...d'un seul coup. Ça doit être magique quoi." ("Just to see the Earth from space, for example. Not necessarily to go to point X, but, effectively, to see that little blue ball. That must be...the sun...to see the stars...all of the sudden. That must be magical.") (3MNE, Jackie)

therefore being dependent on the Earth in order to remain alive and truly human. Take the following examples, where people explain that humans are not “made for” space, but “made for” terrestrial conditions (e.g. 24-hour day/night cycle, terrestrial gravity):

“Très difficile. Mais très sérieusement. *L’homme n’est pas fait* pour aller dans l’espace. L’homme...il y a des rayons, on est malade...d’abord, il n’y a pas de pesanteur. Il faut faire de l’exercice sans cesse. Il faut s’entraîner. Je veux dire...il faut apporter l’oxygène. Il faut recycler l’eau. Sans parler des rayons cosmiques. On attrape le cancer très vite. C’est une catastrophe, hein. Je ne l’imagine pas. Je l’imagine très difficile, très, très difficile...Donc, la vie est extrêmement difficile, compliquée. C’est pas une vie, hein? C’est pas une vie. L’homme n’est pas fait pour vivre dans l’espace” (Jules, 3ME). V10:24²⁰⁵

“Et puis cette notion que nous *on est quand même fait pour* avoir jour-nuit et c’est pas certain qu’on ait ça, jour-nuit et les saisons. Voilà, donc c’est un peu ça. Jour-nuit, les saisons, et de pouvoir marcher et d’être habillée sans avoir une combinaison d’ouf qui pèse des kilos et des kilos” (Nayla, 1FNE). V10:25²⁰⁶

“C’est une perpétuelle contrainte de toute façon! On peut pas dire qu’on verra un jour vraiment, à mon avis, attention, quelqu’un comme ça en apesanteur. *On n’est pas fait pour ça*” (Pauline, 3FNE). V10:26²⁰⁷

“Alors que nous, l’être humain, on est un peu dans la merde parce qu’on n’est préparé à rien. On — le cerveau, donc à réfléchir, à inventer des choses, mais on n’est pas préparé à vivre dans la nature. On n’a pas de poils, on n’a pas de griffes, on n’a pas de sens extra-sensoriels, donc voilà. *On est juste fait pour* être des êtres pensant et encore pas toujours dans le bon sens” (Louis, 1MNE). V10:27²⁰⁸

²⁰⁵ “Very difficult. But very seriously. Man is not made to go into space. Man...there are cosmic rays, we get sick...first of all, there isn’t any gravity. It is necessary to constantly exercise. You have to train yourself. I mean...you have to bring oxygen. You have to recycle the water. Without talking about cosmic rays. We get cancer really quickly. It’s a catastrophe. I don’t imagine it. I imagine it being very difficult, very, very difficult...so life would be extremely difficult and complicated. It’s not a life, huh? It’s not a life. Man is not made to live in space.”

²⁰⁶ “And then the notion that, all the same, we are made to have night and day, and it’s not certain we would have that, night-day, seasons. So, it’s a little bit that. Night-day, seasons, to be able to walk and be dressed and not have a crazy spacesuit that weighs kilos and kilos.”

²⁰⁷ “At any rate, it’s a perpetual constraint! We can’t say that we may really see the day, in my opinion, I mean, someone in zero-gravity like that. We’re not made for that.”

²⁰⁸ “So we, human beings, we are a little bit in the shit because we are not prepared for anything. We...I mean, a brain, to reflect with, to invent things, but we are not prepared to live in nature. We don’t have fur. We don’t have claws. We don’t have extra-sensory senses, so there you have it. We are only made to be thinking beings and even then not always in a good way.”

“Comme je disais à tout à l’heure avec cette histoire d’oxygène, c’est pas des endroits où nous, *notre corps a été fait pour* habiter. Donc, on va vivre comment?” (Jean, 1MNE). V10:28²⁰⁹

We can contrast the conception “made for” (“*fait pour*”) with the expression “*s’est fait pour*” which occurs less frequently. Take this example, from an extended discussion of the ‘hostility’ of space with a science fiction writer I met at the *Convention Nationale de la Science Fiction* in August 2016:

“Alors, d’un point de vue réaliste...l’espace c’est le milieu le plus hostile qu’on puisse imaginer. Pas d’air, pas de gravité pour...pour nous, j’allais dire pour nous maintenir, parce que finalement on sait, notre structure osseuse, *elle s’est faite* pour lutter contre la gravité. Uhh...plus de gravité, plus de sens, plus de vertical, voilà.... on est protégé des rayons cosmiques par la magnétosphère terrestre, donc si on monte au-dessus de 100 kilomètres on n’est plus protégé donc, cancer, stérilité, bref, voilà. Donc, l’espace c’est un mauvais plan pour l’espèce humaine, au niveau...en tant qu’espèce. En tant qu’espèce *on n’est pas fait pour*. *On est fait pour* la Terre ferme. Il y a pas de doute. Ou la piscine. Mais en tout cas, pas l’espace” (Christophe, 2ME). V10:29²¹⁰

Christophe used both “made for” and “made itself for” in his description. The latter is used to discuss a specific physiological system, whereas “made for” is used to discuss humanity in general. “*S’est faite pour*” in this example differs from “*fait pour*” in its connotation of adaptation and evolution. Rather than being constructed by an external force, he describes human bone structure as developing independently according to particular environmental conditions. In continuing his discussion about space, he uses the “made for” metaphor in reference to space, saying that it may not be an environment “made for” living in.

²⁰⁹ “Like I was saying before about the oxygen, these are not places where we, our bodies were made to live. So, how are we going to live?”

²¹⁰ “So, from a realistic point of view...space is the most hostile milieu that we can imagine. No air, no gravity to... for us, I was going to say to support us, because we know that our bone structure is made to resist against gravity. So, no more gravity, no more directions, no more vertical, there you have it. We are protected from cosmic rays by the Earth’s atmosphere, so if we get above 100 kilometers we are no longer protected, so cancer, sterility, voilà. So, space is a bad plan for the human species, at the level of...as a species. As a species we are not made for it. We are made for solid ground. There is no doubt. Or for the pool. But in any case, not for space.”

“Mais en fait, c’est...l’espace c’est pas forcément pour y vivre, je veux dire. C’est pas forcément quelque chose *qui est fait pour* y vivre, mais c’est un océan d’inconnu. L’espace je vois ça comme de l’information. Et, l’information elle est destinée à être divulguée à un moment ou un autre. Donc, on ouvre grand nos oreilles, c’est à dire nos télescopes...ou nos télescopes et nos détecteurs gravitationnels maintenant. Et on écoute et on regarde et voilà” (Christophe, 2ME). V10:30²¹¹

The conception that humanity is “made for” the Earth, or vitally linked to the terrestrial environment is present throughout the corpus. Most people did not think that humanity could realistically move beyond the Earth. They talked instead about how humanity is adapted to and tied to the destiny of the Earth:

“La Terre c’est jusqu’à preuve de contraire, le seul endroit où les humains peuvent vivre sans aucun effort. Meme à poil au milieu de rien, pas au milieu du Québec, ça dépend de la saison, mais tu vois, les humains, ils vivent sur Terre, ils sont adaptés à ça” (Christian, 2ME). V10:31²¹²

“Je pense que notre destin est un peu lié au destin de la planète, donc faut faire les choses bien, quoi. Après si la planète Terre cesse d’exister, on cessera d’exister avec, quoi. Et c’est peut être pas si grave vu ce qu’on y fait” (Véronique, 2FNE). V10:32²¹³

“Et, donc, oui...notre vaisseau c’est la Terre et on se déplace dans l’espace. Donc on est tous des spationautes, donc je suis spationaute comme tous qui habitent notre vaisseau” (George, 2MNE) V10:33²¹⁴

²¹¹ “But in fact, it’s...space isn’t necessarily for living there, I mean. It’s not necessarily something that is made for living there, but it’s an ocean of unknown. Space, I see it as information. And, information is destined to be divulged at one time or another. So, we open our ears wide, in other words, our telescopes, or our telescopes and our gravitational detectors now. And we listen and look and that’s it.”

²¹² “The Earth is, until contrary proof is found, the only place where humans can live without any effort. Even naked in the middle of nowhere, not in the middle of Québec, it depends on the season, but you see, humans live on Earth, they are adapted for it.”

²¹³ “I think that our destiny is kind of linked to the destiny of the planet, so we need to do things well. Afterwards, if Earth ceases to exist, we will cease to exist with it. And maybe that’s not such a bad thing, seeing what we do to it.”

²¹⁴ “And therefore, yes...our ship is the Earth and we are moving through space. So, we are all spacestronauts, so I am a spacestronaut like everyone else that lives on our ship.”

The conception of Earth as an intrinsic part of human existence is also present in the use of the term “earthling.”

“Sur la Terre on a cette possibilité de se promener, de - je suis désolée! je me projette pas beaucoup dans l’espace, je suis toujours très terrien” (Charlie, 1MNE) V10:34²¹⁵

“Peut être que je suis un terrien forcené, je trouve que les terriens devraient s’occuper de la Terre davantage, avant d’aller se promener autre part” (Bernard, 3MNE). V10:35²¹⁶

As seen in a few of the examples above, on occasion people developed the relationship between humanity and the Earth by discussing ‘bad’ human behavior in this relationship (i.e. not taking care of the Earth). For most people, the fact that humans are “made for” the Earth does not seem to contradict the fact that they would destroy it. On rare occasions the question of human destruction of the Earth did create dissonance for interviewees. If humans were truly meant for this world, a few interviewees questioned, why would they do so much damage to it? In these cases, the conception of humanity as integrally linked to the Earth was replaced. For example, Christine explained that humanity must be an alien race that colonized the Earth, otherwise they would not be destroying it:

“On est quand même mal barré, il faut quand même s’en rendre compte. Donc, est-ce qu’on reste sur cette Terre et il faut apprendre à vivre avec...C’est pour ça que peut être on est des extra-terrestres, parce que si on était des vrais humains on chercherait pas à détruire cette Terre. Donc, c’est bizarre qu’on soit dessus, on se développe et... et...et tout ce que fait l’homme, il détruit la Terre. Et pourquoi, tu vois?” (Christine, 2FNE). V10:36²¹⁷

²¹⁵ “On Earth it’s possible to take a walk...I’m sorry! I don’t project myself much into space. I am still very terrestrial.”

²¹⁶ “Maybe I am a fanatic earthling. I think that earthlings should take care of the Earth more, before going around to other places.”

²¹⁷ “All the same, we are not off to a good start, we need to realize that. So, do we stay on Earth and learn to live with it...It’s for that reason that maybe we are aliens, because if we were really human we would not try to destroy this Earth. So, it’s bizarre that we’re here, we develop and...and...and everything man does, he destroys the Earth. Why, you know?”

She continued her discussion of humanity as a potential parasitic alien race, comparing humanity to the xenomorphs in the Ridley Scott film *Alien* (1979). Though a few people discussed the possibility that life on Earth could have originated from an extra-terrestrial source (e.g. Martian RNA arriving to an ancient Earth in an asteroid), none of them developed the conception of parasitism and destruction found in Christine's interview.

For most people, humans are linked to the Earth and therefore human extinction is linked to that of the Earth. Jean-Denis (3ME) described the yearning for space as a yearning for immortality, but argued that being immortal would make humans no longer human. His argument straddles both dominant arguments in interviews: 1) Humans Are Made For The Earth and will become extinct with the Earth and 2) Humans living beyond the Earth would no longer be human at all.

These arguments demonstrate an imagination of humanity as terrestrial by definition. Oceans, mountains, storms, suns and moons - all kinds of natural phenomena were imaginable to interviewees in space. There is nothing particularly terrestrial about the natural world for people, and in their descriptions many discussed experiencing these natural landscapes in space. The majority of people also imagined the possibility of bacteria and other more or less complex forms of life in space. In fact, most thought it highly unlikely that terrestrial life was the only life in the multi-verse. Space, in its infinite vastness, has the potential to hold almost anything for participants, including wildly fantastic phenomena and beings. But, humans and human life are terrestrial. People are one of the more difficult things for people to imagine in space.

10.3 “A human-like thing”

In Chapter Two I cited Friedrich Nietzsche's argument that humans parcel knowledge and shape it into a human-like form so that it is comprehensible and useful to them (an argument expressed in various ways by a number of scholars I have discussed, including Foucault (1994, XVI) and Eco (Beyer and Gorris 2009). I concur with Nietzsche (Crawford 2011) that language is one of the primary tools humans use to transform raw sensory input into adaptive comprehensions and reactions. My data provides evidence of participants' anthropomorphization,

personification, and metaphorization using human source domains of a target domain of knowledge that is largely understood to be lacking in any human element.

It would seem that the more human-like we can make things, the more we have the impression of understanding them (and their motivations). This is the basis of the theory of mind (or ToM), “the human capacity to reason about people’s actions in terms of their mental states” (Gweon and Saxe 2013, 367). ToM is a key cognitive capacity that is not a process of perception of other’s intentions, but of constructing an idea of them that allows us to predict and react to others in the real world. Gweon and Saxe (ibid., 367) describe ToM not only as a process of perception, but of categorization and judgement: “in countless...brief and extended social interactions every day, we do not just describe people’s actions as movements through space and time. Instead we seek to explain and judge and predict their actions, and we do so by appealing to a rich but invisible causal structure of thoughts, beliefs, desires, emotions, and intentions inside their heads.” This is a crucial adaptive strategy whose existence has been explored in other non-human primates (e.g. chimpanzees, Premack and Woodruff 1978). ToM is another strong example of human cognition as a pattern perceiver, and of human beings understanding the world and others through their understandings of their own experiences and emotions.

ToM, like analogy and metaphor, allows us to relate to our experiences in the world through past knowledge and through a process of framing phenomena not only in embodied, human terms, but also within less universal constructs, such as collectively defined emotions (Barrett and Lindquist 2008; Leavitt 1996²¹⁸) and normalized talk within a community of linguistic practice. Within this perspective, metaphors may then permit and encourage the illusion of a transformation of the unknown into an intimately known. However, this transformation remains illusory, as metaphor does not actually transform the world, but only frames our understandings and perceptions of that world. Metaphor can be a useful shorthand technique for grasping complex or abstract ideas. However, the ‘understanding’ constructed from these conceptions can be *trompeur* for a number of reasons:

²¹⁸ “Affective or felt associations, like semantic ones, are collective as well as individual; they operate through common or similar experience among members of a group living in similar circumstances, through cultural stereotyping of experience, and through shared expectations, memories, and fantasies” (Leavitt 1996, 527).

- 1) Anthropomorphization, by definition, addresses that which is not, in fact, human. Therefore, using this trope to understand the inhuman (largely) obscures the reality of the phenomenon in question.
- 2) Humans are not a homogenous group with consistent behavior that operates within a single, strictly-defined logic.

The world and the creatures and phenomena within it are not human-like things. I would argue that the cognitive tendency to pattern the planet as a human-like thing, to provide it with an ontology and to personify and anthropomorphize its existence and upheavals, can pose dangers both to our relationship with the planet, and to our ability to learn from the alterity of the world. This planet is neither a cozy cradle, nor a “tough bitch” (Margulis 1995). It would seem that the more we learn about our thought processes and ways of communicating them, the more we can be aware of these cognitive tendencies towards obscuring that which does not fit into our previously constructed categories and analogies. Being able to recognize these tendencies of obfuscation may allow us to more critically engage with our knowledge construction and the possibilities we create. There is nothing innately ‘wrong’ with human cognition and its particularities. Our cognition is an incredible toolkit that has permitted *homo sapiens sapiens* to adapt to almost every environment on this planet, not through biological evolution, but cultural evolution predicated on our capacity to share knowledge with others and build upon past knowledge (For a fascinating discussion of this cognitive ‘pooling’ over historical time see Tomasello 1999). But, if we can comprehend the pitfalls and habits of our cognition, we may be better equipped to avoid fallacies that our languages or cognition may encourage us to commit.

Humans are wired for patterns, especially those patterns that are linked to our basic-level and prototypical experiences. Pattern recognition operates through what Ramachandran (2011) calls the “a-ha principle” of pleasure. When our minds successfully match a pattern or solve a puzzle a signal of pleasure is sent through the limbic system, positively reinforcing the experience of resolution. Because of this, humans have a mania, in large part, to categorize the

world according to patterns, patterns that issue from their bodies and experiences. It is understandable how this would be an adaptive behavior among social animals for many reasons. Being able to read (non-)verbal emotional patterns from others in our group and being able to project ourselves and imagine ourselves in those states of mind, is essential to our success as a social primate. Humans do this with exceptional refinement and with much adaptive success in their different environments. However, we can also see symptoms of dissonance between this patterning and our environments. “A good servant, but a terrible master,” as Alan Watts (1998) said of the mind. When presented with the novel and unknown, people speculated about (im)possibilities, but tended to force these vast mysteries into intimate terms, terms that risked oversimplifying, or obscuring important elements of the target domain altogether. The comprehension of a natural system, phenomena or catastrophe as human-like, or somehow humanly manipulable, when they are not is a conceptual error that can occasion inconveniences from inappropriate reasoning to damage, destruction and loss.

In her November 2017 Ted talk “How language shapes the way we think,” Lera Boroditsky presents a brief overview of evidence in cognitive research of the influence of language on thought and cognitive models. The ways language “fusses” with perceptual decisions and “guides” human reasoning has “big effects,” such as perceptions of space and time; “deep effects,” where having words for things (e.g. number words) opens up entire cognitive realms; “early effects,” as in the case of color perception; “broad effects,” as in the case of grammatical gender shaping thought about nouns; and “personal” effects, as language influences conceptions of things like blame and punishment (Boroditsky 2017). She argues that these are a few among myriad examples that prove the crucial role of language in crafting human reality.

She ends her talk by asking the public to think about the ways in which the language they speak influences the way they think and to consider “What thoughts do I want to create?” Like Boroditsky’s work, my research is motivated by a desire to better understand the relationship between language and cognition, and how people can create the thoughts they desire using language, especially those that encourage personal fulfilment and positive social change. What can we do with a better comprehension of the way language interacts with cognitive abilities and how can we use these understandings to create positive change?

10.4 Wor(l)d-building

All present perceptions influence immediate future perception and, according to many scholars, long term perception (here we return to the concepts of Shallow and Deep Whorfianism, for example.) But, we can make a distinction between categorizing passive sensations and imagining or projecting one's imagination consciously and actively. There is intention behind the kind of imagination and discourse I solicit from interviewees. They make an effort to understand and resolve possible problems, as well as to judge the possibility, probability and desirability of future events. They actively treat and transform information, putting images 'into words,' positioning themselves within larger discussions on this topic and often reflecting on situations they had not considered before.

This is what I call wor(l)d-building (Black 2018); the mutual construction and deployment of worlds and words. This is not a subconscious recognition of patterns, but a conscious process of connecting and creating them. Language, especially metaphor, is key to this process as it permits the enrichment of cognitive patterns and conceptual analogies. Wor(l)d-building is key to the creation of new worlds, as well as to the conceptualization of all kinds of change, including creating a new world from this world.

Speaking of this relationship between worlds and words, particularly the construction of human spaces, geographer Yi-Fu Tuan (1991, 685) suggests that "Speech is a component of the total force that transforms nature into a human place. [Speech can] make things formerly overlooked - and hence invisible and nonexistent - visible and real." Tuan's argument echoes that of Lakoff and Johnson concerning metaphor. Metaphor "highlights" and "hides," or emphasizes and obscures elements of reality - this visual metaphor of emphasis and obfuscation functions in the same register as Tuan's argument concerning the "visible" and "invisible." For Tuan, Lakoff and Johnson, language is a force that transforms nature, reality and the world 'around us' into a human-like thing that we can categorize, comprehend and to which we can eventually react. Language does this by necessarily obscuring, hiding, or rendering invisible certain elements of experience and reality. Shore (1996, 58) describes this transformation of nature into a "human place" as "talking" an experience or imagination "into meaningfulness"

Scholars like Shore (1996) present compelling evidence that the narratives we construct have a lot to do with the worlds we subsequently build (Bruner 1991a; Schiff 2012). This is true in all domains of knowledge (Baake 2003; Corradi Fiumari 1995), however, it seems particularly influential in highly discursive domains (i.e. those domains of knowledge production less dependent upon mathematics and empirical measurements). Social and political practices are particularly sensitive to rhetorical manipulation (Lakoff 1996; Lakoff 2010) and the effects of the metaphoric process (Chilton and Ilyin 1993; Sandikcioglu 2000; Santa Ana 1999). Even social issues that are proven through ‘scientific fact,’ ‘mathematical certainties’ and empirical measurements (e.g. crime rates and incarceration practices, immigration, gendered and racial structural violence, climate change) are increasingly the purview of popular discourse (Jolley and Douglas 2013; Garrett, Nisbet and Lynch 2013) in a “post-truth era” (Keyes 2004). Around the globe, non-expert talk has become more socially influential than expert discourse concerning any number of issues (e.g. climate change, Grubb 2018; Mooney 2011) (Lewandowsky et al. 2017), often leading individuals to reason about the world according to ‘folk theories’ (Grubb 2018) based on personal experience and the reinforcement of their cultural community (Bakshy, Messing and Adamic 2015) (as well as the increasing influence of the “echo chamber” phenomenon; Barberá, Jost and Nagler 2015; DiFonzo 2011). Though folk theories concerning the world have existed in all human societies, the sociopolitical context of the post-truth world, with its profusion of easily accessible (and easily producible) information, further exacerbates fundamental cognitive tendencies of patterning the unknown on the known.

The digital environment of the internet is a troubling example of how the context of the post-truth world can disrupt human problem-solving and critical reasoning. As I have discussed at length, perception, knowledge construction and wor(l)d-building are activities mediated by embodied experience and cultural knowledge. The greater richness of models we have from these sources of knowledge, the greater our pattern-recognition and categorization can be refined, and the thicker, or more detailed, our analogies can become. As it is these processes of pattern-recognition, categorization and analogy that inform our subsequent reactions and behaviors, rapid accuracy, richness and detail are all useful tools for our success.

For all of the expanse of cultural information the internet can represent, studies demonstrate that the internet increasingly does more, to use Margot's expression, incite people to "fold in on themselves" than to expand their awareness and challenge their biases. The "echo chamber" of the internet, fueled by profit motivations - search engine advertising, number of 'clicks,' 'transformations' (when a client ends up purchasing a product after clicking on an ad and being redirected to the vendor website) - and increasingly determined by algorithms²¹⁹ - feeds on our cognitive mechanisms and their hormonal drives in unprecedented ways (Pariser 2012). Combining a computer screen with a personally tailored experience of the internet populated with advertisements, suggested content and suggested connections to other web users based on your past activity, results in an environment in which users are exposed to little embodied experience and to potentially increasingly tight spirals of cultural information that reinforce each other's veracity and worldview (without presenting contrary world views or information, as might occur in a real-life encounter in a group of people).

Increasingly tribalism and polarization in social life (Chua 2018) and decreasing embodied contact with one's kin (USC Annenberg Communication and Marketing Staff 2009), and other social groups (Engelberg and Sjöberg 2004), limits our available interpretative repertoires and fixes the form and content of our narratives through constant reinforcement. As Einstein (1926, quoted in Salam 2005, 99) reminds us, "whether you can observe a thing or not depends on the theory that you use." Note that he uses the word "whether" rather than "how." Whether or not we can even *perceive* a phenomenon depends on our theories, or world views, as observers. The digital environment of the post-truth era is a potential breeding ground for the creation of tightly closed world views (or "filter bubbles," Pariser 2012) through a poverty of diversity leading to a repetition of basic-level experiences of the same kind; potentially precluding a wealth of phenomenon from people's imaginations and observations, by depriving them (or instigating them to deprive themselves) of diverse theories through which to process information.

²¹⁹ For an excellent overview of the positive and negative projected outcomes in the "Algorithm Age," see the PEW Research Center's overview "Code-Dependent: Pros and Cons of the Algorithm Age" (Rainie and Anderson 2017).

The internet is a single example of a highly-discursive domain of human life in the 21st century that significantly informs human wor(l)d-building. These forms of technologically mediated communication and knowledge construction are risky in the modernist sense of the word (Douglas 1992, 23), in that there are ‘good’ and ‘bad’ risks. The kinds of “talking into meaningfulness” (Shore 1996, 58) that are happening on the internet are fascinating sites for the examination of how people make sense of the unknown and how this sense-making relies on prototypes in language and embodied experience.

My data echo the findings of previous research, that prototypes and categorization are foundational to linguistic and cognitive processes²²⁰; it expands on existing scholarship by demonstrating that these influences are present (and arguably stronger in certain instances) when people imagine the unknown and potential futures. Even when people have access to more accurate sources of information or conceptual resources, they have a strong tendency to give priority to their personal experiences and experiential prototypes over these other resources²²¹. In the next chapter I will summarize the results of my research, concentrating specifically on conceptual patterns in interviewees’ metaphor use and motivations of metaphor use, particularly the influence of basic-level, prototypical experiences in people’s talk about the unknown. I will also discuss the potential applications of these results, limitations of this study and future questions and sites of research that I believe can help us productively construct knowledge about our ways of knowing, talking and wor(l)d-building.

²²⁰ On the role of basic level categories and prototype effects, see Rosch and Lloyd 1978; Rosch 1978; Smith and Zarate 1990; Sweetser 1987; Tversky and Gati 1978; Barsalou 1987; Garner 1978; Harnad 1987; Masters and Keil 1987; Lakoff 1987; Medin and Barsalou 1987; Mervis 1987; Neisser 1987; and Berlin et al., 1966.

²²¹ Here we can think about the discussion in Chapter 9 where participants use the metaphor “tin can” or “box” instead of the literal term “space ship” when talking about crewed spaceflight.

Vignette 11: “Le sexe et le whisky”

(Male, Expert 41 years old)

I laughed and laughed with Simon throughout our interview. Highly energetic, almost spastic at times, he showed me around an exposition of his artwork that was set up in one of the cool, stone buildings shielding us from the August heat at the National Science Fiction Convention. He explained to me with great animation the themes in his work and his techniques. In one painting, a woman seated in the outstretched hand of a giant robot in a stony, extra-terrestrial landscape echoed Faye Wray's lithe form in the paw of King Kong. In another, a Lucky Luke inspired cowboy (complete with yellow shirt and red cape) walked alone through a post-apocalyptic desert. The work on display was richly intertextual, often projecting iconic figures from past texts into future scenarios.

Just as his artwork provoked contrasts and challenged visual expectations, his responses challenged my expectations as a researcher and as a conversational counterpart. Simon, visibly at home in his temporary exhibit, was up to his persona as an artist and agent provocateur. Our discussion was in stark contrast to the more guarded responses of most other interviewees; his irreverent answers that did not shy from the taboo were singular in my data set.

After giving me the tour of the artwork on display, we sat down at a rectangular table near the entrance, from which we could welcome visitors to the exhibit. He settled in across from me and began to doodle; creating worlds and characters throughout our interview. We spent almost two hours talking about his life, his drawing, his family, and space, all the while he teased, made jokes. He seemed to want to find the boundary of what was acceptable, or passable in our interaction, often punctuating his remarks with “Oh no, you can't include that!” to which I assured him, I could.

When we came to the question concerning a kilogram of personal items he answered without hesitation.

“Des capotes.”

I repeated his response to confirm that was indeed his answer and he laughed. He expounded on his choice of condoms, saying how much he would want to avoid getting anyone pregnant in space; joking about climaxing in zero gravity.

“Si, si on sait jamais si je suis accompagné sympathiquement ça serait bête de mettre une polichinelle dans le tiroir. *rire* Non, et puis le foutre en apesanteur c'est *rire* ouais, ça fait encore...Non, je suis odieux. Oui, c'est ça. C'est ça que je prendrais.”

After a good giggle, he straightened his face, saying “Un kilo de capotes, non. Qu’est ce qu’il faudra emmener, un kilo...? Un kilo, un kilo.”

“Un kilo,” I concurred succinctly.

He hesitated, looked down at the table where sheets of paper and his paint pens were scattered, and responded, “De quoi dessiner ça me suffirait. Oui, enfin bon je pense qu’il y aurait des tablettes qui réagissent vraiment comme le papier, ça serait vraiment intéressant. Oui, de quoi dessiner ça serait bien.”

“Un kilo, un kilo...” he continued, and I watched the agent provocateur wane sentimental.

“Je crois que si je devais à tout prix apporter quelque chose et si je devais partir seul, je crois que je prendrais, dans des enveloppes séparées, des photos des gens que j’aime, accompagnées par un bout de leur cheveux. C’est ça que je prendrais. Parce que ce serait mes meilleurs soutiens dans ce voyage. Après le reste, on a tout sur place. On s’en fout quoi.”

“Mais je crois que je prendrais des choses de l’humanité et d’une humanité qui m’est proche. Parce que je pourrais apporter ma musique, non...des gens qui m’auront accompagné juste au début de ce voyage, des gens qui m’ont marqué, des gens qui m’ont toujours transmis leur amour et leur confiance. Voilà. C’est tout.”

As quickly as it had appeared, this display of emotion dissipated. There was a rare moment of silence in our discussion; I moved to the next question, “And what would you miss about Earth if you had to leave tomorrow?”

“Le sexe. Le sexe et le whiskey.”

Chapter 11: Conclusion

“I would like for all of us to begin to dream about and plan for a different world...”
Chimamanda Ngozi Adichie (2013)

In the following chapter I will conclude with four topics: the results of this research, the implications of these results, potential applications of the results and the limitations and contributions of the research. This study seeks to understand the role of language, particularly metaphor, in how the people I interviewed comprehend the unknown and build new worlds within it. In an era where human influence has not only reached a scale of global proportion, but reaches into our solar system and, with the recent advancement of *Voyager 1* (2012) and *Voyager 2* (2018), into interstellar space, how do my interlocutors engage with the novel and the unknown in order to create and innovate by first imagining this novel and “talking it into meaningfulness” (Shore 1996, 58)?

11.1 Research Results

In this thesis I have demonstrated the metaphoric process (Corradi Fiumari 1995) at work in people’s talk about the unknown of outer space. Much of what people imagined about outer space was influenced by (and subsequently influenced) their conceptions of the Earth and humanity as well as their future. As interviewees had no experience in space themselves, they relied on analogies between terrestrial experience and their imagination of space. More often than not, they used their everyday lives and experiences to understand this most distant of imaginable places. The vast unknown and the infinite possibilities of space were encapsulated in their understandings of basic objects and experiences. Interviewees deployed source domains of knowledge in their metaphors that issued from both generalized cultural knowledge (e.g. the limitations created by space such as not being able to buy cigarettes or replace their belongings)

as well as their embodied terrestrial experiences (e.g. with horizons, small spaces, darkness). These source domains inform people's imaginations by shaping their understanding of a potential reality through their comprehensions of current and past realities. Participants in this study made use of all three modes of conceptual metaphor (i.e. structural, orientational and ontological), deploying diverse metaphoric modes including analogies, metonymies and personifications.

People use these metaphoric modes throughout the data set and these modes overlap with different conceptions and conceptual metaphors to discuss both imaginary and real scenarios. Though there is a wide variety of pairings of metaphoric modes and conceptual metaphors, a number of conceptual patterns exist in the corpus. Many metaphoric modes reappear in certain kinds of discussions and this can be understood as evidence of a causal relationship between certain kinds of talk and certain modes of metaphor. It is necessary to note that I have chosen to discuss the most frequent or predominant trends in the data set. However, I am certain that the rich corpus I have created for this research could be further exploited for additional data concerning the motivation and causal relationship between metaphors and forms of discourse.

Personification

People used personification widely to describe both real and imaginary beings and objects. However, there is a consistent personification of the Earth by interviewees accompanied by an absence of personification of other celestial bodies. The Earth, especially when people talk about its relationship to human beings, is typically personified. Informants talk less about the operation of natural systems to regulate homeostasis on the planet, for example. Instead, they personify the Earth as an actor, a damsel in distress or a 'tough bitch.' These kinds of personifications are absent from people's discourse concerning other celestial bodies such as the Moon, Mars, Jupiter, Saturn, etc.

Personification in this data set required a certain level of familiarity with the target domain. Other planets and moons are 'strangers' to interviewees, and therefore they do not conceptualize them as familiar people. People spoke about the Earth as a familiar entity, talking about 'her' (keeping in mind, in French, "*la terre*" is a feminine noun); 'her' beauty and rage, violence or peacefulness. The effects of the natural world on a human scale were analogized with

emotions: storms, natural catastrophes and mass extinctions were understood as the Earth's moods, or actions the Earth took for self-preservation. Participants did possess generalized cultural knowledge of weather and conditions on other celestial bodies (namely the Moon and Mars), however, in their discussions, they did not pair these elements with salient domains of human emotion, nor other human qualities. I would argue that this tendency towards personification of the familiar is not only a question of the availability of information with which to create salient comparisons. I think this is also a question of the extent of the effect of the target domain of knowledge upon humans. The Moon was understood by most as a dusty, inanimate rock, whereas the Earth is a dynamic system that affects human life on every level. As the terrestrial biosphere 'does' things to humans (e.g. rains on them, sends tidal waves upon them), so humans understand this planet as an actor, as they have for thousands of years (e.g. the Gaia conception [Margulis 1995]).

As far as we know, Mars has never 'done' anything to a human, as humans have never interacted with Mars. Similarly, the Apollo missions' engagement with the Moon seemed relatively one-sided to humanity. Astronauts walked on the Moon, planted a flag, played golf, all the while the Moon remained motionless. There are no human experiences of dynamism and animacy on other celestial bodies, therefore agency is not conceptually mapped onto these celestial bodies and they are rarely, if ever, personified in informant's discussions. This hypothesis could be further tested by comparing people's representations of other familiar v. unfamiliar environments (e.g. their home town/city and the desert/mountains/ocean, or comparing the discourse of those who live in a particular environment, e.g. desert, with those who live in a significantly different environment, e.g. a city).

Extended Metaphors and Abstraction

People talked about outer space using a diversity of metaphors, but also by employing literal language. The results of this study echo existing arguments in the metaphor literature (Baake 2003; Corradi Fiumari 1995; Lakoff and Johnson 1980; Kövecses 2010) concerning the use of metaphors to describe the abstract. I in no way argue that metaphors only appeared in

interviewees discussions of the abstract. On the contrary, as I have demonstrated throughout my thesis, participants used metaphors to discuss physical objects and experiences as well as infinitely distant unknown possibilities. Nevertheless, the data demonstrates a tendency towards interviewees developing more abstract discussions of a topic when they have framed that topic using a conceptual metaphor.

This is the case with conceptual metaphors for time in the corpus. When participants use conceptual metaphors to talk about time and future events (e.g. **TIME IS A HORIZON**), their discussions have a greater tendency towards abstraction and the use of additional metaphors to extend the original metaphorical conception. On the other hand, when people employ numerical dates and periods of time, these literal conceptions engender further literal imaginations. This data set demonstrates that, in a majority of cases, abstraction breeds abstraction and vice versa. This hypothesis could be further tested in a variety of ways, including creating two questionnaires on a similar topic as that of this research: one that employs conceptual metaphors in framing its questions and the other that makes use of numerical dates. This would allow for the analysis of whether or not participants extend the metaphor presented in the question to their own discussion or independently deploy metaphors to discuss the non-metaphorical question.

Analogies and the Real

As extended metaphors seem to predispose people to more abstract discussions, so it seems that there is a link between what is considered ‘real’ or potentially plausible and possible and the use of direct analogies. When interviewees talked about what they considered ‘factual’ or ‘probable’ conceptions (rather than what they considered ‘fantastic’ or ‘fictional;’ “*le domaine de la science fiction*,” [“the realm of science fiction”]), they more frequently made use of analogies with past, historical events than more abstract, extended metaphors. The most prevalent of these analogies were analogies between human space exploration and past forms of human exploration, namely the “conquest of the New World,” American expansion into the “Wild West,” and European and Polynesian maritime exploration.

I argue that these source domains are strongly linked to the historical moment in which I was speaking with interviewees (i.e. centuries after European colonial projects in what is now

Canada and the United States) as well as their ethnicity, socioeconomic status and their identification with being and presenting themselves as “French.” As discussed in Chapters Five and Seven, people’s comparisons between European colonization and human exploration of space are often framed within a colonialist European perspective. Similarly, people’s conceptions of “obscurantism” and “expanding horizons” are highly charged with Enlightenment principles and what the French refer to as “*les valeurs républicaines*” (“republican values”). Though these conceptual frames may not be unique to the French, they are certainly not universal.

These culturally specific source domains of knowledge provided a point of comparison for what human space exploration would “be *like*.” People often used these past scenarios to make connections between past events and future probabilities, rather than developing metaphors. For example, when discussing space as analogous to maritime exploration, participants did not extend the conception of “sailors” to “astronauts” nor that of the “high seas” to the expanse of space. Space ships, or “*vaisseaux spatials*” in French, is a term that relies on a metaphorical conception of space as the sea. However, participants did not coin this term (as a few would use novel terms such as “spationauts” or “Marsnauts”), but used it literally in their discussions throughout the corpus (whether connected to discussions of space and maritime exploration or not).

This tendency towards use of direct analogies when stating ‘factual’ conceptions demonstrates how people often directly model future possibilities on culturally specific comprehensions of past events. The probable and possible were more likely to be analogized with the documented real, whereas other metaphoric modes were more frequent when imagining what people considered ‘fantastic’ scenarios. These analogies were also more likely to predispose interviewees to close off other conceptual possibilities. A number of people argued that a voyage to Mars could not be anything but *like* the voyage to the Moon, or that the destructive behaviors of humans during terrestrial colonizations would be inherent to colonization beyond the Earth. It seems that these kinds of analogies between reality and future realities functioned most similarly to ontological metaphors in the corpus. Without saying that one event *is* or *will be* another, these analogies still insist that the target and source domains are (in many ways) the same. Additionally, because these analogies are created using historical narratives (rather than between

objects and emotions, e.g. “my love is like a red, red rose”), they seem to be more resistant to conceptual shifts. These analogies frequently map more characteristics of the source domain onto the target domain. For example, **TIME IS A HORIZON** makes use of a few salient characteristics of the horizon to conceptualize the experience of time. Contrarily, arguing that the voyage to Mars will be “just *like*” the voyage to the Moon maps a maximum amount of characteristics of the source domain onto the target domain, often equating the two completely.

Scientific Knowledge and Metaphorical Conception

A final result of the study that was generalized across the interviewee group was the fact that scientific knowledge, or literal information concerning the topic of outer space did not inhibit, nor diminish the metaphoric process in informant’s conceptions. Just because a person knew a lot of literal information about the topic, and was therefore capable of speaking in detail on the subject without recourse to metaphor, did not stop the metaphoric process from occurring in their discourse. On the contrary, expert participants often developed complex, extended metaphors to explain things to me. Christian (2ME), for example, repeatedly used extended metaphors to explain abstract or complicated processes to me during our interview. At one point, after a long discussion in which he compared the expenditure of energy over time with the expenditure of money to build a house, I commented, “That is a great metaphor! It’s really useful.” to which he replied, “*Bah, c’est pour ça que je l’utilise!*” (“That’s why I use it!”). The utility of metaphors was recognized by these experts, whether or not they deployed them consciously and pedagogically. The data set shows that metaphors are equally widespread in expert discourse as in non-expert discourse, supporting theories claiming the fundamentally metaphorical nature of human cognition (Gibbs 2008; Kövecses 2010; Lakoff and Johnson 1980). Metaphors are not only a stylistic choice of speakers, but are inextricable from their thinking. For this reason, metaphors are a communication device across domains and levels of expertise. Examples, like Christian’s house metaphor, demonstrate how experts deploy metaphors precisely to communicate across levels of expertise. Over and over my interviewees used metaphor and analogy to express themselves and to communicate their ideas. The use of

metaphor is universal in my corpus as people from various backgrounds describe their ideas about reality and their imaginations about potential realities.

As I have noted, this pervasiveness of metaphor was consistent, whether or not the metaphors themselves were more ‘accurate’ or ‘precise’ than literal language. For example, in discussions of human bodies in space, the use of conceptual metaphors is equal if not greater in expert discourse than in non-expert discourse. Embodied knowledge and prototypes are prioritized in peoples’ discourse over more literal terms and scientific understandings. Metaphor is not a cognitive back-up mechanism for comprehending the world when we are faced with the novel, unknown or abstract. Metaphors are a fundamental method for understanding what we experience, think or imagine and people use them to convey their understandings even when there are other linguistic means to do so. Metaphors are not necessarily motivated in this data set by a lack of knowledge or literal vocabulary. The opposite is often true. Interviewees frequently deploy metaphors in cases where the entailments of the metaphors they use compromise the accuracy of their description, and where they could easily have made use of a non-metaphorical conception to describe the same idea or phenomenon (e.g. saying “tin can” instead of “space ship” or comparing space stations to the Opéra Garnier instead of using literal measures).

The way people talked about space in my study demonstrates the conceptual prioritization of previous embodied experience and basic-level knowledge in peoples’ imaginations and understandings. Rather than a cartesian separation of mind and body, the corpus shows that embodied knowledge often takes precedence over ‘textbook’ knowledge when people describe their conceptions. Level of education, professional experience and individual eloquence do not have a significant influence on this effect.

One of my hypotheses in this research was that the hyper-standardization of contemporary French would result in more uniform linguistic production among its speakers (particularly those speakers who are residents of the Ile-de-France, where the French argue that ‘ideal’ Standard French is situated, Black 2009, Dryef 2011), and that this more uniform language will result in more uniform conceptions and expressions among speakers. This seems to have been the case, as interviewees across the participant pool often used identical conceptions (e.g. container metaphors with cans and boxes as source domains) in their discussions. However,

after analyzing the corpus, I believe that this is an effect of linguistic standardization as well as a wide base of shared experiences, particularly prototypical experiences. Though speakers are held in the straitjacket of syntax when it comes to proto-metaphors I have discussed, the uniformity of their metaphorical language is not only a result of a common grammar, but of common basic-level experiences and culturally-informed ways of categorizing and interpreting these experiences.

My data set confirms that interviewees prioritize their prototypical experiences when they describe their imagination of an unknown, even when these prototypes cause a loss of precision in their comparisons and analogies. Participants made use of embodied knowledge throughout their discussions and created analogies between their personal experiences more readily than between their imaginations and scientific or cultural information concerning the topics in question. The study questionnaire asked people what they imagined, not what they knew. Therefore, rather than citing scientific facts, they discussed their ideas and impressions and expressed these things using cultural knowledge as well as embodied knowledge and frames.

11.2 Back to Basic-Level: Prototypes

This project analyzed the dominant experiential and conceptual prototypes in participant discourse, but is not a comprehensive overview of all prototypes found in the corpus. Prototypical source domains of knowledge in the corpus include conceptions of containers, terrestrial and anthropocentric spatiotemporal orientations, voyages, isolation, immensity, and constraint. These prototypes are mostly congruous with widespread cultural models and representations of space, however, people often cited their experiences, rather than the cultural or scientific texts that also possessed these prototypes.

These results are also congruent with previous research concerning prototypes and comprehension (Lehmann 1988; Rosch 1973; Taylor 1989). Participant use of prototypes in their metaphorical constructions confirmed the “fuzzy boundaries of lexical categories, the existence of typicality scales for the members of a category, the flexible and dynamic nature of word meanings [and] the importance of metaphor and metonymy as the basis of that

flexibility” (Geeraerts 2006, 144). The prototypical categories people used were also overwhelmingly experiential, rather than objectivist, echoing Lakoff’s (1987, 99) findings that “both categories of mind and human reason depend upon experiential aspects of human psychology.” This argument has the methodological implication that prototypes in language should not be studied in isolation, but in their experiential context, as this research has done.

My study places a particular emphasis on context and intertext available to people within their community of linguistic practice because one of my interests is the motivation of conceptual metaphors concerning the unknown (therefore influences on the formation of these metaphors is potentially significant). Engaging expert and non-expert participants further allowed me to determine the influence of cultural knowledge and texts on the motivation of metaphors in discourse. According to Putnam’s (1975) theory of the “division of linguistic labor” non-expert participants should be expected to have ‘stereotypical knowledge’ of natural kinds and categories, whereas experts possess technical definitions. This was indeed the case, however, though experts did mobilize their expert knowledge in their imaginations of the unknown, their individual experiences outside of their domain of expertise remained predominant in their discussion.

Putnam’s (1975) theory implies that expert knowledge in many ways determines how terms for natural kinds will be used and understood by members of community of linguistic practice. However, as Geeraerts (2006, 157) notes, stereotypical, or non-expert natural language use is not simply a “sloppy derivative” of expert definitions. The results of this study support his argument that “natural language categorization is not only determined by the state of affairs in the sciences, but also by the communicative and cognitive requirements of the linguistic community in its own right” (ibid.). As this study deals with a topic where scientific expertise plays a considerable role in the available knowledge of the topic, and interviewees’ discourse does not solely derive from scientific discourse, the results demonstrate particularly strong support for arguments positing that prototypes and metaphors are primarily motivated by experience.

Both experts and non-experts relied predominantly on their embodied experiences when deploying metaphors. They deployed metaphors using categorical prototypes in basic-level

experience, such as containers, familiar landscapes and everyday spaces (e.g. interviewees' homes and vehicles). All of the interviewees were educated adults, some with advanced degrees, yet their metaphors typically relied more on their experiential knowledge of the world than on purely semantic information (Geeraerts 2006, 147). These participants were familiar with expert discourses concerning space (and 13% of them were professionally involved in creating these discourses), however, scientific terminology (or more 'literal' terms, such as spaceship, habitat, and space station) was largely replaced by metaphorical language whose semantic content less 'accurately' matched the semantic content of the target domain of knowledge in discussions.

Previous studies in prototype theory, particularly foundational theoretical texts, primarily concentrate not only on known, lived experiences, but on the most basic, recurrent types of these experiences (i.e. color terminology Berlin and Kay 1969; Conklin 1955; kinship terminology Goodenough 1964, 1969; folk taxonomies of the surrounding environment Conklin 1962). This study extends prototype theory beyond everyday categories into imaginations of the unknown. My research provides further evidence of the importance of prototypes in human cognition as we make use of them not only to understand the known, but the (im)possible and unknown. This theoretical extension allows these results to speak to the workings of the metaphorical process when there is no sensorimotor input to categorize.

The results of this study demonstrate that there is a strong tendency towards a use of concrete, basic-level prototypes the more abstract, distant or unclear a situation/topic seems to be to the speaker. Analogies and extended metaphors played an enormous role in participant constructions of their conceptions of unknown experiences in space, and these metaphorical constructions relied heavily on basic prototypes. It must be noted that a large number of the prototypes analyzed in this study, for example "*la bulle*," "*la boîte*," and "*la cloche*," are examples of prototypical objects in both human experience and in cultural representations of space. The use of the 'tin can' metaphor for a space ship is found in a number of well-known texts²²². This demonstrates the relationship between reality and imaginations of potential reality, the factXfiction Fortun (2004) describes, as well as the profound relation between reality and

²²² For example, the popular song (referenced by several interviewees) "Space Oddity" by David Bowie: "Here am I floating in my tin can, far above the Earth."

science fiction in particular, as proposed by scholars such as Chu in his 2010 book *Do Metaphors Dream of Literal Sleep?*

Prototypes are useful in imagining as they allow us to project analogical, intimate experiences onto a blank slate of experience. However, prototypes, because they are not necessarily motivated by tested scientific knowledge, but experiential folk knowledge, do not necessarily represent ‘truth’ or reality. Examples of this abound in the corpus and in the world around us. In my data set people talked about not wanting to go to space because it was a “sea of emptiness,” though we know this is hardly the case (although emptiness is a highly salient quality for people talking about space because of the vast distances between celestial objects and respondents may have been referencing the emptiness of human culture, rather than nature). People frequently talked about the Earth like a tamed, vulnerable creature whose caretaking is humanity’s responsibility, rather than describing the Earth as a unified, natural system whose existence is in no way dependent on human action. I do not refute the usefulness of these rhetorical tools, however, as much as I am passionate about language and its power in human life, rhetoric is not empirical knowledge. As René Magritte might remind us, “*Ceci n’est pas une pipe.*” This is not reality, this is our talk *about* reality; linguistic representations of reality grounded in an historical socioeconomic context and the embodied experiences of speakers. Symbolic representations - whether it be a discussion or one of Magritte’s clever paintings - have the potential to illuminate new perspectives, or to obscure them. If we make use of prototypes and basic level knowledge when constructing these representations of reality or potential realities, this prototypical knowledge will have two important effects on resulting conceptions:

- 1) These conceptions risk being less detailed or exact than those created using more specific, relevant or more ‘accurate’ information.
- 2) These conceptions risk appearing “natural,” ‘logical,’ or ‘sensible’²²³.

²²³ Here we return to Rosch’s (1973) definition of the prototype: the proto-image of all representatives of a category. A prototype will be a ‘good example’ of a category. Rosch (1983) and others (Lehmann 1988; Medin, Altom and Murphy 1984; Smith and Minda 2002) have demonstrated that people recognize prototypes of categories more quickly than non-prototypes. In short, participants had much shorter response times when categorizing prototypes than non-prototypes, indicating that prototypes require less cognitive effort.

Let's take apart these two implications separately. First of all, what is the problem with creating metaphorical conceptions from basic-level prototypes?

First of all, metaphors of all kinds, as I have stated repeatedly, are problematic because of their function of obscuring characteristics of the target domain of knowledge; in this they predispose individuals to comprehensions of a target domain of knowledge that may be (partially) false. To conceive of time as money, the Earth as a cradle, or progress as a horizon is to open oneself to a host of conceptual fallacies. These are useful, shorthand concepts for progressing in our environments, but they remain metaphors; partial analogies between their source and target domains of knowledge. People have produced many highly complex extended metaphors through comparisons of systems, concepts and experiences²²⁴. The more complex or the more developed the source domain of knowledge is in a metaphor, the more potentially rich connections can be identified and fleshed out.

In my data, basic-level prototypes had a tendency to augment the effect of obfuscation in participant metaphors. Discussions of astronauts in 'boxes' and 'cans' predominantly remained at the level of constraint, enclosure, etc., whereas people tended to further develop discussions of more complex source domains, such as explorers or colonists. Interviewees demonstrated a greater engagement with the contrasts and differences between complex source and target domains than with the contrasts between basic-level source and target domains. Complex source domains provide more cognitive material to deal with, more elements that must be transposed upon a target domain or abandoned, and more details that can be exploited conceptually. Participants have more complicated general knowledge about European colonization (to take the example used above) than they do about boxes, and their metaphors reflect this refinement.

Secondly, metaphors created using basic-level prototypes as their source domains have a tendency to appear more 'natural' or 'logical.' Evidence of this in my data set is the prevalence of these metaphors in the corpus across participant categories and in the homogeneity of their use. The conception of a spaceship as a tin can was not a topic of debate among different

²²⁴ E.g. the Bohr model of atomic structure in which the structure of an atom is understood in terms of the structure of the solar system (Bohr 1913, 1921) or the conception of the 'biosphere' of the human body and techniques of 'mapping' these bacterial boundaries using technology designed to map ocean microbes (Gallagher 2012).

interviews; whereas space as a territory for colonization, or the Earth as a ‘cradle’ were conceptions that were subject of disagreement.

Metaphorical conceptions using basic-level prototypes in this data set were conceptions that were largely understood by people as logical conclusions or evident facts. It is for this reason that these conceptions are potentially more insidious. These ideas and ways of imagining are profoundly rooted in our culture, our exposure to cultural knowledge and our personal experiences; they are neither universal, nor empirically true.

My interviewees’ discussions demonstrate well how situated this basic-level knowledge can be. There are simple examples, in which people mapped the characteristics of everyday objects on less-everyday objects, like the examples of “*boite*,” “*bulle*,” “*caisse*,” “*cloche*,” “*dome*” to describe spaceships and habitats, or comparing the size of a space station to the size of the Opéra Garnier. A lot of prerequisite knowledge about tin cans or opera houses is at work in these descriptions. People have to know tin cans intimately to map this understanding onto spaceships: tin cans are metal, small, they seal up what is inside against external elements. The “*caisse*” example is possibly even more particular, as this expression is also used to refer to a junky, old car, and therefore is both an applicable container metaphor, and a fixed expression in French. Using the terms “bell (jar)” (“*cloche*”) and “dome” (“*dome*”) also requires knowledge of these items that are common in everyday life in Paris, but less so in other contexts across the globe. Personally, bell jars have never been such a common thing to see until I moved to Paris. Shop windows are widely populated by them, as they elegantly cover flower arrangements, pastries, watches and luxury bags. “*Cloche*” could also refer to a regular “bell,” like a church bell. Like bell jars, bells also figure prominently in the conceptual (and auditory) landscape of France. These terms do not necessarily mark my interviewees as French, middle to upper class, Parisian or urban, but they do issue from a conceptual constellation in which these factors are at play. At any rate, participants’ use of these terms in analogies in the corpus is evidence of practical knowledge of these items, therefore a knowledge that is situated within their cultural and socio-historical context.

The situated nature of basic-level knowledge and prototypes is even more pronounced in more complete mappings between more complex source domains of knowledge and target

domains concerning the unknown of space. The Apollo conception, used primarily by interviewees in the 60+ age group, is an excellent example of this. For people like François (3MNE), future space exploration would be very much like or the *same* as the Apollo missions. Familiarity with this source domain of knowledge is a requirement of deploying it in analogies. Secondly, as discussed in Chapter Seven (Young 1987), using the Apollo missions as a parallel to future space exploration requires a particular interpretation of the Apollo program and humanity's situatedness in relation to outer space. My respondents' use of the Apollo conception demonstrated a perception of science as positive and effective (Giddens 1991), or an unproblematic "vanguard of progress" (Lupton 2013, 15-16). This perspective is informed by the values of post-Enlightenment France as well as by the context of technoscientific late capitalism (Valentine, Olson and Battaglia 2012).

Complex mappings, like that of the multiple salient characteristics between the Apollo missions and future space missions, are informed by cultural texts and historical events that have become prototypical, but also issue from prototypical, individual experience. Though the act of walking is universal to humans, Antony's description of taking a walk is a rich source of cultural information: about the context of the walk, what it will consist of and Antony's motivations for the walk. Antony describes walking for pleasure, in nice weather and a generally clement climate (e.g. he does not discuss putting on boots, taking any survival gear, etc). He does not plan on hunting or gathering or needing to protect himself. He talks about satisfying the basic needs of thirst and hunger and his ways of doing this are also indicative of his culture and context. He chooses to take a plastic bottle of water and granola bars - common items available for purchase to someone living in a post-industrial, capitalist society. I find the granola bars particularly telling, as they evoke a 'health food' movement that reflects Western conceptions of healthy, portable food that takes no preparation on the part of the consumer.

It would be interesting to compare his description of preparing to leave the house for a walk, with those of people in different contexts. This makes me think of my mother, who works in remote villages in Northern Alaska, and how she gets ready to leave and cross the village to teach her students on the Bering Sea. Thinking about it, my mother's daily experience may be more analogous to the experience of going to space. She must dress for harsh elements (exposure

to which would be fatal were she not properly equipped). She is always supposed to ensure that she has a working communication device (e.g. a world phone) and tucked in the bottom of her backpack, is a small, densely packed survival kit with basic essentials (the towel Antony chose to take is certainly not an item in my mother's backpack! Although her steel wool and matches might not serve well in space...). These two kinds of backpacks and two kinds of walks are profoundly shaped by culture and context. How people experience their culture and context is a situated knowledge they can subsequently use to make other experiences 'known.'

It is not simply interesting to note cultural differences in taking walks and talking about walks. It is important to notice how the things we talk about, the parallels and analogies we make, are informed by the source domains of knowledge we choose/use. There is a logic of experience, be it individual or that transmitted through cultural knowledge, in our language and therefore linguistic relativity and linguistic constructivism are fundamental characteristics of language's functioning. The embodied nature of language and cognition (Feldman 2006; Perlovsky and Ilin 2013; Varela, Thompson and Rosch 1991), their recursive relationship (Perlovsky and Sakai 2014), and the dependence of human cognitive processes on adaptive learning (Perlovsky 2007), make this relativizing process a necessity, not a mystical epiphenomenon (see Schultz's [1990] discussion of criticisms of Whorf's "mysticism"). Both weak and strong Whorfian effects exist and do not depend necessarily on incommensurate qualities between languages or communities of linguistic practice, but on context (Gibbs 2006, 2013), on the level of abstraction of the ideas discussed (Baake 2003) and on the individual conceptions of speakers (Lakoff 1987, 1996).

My data suggest that metaphorical conceptions, whether they issue from prototypical source domains or not, permeate our discourse about the real and our ways of imagining and constructing the future and the potentially real. When people imagine the unknown and potential human realities they make widespread use of basic-level knowledge and prototypes to create analogies and subsequent metaphorical conceptions of this unknown and potential future, whether or not those conceptions are the most accurate conceptions they have at their disposal.

In addition to this, I argue that there is a distinction that we must take into account between the way prototypes influence everyday on-line processing of sensory information and

their influence on imaginations or projections for the future and discourse that attempts to directly affect the future perceptions of individuals and social groups. The use of prototypes in basic-level perception of colors, for example, is different than the use of prototypes in perception of space programs and political discourse concerning funding these programs. Political decisions concerning space programs are complex socioeconomic issues, not basic-level experiences. Research demonstrates that prototypes affect the way we perceive and categorize the world, and can shift perceptions towards cultural models. If this is so in the case of basic-level experiences, we can expect a much higher degree of dissonance, with more drastic results in the case of the application of prototypes to complex problems. And this is what scholarship has demonstrated time and again when examining competing conceptions of social questions/ideologies that engender serious social problems (e.g. racism, Van Dijk 1987, McConahay 1986; homophobia Herek 2004, O'Donahue and Caselles 1993; xenophobia Kirik et al. 2015, Leong and Ward 2006; genocide Cushman 2004, Moshman 2001).

11.3 Application of Results

This research demonstrates that, when imagining the unknown, the discursive world in which a person exists has a crucial role in their perceptions of what is possible and impossible and what is desirable or not. When the metaphors deployed by participants are not motivated by their experiences, they are often motivated by the experiences of historical figures (e.g. astronauts) or by narratives written by individuals who have no experience of the reality they describe in their texts. The present study demonstrates that the factXfiction surrounding a conception strongly influences people's imaginations and comprehensions, whether they are experts or not. Interviewees cited science fiction texts five times more on average than scientific articles, historical events or current events concerning space, with 32 references to "facts" and 152 references to "fiction" in the corpus.

Nonetheless, none of the interviewees solely relied on cultural texts when discussing their imaginations of space and 15% of participants made no reference to cultural texts in their discussions (though this is not sufficient evidence that these texts have no influence on their

imagination). Terrestrial embodied experiences, on the other hand, partially motivated the metaphorical production of all interviewees. The vignettes preceding Chapters two (Charlotte compares her long, solo trips to space travel), three (Charlie imagines walking around his apartment to pack his bag for space), and six (Antony imagines leaving his house to take a walk to comprehend leaving the Earth) are particularly developed examples in which people rely on their basic-level experience to model an imagined experience. Each of these vignettes demonstrates the fundamental role of basic-level, embodied experience in imagining the unknown.

As demonstrated throughout this thesis, all human minds, even those of our most ‘brilliant’ experts, are dependent on previous embodied experience and acquired cultural knowledge to be able to perceive and make sense of the phenomena on this world and beyond it. I was able to witness this process recently, when I logged into my computer one morning to discover that the first images of a black hole had been released the night before. I watched a video of the scientific team explaining these images on *Le Monde*’s website. I waited impatiently for the images to appear and for the explanation of the glowing golden and red ring I saw on the screen. Professor Heino Falcke (Barthelemy 2019) of Radboud University in the Netherlands, one of the 200 scientists on the Event Horizon telescope team that contributed to the image capture, described the image like this:

“This is the first image of a black hole... You have probably seen many, many images of black holes before. But they were all simulations or animations. And this is so precious to all of us because this one is finally real.

... You cannot see a black hole, but you can see its shadow. That’s when the light disappears beyond the event horizon, creating that dark region, that dark shadow we see there. And this is amazing if you think about it... we’re looking at a region that we’ve never looked at before; a region that we cannot imagine being there. It feels like really looking at the gates of hell, at the end of space and time. The event horizon, the point of no return.”

Professor Falcke’s speech was real treat for me, first because he references our ability to simulate and imagine the unknown and then because he engages in the metaphoric process to

speaking the black hole images “into meaningfulness” (Shore 1996, 58). He observes that to look at the image of the black hole we are looking at something we’ve never seen, something that “we cannot imagine.” At this point he immediately shifts into ‘feeling’-based discourse and a metaphor based on Christian conceptions of the cosmos (e.g. heaven and hell). When pushed to the edge of his expert imagination, he shifted his talk into descriptions based on culturally-mediated interpretations of his embodied sensations. His “gates of hell” analogy is explicit and immediately evokes the metaphoric process for a close listener, but less explicit (or invisible) instances of this process, like Antony’s imagination of his walk in Vignette 6, are equally compelling evidence of the metaphoric nature of cognition.

Many people argued that space, and the activity of imagining this unknown, seemed far away and irrelevant to our terrestrial lives. However, in light of the results of research like my own, it is necessary to think about conceptual frames, even imagined ones, not only as rhetoric, but as mechanisms of wor(l)d-building. Words can redefine the way we understand the world, its challenges and our capacities to meet those challenges. However, these words are likely to be less potent the more separated they are from the contexts in which they are spoken and from the meanings and implications attributed to them by specific individuals and communities of linguistic practice.

11.4 Limitations and Contributions of Research

Despite the limited purview of this project, this study could be expanded productively in a variety of ways. First of all, though the participant pool of 40 people is too small to allow for statistically important results, it did permit me to identify conceptually salient domains. Wide-scale surveying techniques of hundreds of speakers would allow for a different kind of documentation of predominant source domains of knowledge, uses of prototypes and motivation of metaphors. This macro-level perspective would be a productive addition to this research and would be helpful in strategizing an application of the research results.

Secondly, as this study concentrated on major trends in the data, there is a wealth of data that was left unaddressed. I am pleased with the depth and specificity that doing a limited

number of interviews allowed and am confident that the current corpus can also be further analyzed, particularly in terms of metaphorical idiosyncrasies and comparisons of metaphors used by participants in discussions of space and in discussions of other topics.

I am also interested in how much the context of my conversations with people affected their usage of metaphors and analogies. It is possible that, had Joseph or Christian been lecturing to a university classroom that they may have not so frequently referred to spaceships as “tin cans.” However, it is equally plausible that they would. Conversely, when Charlotte explains space to her son, does she use more figurative language and analogies to ‘talk [that reality] out’ (Shore 1996)? It may seem evident that certain forms of discourse (e.g. storytelling, poetry, role-playing) may make greater use of metaphor than others, yet scholarship demonstrates that this is not the case (Baake 2003; Messeri 2016). Some metaphors are simply placed under more scrutiny and debate. Scientific metaphors have come under fierce critique and, as I witnessed during this research, are hotly debated amongst their purveyors. This kind of semantic sensitivity may benefit us in other discursive domains, such as journalism.

Finally, it would be productive to pair discursive studies like mine with methodologies from cognitive science and behavioral psychology that allow researchers to track biological cognitive activity. Studies suggest that when Charlie talks about walking through his apartment, or when Antony describes going on a walk, that the brain areas associated with these motor activities will activate in a similar way to their activation patterns were Charlie and Antony to be actually walking (See mirror neuron research concerning language and cross-modal abstraction, e.g. Acharya and Shukla 2012; Rizzolatti and Arbib 1998). I think it is important to expand studies that focus on wor(l)d-building, in other words, that creatively pair discursive data to neurological data in order to document the ways in which boot-strapping processes and shared or co-opted cognitive functions create our ways of perceiving reality via a language-speaking body. As humans are socialized in and through language (Ochs and Schieffelin 1984), I find it crucial to further examine how we build our worlds and perceive the material world through embodied language and cognition.

This research makes a number of contributions to metaphor theory and to the discipline of anthropology. It contributes directly to linguistic anthropology by interrogating long-standing

hypotheses concerning the interaction and language and thought (Whorf 1941; Sapir 1931,1933) in discourse concerning the imaginary and unknown. The results provide a new kind of evidence for the framing effects of language, particularly in support of arguments concerning “Whorfian effects” (Lucy 1992b), prototypes and basic-level knowledge (Lehmann 1988; Rosch 1983). Methodologically, my research contributes to the expansion of metaphor theory in its examination of discourse concerning the unknown. I employed existing methodologies with a new kind of data in my analysis of metaphors with an unknown target domain. My results provide further evidence of the usefulness of methods of metaphor identification (Steen et al. 2010) and critical discourse and metaphor analysis (Van Dijk 1993; Charteris-Black 2004), whether the metaphors analyzed concern reality or imaginations of reality.

I have also coupled the above methods with thematic and key word analysis (Williams 1985) and with an analysis of the factXfiction intertext that informs participant discourse. Thematic and key word analysis allowed me to enrich my study of metaphors by finding key themes within people’s discussions and analyzing the discursive data according to these themes, rather than by analyzing the data according to pre-set themes in the study questionnaire, my own hypotheses, etc. For example, as I discuss in Chapter Ten, the questionnaire is thematically concentrated on space. Nevertheless, interviewees spoke more frequently about Earth and humans when prompted by the questions. Accordingly, I concentrated on these themes in my analysis.

The consideration of sources of cultural knowledge that directly informed interviewees’ discourse proved to be an important element in my analysis. Documenting the kinds of texts participants cited in their discussions allowed me to map cultural influences on their discourse and conceptualization. This is an element lacking in the majority of existing studies on individual metaphor use and provides considerable evidence concerning the motivation of conceptual metaphors (be they motivated by previous embodied experience or cultural knowledge) and the kinds of knowledge and experience that predominantly inform people’s conceptions.

As discussed in Chapter Five, France produces and consumes a wide range of cultural texts concerning the imaginary of outer space. From Jules Verne, to Tintin, to Thomas Pesquet, living and having been educated in France informed the kinds of texts people talked about. One

participant talked to me about images from Karl Lagerfeld's space-themed fashion show a few years back- a Parisian, middle to upper class source domain of knowledge if there ever was one. In addition to more markedly French references, people also discussed widespread cultural phenomena: shows like *Star Trek* and *Battlestar Galactica*; films like *Alien* and *2001: A Space Odyssey*; books by Arthur C. Clarke, songs by David Bowie and astronauts like Neil Armstrong and Buzz Aldrin. A few participants (e.g. Franck [1MNE] and Marie [2FE]) talked about following NASA's Twitter feed or online news about the ISS. Access to and consumption of these kinds of cultural texts situates my respondents within the historical moment of living in Paris in 2019 (e.g. frequent reference to Pesquet on national television during his stay at the ISS), within canonized representations of space present in France (e.g. Jules Verne and Tintin) as well as within globally circulated media (e.g. films and literature from the United States and Europe). Interviewees did not talk to me about Japanese science fiction or Native American conceptions of the cosmos. The cultural texts that informed their discussions were specific to their personal preferences, as well as the "distinction" (Bourdieu 1979) of these (kinds of) texts within the context of an interview with a foreign researcher, and their general prevalence and dominance within the community of linguistic practice.

People's discussions about the Earth and human futures on or beyond the Earth were clearly informed by climate change discourse in the twenty-first century and by the generalized acceptance and fear of the consequences of climate change by the French population. No one I interviewed expressed doubts about climate change, as may be the case in other cultural contexts, and all of my interviewees expressed strong convictions about the importance of human action. This perspective situates these speakers within dominant scientific discourse in France, as well as within a conception of the Earth as being under human control (and often, by extension, human responsibility for Earth's maintenance). Though participants rarely cited particular cultural texts in support of their positions, their discussions, again, reflected a general trust in science and the results of 'scientific studies' characteristic of high modernity (Giddens 1991).

Both the topic of humanity in outer space and the cultural texts that nourish it, and my inquiry into how people imagine the unknown and the (im)possible have implications for an 'anthropology of the future' or of 'future worlds' (Valentine, Olson and Battaglia 2009).

Anthropology of science and the future has predominantly focused on the discourse and practices of scientific experts (Baake 2003; Latour and Woolgar 1979; Messeri 2016). My research makes a novel contribution to this domain in its collection of data from non-experts and the comparison between expert and non-expert discourse on topics of science, technology and human futures.

I echo Valentine's (2017, 192) argument that "thinking humanness through multiple places in outer space offers anthropological insights into the problem of theorizing humanness and what it is to be habituated to a specific position." One result of my project that initially surprised me was how much considering space and imagining themselves and other humans in space provided a counterpoint against which interviewees made a number of arguments not about space, but about humanity. My research provides indications not only on the construction of worlds through words, but also on the egocentric and anthropocentric perspectives that inform this process for my French interlocutors. People repeatedly imagined themselves as isolated in space and projected themselves as disconnected from humanity; therefore centered on themselves. The majority of people talked to me about bringing books and movies to space, for example, instead of objects that would connect them to people from their past (e.g. photos, sentimental bric-à-brac) or that could connect them to people in the present or future (e.g. cards, dice). People wanted to bring data with them and devices with screens through which they could access this data. To me this belies more about human interests in post-industrial nations in high late capitalism, than it does about any egoism particular to the French. My interviewees only rarely imagined themselves in groups or communities in space. Antony's answer that if he had a good team with him in space that is all he would need was singular in a corpus where people repeatedly insisted on bringing a Kindle, an iPad, an external hard drive, their agenda or a book they could not live without.

The twelve vignettes I have included particularly enrich our understanding of this aspect of the data: What do people think they will be doing in space? and What is important to people to have in space (or in general)? For the sake of consistency, the vignettes are all in response to Question 7, but this is not the extent of the data. Nevertheless, the vignettes demonstrate a number of interesting trends, in particular that of interviewees' preoccupation with enjoying themselves in space.

Some people did talk about survival or a connection to Earth, but discussions of items and activities that would be typical of colonizers seeking to establish a new life were largely absent from the kilogram of items my interlocutors described. Similarly, few people really talked about preparing for their death. Only a couple people spoke about bringing memorabilia with them, as Simon describes in the vignette preceding this chapter (i.e. individual envelopes with photos and locks of hair of loved ones). Additionally, it was rare for people to talk about using space travel to provide a testimony of life on Earth. Oliver (1MNE) and George's (2MNE) wish to bring organic, terrestrial objects (e.g. shells, dirt) were uncommon.

The dominant common theme within people's responses was that of enjoying themselves, as if on vacation. Question 7 does not specify a return to Earth, but the majority of people imagined this return and the contents of their kilogram seemed to be based on a vacation model of space travel. Jules (3ME) insists on taking his keys with him (Vignette 1). Éric (2MNE) says it would be "*comme si [il] partais pour de longues vacances*" ("as if [he] were going on a long vacation") (Vignette 4). Véronique (2FNE) describes going to space as being "*un peu comme un marin en mer, quoi. Tu pars trois mois sur un bateau, tu amènes de quoi te faire plaisir un peu. C'est pareil*" ("a little like a sailor at sea. You leave for three months on a boat, you bring a few little pleasures with you. It's the same") (Vignette 10). Charlotte (1FNE) makes an analogy between packing her kilogram for space and packing her suitcase for a visit to Cuba (Vignette 2). Conversely, Adèle (3FE, V8:2) bemoans that space would not be like Cuba: "*Ce qui me manquerait finalement, c'est ça. C'est les paysages. C'est l'air pur. C'est paradoxal ce que je vais vous dire, mais aller dans l'espace, ce qui me manquerait c'est l'espace sur Terre. Je veux dire, c'est à dire, le volume d'air, les paysages, l'horizon, l'infini de l'horizon quand on est au bord de la mer*" ("What I would miss, ultimately, is that. Landscapes. Pure air. It's paradoxical what I am going to tell you, but if I went into space, what I would miss is the space on Earth. I mean, in other words, the amount of air, the landscapes, the horizon, the infinity of the horizon when you are beside the sea").

In Chapter Nine, I discussed Umberto Eco's argument that "we make lists because we do not want to die" (Beyer and Gorris 2009). In my interviews it seems like people made lists

because they did not imagine themselves dying. They brought socks, mascara, lotion, toothbrushes, condoms, whiskey and wine. The objects they chose belie an imagination of themselves in space, alive and well, feet tucked into warm socks, smoking an electronic cigarette, a glass of whiskey in hand. The items they chose are more conducive to an evening *après-ski* in the Alps, than for a trip to the Moon or Mars.

The explanation for this may lie in my interviewees' approach to these questions and to the artificial exercise of imagining themselves in space. They know this scenario is not going to happen to them and do not seem interested in imagining beyond the trip to space itself. There is not much musing about colonization or survival, but more about what matters to them individually if they have free time on their hands. I think this is a side effect of the exercise of imagining what my interviewees' perceived as being 'impossible' or even 'unimaginable,' rather than an effect of their position as members of the French, middle to upper class. However, the imagination of space as being akin to Club Med is also not altogether surprising in the context of my research. It would be an interesting subject of future research to ask this same question to people in different geographical and social contexts than my French interlocutors (e.g. asking people in the Yukon territory, rural China, or Fiji).

In addition to talking about the essentials for their individual lives (or holidays), my interlocutors made claims about what is important or of priority in human life, every day activity and civilization. They described what they found dangerous or beneficial to humanity, both in terms of physical and material elements and more abstract characteristics, such as creativity and 'open-minded' attitudes. These discussions, especially when linked to the future of the Earth, reflect the pervasiveness of anthropocentric perspectives in people's talk. People talked about humans as either being the cause of Earth's problems or the Earth's caretakers or saviors. It occurred to me after a while that, considering the entropic nature of the universe, the 'problems,' 'pain,' and 'abuse' that people perceived vis-à-vis the Earth were primarily problems that inconvenienced humanity (e.g. rising water levels, changing temperatures, famine and lack of fresh water). The Earth as humanity's garden is a metaphor that people extend in many ways, notably that the Earth exists to satisfy human needs and desires.

Most people easily transitioned from discussing human exploration of outer space to discussing the purpose of humanity and what it is to be human. These are not minor concerns, but fundamental questions that were prompted by imagining a far off, possibly fantastic or more or less realistic, projection of themselves into an unknown. Imagining and projecting ourselves into our imaginations allows us an arena in which we can (re)define what we think is possible, probable, desirable or necessary. Imagining the unknown is a process of bootstrapping on current knowledge and reality and wor(l)d-building using analogy, metaphor and displacement. This process permits us subsequent problem solving and innovation as, once we have established what we think is possible, we can begin to manipulate this possibility (potentially widening it, altering it, impeding it, multiplying it).

Therefore, an unexpected contribution of this research is the amount of data I collected concerning interviewees' imaginations and conceptions of humanity itself. My study documents how people interpret the human, particularly future humanity(ies). The imaginary of space confronts us uniquely with ourselves as it requires us to project ourselves into that which is alien and unearthly and permits an 'overview' of (White 1987) and conceptual distancing from the Earth and the human. My results demonstrate that it is methodologically effective to elicit imaginations of the distant in order to document peoples' conceptions of the proximal and the intimate. Space, for people in this research, was primarily a vast unknown that they populated conceptually with what they found most familiar and significant.

Though people talked about dystopian visions and utopian fantasies, in general interviewees argued that the imaginary of space was a way to "make people dream" ("*faire rêver les gens*"). Many people argued that discourse about space and space exploration *did* something. Namely, it caused a micro-level social effect that could have wide-reaching implications and consequences. Knowledge and sharing this knowledge was understood as "widening [people's] horizons" and possibly getting them interested in topics that were unfamiliar. These practices were almost unanimously viewed as positive and productive, reflecting an ideology of universal education and the erasure of what people considered widespread ignorance that dates back to the French Revolution.

As suggested in Chapter Five, this kind of talk also possesses connotations of a vestigial colonial attitude, in which France and knowledge produced in France hold a privileged position and it is important to spread French values and knowledge to others. More specifically, people (e.g. Margot 1FE) discussed spreading and sharing this knowledge with underprivileged nations and communities. STEM (Science Technology Engineer and Mathematics) knowledge was particularly cited as being crucial to spread throughout the world, with the implication that France was an appropriate origin for this spread. As Rigakos and Law (2009) suggest, these kinds of conceptions of problems, or “risks” and solutions belie the moral judgements of a community. The strategies people described to mitigate the risks of climate change, space travel, or improving education resonate with Lupton’s (2013, 12) discussion of Rigakos and Law (2009, 80); that risk is “always becoming...a phenomenon that may happen some time in the future... risk is always a normative statement of morality because it incorporates the notion that it may involve harm to someone or something.”

The risks discussed by my interviewees, whether in space or on Earth, largely related to maintaining what they perceived as a ‘good’ or ‘human’ life. Being able to breathe, eat and procreate were key factors, but many people talked as much or more about being able to eat a varied diet of ‘good things’ (“*les bonnes choses*”), smoking, drinking wine and being able to take walks in the fresh air. Discussions about French meals (which can and often involve all of the elements mentioned above) came up with many different people; they described lingering at the table, debating, enjoying good wines and good weather. Many interviewees talked about how it would be ‘wrong’ or ‘inhuman’ to ‘cram people’ into spaceships for long periods of time. People talked about risks not only as dangers to their lives, but to their way of life. They directly linked this way of life to places and experiences they knew: walking around Paris in the springtime, going to the beach, to the mountains; liberty of movement and interaction with others and a liberty to choose what you want to wear, eat, drink and do.

Similarly, the risks people talked about on Earth related to survival (e.g. catastrophic climate change) and to preserving particular ways of life. Charlotte (1FNE) talked about how a lack of resources could threaten civilized life and human’s capacity to produce art and science. Léon (3MNE) talked about massive influxes of climate refugees that would overrun Europe and

outnumber Europeans, therefore altering the sociocultural landscape. Jean-Denis (3ME) bemoaned transhumanism as taking the humanity out of humans. They did not just imagine humanity as surviving, but thriving in a world of varied possibilities. These visions of thriving in the future were informed by their experiences of living well and models for future scenarios based on scientific advancement and a maintenance of dominant French culture and ways of life.

Though discussions of risk far outnumber those of strategies of managing them, a number of people remained positive about human futures and the power of science and culture to ensure a better human future. Franck (1MNE), Arthur (2MNE), Marie (2FE), Adèle (3FE) and Margot (1FE) all spoke at length about the possibilities of space exploration to inspire humans to unite in common goals to better human futures on this planet and beyond it. Scientific study, scientific vulgarisation and science fiction were all understood by these interviewees to play an important role in changing public consciousness. As discussed in Chapter Five, cultural texts such as *Star Trek* and public outreach media from institutions like NASA and ESA were perceived by many as influencing the way people could imagine the future by presenting representations of possibilities. Whether it be an African American woman exploring space or images of proposed habitats on Mars, putting these ideas ‘into’ peoples’ minds through discourse was understood as affecting the world.

This was exactly the argument of Florence Porcel when I sat down and talked to her at a book release for her comic book *Mars Horizon*. Porcel is dedicated to scientific vulgarization in many forms (e.g. books, articles, Youtube videos, blogs) and strongly believes in the power of imagining future possibilities and informing these imaginations with scientific discoveries and historical data. She, much like Margot (1FE), is convinced that the democratization of scientific knowledge, especially among young people, positively influences scientific and technological innovation. She argues that a life-long passion for science can begin by stirring the imagination through factXfiction, in the form of sci-fi movies or fun videos explaining astrophysics.

In this research, I do not advocate for space exploration or colonization, but, I wholeheartedly agree with people like Porcel and Margot, who argue that space ‘makes people dream.’ Space is certainly a site of dreaming, but humans can dream about all sorts of new worlds and new ways of being in them. It is my purpose with this research that we can learn how

to make this world into a new world, in part by engaging with our language not as a descriptive tool, but as a field of action, performance (Austin 1962), categorization (Hofstadter and Sander 2010), conceptualization (Geary 2012; Grady 2005) and ultimately wor(l)d-building (Black 2018; Goodman 1978).

For this reason I feel one of the most significant contributions of this research is its inquiry into how language can be employed to enable people to imagine new possibilities and new worlds. How can we incite discourse that causes people to imagine positive futures? The results of this study are pertinent to the analysis of discourse and the framing effects of metaphors in widespread social issues, as well as everyday conceptions. Based on these results, I would argue that language, not only performatives, should be engaged with and deployed as an act, as something we do to our minds, our worlds and each other.

I firmly believe in the human capacity to make and remake ourselves for the better and I am convicted that much of this making is initiated in language. Equipped with the results of this study, I echo the call of Chimamanda Ngozi Adichie (2013) when she said, “I would like for all of us to begin to dream about and plan for a different world, a fairer world, a world of happier men and happier women who are truer to themselves” (Adichie 2013). This research demonstrates that one of the ways we can spur this dreaming and incite this wor(l)d-building is through cultural texts and social discourse. It is not a waste of our time to talk about problems, important issues and to dream and brainstorm their solutions. It is not futile to do our best to take the perspectives and experiences of others into consideration when evaluating and framing our own discourse. Humans build worlds in and through words. Our knowledge and imaginations are never entirely novel, they are always informed by pre-existing systems of knowledge that are culturally mediated. However, these ways of knowing and being remain human constructs within the purview of human agency (though it remains that, to use Bourdieu and Wacquant’s [1992] terminology, though we construct these systems, or structures, they then structure us). Humans can change these systems of knowledge and behavior and the most efficient resource with which to do this is language.

To deploy language, especially processes such as analogy and metaphor that have significant conceptual import, in the service of wor(l)d-building necessitates a careful

engagement with how we construct discourse and make this discourse available to the general public. Of utmost importance to this task is an understanding that our analogies and metaphorical language are not empty, ‘dead,’ nor purely rhetorical; they are the molds through which we shape our perception of reality and our subsequent reactions to that reality. Furthermore, we must not shy away from ‘wildly’ imagining, from interrogating that which may seem distant and irrelevant to our individual, terrestrial lives. My research demonstrates that dreaming of the distant has the capacity to bring us back to the present and the proximal, and that imagining beyond what we know can help us to realize our ability to change the known.

Throughout this research, my focus has been on language, particularly the functioning of analogy and metaphor and the illumination or obfuscation they contribute to our ways of knowing. I have concentrated on how metaphors highlight parts of experience, but can also be potentially dangerous because of what they hide. I have argued about what language does to inform perception and categorization; about our limitations. But there is an evident miracle in these findings, concerning what language and imagination demonstrate about human cognitive capacities and their (im)possibilities. People’s imaginations are not “pure,” nor novel. They are informed by culture, community, environment, historical moment and the historical moments that came before them, factXfiction and embodied experience.

And there are unknown unknowns. There are things that remain unimaginable to the human mind. On the rooftop of the Printemps department store François (3MNE) discussed this, couching his answer in the qualification that it was “*une réponse bête*” (“a stupid answer”). “*À partir du moment où l’espèce humaine constatera qu’elle sait le faire, et qu’elle peut le faire, technologiquement, elle le fera*” (“From the moment when the human species finds out that it knows how to do something, that it can do something technologically, we will do it”). He told me that if humanity cannot imagine something, then we cannot accomplish it. This is truism that many may grumble ‘goes without saying.’ This truism I do not find nearly as interesting as its inversion. If we can imagine it, then we can potentially accomplish it. And, as François would insist, if we can, then we will. Our future is as certain as the possibilities we can imagine because *justement*, if we can imagine it, that idea has entered the domain of the possible. Our grasp is potentially as far-reaching as the conceptions we construct and the words we find to

communicate them. With this mind, I would like to encourage each of us, as “enraptured prose beings” (Benjamin 1928), to imagine the most wonderful thing and talk it into being.

**Vignette 12: “J’essayerais de partir avec
la personne avec qui j’ai envie de vivre.”**

(Male, expert, 51 years old)

Christian was well known among the crowd at the Convention Nationale de la Science Fiction. He was only present for one evening to speak about sources of energy for interstellar space travel, but I would hear about him over the whole weekend. He was well-recognized in this niche environment, and, as I would later learn, was also widely known in the French milieux of astrophysics and scientific vulgarization. I myself would experience his ubiquity one day while touring a science fiction exhibit at La Villette. I was perturbed to have the sensation of hearing a familiar voice in the distance. When I turned the corner I was surprised to find myself face to face with him speaking on a big flat screen television in the exhibit.

Christian was impish and ornery, energetic and excited about all number of things: spaceflight, Earth’s future, good science fiction and perfect, rainy afternoons. He lived in the suburbs of Paris, but taught in the city and agreed to meet with me for lunch between classes. We met in a tiny restaurant where the owner knew him well. After ordering, he sat back and gave me almost two hours of animated, lengthy responses. He had a knack for putting things into simple terms. I learned much from him over the course of our interview and on subsequent occasions when I would meet him for a stroll or a coffee. One afternoon we walked part of the length of the international date line as he explained its history. It was fun to know that I knew who to call to mitigate my ignorance of astrophysics and space science.

True to form, when I asked him during our interview what he would bring in his kilogram to space he answered directly and pragmatically:

“On a le droit à un kilo, donc il faut emmener un truc où il y a beaucoup d’information pour pas beaucoup de masse. L’avantage d’emmener des ordinateurs c’est qu’on met des gigaoctées, des teraoctées. Donc, moi j’aimerais bien avoir un truc pour regarder le ciel. Des jumelles, fin, une machine pour regarder mieux le ciel de la station orbitale. Fin, ils ont peut-être tout prévu, les caméras, les appareils photos, plein de trucs. Et sinon, je ne sais pas, des bouquins...des bouquins numériques évidemment, parce qu’il faut que ça soit beaucoup de bouquins dans pas beaucoup de masse. J’emmènerais beaucoup de bouquins et puis je n’en sais rien.”

I gave him a moment to take another bite and contemplate. He went on.

“Ils doivent emmener des cadres de leurs nanas, de leurs copines, de leurs enfants, de leurs copains. J’imagine. C’est pas le truc qui me toucherait le plus quoi. Je ne suis pas sûr que j’emmènerais ça à bord. Surtout sur la station orbitale. Tu peux en gros téléphoner, pas quand tu veux, mais tu peux téléphoner. Ce n’est pas comme si tu étais...si tu pars loin, bon sur une orbite martienne ça sera beaucoup plus compliqué.”

As I realized he was describing a vacation, or research trip, model of space travel to me, I prodded a little further, “Alors, si tu partais très loin pour ne plus revenir?”

Again, he responded without hesitation.

“J’essayerais de me débrouiller pour partir avec la personne avec qui j’ai envie de vivre. Ce qui est compliqué. Ça veut dire qu’elle n’a pas forcément envie de partir. Ce qui rend dur le coup. Forcer, non justement ça serait pas bien de la forcer, mais ça veut dire, presque automatiquement, changer de partenaire pour en trouver un qui est d’accord pour partir avec toi.”

“Tu vois? Avec qui tu partirais est aussi important que comment tu partirais, quelles sont les conditions d’organisation. Et donc il faut des gens extrêmement ouvert d’esprit et ce n’est pas facile. On a tous nos tabous, on a tous nos difficultés, on a tous plein de trucs. C’est compliqué. C’est à dire la où c’est des humains, c’est là où c’est vraiment compliqué.”

Reading back through the corpus, I was struck by this married, father of two’s response to my question. His discussions of technological and social control in space (which were lengthy) were not only projections for others, but for himself. If the person with whom he wanted to spend the rest of his life did not want to go to space with him, his reasoning was to replace that person. Though many people did not insist on taking their families or loved ones, no one spoke about replacing them to find a more suitable space companion. I thought about Josephine’s (1FNE) response to the same question, “Mon enfant et mon conjoint faisant chacun plus d’un kilo malgré leurs efforts, je ne prendrais rien et je ne partirais pas.”

He may have been playing a bit the role of a cold, tough scientist; a man who wouldn’t need his wife or even a picture of her in space. He spoke little of his family as a general rule. But, maybe he was not fully calculating his move in the excitement of imagining a future in space. Whereas he was as full of disdain as any parisien when discussing U.S. politics or tourists taking selfies in Saint Germain, he lit up as we talked about space; brown eyes beaming under his furrowed brow.

“Ah! Saturne! Saturne! Tu imagines? C’est un million...tu imagines le truc. C’est à tomber quoi. Tu as vu Interstellar²²⁵? Tu sais il y a la base...Là à la fin ils sont en orbite autour de Jupiter et ces cons-là, ils jouent au baseball. C’est vraiment des amerlocs quoi. Ils sont cons. Alors, moi, si tu as Saturne, tu arrives en orbite, je reste un an collé au hublot tellement c’est incroyable.”

Like all of my interviewees, Christian knew he would never go to space (he later outlined in detail the training he lacked). Yet, so much of his life had been spent pondering worlds beyond our own, he felt he knew them, desired to have contact with them, while they remained unknown. He took pleasure in

²²⁵ 2014 space drama and mystery film directed by Christopher Nolan.

talking about things beyond his experience and even comprehension. He was thrilled simply by imagining them.

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Appendices

Appendix I. Ethics Approval Certificate



CERTIFICATION OF ETHICAL ACCEPTABILITY FOR RESEARCH INVOLVING HUMAN SUBJECTS

Name of Applicant: Alexis Black
Department: Faculty of Arts and Science\Sociology & Anthropology
Agency: N/A
Title of Project: Metaphor and the Boundaries of Experiential Knowledge
Certification Number: 30004832

Valid From: June 14, 2018 To: June 13, 2019

The members of the University Human Research Ethics Committee have examined the application for a grant to support the above-named project, and consider the experimental procedures, as outlined by the applicant, to be acceptable on ethical grounds for research involving human subjects.

A handwritten signature in black ink, appearing to be "J. Pfaus".

Dr. James Pfaus, Chair, University Human Research Ethics Committee

Appendix II. Research Questionnaire and Translation

Research Questionnaire (Original French)

1. Quand on vous parle de l'espace, quelles sont les premières images qui vous viennent en tête ?
2. Comment voyez-vous la civilisation humaine multi-planétaire ?
3. Imaginez qu'on vous offre un voyage dans l'espace. Iriez-vous ?
4. Comment imaginez-vous la vie humaine hors de la planète Terre ?
5. Est-ce que vous pensez qu'il faut devenir une espèce multi-planétaire? Pourquoi (pas) ?
6. Pensez-vous que les humains qui vivent hors de la Terre resteront pareils à nous, les humains terrestres ?
7. Actuellement, les astronautes sur la Station Spatiale Internationale ont droit à 1 kilo d'effets personnels. Qu'est-ce que vous apporterez avec vous si vous partez aujourd'hui ?
8. Qu'est-ce qui vous manquerait de la Terre s'il fallait la quitter demain ? Qu'est-ce qui ne vous manquerait pas ?
9. Que ressentez-vous lorsque vous imaginez un être humain qui vit hors de la Terre ?
10. Est-ce que vous pensez que l'exploration de l'espace sert à quelque chose ?

Research Questionnaire (English Translation)

1. When some speaks to you about space, what are the first images that come to mind?
2. How do you see [imagine] a multi-planetary human civilization?
3. Imagine that you are offered a trip to space, would you go?
4. How do you imagine human life beyond the Earth?
5. Do you think it will be necessary to become a multi-planetary species? Why (not)?
6. Do you think that humans that live beyond the Earth will remain the same as us, terrestrial humans?
7. Currently, the astronauts on the International Space Station are permitted to bring 1 kilogram of personal effects. What would you bring with you if you left today?
8. What would you miss about the Earth if you had to leave it tomorrow? What wouldn't you miss?
9. What do you feel when you imagine a human being living beyond the Earth?
10. Do you think that space exploration is useful for something?

Appendix III. Corpus Statistics

Name	Interview Length	Belief in ETs	Sci-Fi Fan	Personal Experience with Space Race	Would go to space?	What would you bring to space?
Marie (2FE)	2h 25m 20s	X	X	X	X	<p>Une liseuse (Oh la, tout le 19ème siècle français. L'âge d'Or américain, parce qu'il y'en a plein que j'ai pas lu et que je lirais avec plaisir. Alors, tout Bruner, tout Sargent, mais je crois que j'ai tout lu.</p> <p><i>Time Enough for Love</i>, je le lis en anglais, tant pis. C'est un roman d'Heinlein qui a jamais été traduit. Je pense que je prendrais des films qui m'ont formée. Comme <i>Au bout de souffle</i>, comme <i>Le mépris</i>, comme <i>La règle du jeu</i> ou <i>Les enfants du paradis</i>), du tabac chiqué. Mon mec. Des enregistrements, de tout entre Igor Stravinsky et les Ramones. Jusqu'à dans les années 1990, parce qu'après ça passe. Une robe du soir. Mais peut ne pas peser lourd, une robe de soir. La pilule bien sur. du Lagavalin, 30 ans d'âge, vieilli en fut.</p>
Louis (1MNE)	33m 27s	X	X		X	<p>Mon livre préféré, donc <i>L'Assommoir</i> d'Emile Zola (Bon, mon livre, physique parce que le contact du papier.) Je prendrai mon console portable, si je voyage seul des photos de ma famille, un bon petit plat ("la sauce graine," une spécialité ivoirienne)</p>
Charlotte (1FNE)	43m 2s	X				<p>Un Kindle avec plein de livres chargés dedans (un livre dans chaque langue qu'elle parle), Une poignée de vêtements préférés, une cigarette électronique ou des cigarettes, mon agenda, de la musique dans mon MP3</p>
Madeleine (1FNE)	47m 45s	X			X	<p>Beaucoup de ventoline. Peut être un livre de Bertrand Russell...n'importe lequel en fait parce que quand je lis Bertrand Russell je sens qu'il me reveille toutes mes idées en tête, des cahiers, peut être des crayons</p>
Arthur (2MNE)	1h 7m 47s	X	X		X	<p>Un chien, ou un robot, une source d'échange</p>
Jean Denis (3ME)	38m 3s		X	X		<p>Un ordinateur genre un Airbook, un Apple, avec toutes les données, plein de bouquins, plein de photos, plein de dessins, fin, plein de choses</p>
Éric (2MNE)	24m 7s	X	X		X	<p>Je prendrais du matériel pour écouter de la musique. Je prendrais des écouteurs et mon téléphone qui ne marcherait pas, mais avec lequel je peux écouter toutes mes playlists sur des heures. Mes lunettes de soleil.</p>

Name	Interview Length	Belief in ETs	Sci-Fi Fan	Personal Experience with Space Race	Would go to space?	What would you bring to space?
François (3MNE)	51m 52s			X	X	J'emporterais la photo de ma fiancée. Après ça, j'emporte des chaussettes.
Camille (2FNE)	25m 4s	X			X	Ça serait des produits d'hygiène,
Charlie (1MNE)	48m 49s	X	X			Plutôt des choses qui durent. Plutôt des livres... Une liseuse c'est quelque chose qui peut tomber en panne. un papier et un crayon pour pouvoir dessiner.
Margot (1FE)	1h 2m 1s	X	X		X	Ma liseuse... un chargeur solaire pour ma liseuse... Quand même un ou deux livres en papier... de quoi prendre des notes... deux, trois petits trucs, si je peux, qui me font penser aux gens qui sont derrière moi. Comme, en fait, bêtement ce que je porte sur moi, c'est ma bague serpent
Estelle (3FNE)	10m 40s					Une brosse à dents, une brosse à cheveux, un peigne... Des ciseaux pour se couper les ongles. Un bouquin éventuellement tu peux relire tout le temps.
Pauline (3FNE)	10m 40s					Le stricte minimum
Jean (1MNE)	2h 14m	X			X	J'emmènerais une liseuse avec beaucoup de textes dedans... je prendrais quand même ce genre d'objet avec beaucoup de contenance. Je vais avoir besoin de musique. Il faudrait que j'aie un iPad en fait. Il faudrait que j'aie un iPad sur lequel je puisse créer des dossiers. Et me faire des listes, comme j'ai bien faire des listes, que je puisse tenir mon journal, tu vois avec cet objet je peux répondre à pas mal de besoin... je prendrais une photo
Jules (3ME)	1h 5m 54s		X	X		iBook... mes lunettes, pour voir de loin. Les clefs de la maison parce qu'on sait pas, je pourrais peut-être revenir
Simon (2ME)	43m 51s		X	X	X	Des capotes, de quoi dessiner ça serait bien, des photos des gens que j'aime accompagné par un bout de leur cheveux.
Christian (2ME)	1h 23m 19s		X	X	X	Des jumelles, fin un machine pour regarder mieux le ciel de la station orbitale... des bouquins numériques
Lucas (2MNE)	50m 48s		X	X	X	Une bouteille de scotch. Un livre. Un vrai livre. Appel à la matière. Je pense que je prendrais l'Iliade pour le relire et le relire encore et encore... Un MP3 avec de la musique dessus

Name	Interview Length	Belief in ETs	Sci-Fi Fan	Personal Experience with Space Race	Would go to space?	What would you bring to space?
Adèle (3FE)	2h 10m 52s	X	X	X	X	J'emmènerais des photos de mes êtres chers. De mes chats aussi peut-être...J'emmènerais du son aussi. J'emmènerais finalement au sens propre du terme ce qui m'a toujours fascinée dans le monde moderne, c'est l'audio-visuel. J'emmènerais peut-être aussi une bonne bouteille de Bourgogne.
Bernard (3MNE)	1h 8m 9s			X	"C'est pas non, c'est pas oui."	Ma brosse à dents. Quelques vêtements. <i>The Message In The Bottle</i> de Walker Percy.
Nathalie (3FNE)	1h 7m 10s					Une bibliothèque sur micro, genre mp3 sur un format extrêmement minime, des oeuvres musicales, des oeuvres enregistrées de peinture par exemple
Édouard (3MNE)	1h 18m 17s		X	X	X	Une clef USB, un disc dur, un appareil sur quoi visionner des films, écouter de la musique. Musique, images, littérature. Peut être des photos physiques pour pouvoir avoir une sorte de contact sensoriel entre guillemets, sensorielle avec les images.
Franck (1MNE)	50m 19s		X		X	Mon MP3 et des écouteurs... j'emmènerais 900 grammes de weed mais, c'est ridicule. Je pense que peut être je prendrais une boîte. Une boîte où il y a tous, tous mes souvenirs en fait. Que des papiers. Des tickets, des courriers, des mots, des lettres, ouais, des tickets de plein de choses différentes, plein d'échanges quoi. Une boîte à chaussure pleine
Joséphine (2FE)	N/A (écrit)		X			
Olivier (1MNE)	31m 40s	X			X	Une tablette avec plein de livres...là je peux stocker plein de musique, plein de livres, plein de photos, donc tout ça. Tout ce que je pourrais dématérialiser. Ça, ça pèse peut être 200 grammes. Là j'ai de la place. Je peux stocker tout mon mémoire....Alors je pourrais prendre un bout de la Terre. Quelque chose comme un beau caillou... Est-ce que je prendrais un paquet de clopes? Je pourrais prendre ma médaille que j'ai eue pour mon baptême.

Name	Interview Length	Belief in ETs	Sci-Fi Fan	Personal Experience with Space Race	Would go to space?	What would you bring to space?
Agnès (2FNE)	29m 48s				X	Ma chemise de nuit. Ma brosse à dents. Et puis mon démaquillant aussi. Ma crème. Puis mon shampoing. Mes produits de toilette. Si tu parles de vêtements mon jean et puis mes baskets.
George (2MNE)	1h 0m 40s	X	X		X	Je pense que j'emmènerais un porte bonheur, quelque chose qui puisse me rappeler qui je suis, pourquoi je suis parti, et pourquoi... pourquoi je ne pourrai pas revenir.... En fait, finalement, si on apporte quelque chose comme ça, un gris-gris, c'est qu'on est l'esclave d'une croyance. Et je pense qu'en fait il faudrait peut être partir dans l'idée qu'on ne le sera plus. Peut-être un kilo de la terre. Si c'est un kilo d'humus il y aura tellement de choses avec.
Valérie (3FNE)	20m 49s	X	X	X		J'ai un nounours que j'ai gardé depuis que je suis née pratiquement, j'emmènerais peut être mon nounours
Martin (3MNE)	33m 26s					La musique... Livres...un peu d'aventure... Ah! Des gateaux! Un chat.
Marie Rose (3FNE)	33m 26s	X		X	X	La musique forcément, quelques films parce que j'adore le cinéma. Tous les films de LeLouche. Et puis deux ou trois bouquins quand même
Joseph (2ME)	40m 45s	X	X	X	X	Un disc dur avec beaucoup de choses et de quoi consulter ce qu'il y a dessus, une liseuse, un écran....de la musique, des films, des livres.... Peut-être un instrument de musique, même si j'en joue pas très bien, j'apprendrais là-haut.
Nayla (1FNE)	23m 27s		X		X	Un Kindle, stylo-bloc notes, ma brosse à dents. Dentifrice...ma brosse à cheveux...et j'ai toujours besoin d'être maquillée, donc il y aura quand même un mascara. Et une crème...une crème pour prendre soin...pour ma peau. e suppose de toute manière, tout ce qui est appareil photo, tout ça, il y aura sur place.
Danielle (3FE)	N/A (écrit)		X			De la musique. De la lecture. De l'art. De quoi créer de la musique et de la lecture et de l'art.
Christine (2FNE)	16m 18s	X			X	Des sous vêtements, un t-shirt, un jean. Une brosse à dents, si j'arrive à me brosser les dents dans l'espace. Un sèche cheveux! Et le maquillage. Les produits de beauté!

Name	Interview Length	Belief in ETs	Sci-Fi Fan	Personal Experience with Space Race	Would go to space?	What would you bring to space?
Antony (2MNE)	42m 55s	X			X	Une bouteille d'eau et une bouteille de vin. Une bonne bouteille de vin.
Gigi (1FNE)	1h 2m 14s					Des livres sur l'espace. C'est vrai que si je pourrais prendre ma barre, je prendrais ma barre. Une guitare ça pourrait être pas mal, un instrument de musique...
Léon (3MNE)	38m 8s	X		X		Un ordinateur, un portable... et c'est tout. [et sur l'ordinateur?] Je vais être relié à toutes les bases de données qu'on pourra lire. Tout ce que je veux. Toutes les bibliothèques, LegiFrance, tout, tout, tout ce dont j'ai besoin. C'est pour lire tous les livres qui m'intéressent. Et la musique, les films, y compris la science fiction, que j'aime bien.
Manon (2FNE)	33m 12s	X				De quoi lire... les livres, les photos, de la musique. Un casse-tête,
Véronique (2FNE)	23m 28s				X	De la littérature. De tout. Des romans. Un dictionnaire. Très important un dictionnaire. Parce que c'est...c'est... la première étape de la curiosité, elle est là.... Une boîte de confit de canard
Louise (1FNE)	32m 24s					Alors, je prendrais mon oreiller, comme ça au moins je suis confortable et la nuit je pourrais le serrer. Alors, je prendrais de la musique et si possible, ouais de la musique, alors, ouais je ne joue pas d'instrument malheureusement. Alors, c'est vrai que je pourrais genre emmener quelque chose comme un harmonica peut-être. Parce que la musique ça permet de ne pas perdre...ça permet de se raccrocher à quelque chose d'universel et de poétique et tu peux toujours créer une mélodie qui te fait te souvenir de ce qui est loin. Donc, voilà, je pense que je prendrais un MP3 le temps qu'il sera susceptible de marcher, mon oreiller et un harmonica pour apprendre comme c'est petit. Et puis, de quoi écrire. Alors, léger...je ne peux pas en prendre beaucoup. Alors, un crayon, du papier avec une gomme. Comme ça je peux écrire et effacer, écrire et effacer, et recommencer jusqu'est ce que ça soit parfait.

Appendix IV. Participant Breakdown Spreadsheet

Name	Gender	Age	Education	Occupation	Multilingualism
Non-Expert: 20-39 Years Old					
Franck	Male	36	BA Business	Restaurant manager	None
Jean	Male	31	BA Philosophy; MA, Documentary film	Editor and translator	English and Spanish
Charlie	Male	36	BA, Journalism	Yoga instructor	English and some Spanish
Olivier	Male	29	MA, Film	Multiple; film- maker and freelance critic	Some English
Louis	Male	32	MA, English and MA, History. Commercial training in international business.	Banker	English (former English teacher), some German
Madeleine	Female	28	BA, Architecture; MA, Production Design	Art design for film	English and Arabic
Nayla	Female	28	BA and MA, Physics	Artist (contortionist)	English
Charlotte	Female	38	BA, Political Science, MA, Marketing and Anthropology	Marketing analyst	English, Spanish, German, Pijin
Gigi	Female	24	High school education; dance training	Dance instructor	None
Louise	Female	32	License, MA, Education	French teacher (high school level)	None
Non Expert: 40-59 Years Old					
Arthur	Male	55	BAC+3, scientifique	Nurse	English, Spanish and Portuguese
Antony	Male	45	BA, Engineering	Factory manager	None
Lucas	Male	51	BA Geography; MA Ancient History; currently getting PhD in Contemporary History of Science Fiction	Editor	None

Name	Gender	Age	Education	Occupation	Multilingualism
George	Male	46	BA, Civil Engineering; BA, Visual Anthropology	Editor	None
Éric	Male	44	BAC+2, Sport	Bar manager	English and Spanish
Christine	Female	50	BTS Management and Accounting	Entrepreneur (Owner of dance studio)	None
Agnès	Female	47	BAC G3, Commercial	Music distributor	English, some Spanish and an Algerian dialect of Arabic
Camille	Female	44	BA, Fine Arts and Dance	Dancer, yoga instructor	French, English (past German and Italian)
Manon	Female	53	BA, International Business	Unemployed (formerly perfume distributor)	English and Spanish
Véronique	Female	51	MA Physical therapy	Physical Therapist	None
Non Expert 60+					
Nathalie	Female	65		Retired, Ministry of the Interior	German, functional Russian, Swedish, English
François	Male	70		Retired, librarian College de France	English, functional German and Latin
Martin	Male	60	High school education	Communications advisor	English
Edouard	Male	69	MA, Literature and Film	Film professor (university level),	English and Italian
Bernard	Male	+65	BA, Philosophy and Anthropology; PhD Anthropology	Retired anthropologist	English
Léon	Male	60		Intellectual Property Attorney	English
Valérie	Female	66	MA, Pharmacy	Retired, pharmacist	None
Estelle	Female	76	BA, Physics and Chemistry	Retired, laboratory researcher and high school teacher	None
Pauline	Female	80	BA, Accounting	Retired, Commercial accountant	None
Marie Rose	Female	71	BAC+2	Retired, Flight attendant	English and Italian
Experts					

Name	Gender	Age	Education	Occupation	Multilingualism
Simon	Male	47	BAC A3 (specialized diploma in graphic art)	Illustrator	None
Jules	Male	71	BA, Literature	Retired literature professor; Science fiction writer	German, basic English
Jean Denis	Male	61	MA, Modern Letters	Science fiction writer	English and Spanish
Joseph	Male	44	BA, Physics; PhD Astrophysics	Planetary scientist and astrophysicist	English and Spanish
Christian	Male	51	BA and MA Physics and Quantum Physics; Ph.D. Astrophysics	Astrophysicist	English and Spanish
Marie	Female	52	BA, Psychology and Modern Letters	Science fiction writer	Latin, Spanish, basic English
Danielle	Female	70	PhD Creative writing	Science fiction writer and translator	English
Joséphine	Female	39	High school education	Science fiction writer	English
Adèle	Female	68	MA, Modern Letters	Science fiction and fantasy writer	English
Margot	Female	39	MA, French Literature	Science fiction writer	English, German and some Spanish

Appendix V. Intertextuality Spreadsheet

Text/Event/ Person	Participant									
<i>2012</i>	Margot (1FE)									
<i>2001: A Space Odyssey</i>	Marie (2FE)	François (3MNE)	Jules (3ME)	Danielle (3FNE)	Édouard (3MNE)	Joseph (2ME)	Leon (3MNE)			
<i>The Abyss</i>	Adèle (3FE)									
<i>Alien</i>	Marie (2FE)	Louis (1MNE)	Charlotte (1FNE)	Éric (2MNE)	Adèle (3FE)	Christine (2FNE)				
<i>Arrival</i>	Olivier (1MNE)									
<i>Avatar</i>	Christine (2FNE)									
<i>Back to the Future</i>	Antony (2MNE)									
<i>Battlestar Gallactica</i>	Édouard (3MNE)	Gigi (1FNE)								
<i>Bienvenue à Gattaca</i>	Arthur (2MNE)	Jules (3ME)								
<i>Book of Eli</i>	Margot (1FE)									
<i>Close Encounters of the Third Kind</i>	Adèle (3FE)	Édouard (3MNE)	Joseph (2ME)	Antony (2MNE)						
<i>Earth</i>	Gigi (1FNE)									
<i>Elysium</i>	Christian (2ME)									
<i>E.T.</i>	Jean (1MNE)	Adèle (3FE)	Édouard (3MNE)	Agnès (2FNE)	Valérie (3FNE)					
<i>The Expanse</i>	Marie (2FE)									
<i>Fringe</i>	Jean (1MNE)									
<i>Gravity</i>	Éric (2MNE)	Charlie (1MNE)	Jean (1MNE)	Édouard (3MNE)						
<i>Guardians of the Galaxy</i>	Édouard (3MNE)									
<i>Interstellar</i>	Charlie (1MNE)	Jean (1MNE)	Simon (2ME)	Christian (2ME)	Gigi (1FNE)					
<i>Jaws</i>	Adèle (3FE)	Édouard (3MNE)								
<i>Mars Attacks</i>	Louis (1MNE)									
<i>The Martian</i>	Jean (1MNE)	Lucas (2MNE)	Agnès (2FNE)	Valérie (3FNE)						
<i>Matrix</i>	Arthur (2MNE)									
<i>La Planète Sauvage</i>	Édouard (3MNE)									
<i>Prometheus</i>	Éric (2MNE)	Édouard (3MNE)								

Text/Event/ Person	Participant									
Star Gate	Louis (1MNE)									
Star Trek TOS	Marie (2FE)	Charlotte (1FNE)	Jean Denis (3ME)	Édouard (3MNE)	Antony (2MNE)					
Star Wars	Marie (2FE)	Louis (1MNE)	Madeleine (1FNE)	Jean (1MNE)	Adèle (3FE)	Édouard (3MNE)	Franck (1MNE)	Olivier (1MNE)	Joseph (2ME)	Véronique (2FNE)
Solaris	Nathalie (3FNE)	Édouard (3MNE)								
Spiderman 3	Arthur (2MNE)									
Total Recall	Jean (1MNE)									
Tron	Adèle (3FE)									
Twilight Zone	Jean (1MNE)	Édouard (3MNE)								
X-Men	Lucas (2MNE)									
Isaac ASIMOV	Marie (2FE)	Jules (3ME)								
David BOWIE, “Space Oddity”	Marie (2FE)	Charlotte (1FNE)								
Ray BRADBURY	Jean Denis (3ME)	Édouard (3MNE)								
Arthur C. CLARKE	Joseph (2ME)									
Robert HEILEIN	Margot (1FE)	Marie (2FE)								
Karl LAGERFELD	Bernard (3MNE)									
Ursula LEGUIN	Édouard (3MNE)									
Jack LONDON	Margot (1FE)									
Carl SAGAN	Simon (2ME)									
Jonathan SWIFT (Gulliver’s Travels)	Édouard (3MNE)									
Jules VERNE	Arthur (2MNE)	Jules (3ME)	Édouard (3MNE)	Joseph (2ME)	Véronique (2FNE)					
H.G. WELLS	Édouard (3MNE)									
Dr. Jekyll/Mr. Hyde	Jules (3ME)									
Frankenstein	Arthur (2MNE)	Jules (3ME)								
Robinson Crusoe	Jean (1MNE)									

Text/Event/ Person	Participant									
<i>Tintin Sur la Lune</i>	Jules (3ME)	Véronique (2FNE)								
<i>Treasure Island</i>	Margot (1FE)									
Neil ARMSTRONG	Marie (2FE)	François (3MNE)	Jules (3ME)	Simon (2ME)	Christian (2ME)	Lucas (2MNE)	Bernard (3MNE)			
Chris HADFIELD	Marie (2FE)	Charlotte (1FNE)								
Thomas PESQUET	Marie (2FE)	Charlotte (1FNE)	Christian (2ME)	Lucas (2MNE)	Bernard (3MNE)	Franck (1MNE)	Marie Rose (3FNE)	Manon (2FNE)		
NASA	Madeleine (1FNE)	Arthur (2MNE)	Simon (2ME)	Christian (2ME)	Bernard (3MNE)	Franck (1MNE)				

Appendix VI: Table 5:1: Participant responses to Question 1, “When someone talks to you about space, what are the first images that come to mind?”

Participant	Cultural Models	Embodied Models
Marie (2FE)	“Alors, c’est un grand plan séquence de Robert Wise dans Star Trek. C’est dans le premier Star Trek, <i>Star Trek The Motion Picture</i> . Vous avez l’Enterprise, qui est tout nouveau, tout neuf, qui part des docks. Le plan dure 10 minutes. C’est une de mes extases esthétiques de la vie. Et il part et on voit des petits astronautes sur les docks qui lui font bonjour en passant. Quand on me parle de l’espace, je vois ça. Après il y a <i>2001</i> . Et après, là aussi, tout, après qui tombent en chaine, il y a Neil Armstrong et tout ça.”	
Charlotte (1FNE)	“Les planètes. Mais ça c’est par hasard en regardant des dessins animés ce matin avec mon fils. Ça l’a fait sourire parce qu’il connaît les planètes du livre <i>Le Petit Prince</i> . Donc, c’est ma principale représentation des planètes actuellement en tant que jeune maman. La planète du Petit Prince et les autres planètes. [Je vois ça] plutôt noir avec des planètes de couleur.”	
Madeleine (1FNE)	“La Terre vue de ...dehors. Les nébuleuses aussi. Les trous noirs. Quand est-ce qu’on va pouvoir y aller?” (images de NASA)	
Arthur (2MNE)	“Celles qu’on a vu avec la NASA...”	“...en particulier la Lune, quand on regarde le ciel. Aussi, umm Mars et Venus, quand on les voit, la nuit étoilée, voilà. Ce qu’on voit concrètement, les premières images, c’est ça.”
Éric (2MNE)	"Le cosmos. Les étoiles. Les planètes..."	“...La Lune. Je la vois, très grande, ronde avec beaucoup de cratères, des cratères gris, des grandes étendues. Voilà. Les grandes étendues et la Terre en contre bas, en toute petite. De la Lune tu la vois toute petite.”
François (3MNE)	“C’est 1969, le voyage dans la lune.”	

Participant	Cultural Models	Embodied Models
Léon (3MNE)	“L’espace... premières images... une planète assez lointaine dans le système solaire, comme Saturne ou Uranus. Après peut-être un engin. Je pense à des films, les images de films. <i>2001</i> , je me rappelle plus des titres des films, mais 2 ou 3 films qui me viennent à l’esprit. Pas <i>La Guerre des étoiles</i> parce que je n’aime pas du tout”	
Estelle (3FNE)	Thomas Pesquet (p 114)	
Pauline (3FNE)	Thomas Pesquet; “C’est tout récent ça. Ça fait un mois qu’il est parti. Il va très bien et <i>il est sorti dans l’espace</i> ”	
Jean (1MNE)	“Ah, après c’est idiot mais je pense à des films. Je ne sais pas là, j’ai vu <i>Gravity</i> . Je pense aux <i>Star Wars</i> ... Les vaisseaux, quoi. Les vaisseaux dans l’espace et tu sais quand ils passent dans l’hyper espace”	"le noir et les étoiles au milieu"
Jules (3ME)	“C’est évidemment le 4 octobre ’57. J’avais douze ans et c’est le lancement du Spoutnik. Et moi qui étais nourri avec les BDs Cosmos, Sidérales, Atom Kid...”	
Simon (2ME)	Voyager	“Soit c’est la notion dont j’ai parlé à tout à l’heure sur uhhhh l’appréciation de l’univers que j’occupe, ça c’est, ça c’est c’est mon existentiel.”
Christian (2ME)	“c’est des images, plutôt de science fiction, des grands vaisseaux spatiaux dans l’espace à fond.”	

Participant	Cultural Models	Embodied Models
Lucas (2MNE)	Neil Armstrong, NASA	<p>“Et ensuite je dirais aussi, quelque chose qui m’a beaucoup marqué quand j’étais petit. Je collectionnais, peut être tu le sais pas en tant qu’américaine, mais on avait des images dans le chocolat qu’on collectionnait. Dans des paquets de chocolat il y avait des images et on avait des albums où on pouvait coller les images sur cet album. Et il y avait un album qui était consacré au monde de l’espace. Et donc il y avait la fusée et les dernières images étaient sur le monde dans l’an 2000. Comment dans les années 70 on concevait on s’était dit “Oui, dans l’an 2000 on sera sur la Lune, il y aura des bases spatiales sur la Lune.</p> <p>Et ça m’a énormément marqué. Tu peux pas savoir, ça m’a, vraiment ça m’a marqué quoi.”</p>
Bernard (3MNE) NOTE: I find Bernard’s response fits into both categories as he had previous embodied experience of watching the Moon landing, but many of the images he mentions are also cultural texts created for the purpose of informing the public about space.	<p>“C’est peut-être plusieurs images. D’abord les images des spationautes qui se baladent quelque part en orbite autour de la Terre. Des vues de la Terre...tout ce qui vient avec ce genre d’image, de documentation visuelle. Les spationautes dans leur vaisseau spatial ou bien dans leur station spatiale.”</p>	<p>“C’est peut-être plusieurs images. D’abord les images des spationautes qui se baladent quelque part en orbite autour de la Terre. Des vues de la Terre...tout ce qui vient avec ce genre d’image, de documentation visuelle. Les spationautes dans leur vaisseau spatial ou bien dans leur station spatiale.”</p>
Nathalie (3FNE)	Films et photos	"C’est le ciel étoilé, la voute céleste."
Edouard (3MNE)	<p>“Moi ce qui me vient c’est un extrait de poème, je ne sais plus de qui, mais c’est “les nuages, les merveilleux nuages.”</p>	“les nuages”
Joséphine (2FE)	<p>“le froid,” “le vide” (general cultural knowledge, rather than previous embodied experience of these aspects of space)</p>	
Olivier (1MNE)	<p>“la galaxie” (images from beyond the Earth)</p>	
Agnès (2FNE)	<p>“Mars,” films</p>	
Véronique (2FNE)	<p>“Les cosmonautes. Le premier homme sur la Lune, ce genre de choses, quoi. Les navettes spatiales.”</p>	

Participant	Cultural Models	Embodied Models
Martin (2MNE)	le cosmos	
Marie Rose (3FNE)	les planètes; “quand on a marché sur la Lune”	
Danielle (3FE)	“les splendides photos en fausses couleurs de galaxies et nébuleuses qu’on trouve dans les bouquins d’astrophysique, puis les créations picturales de possibles planètes. Les images du film <i>2001 Odyssée de l’Espace</i> ”	
Christine (2FNE)	"les planètes"	“La Lune parce que c’est celle qu’on voit.”
Louise (1FNE)	“Saturne. *rire* Non, mais, je vois. Oui, je vois...une planète, parce qu’elle est jolie Saturne, avec les anneaux. Et la Lune, je pense. Et puis ensuite, peut-être des choses qui bougent, quoi, des lumières qui bougent dans l’espace. Des matières qui se déplacent. Du mouvement.”	
Margot (2FE)		Stargazing in the Alps
Louis (1MNE)		“Des étoiles...des constellations et surtout le silence.”
Jean Denis (3ME)		“Le ciel étoilé”
Adèle (3FE)		To have been myopic as a child and seeing the blurry stars; “Parce qu’avec la myopie ça grossit énormément ces petits points lumineux dans le ciel et je pense que quand j’étais gamine, étant déjà myope sans doute enfant, les étoiles me fascinaient parce que je voyais des tâches lumineuses plus grosses que les autres personnes dans le ciel.”
Franck (1MNE)		"le noir et les étoiles"
George (2MNE)		space, math and bodies in space
Valérie (3FNE)		"le fait d’être au milieu de nulle part"
Joseph (2ME)		“le ciel étoilé”

Participant	Cultural Models	Embodied Models
Nayla (1FNE)		“l’immensité. Darkness”
Antony (2MNE)		“l’étoile filante. L’immensité”
Camille (2FNE)		"Comme un trou noir. L’espace pour moi c’est quelque chose d’infini et comme un trou noir. Avec peut-être quelques petites étoiles qui scintillent.”
Gigi (1FNE)		“Les étoiles. Lointaines...en fait c’est, quand on me parle de l’espace, la première idée qui me vient en tête c’est quand je regarde le ciel, un ciel étoilé.”
Manon (2FNE)		“L’espace, les étoiles. Les planètes. C’est vrai que c’est aussi pourtant l’espace c’est aussi tout le temps. C’est tout ce qu’on a autour de nous, l’air qu’on respire.”
Charlie (1MNE)		“Alors, du noir. La lumière des étoiles, donc les points dans cet espace noir. Je pense à la voie lactée et aux planètes en fait dans la voie lactée.”

Appendix VII: “Elevation,” by Charles Baudelaire (English Translation)

Above the valleys and the lakes: beyond
The woods, seas, clouds and mountain-ranges: far
Above the sun, the aethers silver-swanned
With nebulae, and the remotest star,

My spirit! with agility you move
Like a strong swimmer with the seas to fight,
Through the blue vastness furrowing your groove
With an ineffable and male delight.

Far from these foetid marshes, be made pure
In the pure air of the superior sky,
And drink, like some most exquisite liqueur,
The fire that fills the lucid realms on high.

Beyond where cares or boredom hold dominion,
Which charge our fogged existence with their spleen,
Happy is he who with a stalwart pinion
Can seek those fields so shining and serene:

Whose thoughts, like larks, rise on the freshening breeze
Who fans the morning with his tameless wings,
Skims over life, and understands with ease
The speech of flowers and other voiceless things.

— Roy Campbell. 1952. *Poems of Baudelaire*. New York: Pantheon Books.

Appendix VIII: Tables 10.1-10.3

Table 10.1: Dominant Lexical Units for the Human and Earth

Nouns and Adjectives Referring to the Human	Nouns Referring to Earth	Sundry Nouns Referring to Earth
“humain(e)” 399 x	“la/sur Terre” “terrestre” 537 x	“berceau” 11x
“humanité” 137 x	“planète Terre” 30 x	“chez nous” 10x
“terrien” 25 x	“notre planète” 19 x	"notre vaisseau" 4x
		“petite balle de bleu” 1x

Table 10.2: Dominant Lexical Units for the Non-Human and Space

Nouns and Adjectives Referring to the Non-Human (in outer space)	Nouns Referring to Space/ Celestial Bodies
“extra-terrestre” 81 x	“l’espace” 510 x
“martien(ne)” 19 x	“la lune” 130 x
	“Saturne” 9 x
	“Vénus” 8 x
	“Pluton” 6 x

Table 10.3: Thematic Distribution of Key Words in Interview Questionnaire

Lexical Units Referring to Space/ the Extra-Terrestrial	Nouns Referring to Earth	Lexical Units Referring to the Human
“espace” 3 x	“la Terre” 4 x	“humain(e)” 5 x
“multi-planétaire” 2 x	“terrestre” 1 x	
“Station Spatiale” 1 x		

Appendix IX: Long Verbatim Translations (In order of appearance in text).

Chapter 4, Section 4.1 The Unknown, Christine (2FNE), V4:1

I think that the next stage for humanity is to learn how to travel in space to try and discover other dimensions...But, I am not sure that it's mathematics that's going to help us cross other dimensions because you have to be able to dematerialize to visit other dimensions because it's too far away. So, right now, we do not have the technological means, there are maybe other, other doors that we don't know about, that have nothing to do with math, that may allow us to travel in other dimensions.

Primary Investigator (author): Do you think we will reach that goal through science?

Christine: No, I don't think so.

PI: What means could it be other than science?

Christine: What else could it be? It could be...it could be...that's a good question. There are several responses. It could be us, our brains, our...our fluid. There's maybe another path that we could discover that has not been exploited that has nothing to do with math, that would be another dimension...how can I say it...we maybe have the capacity within us to travel with our spirit.

There. I don't think that math will suffice for us to travel in time and in space. There. Really, another path that would lead us...it's not spiritual, it's not...already, humans have to know themselves better.

We only use 10% of our brain, so there's quite a bit left in that other 90%, you see? Maybe in the leftover 90% there's some way to travel in space and go see our neighbors.

PI: So, you believe we have neighbors?

Christine: Ah oui, oui je pense. On est peut être déjà nous mêmes extra-terrestres, moi je pense.

Je dis plutôt qu'on vient déjà d'une autre planète, à l'origine. Qu'on a déjà été colonisé par des extra-terrestres et nous sommes restés ou que nous avons été créés par des extra-terrestres, d'ailleurs il y a plusieurs histoires à ce sujet quand tu reprends les anciennes civilisations, chez les Incas, dans la mythologie grecque, dans toutes les religions, dans la Bible aussi. Tu as différentes sources et oui, c'est très plausible qu'on est déjà nous mêmes des extra-terrestres, qui viennent d'une autre planète et qui ont colonisé la Terre, pourquoi je ne sais pas.

Ou alors, on était simplement les animaux sur la Terre et les extra-terrestres sont descendus et ils nous ont aidé à développer notre intelligence. Ça peut être un mélange aussi, tu vois? Entre les extra-terrestres et les humains. Ça tu le retrouves dans la mythologie.

Chapter 9, Section 9.3 HUMANS ARE OBJECTS (in Containers), Christian (2ME), Footnote 169.

“So, preserving the human species on another planet, because that would be dangerous. It’s just not possible. It’s ridiculously outside of our means. We don’t even know how to send humans to Mars and to bring them back alive. Not to send them. So, um, we’re talking about six guys in the ISS. We’re not talking about an orbital space station like in *Elysium* with 6, 7 million people, you see?

So, the whole “we have to become multi-planetary” thing. Sure, why not? If there had been...if there were, ummm, let’s say even 100 thousand or 200 thousand humans on Mars, in an enormous martian base that was really great and worked well and is more or less independent from the Earth, and that humanity is more or less ravaged because there has been an enormous meteorite, like the one that fell on the dinosaurs on Earth and so there are still 100,000 humans on Mars, that’s not going to happen any time soon.

We don’t know how to put three there. And when we’ve got three, they’ll come back. When we put 10 or 15 people who live there full time, it won’t be easy. I don’t even think we’ll establish a colony.”

Chapter 9, Section 9.3 HUMANS ARE OBJECTS (in Containers), Pauline and Estelle (3FNE), V9:12

Primary Investigator: How do you picture multi-planetary human civilization?

Pauline: I don’t imagine it at all. No, no, no, no, no. It’s already difficult to go to another country, so I don’t see it happening in space.

Estelle: Yes, it’s especially having to protect yourself from radiation. Because that is the principal inconvenience, if we are there and we are not protected from radiation we will have to find stations.

Pauline: Exactly and yes, I do not think that we will see that tomorrow.

Estelle: No, it’s almost impossible.

Pauline: But, of course, it's difficult to prognosticate.

Estelle: Will humans have not destroyed themselves on Earth with pollution, overpopulation also...

Pauline: I mean, still, let's say, there are still places on Earth where we could live then. See. Because it would be better than to go...

Estelle:...in planets...

Pauline: ...on planets will there will never be a future, because everything we have tried until now, it's never come to fruition.

Estelle: And then there are contingencies. You need air to breathe, you need water to nourish yourself and to plant things, we can plant in a greenhouse, but that seems...in 500 years honestly that seems really utopian. It's true that science advances quickly, but, still, all the same.

Pauline: That side of things is limited...

Estelle: It's limited by human capabilities.

Pauline: Because, me, that poor man that I saw in his...

Estelle: In his spacesuit...

Pauline: It took them fifteen minutes to take off his outfit! *laughs* Yes! Yes! Non, it's...well, I admit frankly that I don't have much hope for those things.

Chapter 9, Section 9.3 HUMANS ARE OBJECTS (in Containers), Christian (2ME), V9:13

When I say I don't picture it, I mean that I realize at what point it will be difficult for humanity to try, especially to go outside of the solar system...if you would have asked me that question when I was 15 years old, for example, I would have said, 'Yes! Spaceships, cities that extra, orbital cities!' You know, fantastic stuff, from fiction and notably from science fiction films.

Now that - I still have these images in mind - but I know at what point they are distant. They are not impossible...There is no impossibility. So, there are things that

are thinkable, we can think about them, that means that we can imagine them and they are not unworthy of being imagined.

It's thinkable, it's even scientifically thinkable. That means, we can try to get together a to-do list of everything we need to do. And what steps we need to reach to be able to do such and such thing. It's therefore thinkable, but the road map is so demanding that it's not going to happen right away. So, for the moment I imagine all of this, but always have in my mind, I mean, I imagine it a little like we see it in sci-fi. A little, let's say, sexy, imaginative, beautiful images, a little...a little marvelous too. But I know at what point it would be difficult to attain that, for technical reasons and not for scientific reasons. It's not...we're not lacking the science. What's missing is technical elements and, especially our fundamental capacity to control a lot of energy and matter. Humanity already controls a lot of energy and matter, we see this because humanity is a tectonic actor, it's an actor on a global scale. Humanity modifies the Earth's climate. That means, we're not an insignificant actor...it's therefore...humanity is a force of nature, but still very far from the scale we need to attain if one day we want to sow ourselves onto other planets in the solar system, on planets that humans could inhabit, so there are complicated techniques and planets that are directly inhabitable, around other stars and so, in that case, there is not need for any effort to render the planet inhabitable, but there's a big effort to get there and that, that's also really hard.

Appendix X: Vignette Translations

Vignette 1: “I understood the question, but I think about my keys all the same.”

(Male, Expert, 71 years old)

It was finally cooling down after an unbearably muggy August day just outside of Gradignan, in the middle of not much of anywhere at a camp site and recreational area where the National Science Fiction Convention was being held. We had already come to the final evening of the convention. The memorabilia auction was going strong in one of the large, un-air conditioned buildings, and I was sitting outside with “Jules,” a science fiction author, his wife, and the eventual addition of “Simon,” a graphic artist I had interviewed the previous day. It would be one of the most pleasant and fluid interviews of the project as my two principal interlocutors had shared the better part of their lives together and complemented each other’s answers, supplementing information, questioning each other’s accuracy and grinning all the while. Everyone was comfortable in the cool of the evening, away from the noise of the other participants, content after dinner and coffee.

I was unsurprised when, as an author, Jules’s first response to the question “what would you take in your one kilo of personal effects” referenced literature.

“Well, maybe an iBook, all the same. Because iBooks, I don’t use them. I really like books. But a kilo, there an iBook with 6,000 books inside, yeah, not bad...without a doubt, an iBook. So, already that is 100 grams. I can still bring something else.”

His wife intervened, “Music, right?”

“But music is the same. I’ll bring it digitally. You know the USB key in the car, we have 25 hours of music on our little key with 12 gigas, so. So, there, frankly, with 100 grams I can get along.”

I noted his analogy between ‘their USB key’ in the car and the format he would choose to take to travel through space. He continued his response, beginning to cite things that he could not dematerialize digitally.

“Okay, I really like to have pens and paper, but in this case it’s not worth it. Nah, I’ll do without. My glasses. To be able to see far. All the same, yes. There are still stars, and I would like to be able to see them.”

Here he paused for a moment, coming back to his glasses. “Can’t forget my glasses...” And then he said something which surprised me:

“My house keys because you never know, maybe I could come back...”

In my surprise, I interjected, in a manner that I would learn to curb as my interviews went on. “But sir, we stipulated already that you would not be coming back.”

“Yes, exactly, it’s because we specified that I will not be returning that I would take the keys to the house. I understood the question, but I think about my keys all the same.”

Vignette 2: “What did I take to Cuba with me when I went?”

(Female, non-expert, 38 years old)

It was far too loud on the patio, with the late afternoon traffic passing by, so Charlotte and I found a table at the back on her favorite brasserie in the 20th arrondissement. She settled in with her beer and her electronic cigarette and we got immediately into the questionnaire. Having studied social sciences herself, she was familiar with the interview process and was generous with her responses, even though the idea of human space flight did not interest her and was essentially wasteful in her eyes.

Charlotte is an avid traveler and has spent months away from home in distant places. In fact, when we met for the interview she had recently returned from spending several weeks in Cuba. When I asked what she would bring with her to space, she immediately made connections between her past voyages, and baggage, and her imagined baggage to leave the Earth.

“I was thinking about what I brought with me when I left for five months to the Solomon Islands.”

“I took a few books, when possible long ones that I could re-read with pleasure. I remember that I had *Zadig* by Voltaire, among others, but, unfortunately, books, effectively they weight a lot and forcibly we are very limited by what we can bring. So, I know that now, probably today I would opt to take a Kindle with a bunch of books uploaded inside, under the condition that there is an energy source so I am sure that it will be usable once I arrive. If not, I prefer paper books, but I would take less.”

Her choice of literature made, she paused for a bit and asked herself, “What else would I take with me?”

“A handful of my favorite clothes...this t-shirt is one of my favorite t-shirts, so this one, probably a pair of jeans and, I’d say, like two or three pairs of pants and four or five t-shirts. In fact, I get attached to clothes and take good care of them, so I have them repaired when they are...I have already had repaired, I don’t know at all how to sew, so that’s not something that I would miss. I would try to do my best to take care of my clothes so they would last as long as possible.”

She interrupted her train of thought with her memories of what she had taken to Cuba on her last trip. She discussed how she disliked checking luggage, so she took the absolute minimum of personal items (“A few necessary toileteries, obviously, knowing that I won’t necessarily be able to find them there.”) and filled the rest of her sack with gifts for people she would meet in the Cuban countryside. The gifts she did not consider necessary for space. However, her electronic cigarette or a pack of cigarettes she did want to bring with her.

“And what else? I would probably take an electronic cigarette or some cigarettes. That also depends on what I can find when I get there. What could replace that. If there isn’t any electricity it’s a problem, because I couldn’t re-charge the e-cigarette in that case.”

“So,” I asked, “in that case you would take a normal pack of cigarettes?”

“Probably, at least four or five...But it would be a little difficult because it would be necessary in any case to stop smoking because there wouldn’t be any [tobacco] there, that resource would no longer be available.”

And her agenda. “I can’t live without my agenda,” she said. She talked about how most people now use their smartphones, but that she absolutely had to have her paper agenda. “It’s something I absolutely cannot travel without. And some music in my MP3 player.”

She then returned to the question of books, as it seemed to be the most difficult decision. She explained why she would not take *Zadig* with her to space, because she had already taken it on two previous trips. Her experiences traveling and her strategies for keeping herself occupied during long stays away from home were applied directly to her expectations for going to space.

“Obviously I would be limited to three or four books. Unless I had a Kindle. I wouldn’t take *Zadig*, because I took it to the Solomons. I would go look in my library for books that I have re-read with pleasure since I know that I will probably be obligated to re-read them many times. Therefore, it has to be books that I re-read with pleasure. If I took *Zadig* to the Solomons it’s because I had taken it with me on another trip, I didn’t mention it, but I also learned German and to do so I left for four months in Germany. I brought *Zadig* with me on that trip, where again I only had a few books that I could take with me. I was 19 years old, so it was before the trip the Solomons and it’s for that reason that I could take *Zadig*, as I hadn’t re-read it again between the two trips.”

“Probably I would take a book in each language that I speak. Because...unfortunately, *The Old Man and the Sea*, for me it’s logical to read it in Spanish, but it wasn’t written in Spanish. So, it’s a little disturbing. I have it in Spanish at my house, but it’s not necessarily the book I would want to take in Spanish. I would take a book in German, a book in Spanish, a book in English and that’s all because the other languages I speak I don’t really read in. Those are the three languages I can read in.”

As Charlotte’s imagination of her kilogram progressed, it became clear that the purpose of books in her baggage was not just as a pastime, but as a way to keep her multilingualism alive. Essentially, she arrived at a point where she was no longer bringing literature with her, but samples of languages themselves. Whether she would be able to speak these languages with other people was not a question. The importance for her was not to lose the abilities that she had gained, whether they were useful in context or not.

Vignette 3: “I’m just going to go through my apartment...”
(Male, non-expert, 36 years old)

Charlie was a quiet, pensive young man. A yoga instructor and contortion student, he had heard about my study from a mutual friend and contacted me about doing an interview. We met in the afternoon in a café in his arrondissement, where he talked about his work and family and responded thoughtfully to the questionnaire. When I asked him what he would bring with him to space in his kilogram, he paused and reflected, then responded:

“Things that last. Like books, now the choice of books will be very difficult. I would try to bring books that I could re-read. A tablet reader could always break down.”

“Afterwards, effectively, I would take technological objects, maybe, but I would try to avoid that because if I only am allowed one kilo, I want things that can last for the rest of my life.”

He went on to discuss what kind of literature he would bring, maybe adventure novels. certainly books of ancient wisdom. He specified that he would not bring the Bible, and referenced his Catholic upbringing and how much he felt the Bible had been transformed and had become “dishonest” However, he expressed a desire to bring texts of “ancient wisdom,” citing Confucius, Socrates, and Plato.

“I think I would bring a brick²²⁶, something with 300 pages, at least it would take me some time to re-read it. Something relatively complete, I don’t know. There’s a book called *Melmoth (the wandering man)* and it’s a drawer-story, so a story within a story within a story etc. It doesn’t say much, it remains a little, not subjective, but it gives an impression, it’s more of a gothic book, you could say. There isn’t much description, it’s something that ages well, so I would bring a book like that one. Maybe not that one, but a brick. Full of little stories, but timeless.”

Then decided he would like to have a gaming console, but he realized how quickly a kilo adds up. He decided to bring a small console “big like that, like a tablet reader” as well as video games, saying “games are really small, in fact, just the size of a fingernail.” He also wanted paper and pencils for drawing, admitting he didn’t draw well, but he would learn. He commented that the paper wouldn’t last long, but he could probably bring enough to use for a few years.

He stopped speaking, looked away for a moment and closed his eyes. Keeping them closed he started to talk again:

“I’m just going to go through my apartment. My apartment, in fact, is really sparse because, since it’s not very big, I purge a lot and try to only keep the essential. It’s for that reason

²²⁶ Vernacular expression in French to refer to a lengthy and, therefore thick, book.

that earlier when I spoke to you about books, I had my book shelves in sight and I know that those are books that I particularly like. Those that I don't like I get rid of them little by little. So I am trying to think about what I have in my apartment that's pretty light that I would take."

I watched him create a virtual reality in his mind, imagining his most intimate everyday space, his home. Behind his closed eyes he was walking through his apartment, all while sitting with me at a café table several blocks away. "I can see my bookshelves," he says, thinking about what books he has and imaging them organized within a physical space. When imagining his existence in space, he did not close his eyes and project himself into a virtual reality of a space ship, or extra-terrestrial habitat. When imagining this distant experience, conceptually he went home, and used his embodied senses to make his decisions.

I sat quietly as he 'walked around his apartment' some more. He decided upon a few additional items he would like to bring, articles of clothing that he "felt good in." Then he opened his eyes and returned to the café to sip his tea.

Vignette 4: “Like if I was leaving on a long vacation”
(Male, non-expert, 44 years old)

After living in Montmartre for a few years, I began to know faces and they began to know me. Walking past the open windows of La Mascotte I heard my name and looked in to see Éric and François, two friends from the neighborhood, unsurprisingly nursing pastis at a table near the window. As custom dictates, they called me in for “a little glass” and had a glass of white wine on the table before I could get to my seat.

After some small talk it came up that I had been doing interviews for my research that afternoon. Éric noticed the recorder in my bag and asked why I wasn’t going to interview him. “It would be my pleasure to interview you,” I responded, “Just let me know when you’re free.”

“Now,” he said, in his characteristic gruff manner.

“Very well,” I replied, and began pulling out the questionnaire and my notebook, positioning my compact recorder on the table between us. François quickly lost interest and wandered off, and Éric and I sat together in the sunlight, its rays streaming first past the bustle of our neighbors and the inevitable pockets of tourists, pushing past them to finally tumble into our glasses on the marble table top. He sipped his pastis and scowled at me, signaling he was ready for my questions. As we talked he explained that he liked science fiction alright, but that he didn’t think the depictions in fiction could possibly do justice to the reality of things. He went on to detail his deep convictions about the existence of alien life and alien intervention in human civilization.

An ex-military man from Normandy, Éric’s answers to the questionnaire were concise and assertive as they were about most any topic. When asked about his single kilogram of personal affairs, he responded simply:

“I would take something to listen to music with. I would take headphones and my phone, that wouldn’t work, but I could listen to all of my playlists on it for hours. There you are. Because I listen to music all day, all the time, every day. I have to have music. I cannot live without music. What else could I take? My sunglasses.”

He loved those sunglasses and admittedly they suited him well. A few months later he would end up sitting on them and breaking the frame. He threw an absolute fit.

He had quieted and returned to his pastis, so I prompted, “Éric, I think you still have some space in your kilo.” He scrunched his nose and passed a rough hand with a thick silver ring depicting the Kraken across his shaved skull.

“Yeah, but that’s all I would need. Like if I was leaving on a long vacation.”

Vignette 5: “It’s a bit the question ‘if you were on a deserted island what would you take with you?’”

(Male, non-expert, 30 years old)

I went over to Olivier’s apartment near La Chapelle to have dinner with him and his girlfriend. We sat closely around his small kitchen table and ate a nice dinner he had prepared. His studio apartment was lined with posters and bookshelves, the latter packed with books, DVDs, CDs and records. All of these artefacts attest to his lifelong interest in music and film, and to his pastimes as a musician and filmmaker. From the kitchen window he had a lovely few of the Sacré Coeur and we stayed near the open window while he smoked cigarettes and talked to me about space. In his typical humor, he was somewhat patronizing of much of the questionnaire and the purpose of the study in general. I have known Olivier for over a decade, having met him at the University of Bordeaux where he studied philosophy and film and regularly produced his own short and full length films. He is living in Paris now, working as a freelance film critic and film ratings advisor, and continues to write and direct movies. He had never liked science fiction, nor Queen, nor David Bowie and when he volunteered to participate in an interview, I was curious to see what this non-fantastical, ‘realist’ and self-titled pessimist would have to say about potential human futures beyond the planet.

When the kilo question came around, he laughed and said, “That’s not easy. It’s a little bit the question ‘If you were on a deserted island what would you take with you?’”

“If I weren’t coming back? Well, a telephone...no, not a telephone! No, but I could take a tablet with a bunch of books...there I could stock lots of music, books, photos, all of it. Everything that I could digitalize. That, that weighs maybe 200 grams. So, I still have space. I can stock all of my memory. That makes sense. It’s less heavy than bringing all the Pléiade editions of books...”

Reading through the transcripts, I found it intriguing how a certain ambiguity arises from his comment about being able to “stock all of his memory.” He could be referring both to the disk space, or memory, on a computer hard drive, as well as talking about his own ‘memory.’ The use of the term ‘memory’ to refer to disk space on a computer is a metaphor based on the experience of cognitive memories and the ability to access them. In Olivier’s discussion, the two meanings formed an Ouroboros between physical and digital methods of preserving human culture and experience.

He continued with an admission of his materialism, which I knew from seeing his past apartments as well as his present surroundings. “It’s difficult because I am pretty materialistic, in the sense that I like to acquire objects, but I am not really attached to an object in particular. You know, I like albums, books, all of that, but those are all things that I probably couldn’t take with me.”

“Not easy,” he repeated and then paused. “Let me see.” Taking a long drag of his cigarette, he turned his head around the studio apartment and begin looking around; seeing quite literally what he might want to have with him if he were to leave the planet.

“We agree that the tablet can also take pictures. It does everything. That’s what’s great about it.”

Having come to the conclusion that a tablet device would take photos, contain books, music and films and generally allow him to document what he wished and amuse himself, his reflection shifted.

“So, I could bring a piece of Earth. Something like a pretty stone, something mineral that reminds me of where I am from. A piece of the Saintonge, I don’t know. An oyster shell.”

Metonymically, he considered bringing a part of the Earth, or of his natal region and environment as a representation of the planet. The “Saintonge” he refers to is an old kingdom that is located in the present day Charente-Maritime region of France. The current region possesses 463 kilometers of coast as well as extensive inland swamps and this environment enables the Charente-Maritime to be the top producer of shellfish in France, notably producing a third of the total oyster production in the country (Agreste 2014). Olivier’s choice of an oyster shell as a symbol of his ‘homeland’ therefore seems highly motivated by this environment and his embodied experience. He would be one of the few participants to have the reflex of bringing an inanimate element of the natural, terrestrial world along as a souvenir.

Putting out his cigarette, he said, almost to himself, “Would I bring a pack of cigarettes for difficult moments? There will be twenty times in my life where I would say, ‘I need a cigarette.’”

After his brief aside concerning his cigarettes, a dilemma he did not resolve, he went back to talking about the Saintonge, his past and his family.

“I could take the medallion that I was given for my baptism. Still, yes, because we are baptized as infants and we have a little medallion with the Virgin. Me, at least, it wasn’t a little gold medallion with the Virgin on it. So that, I don’t have it on me, I don’t wear it, but it’s in Royan in a little box. I keep it. I don’t really have a lot of jewelry and stuff, but that, that reminds me of my family, it’s something that was given to me, a baptism, it’s something spiritual. There you have it. I don’t know if I’ve reached a kilo.”

Then his spiky personality resurfaced quickly and he gave a wolfish grin to his girlfriend, “But, as a challenge, I would only take 800 grams. I would say, the 200 grams that are left I don’t care. Give them to my neighbor.”

Vignette 6: “A bottle of water and a bottle of wine. A good bottle of wine.”

(Male, non-expert, 45 years old)

Of excellent humor as usual, Antony laughed throughout our interview as we sat huddled in the warm, back corner of a café in the 18ème arrondissement in November 2016. He told me about his mild interest in science fiction, his conviction about the existence of extra-terrestrial life and talked a lot about his work. Antony is the purchase manager for a large factory in the south of France where we has worked for years. He typically works with a team of people and during our discussion he talked at length about what he believes humans can accomplish through teamwork. He extended his own experiences of working on a team, to the teams of humans sent into space and to his own imagined space travel. When I asked him what he would take to space if he had a single kilo, he laughed again.

“Let me think about it. A kilo? I don’t know. What would I bring if I leave...what would I bring. Honestly...tomorrow, I leave...”

“The first thing that comes to mind is that I would take a bottle of water, a bottle of water. I take my backpack, inside I put a bottle of water. What do I do, really, I imagine that I am leaving. I am going to take a walk...”

“I take a bottle of water, I take some cereal bars...I take a towel. What I would need... what I would need to wash up, okay my soap, my soap and then...Okay, I am off to Koh Lanta, Koh lanta. I am leaving, I take a toothbrush, a soap, a towel, a bottle of water. At least one change of clothes. Frankly...”

“So,” I asked him, “You leave the Earth with your soap and toothbrush?” He confirmed once more, “We’re not coming back, right?” “Right,” I responded. He then continued, describing how he would only take the “strict minimum to live.” He returned to the necessity of the water bottle and then, producing a response cited by four other participants: the desire to bring a bottle of wine. Water and wine, he says. “Okay, a bottle of water and a bottle of wine and afterwards, there you have it.” This is the “strict minimum” in his mind.

Then, his kilo begins to transition from necessity, to sentimentality.

“A kilo? A kilo is so small. Afterwards, if you have a picture or two of here, you know... places that I know or...I would say vacation pictures, of a place, I don’t know, wherever, a stupid place, but a vacation photo that I like, or, a picture with, maybe, yeah...family photos. I would take family photos, so that I have pictures of my family, little memories. You don’t know if your family left with you or not...”

“Otherwise...we don’t need to take money...that has no purpose. No, really, no. The minimum, you know. Really the minimum...something to remind me a little bit of the Earth. So...yeah, photos, I don’t know, of landscapes, of Corsica, I went and saw Corsica, Brittany, the

Alps, little pictures...just to be able to say, ‘It was like that.’ Yes, just to be able to remember the Earth a little, you know?”

His reflection slows. He stops to take a drink and, as if cued after swallowing, he returns to that “strict minimum” he had insisted upon.

“A bottle of water and a bottle of wine. A good bottle of wine.”

Hearing the recording I was taken aback when I realized that his strict minimum was, in fact, the basic ingredient of life on Earth (water) and culture on Earth (alcohol). It is widely accepted by the scientific community that water is essential to life on Earth (Ghose 2015) and recent archeological research demonstrates that it is likely that humans first began growing grains to produce alcohol, before they had domesticated grains for other uses (Hayden, Canuel and Shanse 2012) Antony’s micro-level assurance of his health and happiness, of his basic experiences in his human body, reflected a macro-level reality about universal human experience. This assurance also reflects a prevalent assumption among participants that there will not be good wine in space. For many people I would talk to, it is not only a natural environment that sustains human beings. Though water and oxygen are paramount, most participants in this study made arguments for the necessity of culture as well, particularly when culture culminates in an excellent Bourgogne.

Vignette 7: “Du tabac à chiquer. Je ne peux pas sortir fumer sur le balcon.”
(Female, expert, 52 years old)

On a relatively calm patio in the 20ème, I sat for several hours and talked about what seemed like most everything with Marie. While sipping red wine and smoking cigarettes, she talked to me about her career, about space, motherhood, competent women, gendered bias in the sciences and the arts, french fries and butter, and the list continues. It would not be my last occasion to sit down with this sharp, strong person. A science fiction writer and individual passionate about human space travel, Marie answered quickly that yes, she would go to space if given the opportunity. When we came to the question of her kilogram, her response came immediately.

“A tablet reader. Chewing tobacco. I can’t smoke in a space station. And I can’t go outside and smoke on the balcony. What else do I need? My man...my boyfriend. But he doesn’t weight a kilo.”

“Recordings, of everything from Igor Stravinsky to the Ramones. Until the 1990s, because afterwards it’s not so great.”

“An evening gown. But it can’t weigh too much, the evening gown. My birth control pill, of course, it’s getting less and less necessary, but...”

As her remarks drifted into silent speculation, I prompted her further, citing an earlier conversation in which we had discussed the effects of zero gravity on the development of human fetuses. “No, you would not want a baby with bird bones...”

Immediately, she snapped back to the conversation, and what was a discussion about her future in space, became a narrative about her experiences in the past.

“I don’t want a baby at all. And this being said, I never wanted one. I had them, but I never wanted them. I never projected myself into the future saying, ‘I want a baby.’ It wasn’t too bad at the time, but it wasn’t my goal, you know? She then added in English, “Shit happens.”

She took a sip from her glass, placed it back on the table and looked at me through her tinted glasses, “The first time it wasn’t bad...and the second time it was, ‘Well, I had one already, so I can’t abort now.’ I don’t know. I had already aborted once, but before I had ever had children.” She continued to discuss abortions, her personal situation and how well her first abortion had gone, explaining that in that moment, “with that guy,” she was happy to not have had a child.

Then she shifted her imaginings from remembrances of the past, back to the pertinence of these memories to the discussion at hand.

“So, the birth control pill. I wouldn’t need much of anything else. I would miss food, but you can’t bring it. It’s stupid to bring wine into space. You realize? It is subjected to 10Gs at life off, your Beaujolais is dead.”

“Maybe I could bring a whiskey, that would hold up. That will work, I can bring whiskey, Lagavalin while we’re at it. So, maybe a bottle of whiskey, yes. Because, all the same, I have a habit that when I finish a text I drink a glass of whiskey. A celebration, some Lagavalin, 30 years old, aged in oak.”

“On the other hand, champagne, for example, no, because lift-off would do the same thing. And now we’re starting to get close to a kilo. Already two tablet readers and the USB key with the music. I think that would be sufficient.”

Her whiskey, tobacco and tablet devices with music and readings decided upon, I asked for a precision. “Which novels would you bring in the tablet?”

“All of 19th century French literature. The American Golden Age²²⁷, because there are a bunch that I haven’t read and that I would read with pleasure. So, all of Bruner, all of Sargent, though I think I’ve read it all. *Time Enough for Love*, I’ll read it in English, too bad. It’s one of Heinlein’s novel’s that was never translated.”

“There would surely be languages, not necessarily Greek and Latin, certainly a few texts, but grammar books and language courses. One of my dreams if I had three minutes a day to do something would be to learn Japanese, or any other Asian language because there I feel the extra-terrestrial. And I would like to understand, so to speak, how that [language] thinks.”

“Surely stuff like that. Encyclopedias, very, very, very important. A sort of monstrous Google. History books. I am thinking about what I use and what I really need.”

“On the other hand, something that is missing is the graphic. There would be some movies, but movies take up a lot of space. So, would I bring movies that I’ve already seen, or that I had never seen? The movies I haven’t seen, I’m pretty sure no. I think I would take movies that influenced me. Like *À bout de souffle*, like *Le mépris*, like *La règle du jeu* or *Les enfants du paradis*.”

Her response concerning novelty and familiarity interested me. Rather than taking new movies to discover, she was certain that she would prefer to take a series of her favorite films, all from the *Nouvelle vague* in French cinema. For someone who obviously had a thirst for adventure and discovery, over novelty in her selection, she chose movies that had “shaped her,” or had been important in her life. When projecting herself into an imaginary future, she did not want to imagine herself without crucial elements of her past.

²²⁷ Reference to the “Golden Age” of American science fiction, during the 1940s and especially 1950s.

She was cut short by two male voices that had been rising considerably and had now reached a pitch that attracted the attention of the patio patrons and passerby. "One moment," she said, sliding her purse across the table to me. I sat still and silent, watching like everyone else, as she walked over to the two disputing drivers, one who had gotten out of his car and approached the van in front of him brandishing a hockey stick. I could not hear what she said, but after a minute or so, the hockey stick driver got back into his car, the van drove off with the car following shortly afterwards. She came back to the table, "Sometimes you need a little estrogen to balance out a bunch of testosterone." Lighting a cigarette, she encouraged me to continue with the next question.

I was, and have remained terribly impressed with Marie. I say send this one to space.

Vignette 8: “Proofs of life. That’s what I’d bring.”
(Female, expert, 68 years old)

Adèle, a delightful science fiction author in her sixties, was unavailable to speak with me in person. However, she was very generous with her time over the telephone and over the course of almost 4 hours (separated into three interviews) she spoke with me in equal measure about life on Earth and her visions of life beyond it. When I asked her about her one kilogram of personal items, she giggled, repeated the question and laughed again. Her answer began with the recurrent mention of a method for stocking digital information (“a little tool like an SD card”), but, unlike many participants who cited music or literature first, she cited photographs and the first thing she would stock to take to space.

“I would bring pictures of the people who are dear to me. Of my cats, too, maybe, you know I mean pictures.”

“Because I know I really, really, really suffered when I lost memories right after the death of my grandmother. It was one of my greatest torments. In the days, well, in the days, yes, right after her death, I had the impression that I was forgetting what her face looked like. And I think that everybody has had the experience of losing a loved one and go through this dramatic step where they say to themselves, ‘I am forgetting their image.’”

“Because it’s not for no reason that ‘image’ and ‘imaginary,’ it’s all the same family there. And...and so I think that I would bring pictures. Because from a image, I am capable of creating a text, if I dare say it. I create mental texts for myself because I am capable of reconstituting dialogues and things like that, past events, memories that start with an image.”

She then passed to a discussion of bringing music. While we spoke she told me she was seated next to her mother’s piano and said, “as the daughter of a pianist, I would bring music, too. Finally, I would bring, in the proper sense of the word, that which has always fascinated me in the modern world, the audio-visual.”

We had talked length on her fascination with the audio-visual. She recounted to me in detail the first time she ever saw a television and sang the song back to me that she had watched that evening in the early 1950s. She had also described in detail the first science fiction movie she had ever (surreptitiously) seen on the television, while hiding behind the couch in the living room one night. As she continued talking about the music she would bring, she began to describe other sounds she would want to take with her; nature sounds, the sound of the wind. Then immediately she began imagining having a virtual reality headset with her in space so that she could go back to a terrestrial reality; see images and listen to the “sound of the wind, whale songs, things like that.”

“Why?” I asked.

“Because, if I had to go far away, those are the kinds of things that I would miss from Earth. That stuff. The view of faces, landscapes. The sound of the ocean. The sound of the wind. Bird songs. Life, you know. Life. Proofs of life. That’s what I’d bring.”

When I read back through the transcription, this phrase puzzled me. This woman has written dozens of science fiction narratives, populated not only with extra-terrestrial humans, but life forms of all sorts (including bio-technologies). However, when imagining what she would take to space, (what she determines would be lacking there) she comes to the conclusion that she would take “proofs of life.” She would bring evidence to bear witness to the forms of terrestrial life, specifically the forms most familiar to her in her personal experience.

The virtual reality headset being decided upon, a more specific cultural logic took hold, and she added: “I would also maybe bring a good bottle of Burgundy. Voilà, the bourguignonne that I am!”

“Why, she continued, “is the expression ‘bon vivant’ always masculine? Why not ‘une bonne vivant’? I think I’m a bonne vivante, too!”

Vignette 9: “Shit, that’s it? That’s my life?”

(Male, non-expert, 31 years old)

For the first time in ten years, I found myself living in the same city with a dear friend of mine from the Charente-Maritime. He moved to Paris during my fieldwork to take a job as an editor of non-fiction novels. When I told him about my project, he volunteered to contribute his own imaginations. One evening as we sat around coffee and my Sony recorder, he talked to me for over two hours about his imagination, or what he considered a lack thereof, of space. Not a science fiction fan, nor a proponent of human space flight or colonization, he did develop a detailed narrative about his potential use on a human mission to another planet. He decided that he would like to serve as the archivist and documentarian.

When it came to deciding what he would take to space in his kilo of personal effects, he became visibly frustrated with the question. “That’s hard. Really hard. I need to read things. But, shit, it’s heavy.” A single kilogram posed him a major problem that it did not for many participants, as he explained:

“I have a big problem with books...it’s that...I accumulate them. So, I couldn’t do it. Mechanically, there isn’t a library. I would be obligated to do a lot of work on myself, in any case, to prepare myself for it, because I don’t know if the relationship I have with books is reasonable.”

“So, what would I have to do? So, I have to think first about my relationship with books, and with reading. Probably, I would bring a tablet reader with a lot of texts inside. I don’t know how I would choose them since we don’t have access to everything, or nothing. I don’t know, I would find a solution. I would put a maximum of texts on the reader, in fact.”

“So, I would take that and I would definitely take a table of contents of all of the texts that I have in the machine, because the problem with those machines is that that doesn’t exist. You don’t have access to the table of contents. And I’m talking about hundreds of volumes, see?”

“I think that it is necessarily...What’s more, I don’t care. We have to stop acting like it’s the same thing. It’s not the same to have a page with...that you can turn like that between your fingers, than to have lists of 10 words per page where you have to scroll them in the right order. With pages you can read them out of order. You can go straight to the end. But on tablets that is often not the case. You are obligated to scroll through everything in order.”

“It’s awful. It’s lame. It’s lame. It’s really rotten. And what’s more the notion of the page doesn’t exist anymore, so you’ve read 50% or 58% of your book...It’s really. This is hard, like really hard.”

Whereas most participants easily noted a digital reading device with a memory full of books, Jean described his distaste for these objects and his, self-reported ‘unhealthy relationship’

with physical pages and books. Though he resigned himself to bringing a device, he could not give up the idea of having a book with pages to turn with him in space.

“Or, I take a big book. But just one. Do you take the Bible or *Moby Dick*? You see what I mean?”

After having addressed the physical objects that would be necessary to him, books, his discussion passed to things he could imagine taking with him in dematerialized form, namely music and a device on which he could make lists and keep his journal.

Afterwards, if we’re talking about personal effects, I don’t know. I imagine that I would take some kind of object with a lot of memory. I will need music. So, is that part of it? Is the crew allowed to have music? It’s not material.”

“I imagine that I would capitalize on that, because with my accumulative psychology, I would bring something digital, filled to the max. And afterwards I don’t think I have any objects...like that, that I bring around with me. I mean, I bring things with me that are always connected to the place.”

“I would have to have an iPad, actually. I would have to have an iPad where I could create files. And make lists, since I really like to make lists, and that could hold my journal. You see, with this object I could meet different needs.”

He then stopped to picture his imaginary stack of proposed objects and estimate their weight.

“But, you see with an iPad and a hard drive, that’s a kilo. Shit, that’s all? That’s it? That’s my life? Your question-thing is not cool.”

He was obviously unhappy with what the limits of his kilo reflected. He also seemed to be equating in many ways the contents of his kilo and his “life.” Dissatisfied, he reflected about whether or not he would take something else.

“No, but I really don’t have a particular object. Maybe I would take a picture, I know that doesn’t weigh anything.”

“Sometimes we need an object. Would that be the case? Maybe? Because you need it to be there all the time, without having to go look for it, you see? You need it, if it’s a landscape it needs to be permanently open or if it’s a person that they should permanently look at you. I think I would take a picture. I would try to take something...it’s hard because at the same photos are referential to your past life that is gone forever.”

Jean expressed a sentiment that was found in many participants' discussions. If he were leaving the Earth permanently, would he want to remember it? Would he want to have a photograph or someone or something he could never have access to again? References to general human culture, or pastimes or works of art that participants enjoy were much more frequently cited in participants' kilograms than were specific sentimental objects and photographs. Space, in these imaginations, is a profound break with all that is earthly to the point that many, like Jean, felt it better to not bring reminders of Earth with them.

Vignette 10: “A little like a sailor at sea”
(Female, non-expert, 51 years old)

Véronique worked as a physical therapist in the suburbs, but came into the city on her days off when there was nice weather. Her short hair hugged her round face and a pair of quick eyes behind thick-rimmed glasses. When I spoke to her over the phone and said I could meet her anywhere she liked for our interview, she said she enjoyed Montmartre particularly, and would be passing through the next Friday afternoon. She later confided that she enjoyed not living in Paris, but loved coming in to walk around the city. I met her for a coffee in the sunshine on a patio, where we made small talk about her work, recycling and pollution in the city and how much we both enjoyed traveling. Then I began to ask her my “weird questions,” as her friend who had put her in contact with me had described the interview.

“A kilo?” she repeated when I asked what she would bring with her into space. “That’s not very much. A kilo is little. Books, I think.”

I followed-up with a distinction many participants had made, “Paper books?”

“Yeah, or a tablet,” she responded. “It doesn’t matter to me, literature. Everything. Novels. A dictionary. Very important a dictionary, because it’s... the first step of curiosity is there. I am always asking myself questions like, ‘Where does this word come from?’ So there you are.”

She paused briefly before continuing, “Okay, what else? I don’t know. A can of duck confit.” A giggle escaped when she mentioned the confit, and she continued, “Little pleasures. A little like a sailor at sea. You leave for three months on a boat, you bring stuff with you to give you pleasure. It’s the same.”

Véronique was one of only of handful of participants to create her initial analogies between spaceflight and maritime travel on Earth. She did not use this analogy when talking about space ships themselves, or the vast reaches of space to be travelled. This analogy appeared in her discussion when she analogized terrestrial embodied experience with potential embodied experiences in space.

I found it interesting how much her discussion demonstrated the ontological power of analogy. She started by saying “a little like a sailor at sea” and then developed this analogy with a few other elements of comparison she considered important. Leaving for three months on a boat, taking little pleasures with you - her simple “X is like Y” analogy became a miniature narrative. Then it was not only that maritime was “like” space travel, in her discussion she suddenly equated them as being “the same.” When imagining what she would bring on this kind of journey, she developed a conception in which space travel would be the same as maritime travel. She imagined what would be necessary for her - digitalized novels and a dictionary, as

well as a little pleasure (a can of duck confit) if she would to find herself in the position of a ‘star sailor.’

Vignette 11: “Sex and whiskey”
(Male, Expert 41 years old)

I laughed and laughed with Simon throughout our interview. Highly energetic, almost spastic at times, he showed me around an exposition of his artwork that was set up in one of the cool, stone buildings shielding us from the August heat at the National Science Fiction Convention. He explained to me with great animation the themes in his work and his techniques. In one painting, a woman seated in the outstretched hand of a giant robot in a stony, extra-terrestrial landscape echoed Faye Wray’s lithe form in the paw of *King Kong*. In another, a *Lucky Luke* inspired cowboy (complete with yellow shirt and red cape) walked alone through a post-apocalyptic desert. The work on display was richly intertextual, often projecting iconic figures from past texts into future scenarios.

Just as his artwork provoked contrasts and challenged visual expectations, his responses challenged my expectations as a researcher and as a conversational counterpart. Simon, visibly at home in his temporary exhibit, was up to his persona as an artist and agent provocateur. Our discussion was in stark contrast to the more guarded responses of most other interviewees; his irreverent answers that did not shy from the taboo were singular in my data set.

After giving me the tour of the artwork on display, we sat down at a rectangular table near the entrance, from which we could welcome visitors to the exhibit. He settled in across from me and began to doodle; creating worlds and characters throughout our interview. We spent almost two hours talking about his life, his drawing, his family, and space, all the while he teased, made jokes. He seemed to want to find the boundary of what was acceptable, or passable in our interaction, often punctuating his remarks with “Oh no, you can’t include that!” to which I assured him, I could.

When we came to the question concerning a kilogram of personal items he answered without hesitation.

“Condoms.”

I repeated his response to confirm that was indeed his answer and he laughed. He expounded on his choice of condoms, saying how much he would want to avoid getting anyone pregnant in space and making jokes about climaxing in zero gravity.

“Yes, yes, you never know if I am in good company and it would be dumb to put a bun in the oven *laughs* No, and then sperm in zero-gravity *laugh*, yeah, it would be even more... No, I am odious. Yes, that’s it. That’s what I would take.”

After a good giggle, he straightened his face, saying “A kilo of condoms, no. What would I have to take, a kilo...? A kilo, a kilo.”

“A kilo,” I concurred succinctly.

He hesitated briefly, looked down at the table where sheets of paper and his paint pens were scattered, and responded, “What I would need to draw would be sufficient. Yes, I mean I think that there will be tablets that react like paper, that would be really interesting. Yes, what I need to draw would be good.”

“A kilo, a kilo...” he continued, and I watched the agent provocateur wane sentimental..

“I think if, at all costs, I had to bring something and I had to leave alone, I believe I would take, in separate envelopes, pictures of people I love accompanied by a lock of their hair. That’s what I would bring. Because that would be my biggest support during the trip. Afterwards, the rest, we have everything there. We don’t care.”

“But I believe I would bring things from humanity and from a humanity that is dear to me. Because I could bring music, no, it’s people who would’ve accompanied to the end of this voyage, people who influenced me, who always transmitted their love and confidence in me. There you have it, that’s all.”

As quickly as it had appeared, this display of emotion dissipated. There was a rare moment of silence in our discussion; I moved to the next question, “And what would you miss about Earth if you had to leave tomorrow?”

“Sex. Sex and whiskey.”

Vignette 12: “I would try to leave with the person I wanted to live with.”
(Male, expert, 51 years old)

Christian was well known among the crowd at the Convention Nationale de la Science Fiction. He was only present for one evening to speak about sources of energy for interstellar space travel, but I would hear about him over the whole weekend. He was well-recognized in this niche environment, but, as I would later learn, was also widely known in the French milieux of astrophysics and scientific vulgarization. I myself would experience his ubiquity one day while touring a science fiction exhibit at La Villette. I was perturbed to have the sensation of hearing a familiar voice in the distance. When I turned the corner I was surprised to find myself face to face with him speaking on a big flat screen television in the exhibit.

Christian was impish and ornery, energetic and excited about all number of things: spaceflight, Earth’s future, good science fiction and perfect, rainy afternoons. He lived in the suburbs of Paris, but taught in the city and agreed to meet with me for lunch between classes. We met in a tiny restaurant where the owner knew him well. After ordering, he sat back and gave me almost two hours of animated, lengthy responses. He had a knack for putting things into simple terms. I learned much from him over the course of our interview and on subsequent occasions when I would meet him for a stroll or a coffee. One afternoon we walked part of the length of the international date line as he explained its history. It was fun to know that I knew who to call to mitigate my ignorance of astrophysics and space science.

True to form, when I asked him during our interview what he would bring in his kilogram to space he answered directly and pragmatically:

“We are allowed one kilogram, so it’s essential to take something where you can have a lot of information for not a lot of mass. The advantage of taking computers is that we can put gigabytes, terabytes. So, I would like to have something to look at the sky with. Binoculars, or a machine to see the sky better from the orbital station. Maybe everything has already been planned out, cameras, all sorts of things. Otherwise, I don’t know, books...digital books obviously, because it would have to be a lot of books in a small mass. I would bring a bunch of books and then I have no idea.”

I gave him a moment to take another bite and contemplate. He went on.

“They must take pictures of their gals, their girlfriends, their kids, their friends. I imagine. It’s not the thing that would touch me the most. I’m not sure I’d bring stuff like that on board. Especially on an orbital station. You can more or less make phone calls, not when you want, but you can call. It’s not like if you were...if you go somewhere far, like on a Martian orbit, that would be a lot more complicated.”

As I realized he was describing a vacation, or research trip, model of space travel to me, I prodded a little further, “And, if you went far away and never came back?”

Again, he responded without hesitation.

“I would do my best to leave with the person I want to live with. Which is complicated. That means that maybe she doesn’t want to go. That makes things hard. To force, no, it would not be good to force them, but that means, almost automatically, to change partners to find someone who agrees to leave with you.”

“You see? With whom you would leave is just as important as how you would leave, or the conditions of organization. And so, we would need people with really open minds, which is not easy. Everyone has their taboos, their difficulties, we all have tons of stuff. It’s complicated. That means that when there are humans, that’s when it’s really complicated.”

Reading back through the corpus, I was struck by this married, father of two’s response to my question. His discussions of technological and social control in space (which were lengthy) were not only projections for others, but for himself. If the person with whom he wanted to spend the rest of his life did not want to go to space with him, his reasoning was to replace that person. Though many people did not insist on taking their families or loved ones, no one spoke about replacing them to find a more suitable space companion. I thought about Josephine’s (1FNE) response to the same question, “My child and my husband weighing more than a kilo each, despite their efforts, I wouldn’t take anything and I wouldn’t leave.”

He may have been playing a bit the role of a cold, tough scientist; a man who wouldn’t need his wife or even a picture of her in space. He spoke little of his family as a general rule. But, maybe he was not been fully calculating his move in the excitement of imagining a future in space. Whereas he was as full of disdain as any parisien when discussing U.S. politics or tourists taking selfies in Saint Germain, he lit up as we talked about space; brown eyes beaming under his furrowed brow.

“Oh! Saturn! Saturn! Can you imagine? It’s a million...you imagine this thing? It’s a knockout. Have you seen Interstellar²²⁸? You know there’s the base...at the end they’re in orbit around Jupiter and those jerks, they’re playing baseball! Those are really Americans. They’re idiots. Now, me, if you’ve got Saturn, if you arrive in orbit, I would spend a year glued to the porthole it’s so incredible.”

Like all of my interviewees, Christian knew he would never go to space (he later outlined in detail the training he lacked). Yet, so much of his life had been spent pondering worlds beyond our own, he felt he knew them, desired to have contact with them, while they remained unknown. He took pleasure in talking about things beyond his experience and even comprehension. He was thrilled simply by imagining them.

²²⁸ 2014 space drama and mystery film directed by Christopher Nolan.