

Parsing Perceptions of Place:
Locative and Textual Representations of *Place Émilie-Gamelin* on Twitter

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ABSTRACT

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Emory Shaw

We increasingly engage in geographies mediated by social media, which is changing how we experience and produce places. This raises questions about how ‘place’ is conceived and received in networked virtual spaces. Place has remained difficult to grasp in both geography and communications studies that utilize social media data. To attend to this, I first develop a conceptual framework that bridges the phenomenology of spatiality with the communication of place. I then present a case study of *Place Émilie-Gamelin* in Montreal: a plaza located atop the city’s busiest transit hub. Despite its geographic centrality, it is a liminal space appropriated by marginalized groups and contentious political movements. Since 2015, it has been subject to a city-led revitalization program with intentions of attracting party-goers and tourists. Using a communications geography framework, I collected a year’s worth of tweets, first, employing a filter to capture georeferenced tweets in and around the study site, and second, using the site’s toponyms to retrieve tweets through textual queries. To understand these representations, I coded them by relevance, theme and communicative function. Results showed a place evolving in scope, name and meaning, reflecting diverging flows and uses. I found that there were more textual connotations of the study site than there were geotweets, and that the former were more diverse in their representation of place. The thesis demonstrates how promotional content on Twitter should be more critically analyzed in concert with expressive and descriptive tweets and geotweets, and that this implies spatial ontologies and data collection methods that consider a place on social media as a discursive construction. This is especially so since Twitter has become increasingly ‘patial’ through internal changes and its entwinement with other social media platforms: changes which require consideration in all Twitter-based spatial and textual analyses. The study provides an updated perspective on Twitter’s use in the spatial humanities, GIScience and geography and contributes to those interested in applying more nuanced cartographies of places.

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1 Introduction

In a world mediated by hyperconnected screens, the digital map is increasingly our first contact with a new urban place. Its authoritative representation, locating it, naming it, delineating it, fixates place. The map gives us a symbol to grapple and engage with, and a starting point for exploration. What is this place? We don't know that it exists, all that we know is that something, or some idea that is located *there* or intended to be located *there*, must have gained enough notoriety, however limited to an individual or collectivity, to be demarcated on Google's global geodatabase: proud sponsor of the digitally-enabled urban experience. This aerial unit has a flat representation (in that it is a solely visual proposal of geometric form and symbolic name), and our inclination towards visual truth, towards aggregated realities and perfect panorama, pushes the dig for bigger and, most importantly, thicker and deeper understandings: the dig for understanding each other in a globalized, navel-gazing techno-society.

Although a place-database such as Google's may be frequently updated, it is still an accumulation of human inputs channeled by algorithmic hierarchies and corporate priorities (Zook, Graham, and Boulton 2015). While there have been serious efforts to make these representations more dynamic, just, and user-driven (Van Canneyt et al. 2012; Chan, Vasardani, and Winter 2014), there have been others attempting to instill more avant-garde and humanistic stability in cartographic representations by exploding the concept of place across the map (Crampton et al. 2013; Shelton 2016; Caquard et al. forthcoming). Social media have become a prime data source because of their relative ease of access and broad coverage when compared to, say, more laborious qualitative, ethnographic methods. We can apply quantitative and computer-assisted qualitative methods to pre-operationalized human variables, pre-mediated by the user and pre-packaged by the platform. In turn, when harvesting indices from these data to gain knowledge about a place, we face the problem of representation. If place is human-connoted, how do we see this connotation in social media?

Work in geography has been swift to come to conclusions about places based on human-annotated georeferenced documents coming from, for example, Twitter. These studies often fail to put into question how authentic these data are to the places they're representing. For example, ambient geographical information (AGI) posits georeferenced social media as offering in-situ and authentic observations of places (Stefanidis, Crooks, and Radzikowski 2013). Yet the link between these documents and the collocated places from which they arose is not fully

understood, and efforts to understand these links have suffered from their broad scale of analysis, and have been few and far between (Van Canneyt et al. 2012; Hahmann, Purves, and Burghardt 2014; McKenzie and Adams 2017). Not only are the epistemological premises of these works problematic, they also fail to address places as they are connoted.

Emerging works in the geohumanities and deep mapping have re-problematized place beyond a humanistic light as an object of pluralist, intersecting narratives, mediated by contexts and power dynamics and inspire a closer look at social media content and its articulation as geodata. Very little work in social media, and on Twitter especially, looks at how place is connoted (i.e. how people talk about it), whereas a humanistic framework sees this as the fundamental underlying definition of place (Tuan 1979). Studies on location-based social networks (LBSNs) are relevant here (Fazel and Rajendran 2015; Frith and Kalin 2016; Evans and Saker 2017). Geographers utilizing social media (Crampton et al. 2013; Zook, Graham, and Boulton 2015; Shelton 2016), as well as communications theorists (Sullivan 2011; Adams and Jansson 2012), have called for more work to critically address representations of place in social media, yet very few applications have since been carried out. Exploring how place is connoted on social media cannot be as simple as associating near points to any other given point. Rather, place is a mediated constellation of messages that requires aggregation into a place object so that it can then be decoded using concepts and methods from communications and media studies (Carey 1989; Zonn 1990; Adams 2009). The mediated place object requires critical study in terms of how it is connoted and by whom, before any consideration of it as valid data can take hold. Rather than questioning social media content as simply data that is noisy and of questionable quality as done in GIScience, such studies can help us identify the intricacies and variations in such data, first and foremost as representations, in light of their mediation to end-users. And although some communications studies address place, they remain isolated from geographical discourse (Gruley and Duvall 2012; Leduc-Primeau, Sénécal, and Vachon 2013; Brantner and Rodriguez-Amat 2016; Zimmerman et al. 2016).

Just as media studies of places would benefit from geography's rigour and spatially-contextualized gaze, the latter would also benefit from the former by framing such geodata derived from social media as mediated data first, vulnerable to all the biases and contextual influences of everyday human expression. Geography could then further operationalize

consideration for these specificities towards more generalized and potentially accurate representations of places as witnessed online.

We are brought to ask, first, how georeferenced messages and messages containing geographic content compare to each other with regard to how they mediate places and how they can be used as data in more comprehensive studies of places. Then, we may proceed to ask how they relate to each other, and likely, how place as it is connoted on social media can help explain the occurrence of georeferenced messages in the same location as that place. Finally, we are inclined to ask how textual information on place as it is revealed in social media can be operationalized for geographical study more generally. Focussing on a single urban public plaza and how it is represented on Twitter by both georeferenced and non-georeferenced tweets, I aim to address these questions by asking the following: what are the representations of this site on Twitter? How are they communicated, by whom and from where? By producing a one-year longitudinal analysis of a place as it exists on Twitter using both a content-based (toponymic queries) and location-based (a location and a tweet-capture radius) approach, I hope to gain insight into how place is constructed on the medium. I intend to usefully articulate these to provide new ways of analyzing Twitter as a source for understanding and potentially mapping place. While my intent is ultimately cartographic, the methods I advance come from qualitative media studies and corpus linguistics. And although a case study would not necessarily provide results that are generalizable, it would posit a situation that, once broken down, can be used for comparison and eventual scalability.

Over the following pages, I develop a humanistic working definition of place and contrast this with ‘place images’ (Section 2-2.3). I then problematize these within a conceptual framework for digital mediation more broadly (2.4), after which I relate the discussion to others taking place in critical GIS (2.5). Following this, I explain the case study I selected for reflecting on issues brought up in this conceptual proposal (3). I then embark on an in-depth literature review composed of several sub-sections. I begin with a report on Twitter and its user-base (4.1), followed by a meta-analysis of classifications and studies carried out on the digital environment and its many components (4.2). Following this, I describe the dimensions of the platform that have been exploited in geographical studies, and how this has evolved in recent years (4.3). I then propose a synthesis of what has been done using Twitter data with a focus on place (4.4). After the literature review, I propose a research problem (5) and follow with the methodology that I

used to sample, decode and then recode place qualitatively (6). This is followed by an analysis of results (7) as well as a discussion and conclusion to connect the results to the literature and propose future work (8).

All cited sources are in the bibliography (Section 9) except for social media posts which appear as footnotes. Social media posts in footnotes are either used as traditional sources (i.e. to back an argument) or are illustrative of something (since social media posts are the key objects of study in this thesis). English-language posts were prioritized wherever possible. Figures and tables are also located in-text, while illustrative images that aren't critical to the arguments are available for consultation as appendices (10).

2 Conceptual Framework

Human geography, the spatial turn in the humanities, the mobilities paradigm and the 'network' paradigm have all contributed to our understanding of place as a fundamentally relational entity. One of the most influential contemporary thinkers in human geography almost liquified the concept of place itself: Massey not only made clear that places are always in the making, but that their distinction from space, itself a path of subjective experience, is limited, to say the least (Massey 2005). This progressive view of place positions it as inherently temporal, dynamic and modern, and empowers human agents in the potential remaking of places, but it also reminds us to actively nurture those that we hold dear. Massey's arguments optimistically destabilized several caricatured, albeit usefully introductory, dichotomies (see Relph 1976; Augé 1992; Sack 1997). Along with this, there is a necessarily dynamic pluralism that emerged as intrinsic to place. Geographers in the early 2000's asserted the need to move away from a view that "emphasises the structured cohesion of relations in particular sites" and towards one of place as a relational 'process' that "highlights the contingent interactions of diverse (sociologically and geographically) actors" (Nicholls, 2009, 78). Quoting the author, Nicholls illustrates how critical Massey was of the place-space binary: "space is simply a loose aggregation of the qualities found in those different places" (Nicholls, 2009, 81). In effect, Massey entangled the 'places' and 'flows' of Castells onto one plane: as well as the 'armature' and 'enclave', the node and vertex (Roberts et al. 1999; Jensen 2009; Castells 2010). For Massey, the difference between place and space is merely one of scale.

By assuming Massey's conceptualization of space as an intrinsically subjective path, in this first section, I wish to explore and define place more concretely as an articulated moment within such a path. In the following sections, I will conceptualize space as punctuated by *sights* which occur at particular *sites*. In doing so, I will argue that places emerge from these punctuations once articulated and communicated, to which I will add digital mediation as a filter to such communication, further problematizing place. To do this, I will first move from a phenomenological to a communicational perspective of place.

2.1 A Path and its Punctuations

We may often think of 'space' as general and 'place' as particular, but Casey used a phenomenological standpoint to argue that we in fact begin with place as a generalized spatiality, and move towards space as a concept particular to a learned rationalization (Casey 1996). Referring to Kant, Casey asserts "that sensory inputs are the 'occasions' of the perception (eventually the knowledge) of concrete places" (1996, 17). These 'occasions' are influenced by combinations of geometric and anthropological, spatial sensing: a 'spatial syntax' or stickiness or friction or texture (Hillier et al. 1976; Howarth 2001). It consists of a 'haptic' sensing that is observable within the scope of our own experience, within an observer's immediate environment or 'vista space' (Montello 1993; Bruno 2007). It is a spatial particularity that is 'human scale'. Features in the terrain, however natural or built, may favour these inputs that call our individual attention. At a most basic and physical level, geometries such as enclosure and orientation can produce sensations that favour affective stability (Bachelard 1960). Though phenomenology posits a minimum of experience that is universal to humans, for the most part, Earth's geometries are experienced differently based on our respective corporeal and mental experiences. Signs in the landscape, what Jakle (1990) referred to as 'icons', may be culturally loaded, leading to greater or lesser reception depending on the individual. Therefore, these 'occasions of perception' become anchored differently in the mind depending on one's experience or life path. Thus, a place's constitution is due in part to physical features in the environment which are detected by the body, yet this embodied sensing is also dependent on our capacity to read culturally-loaded physical features.

However, Jakle's 'icons' can also be seen as social capsules. In the following quote, they describe place by emphasizing their inherent social composition: "Social situations may be

thought of as temporal-territorial huddles where people communicate either face to face or indirectly through impersonal markers, or both” (Jakle 1990, 85). On the one hand, this passage describes an encounter with ‘impersonal markers’ that I interpret here as a reference to ‘icons’, which “point, signify and symbolize beyond themselves as objects” (Jakle 1990, 84). Yet on the other hand, it describes direct social contact. Indeed, Massey’s ‘spatiotemporal events’ are not merely characterized by a singular materialist interplay, but also a shared experiencing of the environment and the stimulation of social interaction itself. After all, human-human interaction must always take *place* somewhere. Feld, a social network theorist, argued that specific ‘foci’ of activity are at the root of all human sociality; that the social networks that constitute society emerge from and are maintained by specific activities which engage individuals in co-presence (Feld 1981). Though there is no articulated spatial element in their theory, foci of social activity are undoubtedly spatially centripetal. This topology of sociospatial life has been measured from a distance thanks to the surge of location-based social network data in the late 2000’s (Grabowicz et al. 2014), where places are quantitatively constituted by the presence of clusters of individuals. In sum, while there is a necessary centripetal and spatial dimension to the structure of social relations, there is also a fundamentally social dimension to the constitution of places along one’s path.

Time, or its affective stabilization (spatialization?) by way of repetition, is also fundamental to place’s construction. De Certeau’s ‘everyday life’ refers to a reiteration of supposedly banal acts, distributed spatial practices that constitute the agency and creativity (and therefore essence) of urban life (De Certeau 1990), as does Lefebvre’s, whose “sense of spatial practice [...] is local and quotidian; not long-distance journeys, but people’s habitual movements in the lived environment” (Knowles, Westerveld, and Strom 2015, 237). As a precursor to this, Seamon qualified the repeating spatial practices and habit-movements of the everyday that result from them as a ‘time-space routine’ (Seamon 1979, 55), growing experience into a web of familiar atmospheres in which our body is intrinsically bound by memory. This ‘spatial practice’ thickens into a ‘lived space’ that is essential to any further spatial conceptions (Lefebvre 1974). Thus, repetition and duration are factors that also contribute to the subjective construction of places.

So far, I have attempted to describe the generalized sociospatial experience that ingrains a certain subjective texture in the mind as moments or sights along one’s path that are constituted

by salient social and environmental textures and stabilized by repeated bodily presence. The individual is so far described as being on the receiving end of such inputs, leading to a mental kernel that is on its way to my definition of place.

While these inputs are based in the natural world, many take their origin in human intention. Massey argued that if “space is rather a simultaneity of stories-so-far, then places are *collections of those stories, articulations within the wider power-geometries of space*” (Massey 2005, 130, emphasis added). It is true that this ‘collection’ of stories is encapsulated by material manifestations (icons such as architecture and infrastructures) created by humans to symbolize and hence anchor, stabilize, orient and perpetuate such stories through time amid the elusiveness and ephemerality of their bodies. However, it is also true that equally elusive yet powerful discourses encompass such ‘articulations’: they are the language that prescribes such icons, their emplacement and our proximity or distance from them. Indeed, a web of ‘power geometries’ reign on both these infrastructural and discursive articulations of place as both are in constant exchange. The physical and infrastructural can undergo iterations that range from lethargic tectonic forces, to natural disasters, to arson and tactical urbanism. Meanwhile, the discursive realm can redefine places at equally great speeds and magnitudes through advertising and campaigning. It is indeed the discursive articulations that are ultimately the objects of this thesis’ study: the transformation of an intersection of ‘stories-so-far’ into an object we call ‘place’. As Lefebvre put it: “[The] problem is: does language – logically, epistemologically or genetically speaking – precede, accompany or follow social space?” (Lefebvre 1991, 16)

Before discussing how place is prescribed *by* language (Section 2.2), I would like to develop on how places emerge *from* language. So far, I have described a way of knowing the world that is ‘procedural’ or ‘direct’ in that it involves a direct embodied presence within the site (Warnaby 2012). While at times it involves a vehicular filter (i.e. a train, as seen in Massey 2005, 118), the body is spatially situated in the environment which it is perceiving. What emerges is a constellation of atmospheres or vista spaces, each of which require expression for defining. The spatiotemporal kernels of some positive encounters entwine themselves with the affective, interstitial moments in different locales and ingrain themselves into our total experiential history, the result of which can be referred to as one’s overall ‘spatial-’ or ‘urban imaginary’ (Roberts

2009, 85, 92; Kelley 2013). These kernels are constantly reconfigured and re-evaluated through further experience and its associated reflexivity: “the art of memory is an architecture of inner writing in which places are constantly reconfigured as if drawn on wax” (Bruno 2007, 17). Thus, in the mind’s eye, places “exist in an elastic, discontinuous space with dimensions that change with the narrator’s awareness and the intensity of remembered experience” (Knowles et al. 2015, 254). Knowles, who studied the narratives of Holocaust survivors and wrestled with questions of place and ways of visualizing them, rightly asserts that these sights are inherently interlinked: “We perceive proximity and distance, intimacy and estrangement, vastness and crowding, and many other spatial qualities of our social lives, and our experiences of place, in topological terms” (Knowles et al. 2015, 255). Topological spaces, indeed, whose nodes require distinguishing from their vertices...

2.2 From Punctuations to Places

Narration, or the production of narratives, is a discursive performance of a particular version of experience: all narrative accounts are “selected versions” (Taylor 2010, 8), that follow a certain chosen thread of ordering in one’s life. These threads mold the sequencing of narrative utterances and dictate its overall flow, producing a new path: a path that only exists in its present and expressed form, yet which, through every inherently modified and “dialogic iteration” (Taylor 2010, 6), reshapes, builds and smooths the narrator’s internal, spatial imaginary or master narrative. In doing this, we perform our way into identity (Taylor 2010, 8). Enacting this communicational mode brings reflexive order to a series of events, and locative expressions ground these in a shared world, reasserting the speaker’s relation to the world at their every utterance. Through the naming of places, “oral narratives have the power to establish enduring bonds between individuals and features of the natural landscape” (Basso 1996, 40). The narrative product or its representation is therefore an enticing object of study for understanding places.

As Massey proposed, places “can be imagined as *articulated moments* in networks of social relations and understandings” (Massey 1993, 66, emphasis added). It is precisely the point at which places are articulated that I wish to emphasize here: that places emerge as composites of previously-visited sights along one’s path. As Taylor put it, “people construct places selectively as they talk about them, consolidating a multiplicity of identities to a single place” (Taylor 2010, 10). The vague geometries that visibly bind a site together or not would not exist or be

perceivable if it were not for the words that constitute the *parcel* from the *field*. Here, I am asserting that the very point at which a place begins to exist is dependent on its naming. It is through a narrative articulation that we reconcile our experience with its sharing, conceiving discreteness: “the naming of place, [is] a performative act that transforms the place into a linguistic entity (a proper name) which can then be iterated and reiterated as a means to further establish title to discrete pieces of land, i.e. places” (Sullivan 2011, 77-78). This process was illustrated more quantitatively in work by Chan, Vasardani and Winter (2014), who found that through the naming of events, as observed on Twitter, the sites on which these events occurred began to take on the identity of those events, exhibiting both how repeated foci of activity stimulate their communication and how place ultimately takes shape as a composite of such activities.

To resume, through naming, we blackbox experiences into linguistic symbols, eclipsing their totality and binding them as ‘places’. One could call it a process of temporal interpolation and discursive smoothing. Place is an utterance – an expression – that locates our experience and anchors it in a shared world. This communicated composite is the substance with which more collective notions of place are negotiated thereafter.

2.3 Mediated Places

As put forward by Carey’s book *Communication as Culture*: “communication is a symbolic process whereby reality is produced, maintained, repaired and transformed” (Carey 1989, 23). Performance theory further essentializes this proposal, as suggested by Sullivan’s reading of Bialasiewicz: “Performative means that discourses constitute the objects of which they speak” (Sullivan 2014, 1). In effect, places and spaces are constituted by negotiated spatial imaginaries or paths, worlds which exist only insofar as they are expressed. Introduced in Section 2.1, I will now discuss the second part of Lefebvre’s question: “does language – logically, epistemologically or genetically speaking – precede, accompany or follow social space? Is it a precondition of social space or merely a formulation of it?” (1991, 16) So far, language, or ‘communication’ more broadly speaking, has been discussed as something that follows an encounter with sociospatiality and is essential to its formulation into places. In this way, a communicational framework for the production of places from a *sender*’s perspective was proposed. Yet with an outbound message in a circular world must come inbound messages, and

therefore we must discuss communication as a ‘precondition’ to places and spaces. If places are ‘sent’, then they are also ‘received’ by a passive or active ‘audience’ (Shannon and Weaver 1949; Adams 2009). Thus, places can be mediated into our spatial imaginaries: meaning they can also be a result of ‘indirect’ or ‘surveyed’ knowledge (Warnaby 2012), be it through maps, advertisements or conversations, all of which can be said to communicate ‘place images’.

Communicated places and spaces can be conceived by design and bound-up in economic and political stresses and ideologies. The ‘place image’ concept has been explored especially in the context of place branding. Citing Ashworth in their research on place marketing, Warnaby breaks down the production of place images into governments, who sanction the image’s assembly; stakeholders, who assemble the place product; and the resulting image’s consumers, who then create and disseminate their interpretations (Warnaby 2012, 205). It goes without saying that place images have been heavily deployed since the later 20th century to perpetuate and amplify certain elements of places and spaces to promote a specific use of their sites by specific audiences: this is especially so in contemporary urban areas. On top of *creating* places (i.e. ‘placemaking’), there is further a desire by such designers to ‘re-image’ places: “the consumer’s experience of the place product occurs via the selection and commodification of elements drawn from a more holistic place entity” (Warnaby 2012, 205-206). This ‘commodification of elements’ may involve the combination of the site’s geometric features and spatially-contextual elements (i.e. location within an already attractive area), as well as various other preexisting or fabricated ‘images’. Usually, these selected or fabricated elements are underpinned by an urban ideology or master-narrative. Gold’s first concept underlying the place image is characterized “as a manifestation of the specific needs of the communicators and as a product of the broader socio-political system” (Gold 1994, 19). A place image that is being intentionally reinforced may be part of a branding campaign: a component of a broader cultural governance regime. To better frame all of this, Zonn defined four principal elements for an analysis of representation of place: “(1) the medium and its associated image; (2) the place being portrayed; (3) the perceiver of the image, known as the audience; and (4) the individual or collection of individuals who created the image” (Zonn 1990, 3).

Thus, place images influence an audience’s spatial practice, their material and embodied initiatives, and the realization and embedding of these ‘imagineered’ initiatives onto a site (Paul 2004), which in turn contributes to the actualization, materialization and reproduction of these

images as places. The knowledge of a place before its witness along one's own path of experience will undoubtedly add luster to its eventual discursive conception. Once received, they colour our spatial imaginaries. So, while it is evident that not all places are collectively experienced, this suggests that not all places are dialogically or collectively formulated or negotiated neither. Instead, they can often be consumed or received as pre-fabricated images.

2.4 Conceptualizing and Problematizing Digital Mediation

At first glance, the peer-to-peer paradigm of Web 2.0 may appear to blur the lines between the stereotypical broadcast messages of the powerful and civilian voices, especially given the assumption that there is some kind of democratization of representation at play, but the sender-receiver dichotomy suggested by Shannon's communication model and encapsulated well by Zonn remain basic and useful conceptual structures. In such a digitally-enabled, intensely mediated world, critique of media, as a critique of perceptive and expressive filters, becomes a crucial field of discussion when assumptions are made regularly regarding well-balanced exposure based on, for example, internet access. Images and image-generating machines are biased by their format, sensory output, rhythm, language and context. But as elaborated in Section 2.2, place doesn't exist without communication, and hence mediation. Since all mediated geographies assumedly have an inherent bias, it is of interest to better understand their origins as well as their pathways.

In an attempt to conceptually bridge communications and geography, Adams and Jansson introduced four terms which delineate an exhaustive architecture of media and the spatial: "*Representations* and *textures* relate closely to places, while *structures* and *connections* occupy and create spaces" (Adams & Jansson 2012, 306, emphasis added). These definitions of place and space, if taken literally, are not to be taken in contradiction to those I have already laid out. I would instead borrow them as extensions: as a framework that spatializes – and therefore problematizes – places once ensconced by a communicated entity.

By textures, the authors are referring to the environment or the physical sites we encounter, their geometries and their icons, as well as existing discourse which may surround them (Section 2.1). In their own words, textures refer particularly to the cumulated social and 'media regimes' that are spatially embedded and site-specific. The textures of places also influence 'mediatization', or media-related behaviour that shapes the production and consumption of

representations of place. Indeed, certain sites (e.g. a hyped concert venue, a familiar office, a strange park) and mobile modes (e.g. cycling, public transit) influence specific media practices, which have an impact on the consumption and production of media, as well as their content (Hodgson 2012). Therefore, this can have an impact on which aspects of place are typically communicated more than others.

Representations, which are the focus of this thesis, occur precisely as the mediations of our punctuated spatial imaginary (developed in Sections 2.1-2.3) as narrated places or as manufactured place images. While some are visceral, oral and potentially sensed through an ethnography of the everyday, others occur in countless other media that require different methodologies for situating. Representations indicate the image or spectacle of a site in question; its re-creation or simulation that is intended to communicate place. Consuming these representations contributes to the very production of place itself by shaping individuals' perceptions of a given place, blurring the lines between the real and the virtual (Lindell 2015). This is epitomized eloquently in the following passage that hints to the increasing sensorial power of media technologies:

As interface or instrument, the image does not comprise a representation of a pre-existent and independent reality, but rather as a mediated geography that intervenes in the production of the 'real': we are now all active users who actively go into this geography. We have now reached a point where geographers have correlated mediated geographies with actualized experience through the production of embodied sensation. (Aitken & Craine, 2015, 90)

Zook, Graham and Boulton (2015) illustrated this by pointing to how representations of place are made especially poignant through social media and augmented reality (AR), in which the coded representations in mobile devices elevate users' knowledge of their immediate surroundings or of geographies far beyond them. Due to how omnipresent and evocative these representations are, they consider there to be a considerable degree of power imbued in them, and therefore propose a critical stance on their authorship, production and distribution: "the pervasiveness of social media entails a dramatic broadening of access to and usage of 'tools of the powerful' vis-à-vis (potentially) powerful and socially affective representations of place" (Zook, Graham, & Boulton, 2015, 225-226). They warrant a critical look at representations of place, especially by considering how they manifest in social media and intervene in the

production of places. They conceptualized these concerns in four ways – ‘distributed’, ‘communication’, ‘code’ and ‘timeless’ power – by applying a critical cartographic perspective that politicizes mediated geographies (Zook, Graham, and Boulton 2015). These critiques are especially relevant to our understanding of mediated spatialities or representations of place.

By ‘**distributed power**’, the authors are referring to the diffused, crowdsourced and sometimes anonymized authorship of place representations in online, user-generated content. The fact that content can be created and edited by anyone makes it hard to source and engage in critical dialogue with: “the mechanisms for altering content on open systems like Wikipedia can paradoxically be more opaque when people are unfamiliar with who it is that they actually have to petition for change” (Graham 2017, 10). Thus, while some may point to the democratizing effects or openness and accessibility of such technologies and behaviour, it can entail representations whose authorship is obscured from those receiving it. Moreover, this opaque authorship is not necessarily related through experience to the sites of the places they are representing: it can be diffused and distant from (and therefore unknowledgeable of, in Casey’s words) the site of the place itself as well as the people that frequent it most. Further, content can also seem as if it emanated from everywhere, even though it is always geographically unequal. This is well-illustrated by a study that used Foursquare to map urban districts. Much of the poor, racialized, central neighbourhoods of Pittsburgh, the city of focus, were severely lacking in data and hence unidentifiable as even *existing* under the analytical lens of the authors (Cranshaw, Hong, and Sadeh 2012). Thus, not only does user-generated content have the appearance of emanating from undefined yet legitimate ‘masses’, this very appearance obscures the high likelihood that the content is in fact sourced by an unrepresentative, and usually powerful, minority.

Further, given the prevalence, output consistency and at times immersive nature of place representations, a consideration for the temporal visibility of place representations is also relevant. Thus, such representational artifacts are imbued with ‘timeless power’. This critique is aimed at the continuous barrage of ephemeral representations in digital media content by distributed producers, erasing past narratives of a place which may continue to thrive on-site. When prominent communications scholar Harold Innis spoke of space- and time-biased media, digital social media emerge historically, in the scope of written discourse, as a most space-biased medium in that, like newspapers traditionally, they are characterized by circulation and scale-free

potential, rather than concrete, permanent spatial anchoring (the epitome of which might be an engraving on an unmovable stone). However, unlike newspapers, and similar to the stone, it does not disintegrate: it lasts as long as it isn't deleted or intentionally smothered or made inaccessible. I say this to illustrate how, while these representations are easily archived and resistant to aging, they are nevertheless hidden by continuous updates that obscure the past. On the other hand, the old can also be brought forth as an illusory representation of the present. There is therefore an ahistorical dimension to online mediation, one that contrasts strongly with the urban environment itself: often described as a material palimpsest.

As a result, this leads us to an exploration of the conduits within the nebulous virtual spaces: the significant structuring forces of place representations can instead be understood as that which is defined by a social network contained on a social media platform. Within the virtual-scape, digital social ties define channels of vicarious place representation. This is captured by Adams and Jansson's fourth concept, 'connections', which points to these *soft* digital-social structures, and which they suggest creates 'space in communication' (Adams & Jansson, 2012, 306). These social media connections are structured in part by algorithmic infrastructures informed by big data. Zook, Graham and Boulton's critique of this space is referred to as 'code power', which characterizes how these channelings of place representations made by controls and networks in the virtual sphere influence its access. Indeed, we are far from the easily traceable material conduits that guided previous representations of place from, say, the masculine, reductionist and imperialist texts and imagery in *magazines* delivered by in trucks to the doors of homeowners by the National Geographic at the dawn of the 20th century (Aitken & Craine, 2015, 82).

The 'connections' of a particular social media user or digital content producer, or those made available by the content of a place representation through algorithmic pathways, would also be an indication of their 'communication power': which refers to certain individuals' and groups' abilities to use technological channels and networks of communication to perpetuate and stabilize certain representations of place (Castells 2009; Zook, Graham, and Boulton 2015). Characteristics such as, for example, the use of the English language or another regionally dominant one, as well as a large online network of followers, would be indicative of a user with great communication power. Questioning the growing prevalence of AR, Graham persisted years

later “to ask who controls that information, who has the ability to access it, and who has the power to change it” (Graham 2017, 3).

Although as I had previously suggested: these representations travel particular physical geographies as well that should not be disregarded. By the ‘structures’ of a place, Adams and Jansson are referring to the geographies of communications infrastructures that constrain the extent of place representations. These material ‘structures’ of mediation can be understood as the spatial layout of communications technologies (e.g. infrastructures such as cell towers), or simply the ‘geographies of media’ (interfaces), which further shape the ‘space in communication’. Studying these structures can shed light on the extent of digital diffusion of a place and the potential media centrality (i.e. influence) a place may have. Yet it is difficult to justify studying them when focusing on an urban scale, since Western cities are saturated by public and private Wi-Fi networks and users with smartphone data plans, these representations are accessible everywhere (access is instead dependent on a personal device). Literature on the global ‘digital divide’ informs us of these *hard* structures and resulting uneven development of user-generated online content (Haklay 2013; Graham et al. 2014). In this way, digital interface users are the primary structuring actors which produce mediated representations of place in urban environments, just as the reception of these mediations is dependent on the material presence of a said interface.

To recap and conclude this section, places and spaces do not only exist on-site: their perception, experience and production is increasingly diffuse given the growing prevalence of mobile devices and social media platforms which mediate representations of all formats. Adams and Jansson reveal that this distributed nature of place representation has its own geographies, which they describe as ‘space in communication’. Yet this space is more of a topology or network of exposure: a labyrinth of production, opportunity, connection and consumption. The topology arranges representations in ways that can distort time, and their authorship can be distributed or concentrated among many or few, each of whom wield different levels of communicational clout. The textures of our environment are the lowest common denominator in that they constrain or enable mediatization, or the very production and consumption of this topology of place-production and exposure.

While the reigns of representation are assumed to have balanced since 20th century mass communication, there is still a need to measure such representational capacities with a deep

mapping of place-related discourse to effectively separate (1) places, which are emergent from individuals subjective pathways, from (2) strategically-fabricated ‘place images’. Social media, after all, is an arena that facilitates all such representations. We can envision addressing such concerns by asking how the textures of sites may influence our sharing of, say, a georeferenced tweet, and the kind of ‘representation’ of place that may ensue from this. We may also wonder what representations are being generated off-site, from where and from whom, and how they traverse the twitterverse.

2.5 *From VGI to Spatial Media*

Social media content, which has been framed thus far as a vehicle for place representations, can be considered generally as user-generated content (UGC) within the Web 2.0 paradigm – otherwise known as the ‘read-write web’ – typically characterized by a previously mentioned distributed authorship of web content (Crampton 2009, 93). When such content contains information deemed geographical, it has often been considered volunteered geographic information (VGI) (Goodchild 2007; Elwood, Goodchild, and Sui 2013b). Elwood, Goodchild and Sui (2013b) refer to geosocial media (a term prescribed to social media platforms where location-sharing is core to their functioning) as a form of ‘egocentric’ VGI, whereby users are not sharing their position or annotating a user-contributed place with the intention of providing truthful, credible or useful GI, but so that they can disseminate their geographical stories for their own social benefit (Elwood, Goodchild, and Sui 2013b, 578). Stefanidis et al. (2013, 125, 319) proposed that egocentric VGI from social media data avoid the term ‘volunteered’ altogether and that it be understood instead as ambient geographic information (AGI) that is ‘crowdharvested’ as opposed to ‘crowdsourced’: “social media feeds do not aim to empower citizens to create a patchwork of geographic information: geography is not their message. Nevertheless, the message has geographic footprints, for example, in the form of locations from where the tweets originate, or references in their content to geographic entities.” This contrasts with what Elwood, Goodchild and Sui (2013b) refer to as ‘allocentric’ forms of VGI – which is what I interpret as VGI proper – since the data being contributed is intentionally meant to serve as useful, credible geographic information (OpenStreetMap, a user-contributed global map and geodatabase, and Waze, a crowdsourced traffic map, are both excellent examples of ‘allocentric VGI’). VGI that is allocentric can also be referred to here as *crowdsourced* GI, a form of ‘geocollaboration’ where a

distributed set of users are knowingly contributing to a shared, coordinated web of information (Crampton 2009, 95).

And while this specification is useful in that it deviates from that which is ‘volunteered’, what is potentially problematic is the assumption of its ability to offer in-situ observations of the real world that are also based in lived experience.

Hardy, Frew and Goodchild (2012) found that the location indicated in anonymous Wikipedia user profiles and the VGI contained in the articles they contributed were generally proximate, providing evidence for accepting an assumption of localness for ‘allocentric’ VGI (Hardy, Frew, and Goodchild 2012). A certain localness has also been attributed to geosocial media, where the annotated locations that individuals share have been associated with *local perspectives* on places (Humphreys 2010; Kelley 2013). Yet as Johnson et al. (2016) explained, mobile smartphones, which began to take the world by storm in 2007, broke the link between the author and the message. In their critique of the ‘localness assumption’ commonly attributed to so-called ‘egocentric’ VGI, they recount how the assumption stems from when VGI was produced from stationary desktop computers, making the link between device location, home location and the associated practice of producing information about a surrounding locality more direct and intuitive (Johnson et al. 2016). They concluded by questioning the linking of a user to their contributed geographies by showing evidence that the mobile smartphone added an important and confusingly mobile ‘interface’ variable to the process of geospatial information contribution. Thus, questioning the positionality of such information becomes central to the resulting concern. One may ask, to what degree are the lived spatialities of contributors and the information they are producing related? Are they producing places or place images (Sections 2.1-4)?

Indeed, there is an emerging awareness by the Critical GIScience community which essentially consists of a problematization of user-generated geographic information in a way that cannot be resolved by accuracy checks, but rather an investigation of social context. It boils down to an epistemological questioning. I go in much the same direction as Leszczynski (2015) here in saying that geosocial media were confusingly co-opted into GIScience’s own narrative, whereas its genealogy stems from a desire to break the alienation of postmodern cities by connecting people through shared places in a performative way (Humphreys and Liao 2011), much as personal advertisements in the newspapers of rapidly urbanizing 19th century cities once did

(Epstein 2011). The narrative of social media as it pertains to geography has also been heavily conceptualized by a distinct cluster of communications and media scholars, as seen in the previous section (Falkheimer and Jansson 2006; Adams 2009; Adams and Jansson 2012; Jansson and Lindell 2015). Wilken (2017) articulated the importance of dissecting ‘geomedia’, which was advanced by the influential media scholar McQuire in recent years, as a way of critically unravelling the ubiquity, location-awareness, real-time feedback and social simultaneity, and convergence and interoperability of an increasingly geographically-enabled media ecosystem (Wilken 2017).

Yet, whereas the mandate of communications scholars is to question and explain how these media engage and constitute society, discourse within critical GIS and geography-proper takes a position that traditionally sees mediation as a complication to social media geodata that would otherwise be straightforward. Nevertheless, this cluster of researchers has showed openness to mediation as an inherent precursor to social media geodata. Elwood, Goodchild and Sui (2013a, 362-364) provide an excellent reflection on the problems faced by applying spatial models to egocentric VGI which they deem essentially ‘platial’ (that is, that ‘egocentric’ VGI results from socially-specific circumstances that requires other methods of research than spatial methods which directly objectify them) (Elwood, Goodchild, and Sui 2013a). Be it egocentric VGI or AGI, social media geodata is difficult to consider as simply *volunteered* GI, and its *ambiance* is increasingly multifaceted. Thus, a re-articulation of social media geodata has resulted in the term ‘spatial media’. The term was initially coined in reference to the growing importance of cartographic media for browsing increasingly ‘geo-indexed’ information (e.g. Google Earth) that was traditionally separate (Crampton 2009), yet has evolved to include any and all mediators of spatial and ‘platial’ content: “A street map of Chicago, geographic data files about Copenhagen, a postcard with a picture of Oxford on it, a travel guide to Sweden, are all examples of spatial media; in other words, information about geography” (Graham 2017, 44). More precisely, it stands back from the immediacy of social media as geodata by instead proposing “media as an epistemology for thinking networked digital geographic information technologies [that] provides an entry point for considering mediation itself as an ontological claim about the nature of our everyday being-with-each-other” (Leszczynski 2015, 731). Thatcher (2016) also argued for using the term as a resolution for the observed shifts in spatial information: “there remains an epistemological leap from individual to data point”, one which

they deem problematic (Thatcher 2016, 2). Graham (2017) also outlined, following up on earlier work by Graham, Zook and Boulton (2013, 2015), several elements of critical interest behind such representations. Others even went as far as considering GIS as media (Stephens and Wilson 2015).

We are brought here again to see social media – or ‘geomedia’ or ‘spatial media’ – for what it is: interfaces that mediate spatialities and which, while facilitated by users, is also intervened by them. The message, the location of the user at the time of the message’s posting and the user’s unique experiential and narrative path, can all be put into question geographically. Understanding geodata from social media as representations (imbued with sociospatial contexts), brings us to inquire into the positionality of their authors rather than any kind of supposed *accuracy* or *credibility* so often the concern in the spatial sciences. Doing so doesn’t deflate their contributions from data to unsolvable representations, but rather sees the underlying position of these representations as a way of studying society through place.

3 Case Study

As a site for this case study, I selected *Place Émilie-Gamelin* in Montreal, Quebec, Canada. At its very location, there once stood a nunnery whose first stone was laid on May 10th, 1842 (Harel 2013, 155). Founded by the now-beatified Émilie Tavernier Gamelin, the compound, which contained a rooming house, a soup kitchen and a community garden, would become an important place of refuge for the elderly, infirm and poor, and was accessible by foot from the port which, prior to its move eastward in the mid-20th century, was the most transient area in the city (Sisters of Providence 2009; Garrand 2012). In 1963, as Catholicism in Quebec began its mortal decline, the building was completely demolished to give way to construction of the main junction of the green, orange and yellow underground rail lines of Montreal’s public transit system (Garrand 2012). Berri-de-Montigny station – later renamed Berri-UQAM in recognition of the public university that was inaugurated in 1976 adjacent to it – was built with a parking lot atop it (Appendix 2). The space of the former religious establishment remained as such until 1992 when, and in sync with the 350th anniversary of the city’s founding, the City of Montreal rebuilt the site into a public space (Harel 2013, 153). The plaza, initially baptized by the name of the anniversary event that inaugurated it – *Place du 350e* – was also known more generically as Berri Square (Straw and Tallack 2009; Société des célébrations du 375e anniversaire de Montréal

2015). Despite these efforts to “re-symbolize the East of the city” (Harel 2013, 153, translated), the plaza quickly became appropriated by marginalized groups (Siciliano 2004; Straw and Tallack 2009; Harel 2013). Some festive and cultural activities took place on the site, such as *Divers/Cité* (Montreal’s pioneering and, at the time, primary LGBTQ festival), and some performances from *Nuits d’Afrique*, but these were temporally restricted spectacles that did little to overcome the perceived marginality of the space (Siciliano 2004). As of April 30th 1996, due to constant occupation by marginalized groups, which would often last through the night, the City reclassified the *public square* as a *park*, a critical zoning change which would allow authorities to enforce penalties on those loitering on the site after 11PM (Siciliano 2004, 74-75; Harel 2013, 29, 43). After all, the square’s distinctly paved and semi-enclaved context rids any holistic conception of it as a park. In 2005, it was officially renamed *Parc Émilie-Gamelin* (GrandQuébec 2009). During these years, the park/plaza also gained a reputation as a site for efforts in social justice and political contestation (Harel 2013, 129-176). In 2012, it became a vivid fixture in Quebec’s imaginary, when it was a symbol and gathering point for daily protests by the province-wide student movement, dubbed the Maple Spring (Fortin 2013; Harel 2013, 154). Much like Cairo’s Tahrir Square, the plaza became central to the ‘amplified public sphere’ of the Quebec-wide movement, gaining a certain notoriety throughout social and mainstream media and in activist circles across the globe (Nanabhay and Farmanfarmaian 2011). Since, its name has become a casual, province-wide pseudonym for any kind of political contestation¹: as daily protests that began and ended in this ambiguous space were highly mediatized (Belley 2012; Hale 2012). Yet, since then, it has gained considerable attention by the *Quartier des Spectacles* (QdS), a City-backed cultural district revitalisation project, whose mandate has been to integrate the space into its existing collection of outdoor festival sites to the west (Poirier 2011; Cummins-Russell and Rantisi 2012; Carrier, Lachapelle, and Paulhiac Scherrer 2014). QdS essentially succeeded in the summer of 2015 with the creation of an experimental outdoor performance space, restaurant-terrace and horticultural interpretation centre which they dubbed *Les Jardins*

¹ c□, L. [libphil_]. (2016, Mar 12). @Justiciers Je savais pas que la place Émilie-Gamelin était rendue à Chicago [Tweet]. Retrieved from https://twitter.com/libphil_/status/708518671346487296 (last accessed 7 August 2017)

Gamelin (i.e. ‘The Gamelin Gardens’). The program was deemed a success², and so was re-launched for the following year.

On a more geographic note, the plaza’s centrality is unmistakable. Today, it abuts the Old Port, the Latin Quarter, the Village and the Plateau districts, and it is next to several of the province’s most important cultural institutions (e.g. Radio-Canada, TQS, BANQ), as well as the city’s largest university and one of its largest community colleges. All of this endows the site with enormous cultural presence. Situated directly atop the city’s largest metro station through which 45 million people pass yearly (STM 2011), with direct links to the offshore suburbs and every other axis of the island, and adjacent to the metropolitan coach terminal with a direct link to the airport, the square stands literally at the crossroads of Montreal’s metropolitan region. Amid such transience, it is yet still an anchoring point for *transients* over half a century after losing its charitable function...

Any study of place representation should take scholarly perspectives into account as well (Lukinbeal and Craine 2009). Indeed, the square has attracted considerable interest from local scholars from several domains. Straw and Tallack took on a cultural studies gaze, situating it as a cornerstone symbolic of a declining era and area, where an ongoing transience of material cultures and people coalesce with grand, albeit repeated and failed, visions to bring stability to the area (Lachapelle 2007; Straw and Tallack 2009). Harel took on a more geopoetic yet politically critical gaze, recounting the history of the site and its symbolic and very real significance vis-à-vis the city’s increasing neoliberalization and cultural self-commodification. The author also spoke at lengths of the grassroots resistance movements that occupied the site and their historical importance within the Montreal community (Harel 2013). Aesthetically, the plaza was intended by its designers as an abstracted, physiognomic metaphor for the Montreal area, with three miniature canals (each representing one of Montreal’s historic on-island rivers) flowing down a slight incline (representing Mount Royal), on-top of which are three statues that aim to evoke tectonic contrast between skyscrapers and natural landscape (Valois and Paradis 2010). This site is noted by the design community for these ‘narrative’ attributes, yet is considered to have failed to shape the site as intended by its designers. Instead, it has become defined by “the media reactions and the changing and unexpected uses of the space” (Valois and

² spectacles, Q. [QDS_MTL]. (2015, Oct 06). PRESS RELEASE | Well played, Jardins Gamelin! -> [#jardinsgamelin #quartierdesspectacles](http://t.co/e6hQBS57q5) <http://t.co/uuHrppgKmv> [Tweet]. Retrieved from https://twitter.com/QDS_MTL/status/651488546864369664 (last accessed 7 August 2017)

Paradis 2010, 72). In a completely different manner, the *Jardins Gamelin* intervention has also gained attention from the design community³ as one of Montreal's founding pieces of 'tactical urbanism', a phenomenon that has taken the city on by storm in recent years. There is also a third gaze that looks specifically at the marginal groups that have come to call this site home (Parazelli et al. 2014; Parazelli and Carpentier 2016). Parazelli and colleagues have focused more on the social work that has been done in the neighbourhood surrounding *Place Émilie-Gamelin*, on the street youth who have long-resided there, and on the discourse that occurred in mainstream media throughout the 1990s and early 2000s regarding these marginalized groups. In addition, albeit less explicitly-focused on the plaza, works regarding the student movement of 2012 cite it as an important gathering space of protest (Fortin 2013), with any mention of social media relating it to *#manifencours*: the city's go-to hashtag for protests. Very recently, as the *Jardins Gamelin* took hold, a team of students from the *Institut National de la Recherche Scientifique* (INRS) took interest to how it was affecting marginalized groups (Bécharde et al. 2015). And in the summer of 2016, *Amplifier Montréal*, an independent research team, took on an in-depth, 8-week-long ethnography of the site, exploring narratives of cohabitation and encounter between the site's new and old users (Amplifier Montréal 2016)⁴. All of these sources, especially the latter, on-top of my own intrinsic knowledge of the site from having grown up in the district, have intensely informed the present study.

It is without doubt that *Place or Parc Émilie-Gamelin* is as much a symbol and a distant and nostalgic wonder as it is a meeting place, a trading post and a home. It is as culturally and geographically central as it is cognitively, socially and spatially marginalized in practice, and its image has especially evolved and multiplied in scope, name and meaning. No study has looked at it since the student movement, and no published work has appeared on its evolution since 2015's grandiose implementation of an entertainment zone that occupies the site from May to October of every year. Given the park's evident pluralist existence throughout history, it appeared to be a prime topic for an exploration of place through social media. It is only appropriate that, on the 375th of the city, we look at how events are currently shaping the site: 25 years since the one that birthed its current, albeit increasingly modified, incarnation.

³ ADUQ [aduc_]. (2015, Nov 25). Les Jardins Gamelin reçoivent un Prix de mérite aux Prix Shenzhen de la relève en design, bravo @PepiniereCo ! <https://t.co/KPtf2nDiV5> [Tweet]. Retrieved from https://twitter.com/aduc_/status/669549090720645120 (last accessed 7 August 2017)

⁴ Amplifier Gamelin. [Facebook Page]. Retrieved from https://www.facebook.com/Amplifier-Gamelin-838809506220509/?ref=br_rs (last accessed 7 August 2017)

4 Literature Review

In this literature review section, I first describe the Twitter platform by breaking it down into its respective analytical parts and then explain who uses the service based on existing research to better situate tweets in relation to people (4.1). I then explore the kinds of discourses that occur on Twitter and how they have evolved over time (4.2.1-2), followed by a brief meta-analysis of various typologies designed to classify these Twitter expressions over the past decade (4.2.3), a description of how these expressions travel the Twitter ecosystem (4.2.4), and various other classifications that have been made for tweets from a situational – and therefore spatial – awareness perspective (4.2.5). After having reviewed the kind of content that exists on Twitter, I then provide an in-depth look at the spatial attributes of Twitter and how they have been utilized in research (4.3). This third part first looks at recent developments in the spatial metadata of tweets (4.3.1), the utility of profile locations (4.3.2), and the geographic information found in tweets’ textual content and its applications (4.3.3). In the final section (4.4), I look at how all of this can better situate existing research, and I situate the present thesis amid recent, similar works.

4.1 Twitter

Twitter has been an important source of data for numerous research fields, due to its accessible API, allowing relatively accessible methods for attaining its data, but also its de-facto public nature which avoids ethical issues, its popularity as a social media platform, its relative global coverage compared to other platforms, and the heterodox social circles that exist on it. It is seen by many as a unique virtual lens onto society.

4.1.1 What is Twitter?

Twitter is a social media platform, otherwise known as online social network (OSN) (Quezada 2015), a social networking site (SNS) (Han, Tsou, and Clarke 2015), but also a ‘microblogging’ platform (O’Riordan 2016), where users can post small messages called **tweets** which other users can interact with in various ways. To further explain this digital environment, I will break it down into a series of analyzable objects and their respective relational fields, followed by a small meta-analysis of research on tweets and Twitter as a whole.

Firstly, Twitter content generally refers to the text that is contained in tweets as well as various forms of attached media such as photos, videos and hyperlinks. A single tweet contains a body of text, which was traditionally limited to 140-characters until fall 2017 when this capacity was doubled to 280, and allows attachments of up to four photos or 140 seconds of video⁵. Tweets are the ‘sampling units’ (Einspänner, Dang-Anh, and Thimm 2014, 100) of most studies and, as bounded textual aggregates, can also be referred to broadly as ‘documents’ (Hahmann, Purves, and Burghardt 2014). Second, Twitter users are objects representing the account from which an individual may post tweets. Users have profiles which contain publicly displayed metadata such as the date the account was created, a short bio, an editable username and the user’s self-defined profile location, a field intended to allow users to claim geographic affiliation. Users can follow and be followed by other users. This relationality between users can be qualified as the ‘social network’ or ‘user layer’ of Twitter (Symeonidis, Ntempos, and Manolopoulos 2014, 36), made up of users within an ‘articulated network’ (Naaman 2011, 55). Third, the interface of interactivity between users takes place through tweets within a ‘semantic metadata network’ or ‘content layer’ (Steiger, de Albuquerque, and Zipf 2015, 810; Symeonidis et al. 2014, 36), which is made up of ‘content items’ (Naaman 2011, 55) (i.e. tweets). The content layer refers to the text and media contained in tweets as well as the various interactions that users can perform with them such as a favorite, a retweet, or a reply. Indeed, “you’re not dealing with [users] personally, you’re dealing with what they’ve put out there” (Sarno 2009, par. 15, as cited in Rogers 2013, 3). From a user’s point of view, a greater number of followings (what Twitter describes as ‘friends’) will involve exposure to more tweets, and a greater number of followers (i.e. not ‘friends’) will imply that the said user’s tweets will have greater potential visibility. Lastly, the ‘location layer’ of Twitter refers to the coordinate data attached to tweets (Symeonidis et al. 2014, 36), which are a result of either the ‘device location’ at the time of the tweet’s posting (Graham, Hale, and Gaffney 2014, 569), or from a voluntary geotagging of a tweet to a given place (to be addressed in Section 4.3.1). Coordinate metadata for tweets were apparently unavailable before 2011 (Rogers 2013, 7), yet since then, this layer of information has been of key interest to geography and to studies utilizing Twitter data more generally (Steiger, de Albuquerque and Zipf 2014, 818).

⁵ Video, T. [TwitterVideo]. (2016, Jun 21). Now, everyone can post videos up to 140 seconds long! We can’t wait to see the amazing videos you create and share. <https://t.co/DFsuvnXkuL> [Tweet]. Retrieved from <https://twitter.com/TwitterVideo/status/745239649652662273> (last accessed 7 August 2017)

4.1.2 *Who uses Twitter?*

Like any data source, it is important to know where it comes from, and to claim that it comes from Twitter is insufficient without having a good idea of who actually uses the platform. It goes without mention that Twitter is limited to an already unequal population of internet users, which is made up of mostly urban and literate individuals in the global core (Graham et al. 2014). From here, we can add the factors of access to technologies, and a stable-enough income to pay for landlocked internet service or mobile data plans. Any question that asks who uses Twitter only begins here. Blank (2016) provided a summative review of the literature on the topic and sustained the digital divide critique on Twitter. By reviewing and comparing qualitative studies done on a random selection of over 4000 British and American respondents from 2011 and 2013, they compared Twitter user demographics with users of other social-networking sites and those who were offline altogether and found that, overall, Twitter users represented 20-30% of internet users and were much more likely to be young, single, educated, white and have higher incomes (Blank 2016). They also found that Twitter users were much more likely to participate in other online activities and had a more positive grasp of the internet overall. Citing a 2015 study by Pew Research, Shelton sustains these findings broadly, pointing out that 1 in 5 adults and a third of youth in the United States used Twitter (Shelton 2016, 8).

In geography, especially among those who consider themselves to be ‘critical’, there is consistent critique of a supposed overreliance on geotagged tweets based not only on the mismatch between their content and the locales they are claimed to represent (see Sections 2.5, 4.4.2), but the very representativeness of their authors. Beyond the question of who uses Twitter, many have noted the socially-skewed nature of those who choose to opt-in to coordinate metadata-sharing with their tweets (Leetaru et al. 2013; Li, Goodchild, and Xu 2013; Graham, Hale, and Gaffney 2014), suggesting that this subpopulation of Twitter users is not representative of all users (Sloan and Morgan 2015). A 2013 study found that the density of geotagged tweets was highly correlated with “well educated people with an advanced degree and a good salary who work in the areas of management, business, science, and arts” (Li, Goodchild, and Xu 2013, 74), based on spatial autocorrelation of geotagged tweets with American demographic data at the county level. The authors’ method for determining if users were local to a county (and not users tweeting as they travel through it) was based on whether they had tweeted more than once inside

of it over more than 10 days (p. 69). More generally, geotagged tweets were found to be overrepresented in urban areas (Hecht and Stephens 2014). Intra-urban and racial inequality of representation among such tweets has also been noted in case studies on St. Louis (Shelton, Poorthuis, and Zook 2015), and Seattle (Kelley 2013).

In addition, as Lansley and Longley noted in their study of topic distributions among geotagged tweets across London, not all Twitter accounts represent individuals and their opinions, but emanate from companies with vested interests and their agents such as journalists (Lansley and Longley 2016, 86-87). The presence of non-individual users such as institutions and for-profit companies can also be traced historically. Twitter began, after all, as a platform for individuals to connect, yet, like other SNS, has become central to social media marketing strategies: as of 2015, “91% of the largest consumer brands had active Twitter accounts” (Yesmail 2015, as cited in Vargo 2016, 157). Thus, beyond the population of individuals that use Twitter, the collective or hierarchical and for-profit interests of larger organisations are also represented.

In brief, there is a very real and ongoing digital divide whose fault lines span numerous social variables (geographic, social class, racial, etc.), leaving a population without access to the shaping of digital, online representations. Within the growing population of those who do have this access, there is a very describable subset that uses Twitter. As Blank (2016) notes: “a biased sample remains biased regardless of how many millions of tweets are in the sample” (Blank 2016, 13). No study that uses Twitter data can claim that it is representative of the population as a whole. Further, the issue of representativeness of Twitter users is quickly subsumed by the fact that most Twitter users are *lurkers* who do not post at all (Goodchild, Li, Xu 2013, 63). This undoubtedly adds a whole other layer of consideration required for who, within the Twitter population, is producing tweets in the first place. Since “very few are responsible for the great majority of content” (Roger 2013, 5).

Shelton suggests that “Twitter data might better be seen as a real-time digital archive – with all of the attendant biases and limitations of more conventional archival sources – of individuals’ everyday lives” (Shelton 2016, 8). Indeed, whether Twitter is even indicative of the *everyday* of *individuals* remains to be seen... but calling out its status as a mere digital archive that emanates from a distributed yet unrepresentative population, like all archives, is commendable. In this way, its representative validity is similar to other traditional sources like journal entries, flyers, zines,

posters, and public service announcements. This communication-centric perspective somewhat belies persisting assumptions in the GISciences by slightly decoupling body and digital text (Section 2.4), but it only permits us to reconstruct it more effectively later.

Yet unlike archives of empiricist data and records, tweets emanate from a range of intentions, providing documentation on the world in many different implicit and explicit ways. As Rogers stated, Twitter offers a unique epistemology for its users and for researchers onto the world and into humans' psyches (Rogers 2013b, 37). So, what are people using Twitter for? Does it really reveal individuals' psyches and, by extension, the places of their paths? I will attempt to address this in part by using existing literature in the following section.

4.2 *Twitter Discourse*

The present section explores the kind of content that is found on twitter based on research carried out over the past decade.

4.2.1 *The Evolution of Twitter Discourse*

As noted intermittently in previous sections, Twitter is home to a particular form of discourse and social network structure. Marwick (2013, 4) noted similarly that “it is important to distinguish social media behaviour in general from social media behaviour on Twitter.” Indeed, Twitter is more of a microblog than a traditional social network (O’Riordan, Feller, and Nagle 2016). And whereas other platforms such as Facebook may have more affordances in the realm of social connectivity with known peers, Twitter stands out as being particularly good at content discovery and information consumption (O’Riordan, Feller, and Nagle 2016). Rogers described Twitter’s transformation into an object of study over the years, whereby it “evolved from a phatic and ambient intimacy machine, [...] to an event-following and news machine” (Rogers 2013, 7). The author discussed how the emergence of “food tweets” in Twitter’s early years (2006-2009) and the journalistic coverage that surrounded it found this to be exemplary of Twitter’s banality and supposed meaningless chatter, often framed as uninteresting and unworthy of attention. In 2009, Twitter’s content shifted, or was recognized to have shifted, to information sharing, when the trending topics feature was initiated in 2009 (Rogers 2013, 4). One of Twitter’s co-founders noted that Twitter was a vehicle for “massively shared experiences” (quoted on p. 4). Similarly, an influential study concluded the same using statistical benchmarks (Kwak 2010), arguing that

Twitter stood out more as a news network than a typical online social networking site. Within the OECD, 10-20% of online readers tend to use Twitter for accessing the news, and as internet use rises, social media is becoming increasingly users' main source of news consumption across the globe (Newman et al. 2016).

The banal chatter of the early days, where content was not the main concern, but rather to stay in touch and to maintain social ties, was challenged by an understanding of Twitter as a very different, public, information-oriented and disseminative discourse, where “users broadcast or narrowcast to followers” (Rogers 2013, 4). This evolution is best encapsulated by the change in Twitter's prompts. According to Marwick and Boyd (2011, 116), the dialog box that appeared when composing a new tweet once contained the filler text “What are you doing?”, whereas it currently says “What's happening?”

Thus, Twitter can be said to have been initially adopted in a way that encouraged forms of ambient intimacy, but had then evolved into a platform that privileges information-sharing, which inevitably invites one-to-many broadcast and traditional mass media agents. This temporal conceptualization of Twitter pits the vernacular, peer-to-peer sharing of yore against a disseminative, broadcast-like and event- or hype-oriented medium. It also gave way to research agendas whose primary interests were in harvesting actionable forms of information, as will be discussed in Section 4.2.5.

To add to the mix, the early and emancipatory conceptualizations of Twitter as a civic agora that “provides insight into mass user generated opinions, sentiments and reactions to social events” have become figuratively interspersed with posters and billboards (Blank 2016, 13). Like Facebook and Instagram, Twitter, has seen an encroachment of more promotional, for-profit and organizational agents on the medium as capitalism has inevitably caught up with Web 2.0 (Section 4.1.2).

While this differentiation can be seen through time, numerous actors and their discursive intentions continue to permeate and coexist on all major social media platforms, diversifying their content and hence requiring ongoing study. There has indeed been an evolution, but it was not one of absolutes: the platform has absorbed a broad range of communication types. The following sections will explore past research that has attempted to make sense of Twitter's diverse content, users and contexts.

4.2.2 Public, Performative, Phatic, and Spatial Discourse

First, I would like to explore the nature of Twitter discourse by individuals who use it, and how this makes it a unique platform. In doing so, I will question Twitter's capacity to provide views onto the *everyday*, situating it along a certain axis of intimacy.

Twitter audiences are assumed as relatively active, counter to the rightly-associated passivity of traditional mass-media audiences (Marwick and Boyd 2010, 29). This can lead to unexpected forms of propagation. A user may have an audience in mind upon writing the tweets, what Marwick and Boyd (2010) called an *imagined audience*, irrespective of whether this audience is reflected in that user's followers. The *actual audience* of the tweets may simply remain these followers or, with luck, it may be channeled to users fitting the profile of this imagined audience, but it may also be unexpectedly disseminated by a user to another set of followers or users via hashtag, collapsing the context behind the tweets's original intention. Indeed, "social contexts we used to imagine as separate co-exist as parts of the network" (Marwick and Boyd 2010, 130).

Amid this ominous *context collapse*, users are constantly mediating between public and private (Papacharissi 2012). The fact that Twitter was not found to be used at all in a study of parent-child ties on social media suggests its unlikely use for intimate and emotional communication (Longhurst 2015). Rather, Twitter is an especially *performative* medium. Through performance, we may maintain a specific context, or remain defiant in the wake of a context-free network. Users perform themselves as their desired public figure (Papacharissi 2012), however self-interested or information-oriented their tweets are (Naaman, Boase, and Lai 2010). Performance theory argues that identities are actualized through actions as a "stylized repetition of acts" (Butler 1988, 519). Especially online, where posts are the very material by which publics gauge users' existence: performativity "becomes an essential step in presencing these cultural viewpoints and identities" (Papacharissi 2012, 1990). Marwick and Boyd (2010) indicated how, through performance, certain users can be elected to prime positions of networked sociality, as micro-celebrities, displaying elements of "personal branding, and strategic self-commodification" (Papacharissi 2012, 1990). The kinds of content, their consistency and their posting frequency, are all integral to this performance and directs the user's position within the Twittersphere.

This performance can also employ spatiality. In their study of Foursquare, Instagram, and Facebook, Schwartz and Halegoua referred to “the display of physical activities on social media as particular expressions of the ‘spatial self’” (Schwartz and Halegoua 2014, 2). They argue that individuals on social media, and assumedly on Twitter too, employ place in their presentation to an audience, however imagined, of followers, and that this carries with it an intention to bond socially. Bingham-Hall (2017) argued similarly by repositioning the online *imagined audience* as an imagined community that users assemble as a hyperlocal public (understood geographically) through spatial performance on social media. Indeed, online messages’ “value is not in the content, but in the pathways they open up between people and the subtle perceptual reinforcement of the coherence of local identity” (Bingham-Hall 2017, 67). While the authors only focused on posts geotagged to places (instead of all spatial indices in content), they go on to suggest that the performativity underlying these representations must be considered when dealing with the accuracy of geosocial data.

After all, ‘Fake check-ins’ are a documented phenomenon in the use of LBSNs (location-based social networks, an umbrella term for such check-in apps), where the user associates their content to a place and its coordinate metadata simply to add meaning or weight to the message (utilizing the value of the place’s identity rather than its actual geosocial contextualization) (Rost et al. 2013). By shedding light on this phenomenon, Rost et al. “argue for the importance of analysing social media as a communicative rather than representational system” (Rost et al. 2013, 1). Nevertheless, in the GISciences, the communicational subtleties of spatial communication often remains understood in a representational and empirical way, with the phenomenon known instead as *location spoofing* (Zhao and Sui 2017). It is in this way that Twitter is also an especially phatic communication environment: all tweets are to a certain degree, phatic speech acts (Jakobson 1963). As noted by several scholars, the “chatter” and “small talk” acknowledged in the Twittersphere’s early days is recognized as being loaded with intention to maintain social connectivity and relevance (Rogers 2013, 3).

In sum, Twitter is a space where users constantly mediate their behaviour along a public-private spectrum and who, through performance, can attain social goals of networked, social access and self-representation. This complicates a naive view of Twitter as a space for the vernacular and the ‘everyday’ by advancing that it is instead a sphere where discourse is more pre-meditated, public, and maybe even ostentatious. Therefore, when using tweets to understand

human geography, we must not only consider a tweet's context as deduced from where it is situated and directed in a network of performative agents, but also its very existence as opposed to its absence.

4.2.3 *Tweet Types*

The previous section reviewed the literature on Twitter discourse quite broadly, highlighting the various implicit and structural mechanisms that shape the nature of utterances that are found on the platform. Tweets, as digital artifacts resulting from these various qualitative contexts, have yet been categorized in several studies with an intention to make sense of what could be learned from its content. The classifications discussed in the following section served as a basis on which to develop a content analysis for this thesis (Section 6.4).

4.2.3.1 *General Classifications*

As Rogers noted (2013, 2), early studies played a seminal role in tweets' categorization and provided much of the ontologies that persist today, albeit in more qualitative contexts. They referred to a private sector study where the researcher manually categorized 2000 tweets from a two-week timeframe and derived six kinds of tweets: 'spam', 'news', 'self-promotion', 'pointless babble', 'conversational' and 'pass-along value' (Kelly 2009). Self-promotion and news would be deemed conversational if containing an ampersand symbol and those of pass-along value were noted as having more international penetration. Another seminal study on Twitter revealed a similar taxonomy of "user intentions" (62), which are, in descending order of frequency: 'daily chatter' (reflecting people's daily activities), 'conversations', 'sharing information' (URLs) and 'reporting news' (Java et al. 2007). Rogers (2013) noted how these various uses of Twitter gave rise to, or coincided with, certain textual behaviours, such as the hashtag for news and the ampersand symbol for conversations.

However, these early studies mixed up rudimentary tweet typologies now assumed in full by the platform (the retweet as a mechanism to generate tweets of 'pass-along value' and the ampersand as an indicator of 'conversation') with discursive strategies. Naaman *et al.* (2010) derived a more telling classification from a content analysis of 3379 tweets from just over 350 users, which, in descending order of volume, consisted of 'Me now' (41%), 'Statements and random thoughts' (25%), 'Opinions/Complaints' (24%), 'Information sharing' (22%), and the

remaining categories (< 10%) were ‘Self-promotion’, ‘Questions to followers’, ‘Presence maintenance’, ‘Anecdote (me)’, and ‘Anecdote (others)’. In this case, double-coding was permitted (categories were not necessarily mutually exclusive).

Many of these categories intersect and can even be considered redundant. As argued by Papacharissi and others in the previous section, the phatic communicative strategy argued to be prevalent on Twitter is likely to permeate all content types in some way or another. Therefore, it remains unclear whether ‘presence maintenance’ is a useful stand-alone content-type here (I would add that ‘Question to followers’ is an especially phatic content-type as well). Secondly, these studies have a consistent reference to ‘News’, ‘reporting’, and ‘information-sharing’, all of which are arguably of ‘sharing’ and ‘pass-along value’ as well. Lastly, the largest body of messages appears to pertain to information and messages of a more constrained, subjective relevance. While ‘anecdotes’ appears to be a more elusive category that may bridge the ‘informative’ and the ‘me now’, all others suggest a breakdown of ‘daily chatter’ and the hardly useful classification by Kelly (2009) ‘pointless babble’ into ‘statements and random thoughts’, ‘opinions and complaints’, and ‘me-now’, a reporting of daily activities that may be revelatory of Schwarz’s ‘spatial self’ (Section 4.2.2). All in all, there is clearly a distinction to be made between the information-sharing nature of content, a certain ‘promotion’, and the more vernacular and expressive kind of the everyday.

4.2.3.2 *Linguistic Classifications*

Quesnot and Roche posited that “our respective spatialities are structured as real *speech acts*. These acts must be understood here as a semiotic process (i.e. loaded of meanings) involved in the constant reconfiguration of the society’s spatial arrangement” (Quesnot and Roche 2015, 1975, emphasis added). Elements of speech act theory (SAT) are present in Naaman et al. (2010), who hinted at trying to unravel user-intentions. While they successfully overcame some more archaic distinctions like ‘pass-along value’ and ‘conversational’, some of their ontological choices remain unclear. A more in-depth look at communicative intentions and strategies is therefore warranted.

The highest level of language structuration could be said to be made up of axes that include syntax, which dictates the combinative and associative axes of language into a vector of words (Jakobson 1963, 48), semantics, or the meaning and significance of language, and pragmatics,

which look at the effect of language onto the world. Einspänner, Dang-Anh and Thimm (2014) proposed that tweets be classified by the kind of speech acts (pragmatics) that they contain to reveal “the types of actions that people want to accomplish through communication” (103). Ludwig and de Ruyter defined SAT as follows: “As the most influential linguistic theory to study language-in-use, SAT refers to how word categories and sentence constructions, apparent in people’s everyday language use, give insights into their intentions, perceptions and identities” (Ludwig and de Ruyter 2016, 125). Such ‘everyday language use’ is made up of ‘utterances’ which are made ‘purposeful’ by their inherent intent to accomplish specific actions. They are therefore qualified by the kind of strategy that they employ (Nastri, Peña, and Hancock 2006, 1028). Traditionally, a communication strategy can be determined by simply asking: what is the intent of the utterance? To answer this, it requires implicit contextual and intertextual knowledge of the utterance.

While Jakobson was the first to propose a taxonomy of such ‘linguistic functions’ (Jakobson 1963), Searle built upon it significantly (Searle 1976; Sullivan 2011; Einspänner, Dang-Anh, and Thimm 2014, 103), and coined them as ‘speech acts’. Some have also called them ‘linguistic strategies’ (Einspänner, Dang-Anh, and Thimm 2014, 105), ‘practices’ (González-Bailón et al. 2012, 5) or, similar to Jakobson, ‘functions’ (Heyd 2014, 496), which is the term I will use from here onward.

Every utterance contains elements of each function, yet one always predominates (Searle 1976). Jakobson (1963, 213-218) proposed seven such functions, of which I would like to note, firstly, the ‘poetic’ (whose intention is the aesthetic of the textual result itself, 218-220) for its specificity, and secondly the ‘phatic’ (whose intention is to maintain contact with the addressee, 217) for its universality (on Twitter). The other five largely parallel those proposed later by Searle (1976), which consist of ‘assertives/representatives’, ‘directives’, ‘commissives’, ‘expressives’ and ‘declaratives’ (10-16).

Since Searle’s influential classification, researchers have applied them to analyses of various online environments such as chat platforms without any adaptation (Nastri, Peña, and Hancock 2006), and to online message boards and forums with minor adaptations (Riloff & Qadir 2011). Several have more recently looked specifically at tweets (Zhang, Gao, and Li 2012; Weller et al. 2014, 101; Zarisheva and Scheffler 2015; Stephan et al. 2016; Vosoughi and Roy 2016). Indeed, just as the sentence could be the smallest semantic unit in textual language

(Barthes and Duisit 1975, 239), a speech act can be said to be the smallest observable unit of intended communication. Both such structures fit snugly within a tweet. In this way, a small dataset of tweets is a prime resource for this kind of analysis, as it gives way to preformatted utterances: individual data packets that can be identified at least in whole by their communicative function. Indeed, there can be several functions (intents) inside a single tweets, as considered by Zarisheva and Scheffler, but like Zhang, Gao and Li, a practical classification would stop at a single function per tweet.

Usually, the declarative is left out completely for analysis of online utterances (Qadir and Riloff 2011; Zhang, Gao, and Li 2012; Zarisheva and Scheffler 2015), and while ‘commissive’ acts were among the most frequent in a study of selected utterances from peer-to-peer discussion in online forums (Nasri 2006), Twitter, which is most often annunciative rather than intimately conversational, has been shown to mostly contain ‘statements’ (i.e. Searle’s ‘representative’). Vosoughi and Roy (2016) proposed their adaptation of Searle’s speech act as ‘tweet acts’. These included ‘assertion’, ‘recommendation’, ‘expression’, ‘question’, ‘request’, and ‘miscellaneous’. By removing the ‘commissive’, deprecating the directive into ‘recommendation’, ‘question’ and ‘request’ and adding a sixth ‘misc’ category for difficult, short tweets, they distill and modify these categories in accordance with Twitter. They, like Zhang and colleagues (2012), used semi-supervised machine learning techniques to automate speech act recognition. The latter noted Twitter’s distinct “Netspeak style that is situated between speech and text but resembles neither” (Zhang, Gao, and Li 2012, 19). These researchers modified Searle’s work into the following: ‘statement’, ‘question’, ‘suggestion’, ‘comment’ and ‘misc’. While ‘statement’ is analogous to Searle’s ‘assertive’ utterances, ‘suggestion’ to ‘directive’ and ‘comment’ is (somewhat) to ‘expressive’, ‘question’ arises as an act somewhat similar to the ‘directive’, yet with a simpler end goal that only prompts for a user’s textual response. ‘Misc’, like Vosoughi and Roy (2016), was deemed a useful bin for difficult tweets, which often consist of too few words to be associated textually to a speech act type (Einspänner, Dang-Anh and Thimm 2014, 104). Finally, In a manual content analysis of 1798 tweets from trending topics over a six-month period, Papacharissi identified ‘play’ as a ‘performative strategy’ unique to this online platform (Papacharissi 2012, 1996; Weller et al. 2014, 117). Two thirds of tweets sampled from trending hashtags were classified in this way based on the presence of syntactical reordering, exaggeration, fragmentation and repetition of words.

Linguistic classifications appear to align quite well with those described in the previous section, yet there are two major improvements: (1) ‘suggestion’ and ‘recommendation’ are added (virtually unmentioned in previous studies). (2) ‘Thoughts, Statements and Opinions’ are broken down usefully into ‘Assertion/Statement’ and ‘Comment/Expressive’. As seen in Table 1, we can deduce an initial spectrum of communicative functions which may still exist on Twitter today. However, what remains unclear is how these functions relate to expressions of place.

Table 1. Proposed synthesis of typologies for communicative functions found on Twitter.

Information -sharing	Promotion (self)	Activity (me-now)	Assertion / Statement	Comment / Expression	Suggestion	Anecdote	Question
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4.2.4 *Network Structure*

In 2010, tweets came in two highly-abstracted forms of content, reflecting what Rogers described in 2013 (Rogers 2013a). This has also been shown by more in-depth analyses of the Twitter network as a whole and observed user types.

The tweet sample used by Naaman, Boase and Lai (2010) was derived from a set of users over a period of time, allowing them to observe and aggregate tweets at the user-level. They found their classified content to be distributed across two broad user-types: ‘meformers’ (more self-interested content producers), and ‘informers’ (those focused more on information dissemination and commentary), forming two distinct ‘content camps’ (Naaman et al. 2010, 192). The latter tended to interact more and have more contacts, yet formed a minority (20%) among a majority of users posting more self-interested posts. However, they do not say whether the users they selected included broadcast media sources (unlikely given their discussion about ‘individuals’), so the proportion of ‘informers’ is probably higher. Statistical tests found that users whose messages were more predictable and consistent in content-type tended to post more frequently, whereas users posting more diverse tweet types had a more moderate posting frequency, but were more likely to interact with other users (mentions, RTs and replies). In brief, this tells us that there is a majority of ‘meformers’ posting messages relating to themselves and what they’re doing, and a more connected minority of ‘informers’ posting mostly information of wider relevance.

As was presented previously, Twitter is a microblogging platform rather than a traditional SNS, so ‘follows’ are not necessarily reciprocal friendships. If we were to qualify follows as relations, they would be bi-directional – or conceivable as ‘friendship ties’ – only a minority of the time. A 2010 study showed that only 22.1% of followings were reciprocated, and that 67.6% of the 41.7 million user-objects harvested were not being followed by any of the users they were following (Kwak et al. 2010, 3). This pointed to the peculiarity of Twitter, and led Kwak et al. to conclude on Twitter’s high presence of news and information sharing rather than typical peer-to-peer relations, as was similarly concluded later (Vicari 2013). Years prior, Java et al. (2007) noted three main user types based on follower-following ratios and network characteristics: ‘information sources’, ‘information seekers’ and ‘friends’ (63). A more qualitative take on it revealed ‘broadcasters’, characterized by larger following and content production, ‘acquaintances’, which generally had reciprocated followings of moderate size, and a third group made up of ‘miscreants’ and ‘evangelists’, who followed many but had relatively fewer followers (Krishnamurthy, Gill, and Arlitt 2008). In sum, there is clearly a majority of unidirectional content-seekers, and a minority of more watched and active content creators. To this, we can also add bots, which consist of automated Twitter accounts whose tweets are triggered based on programmed rules. Bots colour the twittersphere in ways that range from aggressive marketing to political noise to curated content disseminators, and whereas some are merely experimental, many are employed deliberately to influence conversation (see Mowbray 2014).

It has been consistently shown that most tweets come from relatively few users (Section 4.1.2). Li et al. cited a 2006 study claiming that on most social media platforms, 90% of users are lurkers who never contribute at all (Li, Goodchild, and Xu 2013, 63). A 2009 study showed that 20% of Twitter accounts were unused, 50% hadn’t tweeted in the last week, and only 5% of users contributed 75% of Twitter traffic (Sysomos 2009). Some years later, the exhaustive study by Leetaru et al. (2013, 2) found that 5% of users accounted for 48% of tweets. Finally, by 2014, a report found that 44% of users were non-tweeting lurkers (Koh 2014). This shows that, while the proportion of active users over the years has grown as Twitter has matured, there is still a minority of content creators.

Further, there is a networked order to the information diffusion. Bruns and Stieglitz (2014) proposed a surface-level classification of users whose differences they conceptualized by having behaviours that are either ‘annunciative’ (mostly original statements), ‘disseminative’ (mainly

retweets), or ‘conversational’ (mainly mentions and replies) (Bruns and Stieglitz 2014, 72-73). Bailon and Wang decidedly concluded that networks formed by mentions were more biased to central users than those formed by retweets (González-Bailón et al. 2012, 17). Again, this illustrates an information-disseminating and interactive central density, with ‘lurkers’ or ‘information seekers’ at the sprawling periphery.

Yet not all central, highly-followed users are so interactive, nor do they become elected to central positions through the twittersphere. In their case study of Iberian politicians, Amaral et al. (2016), found that they used Twitter in much the same way as traditional broadcast media would, without engaging with their audience in the way that the platform allowed by utilizing it to become opinion leaders within the Twittersphere as others do. Their communicational flows “were essentially unidirectional channels to disseminate information and capitalize social reputation through regular references to social actors recognized in the sphere offline” (Amaral et al. 2016, 124). Rather than reaching out and responding within Twitter, their social stature was merely defined by their obvious offline importance and relevance, and the connections they did make were more phatic and expository than discussion-oriented. This one-way communication model observed among politicians who had high numbers of followers was also observed by Sevin (2013) in their study on place branding organizations on Twitter (Sevin 2013). Their content analysis of one year of tweets from five prominent American city-marketing organizations showed that they operated primarily on a one-to-many communication model rather than in an engaged one-to-one way. When they did connect to other users, they did so mainly with pre-existent, offline bureaucratic affiliations rather than reaching out to new audiences.

While these studies tend to identify one dimension of users or their relations in isolation, a comparative reading of these suggests that Twitter stands out for its informational hierarchy from which certain utterances inherit more exposure. There was found to be a minority of ‘informers’ who had more followers and followings. This minority arguably overlaps with a minority of core content-creators: annunciative tweeters who are central to a network and whose position is maintained by consistent quality of content and output frequency. They are generally very interactive, yet they may also be operating in a solely broadcast-like manner. These are surrounded by more peripheral, information-seeking lurkers who may or may not engage in further dissemination of the content to an even more extant, inactive class of users. These, as

Naaman et al. found, are also more likely to be ‘meformers’. This strongly situates Twitter as a platform that values information dissemination rather than an explicitly performative one saturated by ‘meformative’ posts. While all do coexist, information seems to be more globally valued as exhibited by a literature review of its network structure.

4.2.5 *Spatial Classifications*

The linkages between geography and Twitter have been addressed in part by an ongoing interest in social sensing systems and situational awareness (SA) efforts. Many researchers have flocked to build more precise social-sensing systems for identifying distress amid natural disasters. These often involve the identification of geographic cues (places) in relation to an event, usually a drastic and unusual one. In 2015, disaster relief-related work represented 27% of reviewed studies using spatiotemporal elements of Twitter (Steiger, de Albuquerque, and Zipf 2015, 816). Tweets have been a primary focus in the field of SA, a body of literature which “assists in positing helpful processes and strategies for those seeking awareness in emergency situations” (Vieweg et al. 2010, 1079), with a hefty amount of literature on crisis events: a subfield of SA known as ‘crisis informatics’ (Starbird and Palen 2012; Palen and Anderson 2016). Just as Rogers noted how it became of value in Twitter research to qualify reliable accounts “from the ground and from online for event-following” (2013, 5), studies with a prime focus on SA during crisis events have fostered several classifications of their own, albeit driven primarily by a focus on the informational credibility of tweets (i.e. the extent to which they reflect real-world occurrences). It is especially here where the concept of AGI fits, since social media is valued for its in-situ, observational quality. Some researchers have preferred to stick to geotagged tweets for SA research (Crooks et al. 2013), yet identification of locative expressions and toponyms (i.e. geoparsing) on Twitter has gained more attention for informing relief efforts and mapping the development of disaster events (Gelernter and Mushegian 2011; Andrea, Stuart, and Laurissa 2013; Panteras et al. 2015). The most insightful studies here have been small-data, analytic approaches that disregarded geotagged material completely (Starbird and Palen 2010, 2012; Vieweg et al. 2010; Truelove, Vasardani, and Winter 2015; Palen and Anderson 2016).

Vieweg et al. (2010) provided much-needed insight on the differing temporal behaviour of tweets depending on the event, as well as the need to identify users who provide useful

information. Their much-cited piece was an in-depth analysis of thousands of tweets from two natural disasters from 2009. They observed differences in how users revealed places in tweet content and how spatial features were referred to implicitly as the event carried on in time. After an exhaustive qualitative content analysis which resulted in several thematic and communicational categories (e.g. weather, advice, evacuation information), they found statistically significant differences between their distribution in both the flood and the wildfire corpora. A temporal analysis of these tweets also revealed how the two crises had different visibility in both their buildup and aftermath. In the end, they found that it was most effective to identify “high-yield Twitterers” (p. 1086) who consistently provide curated and informative content. Other studies have since shown interest in identifying high-quality users based on geo- and topical-relevance to protests (Kumar et al. 2013).

Starbird and Palen (2010) found that crowdsourced intelligence of Twitter was useful in identifying high-quality tweets, and shed light on the kind of information shared at different geographic scales during an event. Using the same dataset as Vieweg et al., they suggested that retweets could be used as a noise-filtering mechanism for identifying informative and relevant tweets during emergencies, yet they also pointed to how local and international users retweeted differently, with more abstracted content being spread abroad and locals retweeting more detailed info relevant to on-the-ground, localized awareness and response. In both cases, tweets that were retrieved from the chosen queries were tagged manually as on- or off-topic (indeed, there was no location-filter, so any mention of red river anywhere else in the world would have been captured by these data harvests and cleaned thereafter). In 2012, they followed up with a qualitative analysis of retweeting behaviour during the 2011 ‘Arab Spring’ in Egypt (Starbird and Palen 2012). They divided users who retweeted by their self-reported profile location to gauge how certain messages were disseminated internationally or locally. They found a distinction between local users who were sometimes virally retweeted by more internationally-based users who contributed consistently to more popular and diverse feeds. They also explored how certain messages or memes were more likely to be carried internationally and out of more restricted, local twitterspheres. This all points to how various versions of an event propagate differently across spheres of users.

More recently, Truelove, Vasardani and Winter (2015) used the query “bushfire” and developed a grounded framework for coding tweet content based on the credibility of their

content in their reflection of real-world events (i.e. degree to which they reported actual physical happenings). They differentiated between witness, impact and relayed accounts to characterize the ways in which tweets reported Bushfires in rural Australia at different levels of lived or mediated observation, indicated both through coordinate metadata and place names contained in content. Their inquiry aimed to develop a theoretical framework on which more automated data mining methods for place descriptions could enable an extraction of event information.

It is hoped that insights from SA having to do with ‘crisis informatics’ could contribute to more consistent and revelatory, local forms of ‘urban informatics’ (Zimmerman et al. 2016, 1). The literature on SA is relevant for its astute breakdown of Twitter’s spatial dimensions and brings us a step closer to an exploration of how tweets have been regarded for how they reveal place. Yet they only hint at the different ways in which tweets may be revelatory of places. These studies generally have an interest in evaluating the geographical or informational relevance of users to specific events to better retrieve actionable information from microblogs, as demonstrated by a focus on ‘high-yield twitterers’ and on-the-ground witness accounts, drawing a line between uninformative, self-interested tweets and more informative ones (Vieweg et al. 2010; Truelove, Vasardani and Winter 2015). All of them conclude that users that are physically closer to the event provide more detailed and useful information. Yet there tends to be more effort made in breaking down the informative tweets by their level of credibility, as defined by how reflective they are of direct or mediated experience. This literature suggests that the revelation of toponyms and locative expressions in Twitter content may be highly dependent on real-world occurrences either in mediated form (e.g. the news and ‘relayed impact accounts’), or directly. Before exploring how place is revealed in Twitter content more closely through its content, we will do a review of which kinds of geographic indicators exist on Twitter and how they have been employed in research.

4.3 Twitter and Location

This section considers several kinds of geographic information that Twitter provides in a parsed and readable format. Firstly, I will discuss ‘device location’, which are precise coordinates appended to tweets, and how this differs from Twitter places, which are nameable locations in a geodatabase that users can tag their tweets to. Secondly, I will approach user location, which can

be estimated in several ways such as from a self-declared geographic affiliation, time zone, and tweeting behaviour. Finally, I will look at how places can be connoted in the tweet text itself.

4.3.1 From Rare Geotweets to Rarer Tweet-Ins

In the decade leading up to 2017, studies reported that only a small minority of tweets had coordinate metadata representing ‘device location’ (Graham, Hale and Gaffney 2014), or the location of the device at the time of the tweet’s posting. The reported percentages ranged from a meagre 0.5-0.77 (Hecht et al. 2011, 239; Murdock 2011, 64; Graham, Hale, and Gaffney 2014, 570), to 1.5 percent (Van Canneyt et al. 2012, 2; Patel et al. 2017). An influential study by Leetaru et al. put this percentage higher at 3 percent, emitted by a similarly small proportion of users. Yet a closer look revealed that, in this calculation, they also included coordinates input automatically by third-party apps in the self-reported location field of user profiles (Leetaru et al. 2013, 4). Overall, the oft- yet casually-stated consensus for the proportion of georeferenced tweets in the global stream seems to have remained at around 1 percent (Crampton et al. 2013, 134; Jurgens et al. 2015; Truelove, Vasardani, and Winter 2015), despite one of the most recent calculations (that still uses data from mid-2015) showing the rate at roughly 2 percent (Poorthuis and Zook 2017). This minority of tweets is referred to by some as ‘geotweets’ (Hong 2016; Patel et al. 2017), and their rarity – that is, Twitter’s ‘location sparsity’ – is a well-documented theme across the literature (Wilken 2014, 161).

Yet as noted by Shelton (2016, 8), “not all geotagged tweets are created equally”. As stated above, it has been generally understood that geotweets include only tweets containing a single set of coordinates equal to the device location, but most studies remain vague about whether they also include tweets tagged to ‘places’ in their samples. Unlike a geotweet tagged to the exact location at which it was posted, the coordinates attached to a geotweet that is tagged to a ‘place’ will reflect the location of that place entity. Understanding this difference is crucial since geotweets which are tagged to ‘places’ reflect both a location that is not necessarily that of the user, and a location that reflects a different geographical scale (i.e. the centroid of a polygon). As Shelton (2016, 8) noted, the analytic inclusion of geotweets tagged to ‘places’ should ideally depend on the scale of study: with exercises utilizing globally-harvested geotweets likely including those tagged at the city and even country scale, and with more in-depth urban studies (hopefully) omitting these. Unfortunately, the ‘place’ feature has only been mentioned in passing

at most (Crampton et al. 2013, 134; Shelton 2016, 8; Patel et al. 2017, 320; Williams, Gray, and Dixon 2017, 69). Studies that utilize geotweets are often vague about whether they included all geotweets or only those with precise, local, device-level coordinate metadata. In turn, tweets tagged to places have likely often been ambiguously lumped in with calculations of geotweet frequencies or omitted without clarification, which begs the question whether the varying rates of sampled geotweets can be explained by such an unstated omission or inclusion.

Geotagging tweets works differently depending on the device used and the account's location settings. When tweeting from a stationary desktop or laptop computer, the scale associated with the tweet is selected by the user through recommendations based on the device's IP address. Once selected a first time (e.g. "Ontario"), tweets from that user will thereafter always contain the same place ID unless manually changed (Leetaru et al. 2013, 3). This is to say that the feature does not actively detect the user's location from a desktop computer and post accordingly upon each tweet's posting. When using a smartphone, however, Hemsley and Eckert (2014, 1849) explained that GPS and cell phone tower triangulation determines the user's location and tags their tweets based on their account's security settings, which, until 2015, would range from a lenient allowance of precise coordinates reflecting the device's location, to a stricter one that permitted association to a much coarser Twitter 'place' (i.e. a city, region or country-level polygon) within which the device was located. Unlike the computer's IP address, this location would be detected automatically every time a tweet was posted. Following their launch of a coordinate metadata-sharing option in 2009 (Leetaru et al. 2013, 3), Twitter had reportedly announced a partnership with Foursquare in 2010 to allow smartphone users to tag their tweets to more 'local' places (Laraki 2010; O'Dell 2010) – otherwise known in GIScience as points-of-interest (POIs) – yet this feature was never successfully rolled out.

The ability to choose a level of precision at which Twitter could automatically geotag a user's tweets changed significantly several years later when, in the spring of 2015, a quietly-announced and more successful partnership between Foursquare and Twitter made the place feature a necessary, core feature of geotweets (Crowley 2015)⁶. Then, after a year of users realizing they could now more intuitively and actively select a POI to exhibit more sociospatial context in their posts, they were also given the ability to view tweets by POI in May 2016 (i.e.

⁶ Twitter [Twitter]. (2015, Mar 23). Coming soon! We're working with @foursquare so you can tag specific locations in Tweets: <https://t.co/MwILz5Pfvq> <http://t.co/jATzXvbuV6> [Tweet]. Retrieved from <https://twitter.com/twitter/status/580049522170011648>

though browsing by place is still difficult, tweets tagged to any POI can be viewed using Twitter’s online search tool if the place ID is known) (Constine 2016). Thus, as of 2015, Twitter users could, when tweeting from a smartphone, choose to tag their tweet one of many nearby POIs supplied by Foursquare’s very own ‘user-generated place database’ (UGPDB).

This has changed the way in which the Twitter platform treats location. In geography, a lot of literature has emerged in the past decade on LBSNs, otherwise known as social location sharing (SLS) platforms (Quesnot and Roche 2015), as exemplified by ‘check-in’ apps such as Swarm (owned by Foursquare), Gowalla, Dodgeball and Google Latitude (Humphreys 2010). Yet, beyond the fact that Facebook adopted this same check-in function, allowing it to build up its own UGPDB as of 2011 (Quesnot and Roche 2015, 1980), the traditional ‘check-in’ apps have been in decline, leading some to relegate this form of social networking to the history books (Evans and Saker 2017; Wilken 2017). However, thanks to Foursquare’s unique and voluminous history of check-ins (still ongoing thanks to its Swarm app), the company has since found a niche by providing its resulting high-quality UGPDB as a location-intelligence service (Crowley 2015). In 2015, Foursquare’s UGPDB was still the most exploited worldwide (Quesnot and Roche 2015, 1976). Instagram was an early adopter of this database, allowing users to link photos to places. However, beginning in 2014, and following Instagram’s acquisition by Facebook in 2012, it began to use its own – Facebook’s – more proprietary UGPDB (Desreumaux 2014). Today, ‘Foursquare places’ inform both ‘check-ins’ and ‘tweet-ins’, while ‘Facebook places’ are used for Instagram posts (Table 2). Ironically, checking-in now permeates the mainstream social media platforms that were once dissociated from this practice.

Table 2. Outline of major UGPDBs and the LBSN services that use them as of 2017.

<i>UGPDB Provider</i>	Foursquare		Facebook
<i>LBSN Platform</i>	Swarm	Twitter	Instagram
<i>Relationship</i>	‘Check-ins’ are constituted by their association to a nearby POI.	‘Tweets’ are voluntarily associated to a nearby POI.	‘Posts’ are voluntarily associated to a nearby POI.

With Twitter’s recent partnership with Foursquare, it has introduced itself for the first time to the LBSN paradigm. From a user’s perspective, given the GPS capabilities of

smartphones, the option of what I am referring to here as ‘tweeting-in’ is only available to mobile tweeters. Similar to a check-in from an LBSN like Swarm, each tweet could be optionally rooted within an area with a human-readable ‘place name’ that is georeferenced by a point, and which is suggested to the user based on the device’s present location. Like before, the user must opt-in at the account level to enable location features. Doing so means that all tweets thereafter are associated automatically with the city or region polygon in which the device is located at the time of the tweet’s posting like before. Attaching a POI to a tweet must however be done voluntarily on a tweet-by-tweet basis. If the user desires to share their ‘device location’, they must go through an additional step to “share precise [device] location”: this option, once automatically enabled at the account level, now requires a manual opt-in at every tweet’s posting (Twitter 2017a). In brief, as of 2015, associating a POI or precise device-level coordinates to a tweet requires an extremely manual, tweet-by-tweet level of attention, suggesting that today (and as cursory searches using large location-filters will reveal), most geotweets native to Twitter are only geotagged at the city or regional level.

In light of these changes for Twitter, from a data validity perspective, issues of scale and ‘fake check-ins’ (at far-off POIs) become *mostly* resolved since, unlike that which was possible with traditional check-in apps, a user cannot choose a POI inside another city/region polygon than the one in which their device is located (e.g. a user in Montreal can still choose to ‘fake’ a tweet-in from ‘Toronto’, but not a café *in* Toronto). A user can, however, associate their tweet to a distant POI within their present city/region polygon.

This newer and more local ‘Twitter places’ feature also introduces a new form of information organization and archiving. Unlike hashtags, which are Twitter’s claim to fame for organizing content, Twitter’s partnership with Foursquare allows for a publicly-viewable and intuitive geographical indexation of its data. Researchers in the past have used place-based hashtags, for example, to frame their study of the role of place in contentious politics (e.g. #occupyDenver) (Hemsley and Eckert 2014), yet such a geosemantic anomaly would in theory no longer be needed, since messages can, as of 2015, be sorted both semantically (hashtags) and geographically (POIs).

What is clear is that Twitter has embraced a more ‘platial’, rather than spatial, approach to location-sharing. By platial, I intend to describe how tweets are tagged to place names or points-of-interest rather than to unnamed coordinates, as done by Quesnot and Roche (2015). This rings

true with what these authors argued in 2015 about geosocial media more generally, in which they said that there was an increasing amount of places, and less and less space, in geosocial media (Quesnot and Roche 2015). How will this recent change connect the semantic layer with the location layer of tweets (Section 4.1.1, also see 4.4.2)? Although we may have seen a plunge in an already low pool of precise geotweets that indicate the device's exact location, as was found in recent proceedings citing the same trend (Tasse et al. 2017), this more directly connects the semantic layer to the geographical layer in-house. 'Tweeting-in' may indeed resolve some confusion regarding 'being-in place' as opposed to 'tweeting-on-site'. The present study offers a preliminary look at the changed state of geotweets.

4.3.2 *User-Defined Locations: Common, but Coarse and Messy*

The 'location' field of the user's profile provides an optional self-reported affiliation. Usually, users will indicate a place name, yet there is nothing stopping them from indicating more than a single place name (e.g. "Paris & Montreal"), a vague one (e.g. "North America"), abbreviations (e.g. "SF // NYC // MTL"), a fictitious one or an unfindable, generic or personal one. Even in its most truthful possible form, it remains to be seen whether the field is used as a self-declared centroid of spatial practice, or one of native affiliation and origin. In their much-referenced study, Hecht et al. (2011) proposed an initial critique of the utility of this freeform field provided to users of most social media platforms. They found that 66% of 10 000 surveyed active Twitter users had indicated identifiable locations, whereas the remaining third was split evenly between unidentifiable locations (e.g. implicit, generic, fictitious, or personal place names) and blank entries (a similar proportion of blank entries were found by Graham and Hale (2014, 573). Of the 66% properly identifiable ones, 2.6% of these entered two or more locations and 11% of them had input coordinates. Lastly, the most common scale of spatial identification (64%) was found to be at the city scale (Hecht et al. 2011). Along a similar vein, Stephens and Poorthuis ran three geocoders on a sample of user-defined locations with the intention to retain only those whose location was coded to within 10 miles of each other at most. After removing all locations coarser than the city level, for each geocoder, 26% of the original data frame remained properly geocoded (Stephens and Poorthuis 2014, 3). Leetaru et al. (2013) were able to geocode a third of the 1.5 billion harvested tweets using a simple global gazetteer of cities. Yet, Hecht et al. ended up concluding that, given the inconsistencies related to location reporting on users'

profiles, efforts in automated location inference using linguistic tools on tweet content be prioritized in future research, which has since been duly noted (Han, Cook, and Baldwin 2014).

Another straightforward but less precise method involves identifying the user's time zone. Though there are built-in biases for this too. First of all, all new Twitter accounts have their default time zone set to North American Pacific Time, making correct indication of one's time-zone an opt-in process. Graham and Hale (2014) noted that this faces similar issues if not worse than the profile's 'location' field since it is also self-reported and, with many users accessing Twitter through third-party apps, has an uncertain level of accuracy (570). They found that only 57% of users who had posted a geotweet in the Montreal area had Eastern Standard Time selected in their profile settings, and that just under a quarter of profiles were set to Quito, Ecuador (they don't explain why, but simple reasons such as the fact that Quito is longitudinally near Montreal and the fact that the 'Quito' option is adjacent to Eastern time in the profile settings may be contributing factors here). Yet, this extraordinarily low measure is also likely dependent on the timeframe of their data collection (e.g. during an international event). Graham and Hale concluded that neither the hometown field nor the time zone provided sufficient data to accurately derive locations from in an automated way, as manual coders always outperformed their tested tools.

What this really points to is how a single utterance coded in space is but a point within a path of many. In other words, the location of a single tweet is hardly enough to represent a users' overall activity space, especially considering contemporary levels of global mobility. Hemsley and Eckert contended that by the same token, just as a single geotweet is but a mere fragment and, hence, is likely unrepresentative of one's personal geography, so is the user-defined location (Hemsley and Eckert 2014, 1849). Still, this user-defined location (or time zone) positions the user more strongly at the centre of a relational space of places (Hemsley and Eckert 2014, 1849). What this research has consistently pointed to is the need to combine user-level, self-declared indicators of geographic affiliation with the geographic footprints of the AGI that they produce to properly deduce not only their whereabouts, but their worldviews too.

Thinking back to Section 4.3.1, if enabling location services at the account-level will tag tweets automatically to the device's surrounding city-region, and the most common geographic scale of affiliation that users declare in the location field of their profile is also at the city-level

(as was explained in this section), then opportunities for studying intra-urban social geographies using the spatial metadata of geotweets appear limited so far.

4.3.3 *The Many Places in the Textual Content of Tweets*

While Twitter itself has been referred to as a place (in cyberspace), especially with regard to contentious politics, making it a kind of virtual agora (Hayes 2017), places also arise through the chatter that it accommodates. We have already seen how users may actively or passively geotag their tweets, and how this has changed over time (Sections 4.3.1-2). Yet place in the current sense of the term is best understood through human expression (Sections 2.1-4). Beyond what a direct observational or conversational account of spatial practice or talk may reveal, on Twitter, such expression would be found in a tweet's freeform text.

Textual data is often known to be unstructured (Abernathy 2015, 73), yet thankfully tweets limit text to a small and consistent word-limit with an associated attributes and metadata. Unlike the text from, say, a book, the bounds of Twitter text need not be determined (chunked) by the researcher: the tweet is isolated as a pre-packaged and intuitive semantic unit, with all contextualizing relations up for estimation after-the-fact. Thus, tweets can be analyzed within traditional structured relational database management systems (RDBMS), making them especially attractive to those with backgrounds in geographic information systems (GIS): this is especially-so when tweets each have a set of associated coordinates (recall 4.3.1).

However, looking at places within tweets slightly defies this consistency since many places and spatial features can be present within a single tweet, allowing for multiple potential geographic relations per tweet. Further, they may use abbreviations, slang or use implicit wording to describe features in relative space. Research that involves Twitter and places generally requires some kind of rule-based or supervised toponym detection algorithms. A whole sub-field of linguistics has opened up to more accurately and efficiently identify toponyms and even vaguer locative expressions: "Simplistically, geoparsing can be considered to be a sub-task of named entity recognition (NER), that is, the task of identifying (mostly proper) names of people, organizations, locations" (Liu et al. 2014, 6). As for toponyms specifically, their occurrence is indeed documented, but has received far less attention than the coordinates of geotweets. Leetaru et al. (2013, 11) were able to geocode a quarter of the millions of tweets they collected based on in-text proper noun place names using an algorithm that sourced from a country- and state- level

gazetteer. Whereas traditional geocoding would refer to a single location per tweet, they referred to the geocoding of multiple textual places per tweet as ‘full-text geocoding’. They noted, however, that most place names used in tweets appeared at a more local city and landmark level, which they deemed beneficial to location inferencing exercises but more difficult to disambiguate with a geoparser and geocoder.

As was already discussed in Section 4.2.5, many studies that take interest to place mentions in tweet content have to do with events relating to weather and natural disasters. They give us a clue as to how toponyms manifest in text. As discussed in Section 4.2.5, tweets relating to crisis events have been shown to generally contain high numbers of place mentions (Truelove, Vasardani, and Winter 2015, 340). A study on Japanese tweets that focused on mapping precipitation using the place names they contained found that toponym information was present in between 5% and 10% of tweets that were queried using the terms ‘snow’ and ‘rain’ (Kitamoto and Segara 2012). Vieweg et al. found that, dependent on the event, explicit references to places were found in up to 18% of flood-related tweets and up to 40% of fire-related tweets, which they note is likely due the spatially-volatile behaviour of fires in open land compared to the flooding of a known river (Vieweg et al. 2010, 1082). Vieweg et al. further noted that once a place name has been used, tweets that follow it present less explicit place-name referents. This is known as ‘markedness’ (where the spatial context is established and then implicitly assumed to be understood) and should be noted when choosing queries that are place names. At a more macrotemporal level, Vieweg et al. also remarked the differences in how users used place names at various stages of disaster events, notably in the warning phase and the impact phase (1083). They noted that, beyond the physiognomic differences between floods and fires that were previously noted, the river flood had a long period of warning, and hence less of an impact phase, whereas it was the opposite for the wildfires, where impact was sudden and locations were shared in large volumes and were of increased use for impact and recovery stages. These insights shed light on how place names may be utilized in more urban contexts by suggesting that the rate by which users employ place names in tweets is event-dependent, and varies at various stages of an event. Overall, these findings show that there is a relatively large amount of toponyms and hence geographic information when compared to the prevalence of spatial metadata for tweets. Further, and as discussed in Section 4.2.2, unlike direct messaging, the public nature of expression on Twitter and the potential for context collapse could mean that proper noun place names are more

warranted than in more private and conversational media, where descriptions of relative space may be more frequent.

In light of this information of place-sharing behaviour in-text, some interesting work has also been carried out using toponyms. In one that focused more on places themselves, Vasardani and Chan (2014) used an event-oriented logic for deciphering emerging colloquial place names found in tweets based on events that may repeatedly occur at the site of that place: their goal being to provide more up-to-date and accurate gazetteers that reflect the way people connote places. In another that looked more at user ‘activity spaces’ (what we have determined in Section 2.1 as ‘paths’), Xu, Wong and Yang collected place-mentions from Twitter users’ content and compared the geographic extent of these places with their home location and self-reported activity spaces (Xu, Wong, and Yang 2013). The premise was, given that “individuals tend to center their mental maps around their ‘home’ location”, and that “naming places is a fundamental step to formulate one’s mental map” (105), this would manifest itself through the naming of places in social media and would likely be centred around the user-defined location declared on their Twitter profile. Using NLP (natural language processing) methods, they georeferenced the named geographic entities in users’ tweets and found that the median centre of the deviational ellipse derived from the points varied in distance from their home location based on their local, national or international interests, yet was always within the same subnational region as their home. They were surprised to find that local places did not always figure most prominently among geographic scales tweeted (though the authors did not specify which gazetteers they were using and their exact toponym detection technique). But based on their qualitative follow-up with the users, the places mentioned on Twitter were found to accurately reflect aggregates of their past, actual and aspired activity spaces. In another study, named geographic entities of this sort were used to evaluate geographical awareness in US cities as it compared to the global connectivity of that city (Han, Tsou, and Clarke 2015). Using the GeoNet Names server as a reference of gazetteers, the authors geoparsed millions of tweets for city names and found that users in global or alpha cities mentioned a greater diversity of cities as well as ones that were further away, whereas users in lower-order, medium-sized cities were more constrained by Tobler’s law: that is, they mentioned more regional cities and fewer international ones, confirming that existing theories on urban hierarchal systems of connectivity persisted within people’s psyches as represented by Twitter. They also found that, temporally, cities further away

from the locus of the user tended to be mentioned more during holiday seasons, reflecting well-known patterns of macrosocial experience. In brief, people talk about places that matter to them on Twitter, though they tend to reflect their geographic imaginaries rather than mere activity spaces in the strictest sense.

4.4 Deconstructing Twitter from a Place-based Perspective

In this section, I reconnect the literature on Twitter with the conceptual framework outlined in Section 2. I begin by critiquing some recent work by returning to concerns raised in Sections 2.4-5 on the epistemological mix-up that often occurs with geosocial media. I then follow-up with a review of studies that looked in-depth at the inconsistencies between users, the spatial metadata of messages and the GI found in message content. I conclude by reviewing several recent studies that adopted methodologies that inform the current study.

4.4.1 Big Data Approaches to Place

Research utilizing big data has typically followed the AGI trope uncritically and objectified Twitter as a legitimate source for studying society as a whole. Rogers stressed: “The issue no longer is how much of society and culture is online, but rather how to diagnose cultural change and societal conditions by means of the Internet” (Rogers 2013b, 21). Yet many, often empirical, studies have uncritically skipped this point, treating Twitter data as naturally indicative of measurable, real-world phenomena in society, while few others take a closer look and a more critical stance regarding the social mechanisms that underlie Twitter practice. Many of the former have tended to use vast quantities of tweets and automated processing methods to glean aspirationally panoramic understandings of society. These studies can be understood within the umbrella-term of ‘big data’, which Crampton et al. define loosely as “the collection and analysis of massive, cross-referenced databases about citizens and their activities” (2013, 131).

With the advent of geotweets in 2009 (Leetaru et al. 2013, 3), interest in them seemed to trump interest in tweet content as geographic studies using the latter dwindled until 2013 (Steiger et al. 2015, 819). Yet, as noted by Shelton, geotweets alone have been able to reveal little more than vague estimations of users’ activity spaces (Shelton and Poorthuis 2017). Advances in linguistic tools and their growing accessibility have potentially aided in reversing an obsession with tweet coordinates, yet most studies have used and still use these tweets as their base dataset

to maintain a cartographic simplicity for their results and enable spatial analyses. Studies on regional mobility in concert with the modeling of topics from geotweets' content have been carried out to estimate land use (Crooks et al. 2015; Lansley and Longley 2016; Zhou and Zhang 2016) and 'thematic' regions, deriving 'patial themes' from what they refer to as the 'patial content' of geotweets (Jenkins et al. 2016); finding spatial autocorrelation between semantic indicators of landuse and census data to reveal things the latter did not (Steiger et al. 2015); and the distribution of topics in cities more generally (Lansley and Longley 2016). This latest rush in combining geotweets with their content wouldn't be without focused and ever-improving NER methods catered to inherently messy textual tweet content (Jung 2012; Le, Mallek, and Sadat 2016). Topic modelling has also been an overall aid to decomplexifying tweets content, some have used semantic knowledge bases like Wikipedia to structure topics retrieved (Michelson and Macskassy 2010; Jenkins et al. 2016), but unsupervised machine learning techniques like Latent Dirichlet Allocation (LDA) have been the most widely used in recent years (Ghosh and Guha 2013; Steiger, de Albuquerque, and Zipf 2015; Jenkins et al. 2016; Kim, Kojima, and Ogawa 2016).

Crampton et al. (2013) noted how these big data studies tend to suffer from their "simple spatial ontology, tied closely to the idea of 'geotagging'" which "displays an overreliance on geotags as a way of situating this data in geographic context" (p. 132) (recall Section 2.5). When speaking of how the semantic layer of Twitter data pertains to place, Jenkins et al. (2016, 2) refer to this as 'patial content'. Yet they are actually reifying content that is merely geolocated as place-regions. Suggesting topical content clusters as 'places'. All in all, these tend to identify semantic regions of similarity amid geo-located tweets to estimate real-world, sociocultural phenomena, but they fall short in several interdependent ways that have to do with data provenance, method and scale. For instances, their dependence on geotweets incites two issues: first, given the sparsity of geotweets and the necessity of their methodologies for very large volumes of them, not only are their study sites limited to large metropolitan areas of intensive Twitter use (of which there are few in the world), but they inevitably lead to coarse and blunt understandings of places. Further, they miss the mark in their omission of places themselves: as communicated – let alone negotiated – entities representing human-scale, momentary spatial appropriations (recall Section 2.2). Smaller qualitative studies have attempted to use geotweets too, such as one on a literary

festival in Dublin (Travis 2015, 942), yet even this one relied on the occurrence of a large event to generate a *very small* volume of geotweets.

In sum, the pitfalls of coordinate sparsity have been presumably overcome by large data sets (exhaustive sampling of tweets over long periods of time at a global scale), and increasingly complemented by Twitter's semantic layer with the help of linguistic tools. However, beyond the critiques of big data for advancing a 'speedy pseudopositivism of tweet-space' (Wyly 2014, 30), there are natural limits to big data regarding how much they can tell about our cities at a local, sub-metropolitan level, further questioned by the latent geographic, socioeconomic and education-related biases potentially inherent to the minority of users who opt-in to using geotweets (Graham, Hale, and Gaffney 2014, 570). The current thesis aims to overcome some of these limitations, which were raised concisely by Crampton et al. in 2013 (p. 131). Whereas big data could maybe provide a panoramic and distant way into the city, a place-based approach could potentially provide a way up and out of it.

4.4.2 Georeferenced versus Spatially-Relevant Messages

The king of Qatar gave a million dollars to McGill University in Montreal. Why? Beyond the fact that staff gave him a very pleasant campus tour, a world-class library on Islamic studies is situated there which houses thousands of valuable and insightful documents on the history of Islam, a vast history whose places are mostly located thousands of miles away. Indeed, while Montreal had a sizable Muslim population, this does not explain the location of such a key library. This analogy is meant to help us think about tweets, repositioning them as documents that may talk about places anywhere in the world from anywhere else. As Shelton (2016) argued, the major misunderstandings between critical human geographers and those who employ geotweets quantitatively hinge on "the conceptualization of space and spatiality as it applies to this [geosocial] data" (Shelton 2016, 2). Put more bluntly, "GPS shows the location of the user, but not the location of the topic" (Kitamoto 2012, 24). In other words, there is a need to separate the 'place-centric information' from the 'location-centric information' (Zimmerman et al. 2016). Another way to illustrate this is to look at the freeform textual tags attached to Flickr photos: tags identifying the location that the photo was taken in would be the 'spatial coverage' of a photo (e.g. the man is standing on a stage in Geneva), whereas those which delineate a place as a contextualizing geography to the photo's content are referred to as 'spatial references' (e.g. the

man on stage is from Montreal) (Tardy, Moccozet, and Falquet 2016). Decoupling the ‘device location’ from the message’s ‘patial representation’ is a necessary step towards a more useful framework for understanding place. We can clearly connect a user to a site and location by way of their message’s location (i.e. the device’s location at the time of the message’s posting), but connecting messages to specific places, and hence users to those places, is a challenge. Shelton (2016, 2), citing themselves along with Crampton put it as follows: “a piece of information geotagged to a particular location may not necessarily have been produced in that location, be about that location, or exclude reference to any other geographic locality. Indeed, myriad examples suggest that geotagged content often exhibits a variety of spatial referents apart from the hidden latitude/longitude coordinates attached to it” (Crampton et al. 2013, 132).

Few studies have questioned the relevance that geolocated messages have to the kind of social landuse of co-located POIs. Canneyt et al. (2012) attempted to detect generic place-related descriptions inside geotweet content and Flickr photos (which they refer to as ‘geographically distributed information’ (p. 447)), with the hypothesis that georeferenced social media posts could be used to dynamically update UGPDBs. They used open source gazetteers (e.g. Geonames) as a grounding measure in the hopes of finding correlations between georeferenced media content and co-located georeferenced ‘place types’ (e.g. libraries, places of worship, graveyards). While they hypothesized that Twitter would be able to reveal more local places types, and Flickr, more tourist-oriented ones, this was inconsistent with their findings: only a select few place types had any correlation at all: such as schools, hotels and train stations (Van Canneyt et al. 2012). In a similar vein, a study by Hahmann, Purves and Burghardt (2014) collected geotweets for all of Germany and used OSM place types as references for these to answer the very question: “to what degree are the contents of individual microblogging texts related to their location?” (p. 2). Initially, they noted that tweets inside Dresden did indeed mention “Dresden” more than outside of it (p. 4). Yet for POIs, they found that, after doing a manual content analysis, only geotweets in the environs of train stations and airports contained content that was relevant to those place types (20% of tweets geolocated in these areas were related to these feature classes, meaning that they were related to events occurring in that place or to attributes of the site itself), whereas others such as cinemas, restaurants, bars and supermarkets, had no relationship whatsoever (< 3%). They then used semi-supervised machine learning classification to extend the method: finding similar results. They note density as one –

rather obvious – deterrent here. However, they did not do any kind of temporal analysis, meaning that denser areas where a supermarket may be located above a nightclub were understandably confused. They conclude that geotweets should not be taken for granted as relevant to the sociospatial context of their coordinates: “There is a pressing need to more critically consider the extent to which the coordinates of a piece of information can be related to the location by considering issues such as scale, abstraction and more cognitively adequate tessellations of space” (Hahmann, Purves, and Burghardt 2014, 30).

Similarly, McKenzie and Adams (2017) asked “do the locations where people talk about bars align with actual brick-and-mortar bars?” (McKenzie and Adams 2017, 2) To attend to this, they harvested georeferenced Twitter, Instagram and Yik Yak posts from the Los Angeles area over a three-month period beginning in January 2015 as well as ‘place instances’ from the same area which were provided by Foursquare’s UGPDB (note that, recalling Section 4.3.1, this was before both Instagram’s significant API restrictions in Spring 2016 and Twitter’s partnership with Foursquare in March 2015). They did this with the intention of identifying how much or whether the content of thematic regions derived from geo-located posts retrieved from these three social media platforms had any relation with the ‘place-region types’ nearby, themselves composed by aggregating Foursquare POIs based on a weighted kernel density estimation model. They derived temporal signatures for each place-region from Foursquare’s check-in data, and linguistic signatures from these places’ ‘tips’ text using LDA. Their findings, however, suggested a severe disconnect between the content of georeferenced posts and ‘human-made’ (p. 11) places (i.e. POIs). Only large, physiographic regions (e.g. the ‘Beach’) showed any relationship (McKenzie and Adams 2017). The authors themselves identify the source of these unsatisfactory findings as stemming from a tension between spatially tagged social media and “patial sources” (i.e. derived from POIs): “Spatially tagged social content reflect observations of individuals at certain locations and times. The content of an observation, however, need not reflect the affordances or activities associated with the space from which the observation was made.” (p. 11)

Despite these disparate but conclusive findings, coordinate-tagged geotweets have continued to be taken for granted as in-situ human sensing of the real world and of meaningful indicators for understanding places (Section 4.4.1), often attributing problems they face to the simple ‘messiness’ of social media data. As previously discussed, Shelton (2016a) provided a useful critique of the problematic and overbearing dependence on the geotag. Using tweets

relating to a real-world event – a police shooting that took place in Missouri in 2015 – they illustrated how a local phenomenon can have repercussions across the globe, demonstrating the interconnectedness of places as communicated intersections of trajectories by distinguishing the coordinates from the content of events. While it was more of a manifesto than a full-on study, they conclude that there are no inherent flaws in geotagged Twitter data, but rather that they're use tends to overlook their intricacies (Sections 2.5). Finally, on top of this disregard for separating content from coordinates, studies have mostly ignored “the multiplicity of ways that space is implicated in the creation of such data” (Crampton et al 2013: 132, as seen in Shelton 2016a, 2), a phenomenon described by Adams and Jansson (2012) as ‘mediatization’ (recall Section 2.4). The studies reviewed in this section show a determination to better understand this, yet they still focus on place-regions in urban areas (coarse topically-aggregated geolocated content) as opposed to ‘places’.

4.4.3 *Studying Places Through Twitter*

Communicational breakdowns of connoted, mediated places have been carried out in several interesting ways, stemming from a variety of qualitatively distinct contexts and interests. Journalistic and media studies stand out here: projects may look at how a particular region of the world is mediated over time (Gruley and Duvall 2012), or may look at how different media sources mediate distinct geographies (Gasher 2009). Regarding world news and events found on Twitter specifically, Quezada and colleagues used recurring words from 18 000 news events to perform searches for relevant tweets (Quezada, Peña-Araya, and Poblete 2015). Tweets were aggregated by the event they referred to and then all ‘protagonist countries’ contained in them (country-level toponyms) were identified using a coarse geoparser. The self-reported locations of users from which these tweets came were then geoparsed and identified as ‘participant countries’ (the locations from which the messages came). This created a matrix that identified linkages between the geographic origins of news and their geographical content. Yet the study’s biggest fault (as is the case for many Twitter studies) was their limitation to English tweets, meaning that links observed between Germany and Brazil (mostly driven by FIFA 2014), or Ukraine and Russia (notably the conflict occurring then and there), were conceived through English-only media sources. Rather than identifying cultural and semantic linkages between countries in a way that was local to those countries, they identified what English media in those countries said about

others (and hence was more an interlinking of actors as seen from within the Anglosphere). It nevertheless presents a good example and application of how to study geographic mediation and worldviews by breaking down the geographical dimensions of tweets.

Yet these hardly involve places. When breaking down the social media representations of actual ‘lived’ or ‘local’ places in urban contexts, they most often involve public squares and parks. Protest is often a central theme to place mediation on social media given the ‘amplified public sphere’ that is created during social movements of protestors on the ground (Nanabhay and Farmanfarman 2011), especially given how similar plazas and parks are – in their provision of ‘democratic’ spaces of self-expression – to social media cyberspace (Arora 2015). The mass-mediation of places such as Tahrir Square has brought some to question the extent to which our ‘image of the city’ is changed by social media (Lynch 1960; Al-ghamdi and Al-Harigi 2015). Brantner and Rodriguez-Amat (2016) did one such study that focused on a single public space in Vienna, Austria during a series of protests. Cognizant of the possibility that the sole study of such media representations “[...] might lead to a distorted appearance of the nature and configuration of a public space” (Brantner & Rodriguez-Amat, 2016, 302), the authors divided tweets collected using queries over one week into three themes of place representation based on their textual and media content: depictions of territory (e.g. coarse, conceptual descriptions of the protest as a ‘new danger zone’ using images, maps and words), location (e.g. landmarks, POIs), and activity (e.g. events, occurrences). Within the theme of activity, they identified three conflicting representational narratives of the city: (1) the elegant city, as illustrated by images of the event’s individual participants and the event itself in a way that champions its causes, (2) the city of protesters, characterized by contention, (3) and the safe city, seen in images of police and spaces devoid of chaotic participants. Yet, taking heavy inspiration from Adams and Jansson (Section 2.4), they stress that a study of representations of public space should be done alongside “the configuration of constraints (structures), the context (textures), and the possibilities (connections)”, since “without considering these four elements simultaneously, any analysis of the public space might be insufficient and misleading” (Brantner & Rodriguez-Amat, 2016, 316). Though there is due recognition of these elements, their study does not address the ‘texture’, ‘structure’ or ‘connections’ of a place, nor did they evaluate the ‘power’ of these representations, and their respective geographic contexts.

Representations of urban public plazas and parks have also been carried out with a focus on more cultural elements, usually pertaining to forms of entertainment or leisure. Schwartz and Hochman began with the question “How do we ‘know’ a place?” (2015, 52) and looked at geotagged Instagram posts over 6 months in three parks of New York City to understand the ‘social media image of a public place’ (p. 53-54). They proposed such a methodology as a potential improvement on more traditional direct observations made of public spaces in urban studies, as well as – and similar to the argument advanced in Section 4.4.1 – big data approaches in the city sciences because of their failure to reveal the “particularity of specific places within the city” (p. 53). By plotting their thousands of Instagram posts on a map, they performed a manual, ‘spatial reading’ of these and came up with design and activity-based reasons for the observed clustering of photos in certain parts of these parks. For example, in Union Square, based on a manual reading of photos, they concluded that the northern cluster resulted from a tri-weekly farmers market, while the southern cluster occurred because it was a site of repeated gatherings and protests (p. 57). They also visualized these using the mean frequency distribution of tweets by time of day, noting that the parks were more occupied in the afternoons at around 4 PM. Finally, they parsed the reviews of these parks left by Yelp users and generated word clouds and ‘phrase net visualizations’, advancing a so-called more ‘experiential’ reading of places by qualitatively interpreting these. Finally, they noted that “social media signals in public spaces are biased toward special events or activities that are out of the usual” (Schwartz and Hochman 2015, 63).

Another study focused especially on a single and highly-mediated place through the events hosted there (i.e. concerts at a music festival in Denmark). Zimmerman and colleagues collected thousands of postings from Twitter, Instagram and other social media feeds, based on both mentions of the festival anywhere in the world and those geolocated in the festival grounds as well as additional GPS tracks from the festival’s smartphone app to compare the dynamics between the mediated buzz of a concert and its on-the-ground presence (Zimmerman et al. 2016). This allowed them to meticulously define levels of relative ‘appreciation’ for different events (i.e. concerts) occurring at the festival site by comparing the volumes of georeferenced posts and GPS tracks to the mediated buzz occurring before, during and following the events. They argued mainly for a more event-oriented approach to studying digital place.

Finally, a most relevant and recent study using Twitter with an interest in urban places looked at the degree to which different parks in Birmingham, England accommodated local or internationally-oriented events (Roberts 2017). Like Schwartz and Hochman (2015), they regarded Twitter as a useful follow-up to a long history of studying urban public spaces: notably as a combination of both observational methods and qualitative accounts. Using a single official place name as a query for each of 46 parks of interest, they captured 2847 tweets over three summer months. This was followed by a manual relevance-verification to include only those that “reported an interaction with the specified urban green space” (p. 15). While they did not describe their content analysis or their criteria at all, they highlighted that most events were ‘local’ and connected citizens to each other and to the places in question.

What this small literature on representations of urban places on Twitter and other platforms shows us is how these images travel beyond the boundary lines of the site in question as well as how event-driven these mediations are (as seen tangentially in Section 4.2.5). Two principal ways of entering ‘place’ analytically were used, which bridge the epistemological concerns pervasively raised. Schwartz and Hochman (2015) took on a purely ‘location based’ approach, while Roberts (2017) found tweets of interest based on textual queries (i.e. a ‘content based’ approach). Zimmerman et al. (2016) combined both approaches, yet did so only to conclude with an ‘index of appreciation’ for concerts rather than consolidating their insights towards a methodology for studying places. Moreover, they were unusually privileged in having results informed by additional GPS tracks provided by a custom proprietary app.

If a public space is the intersection of numerous individual and community identities and political interests, then this variety demands exploration. There is a need to explore, read and interpret the geographies and communication powers of ‘patial representations’ in social media, and how these create places. The current study, while webbed across a vast literature as demonstrated in previous sections, continues in the path of this sparse but more methodologically similar literature, all the while interrogating the spatial and textual epistemologies of Twitter for studying place.

5 Problem

There are fundamental differences between a tweet that contains ‘patial content’ and a georeferenced tweet or traditional geotweet, but the differences between the two are often

overlooked. And although studies have tried to gain insight into geotweets and how revelatory they can be of semantic regions, or what some refer to loosely as ‘places’, they have suffered from their coarse and regional scales of analysis, due in part to a big data agenda, an obligation to collect large amounts of tweets, and a contrived definition for place. Communicational theories require more applications in geography and can be used to shed light on how places are mediated on social media, and while different elements of place-related discourse on Twitter have been noted disparately, they require synthesis within an open longitudinal study on a place. Further, understandings of urban places have also been lacking, and they could utilize insights proposed by literature in situational awareness, speech act theory, and classifications done on Twitter within the last decade. The Canadian twittersphere has also been understudied, and inclusion of multiple languages is extremely rare (as is necessary when studying Montreal).

On the one hand, there is interest in understanding places as they are connoted on social media, much as anyone might talk to you about a place, discursively and reflexively constructing it. On the other, there is a natural want to make sense of it spatially, as an aggregation of co-located expressions. While this may appear at first as opposing a more cultural and qualitative perspective of place against an objectifying one adopted by the spatial sciences, there is reason to consider the two as more adaptable to each other, and may reveal different aspects of places. In light of all this, and in returning to the case study, we must begin by asking: what are the representations of *Place Émilie-Gamelin* on Twitter, who and where do they come from, and how do they change over time? On a more methodological level, how would a content-based approach compare in terms of representativeness of the plaza when compared to a location-based approach? How might these two data-collection methods complement each-other? Lastly, and on a more conceptual level, how can we distinguish *place images* from *places* towards an understanding of collectively defined place?

6 Methodology

I begin this section by explaining Twitter’s APIs and clarifying some confusion regarding their abilities and scope (Section 6.1). Then, sourcing from works in the literature review, I outline my methodology for data collection and analysis. The data collection phase consisted of two Twitter harvesting methods: a content-based collection using textual queries, and a location-

based collection using a spatial catchment area (Sections 6.1-2). This was followed by a multi-phase content analysis of both samples (Section 6.4).

6.1 Twitter APIs

There are two kinds of APIs for retrieving tweets: Streaming and Search. Poorthuis and Zook (2017, 4) noted rightly that many studies are opaque about their data collection methods used. This short section will aim to shed some light on what options exist.

The Streaming API maintains an open connection to receive tweets as they are posted in real-time, moving forward with time. Researchers who do not pay Twitter's commercial data curator are only allowed 'spritzer' access when using the Streaming API, representing 1% of global tweet output, instead of a much more desirable 'firehose' access to all tweets. Since this maximal proportion is supposedly always relative to global output, it has been argued by scholars that any textual filter applied to the Streaming API will return 100% of those that match it as long as the filter never matches more than 1% of global tweet output (Morstatter et al. 2013; Hahmann, Purves, and Burghardt 2014, 7; Poorthuis and Zook 2017). Also, with or without a filter, the Streaming API is by far the most used API in studies that involve exclusively geotweet collection. Indeed, with the rate of tweets containing geographic metadata known to be at around 1%, the 1% access from the Streaming API is likely to get the majority of geotweets (Morstatter et al. 2013, as cited in Poorthuis and Zook 2017, 5).

In contrast, the Search API looks backwards in time. In Twitter's own words, it "searches against a sampling of recent tweets published in the past 7 days" (Twitter 2017b). The Search API is similarly vague in terms of its true access, but reasoning indicates that a similar small-data approach could be used to maximize representativeness. A cursory search on Twitter's 'developers forum' revealed that a comparison between the two APIs when using specific queries showed that, aside from the fact that the corpus returned by the Search API included retweets, no differences in results were found when comparing retrieved original tweets (Piper 2016). Further, the Search API will supposedly return *all* tweets matching a query as long as they are not 'high volume', which some have determined as being up to 3500 tweets per request (Poorthuis and Zook 2017).

Knowing these limitations could allow for larger quantities of tweets to be retrieved if well planned, as is being done with the tentative design of a software that would juggle between and time requests by both free APIs, which its authors claim will make big data *small* and allow researchers to quickly extract only the relevant data (Poorthuis and Zook 2017). Morstatter (2013) similarly argued that filters and queries be used wisely to refine data retrieval to maximize representativeness. And as Rogers (2013a, 7) argued, citing the lead data scientist at Twitter at the time, small data studies are more relevant and valid considering researchers' overall inferior access to a rather opaque Twitter ecosystem, as only paid access would guarantee that large samples be representative and exhaustive.⁷

6.2 Querying

Like similar studies by Vieweg et al. (2010), Kitamoto and Segara (2012), Stephens and Poorthuis (2014), Quezada et al. (2015) and Roberts (2017), I selected the Search API because of the harvesting time-frame (as seen in Section 6.3), the specificity of queries used, its capacity to reach back in time for already-posted tweets, and its overall controlled, iterative querying flexibility. With the aid of the Tweepy Python library, I wrote several scripts to automate the harvesting of both a content-based population using textual queries and a location-based population using spatial parameters.

Sampling 'small data' is extremely important since, unlike big data, whose exhaustive nature avoids sampling bias but offloads the potential for error onto measurement quality and exactitude (Kitchin and Lauriault 2015), it is imperative to have a well-defined target population and collection strategy. The use of key words for collecting data is known as 'topic-' or 'content-based sampling' (Gerlitz and Rieder 2013; Einspänner, Dang-Anh, and Thimm 2014, 100). Content-based sampling will *only* return tweets whose textual content contains the elements being queried, making it of utmost importance to formulate these in a way that guarantees a retrieval of data that is authentic and representative of the target *topic*. Thus, queries were selected based on place names seen in academic literature and press releases about the study site along with some preliminary searches on Twitter's webpage. Thus, a selection of proper-noun place names which signified the site was selected as follows: *emilie gamelin, parc berri, berri*

⁷ In April 2017, Twitter announced a groundbreaking update to their API. As of fall 2017, so-called 'developers' could opt-in to use a consolidated, universal Twitter API, no longer needing to juggle between Streaming and Search (Piper 2017). Their documentation removes ambiguity by claiming "full fidelity" and a possibility of upgrading to access of up to 30 days into the past (though strict limitations to volumes harvested remain).

square, jardins gamelin. Several spelling variations of these queries were also included (i.e. *emiliegamelin, jardinsgamelin, emelie gamelin*).

The location-based query involved the study site's centroid, which was determined as 45.515414, -73.560029 (WGS 84), and a circular geofenced area surrounding it based on a radius of 100 metres to cover the entire surface-area of the study site in order to capture geotweets.

6.3 Data Collection

Query-driven, content-based tweet collection began on March 7th 2016 using the Search API on a weekly basis. Over time, a population of tweets emerged whose sole relevance pertained strictly to any linguistic reference to this specific place. In parallel, geotweet collection elapsed using a geographic query (i.e. the study site's centroid and a radius of 100m) instead of a textual one. Geotweet collection began two months later on May 7th 2016.

Like other qualitative, small-data studies utilizing tweets, such as Wessel (2015) in their spatiotemporal study of food vendors' in cities and Sevin's (2013) study of city promotion, I intended to collect a year's worth of tweets. Both harvests persisted until May 6th 2017, long enough for both corpora to contain at least 12 months of material. The 12-month samples are used at all times in this study, except for some illustrations which present the 14-month content-based population exclusively in Section 7.2.

A total of 2208 tweets and retweets were collected for the 12-month content-based population. In parallel, the location-based harvest retrieved a total of 1088 geotweets collected during the same 12-month period (note that the latter technique does not capture retweets). These two distinct populations were then coded.

6.4 Content Analysis

Content analyses are common in media studies, especially with regard to place images (Gold 1994; Adams 2009; Gomez and Jones 2010; Gruley and Duvall 2012; Avraham 2015). They have also been widely applied to small data studies of Twitter (Starbird and Palen 2010;

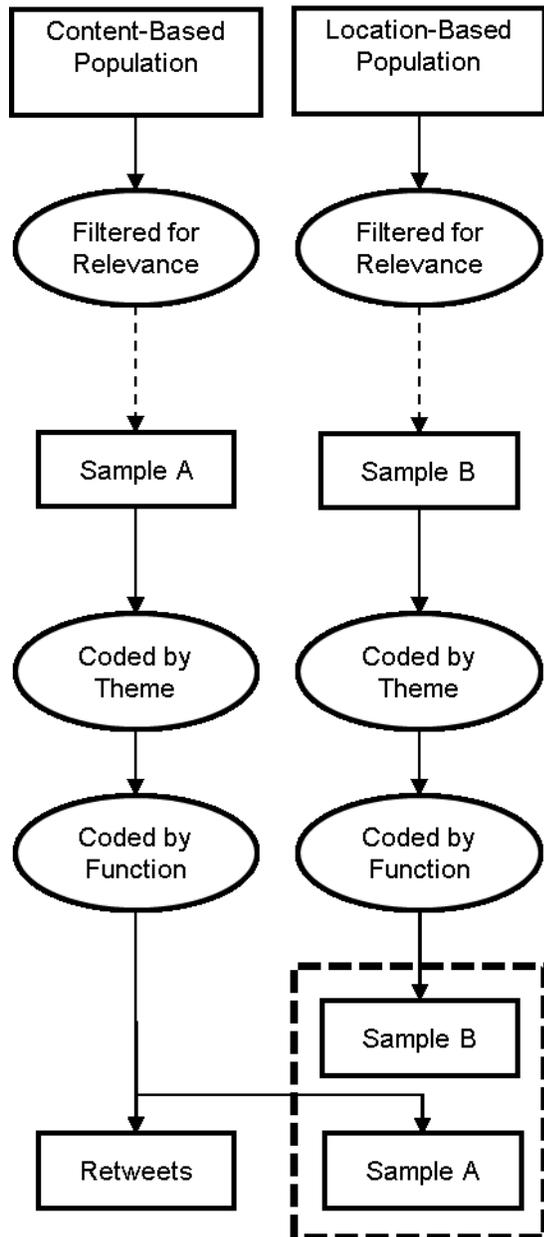


Figure 1. Flowchart outlining the methodology described in Section 6.4.

Vieweg et al. 2010; Papacharissi 2012; Hahmann, Purves and Burghardt 2014; Truelove, Vasardani and Winter 2015; Roberts 2017). While structural features tend to be better captured by algorithmic methods, socio-cultural contexts “built up around these features need the careful attention of manual methods” (Lewis, Zamith, and Hermida 2013, 39). Given that the bilingual nature of the corpus hindered efforts in more automated methods such as Latent Dirichlet Allocation (LDA), the processing time of a manual content analysis approach was deemed justified given the small population sizes, as well as the insight and accuracy that it would bring.

Tweets were regarded as individual sampling units (Einspänner, Dang-Anh and Thimm 2014, 100), and so each one was coded in whole to a single concept instead of several. While the brevity of tweets made conceptual ambiguity less persistent than it would have been for larger documents, in the thematic analysis (6.4.2), if a single tweet did contain elements attributable to two or more concepts, certain concepts took priority over others, making the coding of multifaceted messages less ambiguous (explained in the upcoming Section 6.4.2).

In order to make sense of two populations totaling 3296 documents, the noisiness and dimensionality of the data was first reduced inductively using tag-annotations, also known as an ‘open vocabulary’ coding approach (Schwartz and Ungar 2015, 80). As I will further explain, this first sweep, a pre-analysis which was also necessary to familiarize myself with the data, brought valuable insight on all fronts, helping to shape the final coding scheme. In the end, three final analytic dimensions were applied to the data: relevance, theme and function. In this way, each observation was individually-studied and triple-coded. Note that each tweet also came with a wealth of metadata, including the app from which it originated, the username, but also textual cues indicating, for example, whether the unit was a retweet or not (i.e. the presence of “RT ”), and whether it was part of a conversation or was standalone. These were used as filtering mechanisms to aid in the qualitative coding process, as will be explained in following sections.

6.4.1 *Relevance*

The first and most decisive layer of coding was for relevance. Like Vasardani, Truelove and Winter (2015, 347) in their classification of tweeted witness accounts in relation to real-world events, my aim was to evaluate on-topic tweets as defined by their relevance to the study site *Place Émilie-Gamelin*. Unlike a vaguely-defined ‘interaction’ with the site of interest as described in Roberts (2017, 15), as I explain in the following subsections, these included any kind of explicit or implicit reference to the study site or to an event that I knew had taken place on the study site. In addition, while Vasardani and colleagues filtered their analysis to only include tweets that were on-topic, from individuals and were ‘original’ (i.e. native to Twitter), I also coded tweets from organizations as well as from third-party platforms. This contradicts the common removal of posts from third-party platforms (Canneyt et al. 2012, 4; Hahmann et al. 2014, 7; Vu et al. 2016), however I decided to leave them in due in part to their relative prominence within the populations, but also because my intention was to look critically at how place was mediated on Twitter in whole.

6.4.1.1 *Content-based population*

Since any reference to the study site was the primary criterion for inclusion in this population, toponym disambiguation was the only reason for filtering the content-based

population (N = 2208) for relevance. The majority of tweets in the content-based population were deemed on-topic. Off-topic tweets occurred primarily because of the very inclusive *emilie gamelin* bigram used during the harvest. Events that related to the beatified social worker's birthday and others occurring in locations around North America with her name – including a community centre, a school and most notably a nursing home several blocks east of the study site where a murder occurred (inducing a flurry of off-topic tweets in spring 2017) – made up the majority of those removed (42 tweets). 2166 tweets and retweets remained for further coding. I will henceforth refer to such 'relevant' tweets from within the content-based population as Sample A.

6.4.1.2 *Location-based population*

Coding the location-based population (N = 1088) for relevance required more time, notably because of the implicit nature with which many geotweets related to the study site, requiring more manual investigation. While coding the content-based population was binary, the location-based population was first classified in four degrees of relevance to the study site: (a) irrelevant, (b) site-related, (c) event-related and (d) unknown (Table 3).

Thus, (a) tweets that were irrelevant were determined by their direct association with neighbouring places that were covered by the 100m radius, yet which were also not considered part of the study site based on criterion c. For example, those emerging from Berri-UQAM station directly underneath the plaza, as well as from a hotel, a bar and some restaurants across the street from it were coded as irrelevant in this way. (b) Tweets coded as site-related had either *Jardins Gamelin* or *Place Émilie-Gamelin* in their metadata as a place tag, or a site-related toponym in the tweet's text. The latter case appeared only very rarely for native geotweets (nine cases). Rather, in-text toponyms were more common in geotweets originating from Swarm or Instagram. In these cases, the Facebook or Foursquare place tag was appended to the tweet's text. Conceptually, the voluntary geotagging of posts by Twitter, Swarm or Instagram users was considered sufficient evidence of direct relationality between the post's content and the study site (e.g. none were considered as potential 'fake check-ins'). (c) Tweets coded as event-related were those that did not contain one of the two main site-related toponyms, but had to do with an event that was known to have taken place on the study site based on the pre-analysis of Sample A (e.g. the T-Dance pride party, a circus festival performance, a protest against electroshock therapy).

(d) All remaining tweets were coded as unknown since they could not be determined as explicitly linked to the study site by place or any related event.

Table 3. Location-based population breakdown by relevance type.

	Relevance type	Percentage of Total (%)		
a	Irrelevant	37.32		
b	Site-related	22.15		
c	Event-related	9.01		
d	Unknown	d.1	Irrelevant	28.49
		d.2	Site-related	3.03

In a second stage of coding, tweets previously tagged as ‘unknown’ (d) were perused for a more in-depth estimation of relevance with the intention to deprecate the category into (d.1) ‘irrelevant’ and (d.2) ‘site-related’ (Table 3). The work needed here was greatly reduced when it was determined that a single user who only posted from Instagram about an ‘irrelevant’ nearby indoor festival was behind 62% of this subsample (*FetishWeekend*, whose favourite place to geotag – an arbitrary point representing much of the festival’s geolocated posts – fell within the sampling radius).

This left only 152 tweets needing a second look. Out of these, only 25 were original tweets, all of which were determined as ‘irrelevant’ once having manually perused them online. The remaining 127 were from Instagram also required individually opening their associated URLs and consulting the post’s webpage. Once open, the tweet’s direct relevance to the study site was easily determined by the displayed place tag associated with the Instagram post. Like McKenzie and Adams (2017, 4) I only looked at Instagram captions and metadata to determine site-relevance; not photos, in this case because this is what was directly accessible from Twitter’s API and easily comparable with other tweets. These were all cases where the Instagram caption surpassed Twitter’s 140-character limit at the time, so the Facebook place name was not visible in the tweet’s truncated text, nor was it properly mapped to the tweet’s place metadata either because of a universal misalignment between Twitter’s and Facebook’s respective UGPDBs (see Table 2). In these cases, the place attribute visible in Twitter’s metadata was instead deprecated to the Montreal area (e.g. Appendix 8). The precise coordinates of the third-party place tags were however transmitted to Twitter’s API, which explains why they were captured by this experiment’s location-based filter. In the end, thirty-three out of the 127 Instagram posts were

considered relevant to the study site, making a total of 372 tweets considered as relevant to the study site either by direct relation to the site or to an on-site event. These relevant tweets from within the location-based population are henceforth referred to as Sample B.

Theme

The remainder of the content analysis was carried out on tweets deemed relevant, that is, Sample A (n = 2166) and Sample B (n = 372). Tweets from both samples were first coded by theme, that is, their topical orientation with regard to the study site.

6.4.1.3 *Sample A*

As explained previously, this initially used an open vocabulary which, over time, led to a diverse concept inventory. Coding was also computer-assisted. For example, frequent keywords detected within the corpus were used to do code multiple tweets in batches (e.g. the colloquial term for demonstration, *manif*, would result in it being coded as related to ‘protest’). All retweets were coded automatically in the same way as the tweet from which they originated. Like Starbird and Palen (2010), I expanded the definition of retweets to include tweets with identical text (these were often copies by bots).



Figure 2. Sample A word frequency cloud of open-vocabulary keywords.

These terms served as guides towards further topical abstraction in a second sweep that aimed to reduce each tweet to mutually-exclusive categories. To maintain consistency, these higher-level categories relied on a ‘closed vocabulary’ (Schwartz and Ungar 2015, 80), or a predefined set of concepts deduced from results of the initial tagging phase. In doing so, the corpus became a dataset of discrete nominal values. Items such as ‘homelessness’, ‘drugs’ or ‘skateboarding’ were lumped together as ‘marginality’; ‘protest’, ‘political campaigning’, and ‘identity’ became ‘political’, and the all tweets that related to ‘public art’, ‘dance’, ‘performances’ or ‘parties’ were brought together as ‘entertainment’ and thematically-related categories (see Table 4). Finally, ‘leisure’ was used as a category for tweets that related to enjoying the plaza, yet without any noticeable relation to a source of entertainment (many of these also happened to be Instagram posts). In cases where a tweet contained more than a single distinct theme, such as evidence of both ‘leisure’ and ‘protest’, the tweet would be tagged as the latter. If both ‘protest’ and ‘homelessness’ were present in a single tweet, the tweet would be tagged as the latter.

Table 4. Closed vocabulary thematic category descriptions with examples in footnotes.

Themes	Description
Festival	Mention of <i>Jardins Gamelin</i> without any specific sub-event. ⁸
Entertainment	Any discrete leisure-oriented events related to the study site. ⁹
Leisure	Activities, generally enjoyable, yet without cited source of entertainment. ¹⁰
Project	Assets of the project with regard to revitalization of the sector, etc.. ¹¹
Work	Job calls and posts about work. ¹²
Marginality	Any mention of marginalized groups or activities. ¹³
Political	Protest and politics. ¹⁴
Misc	Unclassifiable (e.g. too few words, too infrequent a theme). ¹⁵

6.4.1.4 Sample B

Sample B was also coded using the closed-vocabulary concept inventory inherited from Sample A. While there was a general openness to new concepts, none emerged. The synchronicity of topics ensured comparability between samples.

⁸ Tips, M. [montrealtips]. (2016, May 13). It's summer in Montreal: Jardins Gamelin kicks off 2nd year in a row - CBC.ca <https://t.co/4oFWi7HFDc> [Tweet]. Retrieved from <https://twitter.com/montrealtips/status/730991421474275328> (last accessed 7 August 2017)

⁹ Jane, R. [djrubbyjane]. (2016, May 27). Lunchtime downtown? Come hear me spin a stack of 45s 12-2pm at #jardinsgamelin #quartierdesspectacles [Tweet]. Retrieved from <https://twitter.com/djrubbyjane/status/736192734445207555> (last accessed 7 August 2017)

¹⁰ TruckerinDataScience [MontrealIndian]. (2016, May 28). #GoodMorning Montreal what a lovely morning in Parc Émilie-Gamelin. Anyone close by? <https://t.co/M7Nj7peC4A> [Tweet]. Retrieved from <https://twitter.com/MontrealIndian/status/736532311513141248> (last accessed 7 August 2017)

¹¹ spectacles, Q. [QDS_MTL]. (2016, Aug 25). Six perspectives on Les Jardins Gamelin <https://t.co/zYmhe0ysTl> #jardinsgamelin #blog <https://t.co/KsZTUgUyvG> [Tweet]. Retrieved from https://twitter.com/QDS_MTL/status/768812870301786112 (last accessed 7 August 2017)

¹² Urbain, S. [sentierurbain]. (2017, Feb 23). Nous recrutons une (ou un bien sûr) horticultrice animatrice pour les Jardins Gamelin. Souhaitez-vous contribuer... <https://t.co/KRSGLnGfsm> [Tweet]. Retrieved from <https://twitter.com/sentierurbain/status/834881303870853121> (last accessed 7 August 2017)

¹³ Mina [amuseMina]. (2016, Jul 29). Jardins Gamelin - aka drug park.. Cool concept though #montreal #outdoors #berri #514 #live... <https://t.co/YaV313d9fi> [Tweet]. Retrieved from <https://twitter.com/amuseMina/status/758877754796367872> (last accessed 7 August 2017)

¹⁴ fr0gz [frogsarelovely]. (2016, Oct 03). "Memorial March for Missing & Mudered indigenous Women" October 4th, 6pm. Parc Émilie-Gamelin <https://t.co/LWsbjgRBhE> #manifencours #polqc [Tweet]. Retrieved from <https://twitter.com/frogsarelovely/status/782780064781967360> (last accessed 7 August 2017)

¹⁵ Gamer4life [Henritoxbox]. (2017, Feb 12). #lumia950xl #montreal #sightseeing @ Jardins Gamelin <https://t.co/mlRcmbJ8Ck> [Tweet]. Retrieved from <https://twitter.com/Henritoxbox/status/830867443128160258> (last accessed 7 August 2017)

6.4.2 *Function*

While thematically coding tweets, more fundamental differences arose. Beyond their topical differences, it was the way that they were worded which manifested different intentions and, in turn, revealed different information about the place. Stark differences between tweets that were more promotional and others that were more expressive and descriptive required another dimension of analysis since they did not appear unique to specific topical categories. As explained in Section 4.2.3, previous Twitter classification studies and elements of SAT were key to conceptually grappling with this issue. The difference here was that the analysis surrounded an outdoor urban plaza rather than major disasters or political demonstrations. Section 4.2.3 asked: What would communicative functions with regard to place look like?

6.4.2.1 *Sample A*

Some tweets were conceptual musings about one's relation to that place; their claim on it or what they thought of it in general terms, while others indicated a more direct representation of a specific activity in place, indicating its material presence, some of which had more sentimental associations. Meanwhile, others were noticed for their projected intentionality towards a certain practice on site. They could also include an affective or a more reflexive comment with regard to certain memories or practices in-place.

Using the concept inventory described in Section 4.2.3.2, tweets were initially tagged as such (Table 1). This proceeded by a conceptual chunking, resolving certain infrequent, redundant or superficial categories. Questions, for example, were very rare (33 could be considered so), and many of them were contextually interpreted as either 'commentary' or 'promotion'. 'Commissive' tweets (14 in all) were also rare, and were more efficiently interpreted by other functions. Qualifying tweets as simply 'questions' or 'commissives' was also too superficial for the discursive qualities they contained in relation to place.

First of all, 'Information-sharing' and 'activity (me-now)' both involved the description of situated activities, the sole observed difference would have been that institutions (e.g. news reporters, bloggers, cultural industry representatives) report on a sight's happenings while individuals report on what they personally witness within the study site. In this way, they were tweets from both 'informers' and 'meformers' (Naaman, Boase, and Lai 2010). I deemed these

tweets, which were neutral in tone, as ‘descriptive’. Second, Self-reported activities that were more than simple descriptions in that they contained emotional and personal qualifications and affective inflections were termed ‘expressive-descriptive’. Third, ‘Expressive’ was used to describe tweets that only contained expressive words and emoticons without any description of activity. These tended to come from the photo-first medium of Instagram. Then, many were articulate ‘suggestions’ and promotional messages for the place and its events. Some of these were self-promotional, a frequently-seen characteristic in Naaman et al. (2010), yet they always promoted a performance of the self in place, or they promoted the place itself. These tweets, which often referred to an event to occur in the future, were termed ‘directive’. Lastly, ‘comments’ and ‘anecdotes’ that didn’t describe a specific event – tweets that were less explicitly *spatiotemporal* – were categorized as ‘commentary’. They either described the history of the place, talked about a past event at an undisclosed time, commented on it with regard to civic happenings, or used it as a landmark to locate the topic of a satellite discussion. These five inductively-chosen, higher level indices subsumed those derived from the literature review (summarized in Section 4.2.3.2). They are described in Table 5. Note that the words-world analogy used in Table 5 is extended from Searle’s (1976) understanding of the relationship between speech acts and reality whereby “Some illocutions have as part of their illocutionary point to get the words (more strictly – their propositional content) to match the world, others to get the world to match the words. Assertions are in the former category, promises and requests are in the latter.” (p. 3)

Table 5. Typology of Twitter functions adapted to 'places' from the literature and inductively from data collected.

Function	Commentary	Expressive	Expressive-Descriptive	Descriptive	Directive
Representation	Words \Leftrightarrow World	Words \leq World	Words \leq World	Words $=$ World	Words \Rightarrow World*
	CONNOTING	REACTING	REACTING+REPORTING	REPORTING	PROMOTING
Definitions	Direct and indirect discussion about the site. Place is the referent or a radial category. ¹⁶	Reactions to unnamed occurrences. ¹⁷	Described on-site occurrences with personal, affective inflexions. ¹⁸	Indicates use-of or simply presence-on site. In the present or in the recent past. ¹⁹	Promotion of the site for a particular use at a specific time. 20 21
Applications	Critical reception, user-input, closer reading, symbolic function of place	Sentiment analysis, user input, mapping emotions, opinion mining		event detection, landuse, situational awareness	intentionality, political will, place branding, place making, mobilizing

6.4.2.2 Sample B

Much like in the classifying of themes, coding Sample B for functions utilized the same tags as in Sample A, especially given the latter's superior sample size. Unlike Sample A, directive tweets were very infrequent, with the more descriptive and expressive tweet-types dominating the sample. Again, this was likely due to the fundamental differences between Instagram and Twitter.

¹⁶ RAS Podcasts 10 Ans [ReseauAntiSpin]. (2016, Jun 02). Un lieu hijacké par les extrémistes de tout acabit, salissant ainsi le nom d'Émilie Gamelin, une grande dame <https://t.co/iJpc2bLqSM> [Tweet]. Retrieved from <https://twitter.com/ReseauAntiSpin/status/738395074342555648> (last accessed 7 August 2017)

¹⁷ DivaJoly [DivaJoly]. (2016, Jun 03). Montréal, tu es belle! Je t'aime! #soleil #UQAM #JardinsGamelin #été #Montréal <https://t.co/1glAoE7WUN> [Tweet]. Retrieved from <https://twitter.com/DivaJoly/status/738783159488270337> (last accessed 7 August 2017)

¹⁸ Hoskin, O. [oliviahoskin]. (2016, Aug 13). some really really really REALLY terrible Whitney Houston karaoke going on at #JardinsGamelin right now. pls get out. [Tweet]. Retrieved from <https://twitter.com/oliviahoskin/status/764284059275005954> (last accessed 7 August 2017)

¹⁹ Spector, D. [danspector]. (2017, Feb 15). A few hundred women and men rallying at place Emilie gamelin to protest #rapeculture. They'll be marching to the Mo... <https://t.co/GiFP8NGZfg> [Tweet]. Retrieved from <https://twitter.com/danspector/status/832009319810007040> (last accessed 7 August 2017)

²⁰ Gazette, M. [mtlgazette]. (2016, May 13). Feed Your Head: Wanna build furniture? Learn how on Sunday at Les Jardins Gamelin <https://t.co/HziZFPY0Id> [Tweet]. Retrieved from <https://twitter.com/mtlgazette/status/731125118169055232> (last accessed 7 August 2017)

²¹ Vargas, E. [EstebanWasEaten]. (2016, May 12). Show alert: @MilkAndBone will be playing a FREE show tonight at Les Jardins Gamelin in @QDS_MTL before leaving to Europe. 7:30pm. [Tweet]. Retrieved from <https://twitter.com/EstebanWasEaten/status/730763239018090496> (last accessed 7 August 2017)

7 Results and Discussion

	Sample A			Sample B
	Tweets	Retweets	Total	Tweets
<i>Tweets</i>	1186	980	2166	372
<i>Users</i>	681	612	1239	193
Language	%	%	%	%
<i>French</i>	65.94	82.86	73.59	25.00
<i>English</i>	30.44	16.22	24.01	69.03
<i>Spanish</i>	0.84	0.71	0.78	1.38
<i>Other</i>	2.19	0.00	1.20	3.40
<i>Undetermined*</i>	0.59	0.20	0.42	1.19
Platform				
<i>Twitter**</i>	33.47	90.82	59.42	9.56
<i>Instagram</i>	20.15	0.00	11.03	84.28
<i>Facebook</i>	12.23	0.00	6.69	-
<i>Foursquare</i>	2.36	0.00	1.29	5.33
<i>Other***</i>	31.79	9.18	21.56	0.83
Theme				
<i>Festival</i>	2.36	0.92	1.71	-
<i>Entertainment</i>	63.66	62.45	63.11	66.40
<i>Leisure</i>	12.14	1.22	7.20	5.91
<i>Project</i>	2.36	1.94	2.17	0.27
<i>Work</i>	1.18	0.20	0.74	1.34
<i>Marginality</i>	3.63	2.45	3.09	-
<i>Political</i>	10.54	27.65	18.28	6.45
<i>Misc</i>	4.13	3.16	3.69	19.62
Function				
<i>Commentary</i>	11.13	9.29	10.30	1.88
<i>Expressive</i>	6.75	0.92	4.11	13.98
<i>E-Descriptive</i>	4.55	3.88	4.25	38.98
<i>Descriptive</i>	38.03	26.63	32.87	42.47
<i>Directive</i>	39.54	59.29	48.48	2.69
Scale****				
<i>Local</i>	61.89	51.84	57.34	53.76
<i>Provincial</i>	6.75	8.37	7.48	6.45
<i>National</i>	4.30	2.96	3.69	6.99
<i>International</i>	11.30	8.47	10.02	21.77
<i>None</i>	15.77	28.37	21.47	11.02

Table 6. Frequency table of samples A and B by both default and coded attributes (N=2538).

* The language of tweets that were either too short or only had generic hashtags could not be determined either by Twitter or the analyst.

** Any official Twitter client (e.g. Twitter web, Twitter for Android, Twitter for IOS, etc.).

*** Tweets that are native to the platform yet which were emitted by third-party Twitter clients (e.g. tweetdeck, hootsuite, etc.).

**** Scale refers to the geographical hierarchy to which the tweets' respective users affiliate themselves. Local is equal to the island of Montreal, while provincial, national and international relate to Quebec, Canada and the world respectively.

This section will present results from the content-coding, framed as a descriptive comparison between samples along with integrated discussion on the case study. Summary statistics will be followed by temporal analyses of the data, as well as some more in-depth observations of certain variables, relationships and issues. Using the themes and functions whose coding was explained in Section 6, I break down the samples by several dimensions that include name, language, profile-location and user-base. Although chi-square contingency tests were considered, the fact that this was a case study using an inductive and mixed methodology made testing for statistical significance seem excessive.

7.1 Descriptive Statistics

The present section describes a surface-level reading whereby retweets and tweets are compared as well as samples A and B more generally.

Rather than a user-object and its own timeline of tweets, the resulting corpus consists of the most complete possible place-object retrievable from Twitter based on the established search criteria using the Search API. Note that, as described in Section 6.1, retweets are only captured by textual queries. Table 6 shows a breakdown of Retweets from the content-based sample whose tweet-level attributes derived from the content analysis were copied from their associated ‘original’ tweets which make up Sample A. The location-based approach naturally didn’t capture any retweets, nor were any retweets from the content-based sample georeferenced. However, if we were to regard the ‘retweet count’ *metadata* of Sample B as equivalent to the retweets captured through the content-based approach, Sample B was far less retweeted than Sample A (0.26 versus 0.82 retweets per tweet): retweets of Sample A made up just under half (46.5%) of relevant documents collected with the content-based approach. The difference in sample size between the content- and location-based approaches is largely due to this fact. Yet still, only a minority of location-based tweets collected were relevant to the place of interest (34%), versus a much larger proportion of tweets harvested based on content (98%) . Thus, when controlling for relevance, a location-based approach collected three times less information on the study site (372 tweets) than did a query-based approach (1186 tweets).

Within Sample A, the extent to which tweets were disseminated by users differed immensely by theme and function. For example, French language content was much more retweeted than English language content, indicating a larger presence of the study-site in the French-language *twittersphere* overall. If we look at the data thematically, ‘political’ tweets also generated a disproportionate number of retweets (over 2.5 retweets for every tweet): more than any other thematic category. ‘Entertainment’ tweets were highly retweeted as well, yet to a much lesser degree. In contrast, almost no leisure-related tweets were retweeted. When it comes to communicative functions, promotional material (directive tweets) also clearly solicited higher user-engagement in the form of retweets than other communicative functions.

This correlates with the fact that more than half of ‘political’ tweets were also of the ‘directive’ function (up to two-thirds, if we include retweets; political tweets generally involved mobilizing calls for action). ‘Entertainment’ was also highly promotional. In contrast, Tweets classified more generically as ‘leisure’ were almost entirely descriptive or expressive in function. Looking deeper into the thematic and linguistic breakdown of Sample A revealed other patterns. ‘Political’ tweets were more French than any other thematic class and, along with ‘marginality’-related tweets, almost exclusively its French-language content was retweeted. There were also slight variations in the self-declared location of these tweets’ users. More users tweeting politically about the plaza were local (i.e. they had self-reported, profile-level locations in Montreal or Quebec) than in other thematic categories. In addition, far more tweets coming out of Montreal or Quebec were ‘directive’, whereas tweets from users affiliated to ‘Canada’ or ‘Abroad’ were more ‘descriptive’. The majority (86%) of ‘directive’ tweets were also in French. By contrast, English made up 40% of descriptive tweets, and English tweets were also more ‘expressive’.

The qualitative differences are also apparent between samples A and B. In this case study, Sample B was more than twice as English as Sample A and was sourced from nearly twice as many users from ‘Abroad’. Sample B also did not reveal any trace of ‘marginality’, and very little that was ‘political’ about the site (only a single Instagram user protesting electroshock therapy in May 2016 supplied half of Sample B classified as political). Far more of Sample B was also classified as ‘misc’, indicating that they were difficult to fit into any single thematic category, usually because of an insufficient amount of words. Indeed, tweets in Sample B were four times more likely to have come from Instagram: a photo-first medium. They were also

7.2 *Temporal Reading*

To explore the interplay between place-related tweets by theme and function, my initial temporal reading excluded Sample B from analysis due to its lack of variation in this regard. I utilize a slightly larger, 14-month version of Sample A ($n = 2378$), which includes two months (March and April 2016) leading up to the original data collection timeframe that began in May. These months were also filtered for relevance and categorized by theme and function during coding of the original 12-month sample. This expanded version of Sample A is only used in this section for illustration purposes to tell a more complete story.

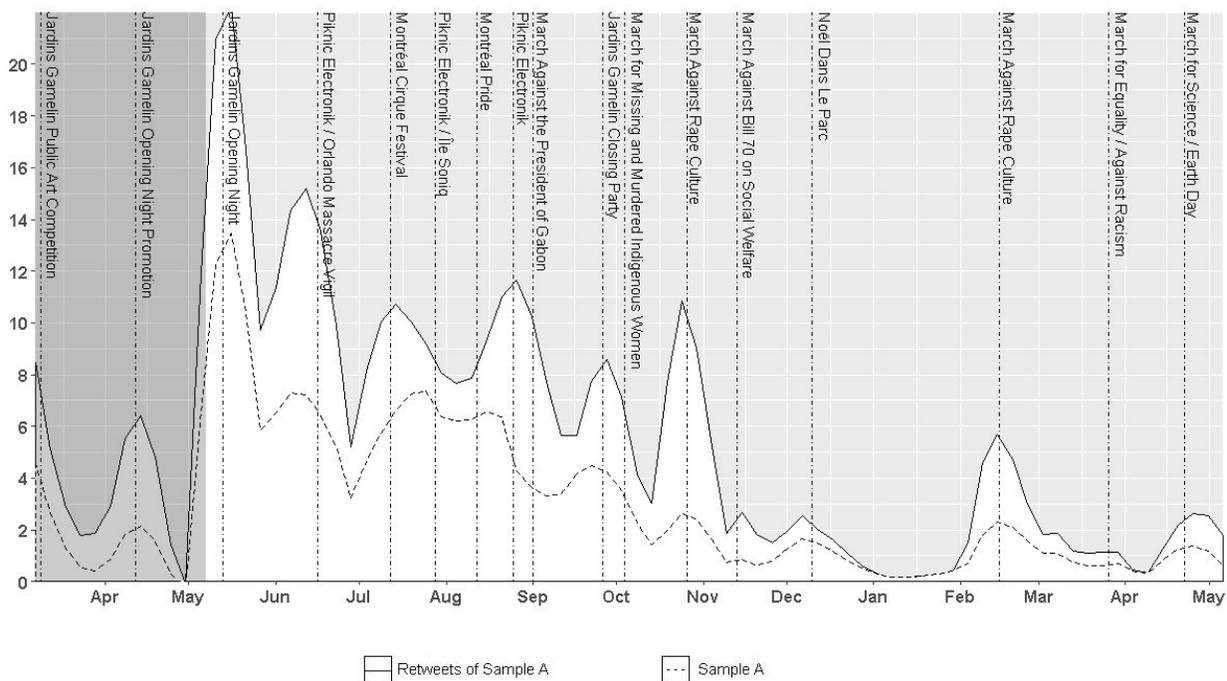


Figure 4. Stacked, smoothed frequency distribution of Sample A and Retweets of Sample A (14-month version).

Frequency distributions are a common way of analyzing Twitter data (Crampton et al. 2013, 136). An example of references to Tahrir Square over two weeks presents something rather similar to the figures presented here, yet without any content analysis of the data (Stefanidis et al. 2013, 325). Here, I present a coarse (day-level) distribution of tweets as they were posted throughout the 14-month period when content-based tweets were collected.

Within the scope of a single year, Sample A revealed seasonal changes in how the site was connoted on Twitter. The themes show us how different places co-exist asynchronously over a 14-month period (Figure 5). Entertainment-related and political themes are more clearly event-related, whereas references to marginality were more often classified as ‘commentary’, independent of events, and spread throughout the year. References to marginality still occurred more frequently outside the festival season, during which entertainment reigned. Indeed, there is a more volatile seasonal variation between ‘political’ and ‘entertainment’-related discursive appropriations of the site. Summer months were dominated by ‘entertainment’ and ‘leisure’, whereas ‘political’ representations topped the charts during spring and fall when the outdoors is still free of snow and cold. Montreal, after all, is a wintry city, as is illustrated by the place’s relative absence in the *twittersphere* during winter months. But entertainment did pop-up again during the lead-up to the Holiday Season, when a public-private funded Christmas market called *Noël dans le parc* chose *Place Émilie-Gamelin* as one of its three operating sites around the city.

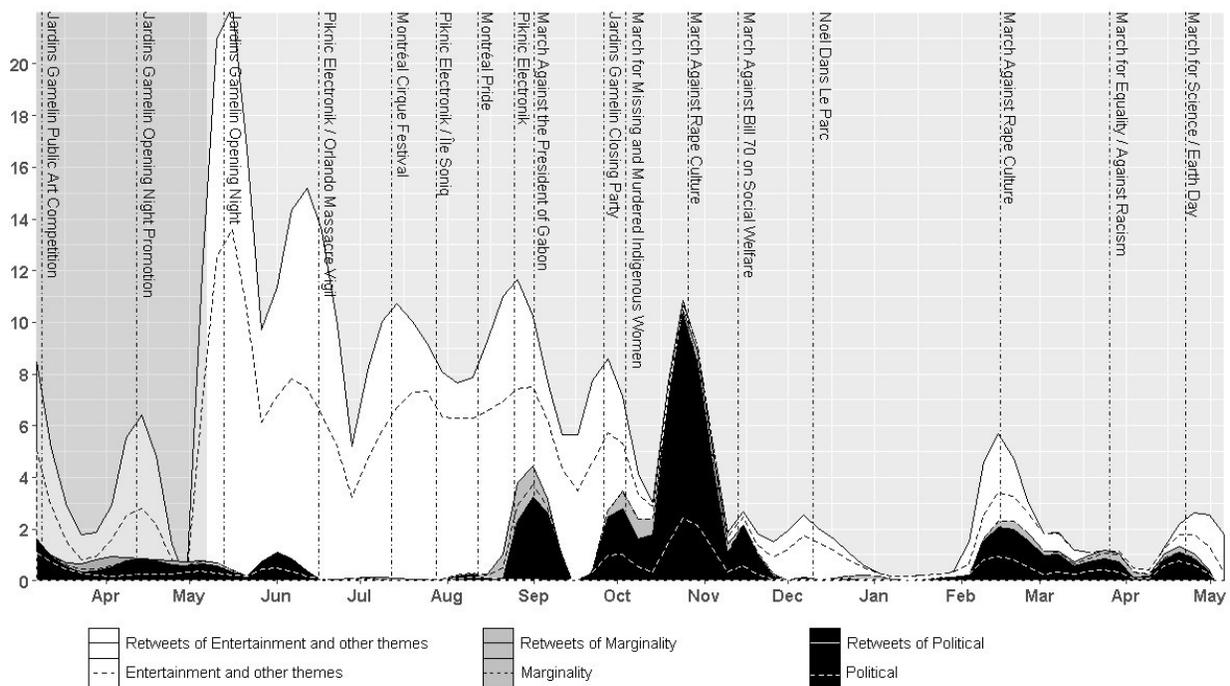


Figure 5. Stacked, smoothed frequency distribution of theme categories within Sample A (14-month version).

Could these Twitter manifestations of place coincide with the seasonal differences of the site’s actual use? How could we explain the peak leading up to May? Why would there be so much entertainment-related content at a time when the plaza is a site of melting snow, leafless trees and brown grass (Appendix 7)?

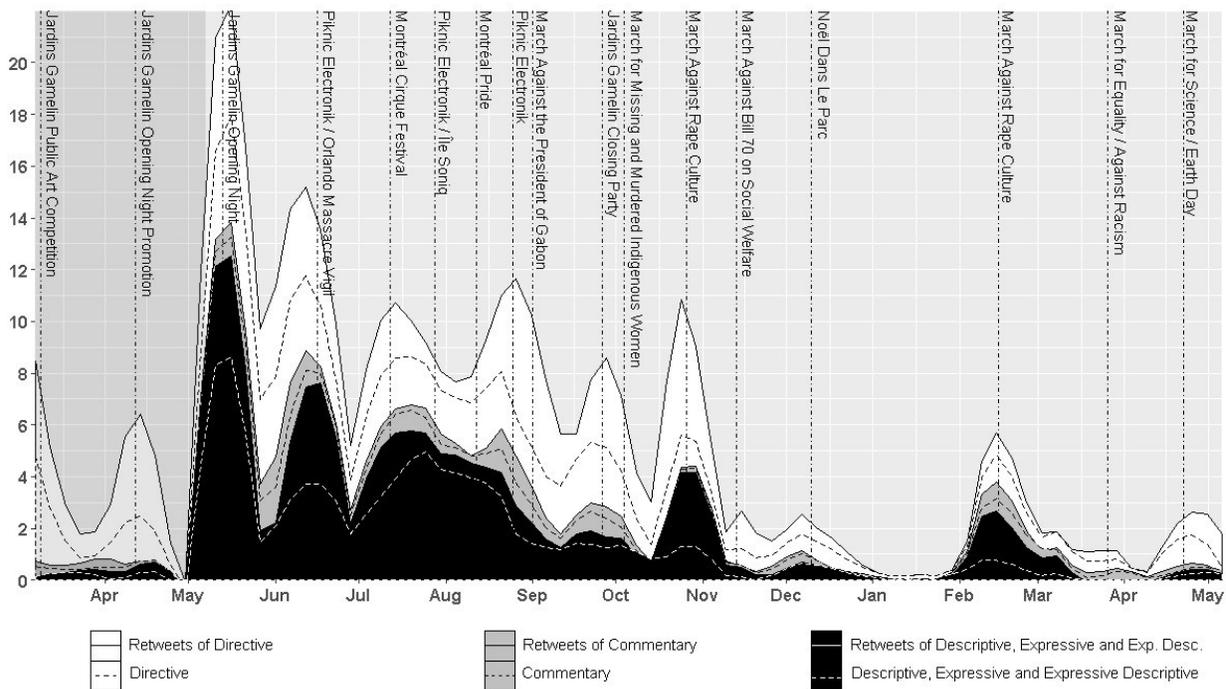


Figure 6. Stacked, smoothed frequency distribution of function categories within Sample A (14-month version).

At this same event-level granularity, after having collapsed descriptive, expressive and expressive-descriptions together, we can observe interplay between these and more promotional tweets, and how they operate within themes. To illustrate how a single theme could be spread across different functions, the small ‘work’ theme appeared in Sample A as directive tweets soliciting applicants to work for the *Jardins Gamelin* during the off-season, yet during the summertime, it appeared as descriptive accounts of one’s current day at work for *Jardins Gamelin*. More generally, directive material predates descriptive and expressive material, yet they also often occur on the same day, several hours ahead of the event. Sevin noted that 60% of their sample of tweets related to ‘place marketing’ contained linked material (i.e. links to websites outside of Twitter), much higher than the recorded standard for tweets at the time (Sevin 2013, 232). In this 14-month content-based sample, 87% of directive tweets contained linked

material, versus 53% for expressive, expressive-descriptive and commentary tweets when excluding tweets originating from Instagram (which all have links to their original posts by default).

To attend to the question posed in the previous section, the thawing months of spring were when massive entertainment-related efforts and promotion occurred, especially for the *Jardins Gamelin*'s opening night on May 12, 2016, which provided an outstanding amount of expressive and descriptive tweets: reasonably indicative of a successful event (Appendix 5). Being the *Jardins Gamelin*'s second season in operation, the promotion for both the festival as a whole and events taking place there was heavy, both on- and offline, within and beyond social media (Appendix 6). By contrast, Pride events in August, which exhibited a sustained amount of descriptive and expressive tweets, were associated with far less promotional tweets, likely due to the ongoing tradition of Pride week's events in the plaza, its established clientele, and the distributed nature of the festival across multiple urban sites, which possibly required less explicit beckoning of festival-goers to that place specifically. A study of the tweet activity of food truck vendors found that one-time events were tweeted-about (promoted) more often than repeated, routinized ones (Wessel, Ziemkiewicz, and Sauda 2015). This suggests that there may be a quantitative mismatch between the frequency of directive tweets and event frequency or attendance, since not all are promoted equally. Finally, 'commentary' was a communicative function that remained relatively consistent throughout the year.

What is also of interest is how these themes and functions related to the name of the place employed by Twitter users to designate the site. As can be seen in Figure 7, Pride attendees, who are established, veteran users of the site as a place of leisure and entertainment, referred to the site overwhelmingly as *Place Émilie-Gamelin*, in accordance with its more traditional name, despite the presence of some *Jardins Gamelin* infrastructure²⁴. Otherwise, most other 'entertainment' and 'leisure'-related tweets, and almost all of these that were 'directive', were talking about *Jardins Gamelin*. In contrast, almost all of the 'political' tweets referred to the site by its traditional name (*Place* or *Parc Émilie-Gamelin*): which suggests an unflinching cumulated knowledge of the site, regardless of its increasingly festive use. It is likely that any 'entertainment'- or 'festival'-related mention of the *Place* or *Parc* had to do with anchoring the

²⁴ Beaulieu, P. [ChaacQC]. (2016, Aug 15). Jour 227: gérer la Place Émilie-Gamelin lors de la dernière journée de Fierté Montréal: Check!... <https://t.co/J4BR1MmPXW> [Tweet]. Retrieved from <https://twitter.com/ChaacQC/status/765012522172690432> (last accessed 7 August 2017)

Jardins within an already well-known but notorious plaza, promoting the *Jardins project* and *place* as a whole, rather than specific events taking place there: a way of orienting and readying the audience, so to speak (see ‘festival’ theme in Table 4).

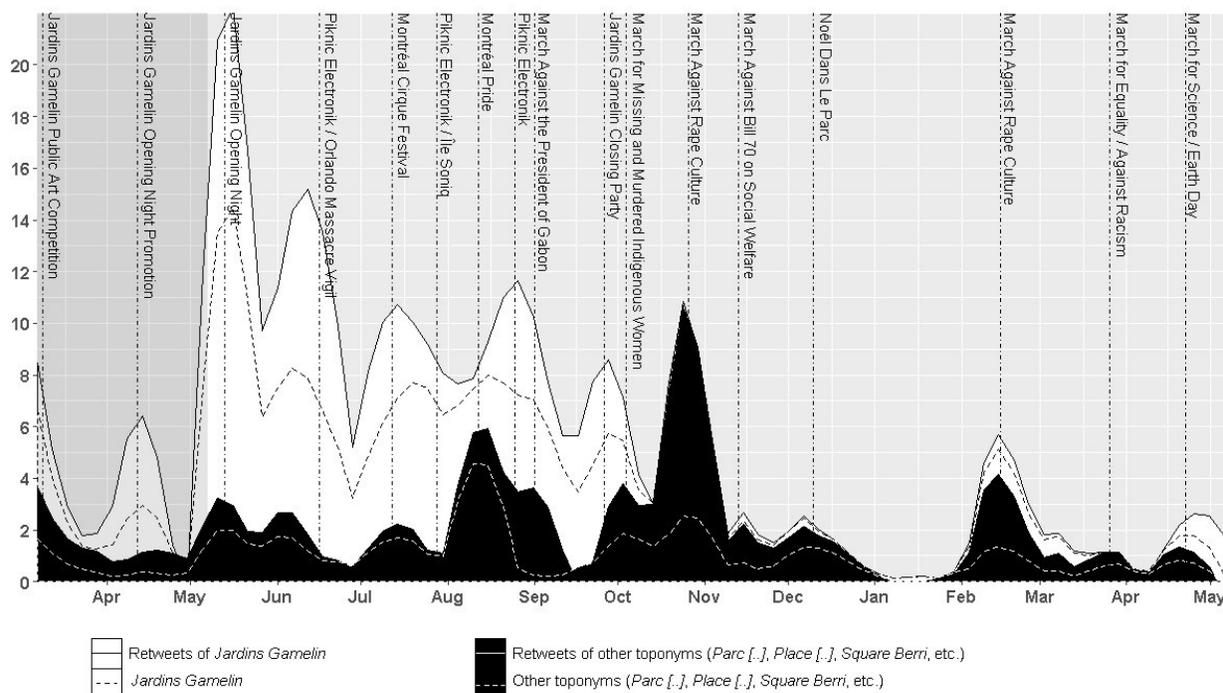


Figure 7. Stacked, smoothed frequency distribution of name categories within Sample A (14-month version).

While the themes elucidate what people associate the site with, the functions give us more insight into these themes, revealing how ‘entertainment’, ‘leisure’ and ‘political’ appropriations are both promoted and experienced by users off- and on-site. Indeed, ‘descriptive’ and ‘expressive’ tweets are indicative of bodily presence linguistically, but we cannot be certain at this point. A comparison with Sample B is warranted.

7.3 Qualitative Comparison

When looking at Sample B in Table 6, over 95% of tweets were ‘descriptive’, ‘expressive-descriptive’ or ‘expressive’. The relationship between these largely entertainment-related and event-driven geotweets with the ‘descriptive’ and ‘expressive’ tweets in Sample A is somewhat distinguishable when visualized, yet does not appear proportional (Figure 8). Given this

decidedly *situational* linguistic nature of geotweets, and that they are the best indicator of bodily presence on-hand, this suggests that expressive and descriptive tweets about place (geo-located or not) might be the best proxy for bodily presence.

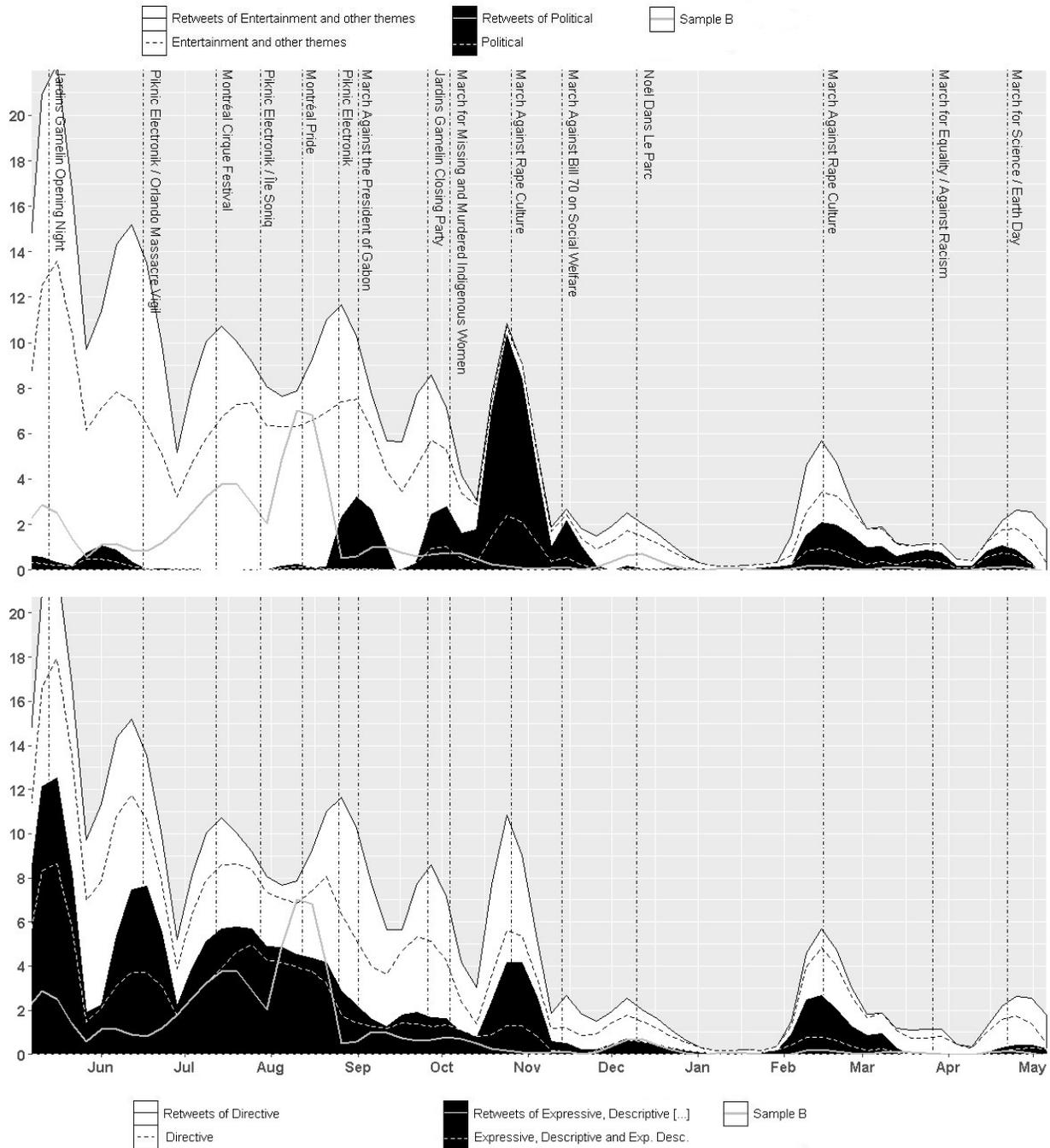


Figure 8. Stacked, smoothed frequency distribution of [top] theme categories within Sample A versus Sample B and [bottom] function categories versus Sample B.

Sample B occurred in large numbers at the *Jardins*' opening night, as well as during *Montréal Complètement Cirque* in July, and generally followed the trend of Sample A's descriptive and expressive tweets. Yet it captured a much greater number than Sample A during Pride week (many of which were also Instagram posts), probably due to the amount of geotweets deemed relevant because they were place-tagged to on-site, event-specific POIs, and which were not captured through the content-based collection because there was little mention of the plaza. Not having much to do with political – and nothing to do with marginal – representations, Sample B also barely emerged during 'protest' season which, as mentioned previously, did not coincide with any Instagram posts. What may further explain an extraordinary lack of geotweets during shoulder season may also be due to the site's unusually long closure. Indeed, during the assembly of *Jardins Gamelin* infrastructure in the spring, the site was closed for two weeks (Appendix 7), and in the frosting fall season, the grassy section of the plaza was cordoned off for an entire month to let the grass grow back ...

7.4 Third-Party Platforms

As noted by Marwick (2013, 113), "Twitter exists as part of an ecosystem of communicative options for users, and often what is posted on Twitter is not limited to that medium". Results show that Instagram figures very prominently as part of this ecosystem, and makes up the majority of geotweets across the board. Thus, the external platforms from which users contributed content to Twitter deserve attention.

I will use the coordinate metadata provided by both samples to explain this finding. While 22.6% of Sample A tweets contained coordinate metadata, only 15.4% of Sample A contained local coordinate metadata (Table 7). Only 4 (0.3%) were native tweets: all others came from Swarm or Instagram. The rest of the coordinate-bearing tweets in Sample A (7.2 %) were tagged to coarser city or country-levels, with their locations at those entities' centroids (mostly 'Montreal' and 'Canada'). Thus, with the total proportion in Sample A containing coordinates at 22.6%, the oft-mentioned 'coordinate sparsity' phenomenon on Twitter was less persistent for a sample derived from toponym queries than has been reported in other studies using queries for non-geographic topics (Section 4.3.1). However, this immense difference was primarily due to third-party apps Swarm and Instagram which, when shared to Twitter, manifest their 'place attribute' within the tweet's textual content (Appendix 8), thus allowing such geotweets to be

captured by a place name as a textual query. Furthermore, with only 0.3% locally-tagged, native geotweets, Twitter’s interface was clearly an extremely unimportant provider of local coordinate metadata, and Instagram was an extremely important one.

Table 7. Breakdown of local and coarse geotweets by platform of origin (all percentages in relation to sample total).

	<i>Coordinate Metadata (%)</i>		<i>Twitter (%)</i>	<i>Instagram (%)</i>	<i>Swarm (%)</i>
<i>Sample A</i>	22.6	Local 15.4	0.3	12.9	2.2
		Coarse 7.2	7.2	-	-
<i>Sample B</i>	100	Local 100	19.6	75.3	0.6
		Coarse -	-	-	-

Sample B was even more conclusive in this regard, showing a similar breakdown of platform sources, yet with a far greater number of locally-tagged geotweets coming from Twitter. Indeed, with native geotweets mostly no longer sharing precise device-level coordinates, the sole reason that we see a much larger proportion of geotweets native to Twitter in Sample B is because these are ‘tweet-ins’ (and while under 2.7% of the entire location based sample had device-level coordinates, none did in Sample B). These, as explained in Section 4.3.1, are tweets tagged to a ‘Foursquare place’ whose location resided within the geofenced sampling area, yet whose ‘place attribute’ appears in metadata and *not* in the tweet’s textual content, making them not harvestable using the content-based approach (Appendix 3). But even though the proportion of native geotweets was higher in Sample B, like in Sample A, the vast majority came from Instagram. This serves as a concrete illustration of the ‘patialization’ – to borrow from Quesnot and Roche – of geotweets (Section 4.3.1), which was also noted in a recent assessment using a much larger dataset (Tasse et al. 2017).

The comparatively large ‘misc’ category seen in Sample B can also be explained mostly by its overlap with tweets from Instagram and Foursquare. 70% of ‘misc’ tweets in Sample B were from Instagram. Tweets from Foursquare were also difficult to categorize (54% of query-harvested original tweets from the platform were ‘misc’), given the little amount of articulate text beyond their ‘check-in’. Other platforms in Sample A contained much smaller (<5%) proportions of ‘misc’ tweets. In addition, 90% of tweets categorized as ‘leisure’ in both samples were posted from Instagram. Further, many of these were directed at the net structure hanging over the park for the duration of *Jardins Gamelin* (Appendix 9), much like how Schwartz and Hochman (2015)

noted the prominence of public art in Instagram photos in their study of public parks (Section 4.4.3). Thus, posts coming from Instagram and Foursquare were more inarticulate than native tweets and generally reported more affective accounts of people's leisure activity.

In complete contrast, under 1% of 'political' tweets came from Instagram or Foursquare. This fits with the well-documented and widespread use of Twitter for political and especially activist means. Looking at Instagram posts overall, they were far more amenable to festival-related categories. Yet these thematic categories were equally observed from Twitter itself, albeit in ways that were more promotional and commentative. Finally, tweets from users whose self-declared origin was 'Abroad' were also more likely to be Instagram shares than in other geographic categories.

We can see a picture emerge, where more articulate, promotional and somewhat descriptive talk occurs natively on Twitter with regard to place, and other somewhat descriptive, yet far more expressive, less articulate, and often georeferenced tweets occur in parallel, largely in the form of posts from third-party platforms such as Swarm and Instagram.

7.5 *The Communication Power of Users*

It is important to remind ourselves of who may be saturating *Place Émilie-Gamelin's* representations: "Communication power refers then to the differential capabilities of particular groups, individuals or interests to assert and to stabilize particular representations of place, and the practices by which those capabilities are realized" (Zook, Graham and Boulton 2015, 228). In the case of Sample A, 'entertainment', despite being the largest thematic category, still had the highest user-concentration with an average of 1.86 tweets per user, whereas representations of 'marginality' and 'politics' were spread proportionally among more users (1.23 and 1.16 respectively). 'Directive' tweets were also concentrated among fewer users (1.82), versus 'descriptive' and 'commentary' (1.36, 1.40), with the least concentrated shares coming from 'expressive-description' and 'expressive' ones (1.15, 1.14). In brief, the authorship of promotional and entertainment-related tweets was much more concentrated among fewer users than all other tweets. Table 8 shows the top users and their most tweeted themes and functions.

Table 8. Top users based on number of tweets in Sample A.

Twitter handle (@)	Followers	Tweets	Retweeted	Themes	Functions
QDS_MTL	63154	66	184	entertainment	directive
Salsafolie_com	56	49	7	entertainment	directive
maintenant_mtl	210	32	1	entertainment	mixed
Mankool Montrea	157	17	0	entertainment	mixed
offta	3264	15	6	entertainment	directive
sentierurbain	533	12	1	entertainment, leisure, work, misc	directive, commentary
Accesasie	291	10	4	entertainment	directive
DessineGamelin	27	10	1	marginality, misc	commentary
ManoloOlvera	65	10	0	entertainment, leisure	descriptive, expressive
mtlccirque	2412	10	21	entertainment	directive, expressive

There is indeed a clear predominance of a select few users such as QdS, the main *Jardins Gamelin* funder and organizer, followed by several event organizers and curated content disseminators. The list drops quickly, as if following a power law trend downward. While these were the users who saturated Sample A the most, not all of them were equally powerful in terms of their communication, as seen in their respective number of followers and retweet counts.

Indeed, and in conversation with Section 7.3, Twitter users posting from third-party apps were also much less widely disseminated (i.e. retweeted) in the *twittersphere*. Under 2% of Sample A's retweets were of tweets shared from Instagram, Foursquare or Facebook: clearly, those who operate natively within the *twittersphere* are more susceptible to engaging other actual Twitter users. Frequent posters from third-party apps may also likely have fewer followers. For example, one user (*mathieulabs*) posted periodically on Twitter from a third-party app (Facebook) about the charitable services to the homeless that their organization was offering in the plaza. The user's main audience was manifestly on Facebook (5200 followers), after finding that his Twitter timeline (30 followers) was solely composed of automatic posts by Facebook. Likewise, all tweets by a dance event organizer (*salsafolie_com*), one of the most frequent tweeters in Sample A – who consistently promoted dance-nights in the *Jardins Gamelin* – were from Facebook. The user only had 56 followers on Twitter, as opposed to 4100 followers on Facebook, with very little user-engagement on the former. Thus, while some content-disseminating users may produce enormous amounts of content, their followers and especially

their platform of origin can indicate if their tweets have any exposure at all and representational power at all.

7.6 Sources of Error and Possible Improvements

This brings us to focus on what techniques and parameters could have been improved in this study to better guide any future elaborations, as well as certain elements which require a more in-depth look.

Most critically, several factors make the study-site unique from a geosocial perspective, which put into question the generalizability of the results. Firstly, the plaza's unique name is likely to have made the query-based approach more fruitful by generating less false-positives than if the site's name had been something more generic like *Montreal Square*. Second is the site's dense urban context. The metro station underneath it, as well as a frequently-tweeting nearby user (*FetishWeekend*), whose shares from Instagram made up an astonishing 40% of the entire location-based population, were significant factors contributing to the number of false-positives from location-based data collection. As previously noted, most geotweets were deemed irrelevant to the study site, yet not because of what had been previously assumed – that is, that the location of a message doesn't imply much about the message's content – but rather that the location of many (Instagram) places were arbitrary, inaccurate or totally incorrect. For example, Instagram photos shared to Twitter that were tagged to *St Hubert Street* were located just off the street inside the plaza²⁵, why the anglicized location of this 11km-long street is located here is unknown. An anglicized *Montreal Old City* (actually one kilometer south) was located in the middle of the plaza under study²⁶, and a poorly-worded *Vieux-port de Montréal L'horloge*, referring to the Scotsmens' Clock Tower one kilometer to the southeast²⁷, was also within the plaza. Beyond the fact that some of these features – lines and polygons – are difficult to locate with a point, it is the locational accuracy and comprehensiveness of places in UGPDBs such as

²⁵ 📍Giannina Sexy 😊 [GianninaP97]. (2016, Dec 29). Nieve!!! 🍷🌸 @ Saint Hubert Street <https://t.co/yYXpAVHLS8> [Tweet]. Retrieved from <https://twitter.com/GianninaP97/status/814490605250314241> (Last accessed August 7 2017)

²⁶ Fixxxer1971 [fixxxer1971]. (2016, May 08). Old Montreal Parliament. @ Montreal Old City <https://t.co/HcdBmxEPyk> [Tweet]. Retrieved from <https://twitter.com/fixxxer1971/status/729143478396039168> (Last accessed August 7 2017)

²⁷ JESSICA [JessicaNaval]. (2016, Aug 05). Just posted a photo @ Vieux-port de Montréal L'horloge <https://t.co/vJqR36eJPJ> [Tweet]. Retrieved from <https://twitter.com/JessicaNaval/status/761533784189796352> (Last accessed August 7 2017)

Facebook's that is in question here. So, just as name genericity could be the bane of query-based approaches to place-based research, density (of both the human population and of user-generated place-locations) can be a deterrent to accurate geotweet harvests with similar intentions. In the latter's case, however, the false-positives are due to the creator of the mislocated POI which, by creating another version of the same place, creates an anchor for innumerable, cascading, misdirected (but properly *placed*) social media posts. Accurate geotweet collection must therefore take into account tweet-ins, spatially-near *rogue* places (many which are from Instagram) and posts tagged to temporary events (which often also manifest themselves as POIs on Instagram, for example).

In fact, given Twitter's 'patial' shift, a bare-bones formula to improve geotweet collection accuracy in this way (and reduce the need to post-process for 'relevance') would be to not use a locational filter *at all*. This might involve (1) the selection of geotweets containing the desired toponym yet which are also sourced from Foursquare or Instagram (to ensure the correct coupling between location and content-relevance). Then, with Twitter's recent partnership with Foursquare and a hopefully-emergent trend of *tweeting-in*, (2) native tweets with that place name in their metadata could also be harvested. This query-based approach *on geotweets* would capture 76% of Sample B. It would be accurate as an approach to strictly site-related tweets, yet it would leave out a blatant part of the mediated place in its omission of 'event-related' geotweets (see Section 6.4.1.2)

Regarding data more generally, Song Gao (2017, 7) demonstrated an inspirational use of the Streaming and Search APIs complementarily. This would have broadened the scope of analyzable material, especially with regard to events. A future application of this kind of study could implement a filtered stream for the place and, upon emergence of important events, could enforce searches followed by new filtered streams to track events that were present on the site, and how they propagate beyond it. Indeed, the phenomenon noted in Section 4.2.5 known as 'markedness' would be accounted for here, and when an event emerges, new key words would be adopted for a more dynamic place-based data collection. Yet this could also distort the place profile unnecessarily (extending it to associated events that may go beyond the place itself). It would depend on the goal of the study and would have to apply the right controls.

More dynamic harvesting of conversationally-related tweets would have also been beneficial. Palen and Anderson (2016, 225) noted the difficulty of accessing the context of tweets (i.e. how

they figure within a monologue, let alone a conversation). The usual unitary collection of tweets has made most researchers miss out on their locally-discursive context. This, the authors noted, makes many tweets that would otherwise be informative useless. Indeed, this further suggests that the intertext should be explored in a future discourse analyses social media content. Consistent harvesting of all tweets related through conversation to those harvested would need to be undertaken.

Regarding coding, a future adaptation of this would require more clarity with regard to precisely how much of a discourse versus content analysis is being undertaken. Various implicitly promotional tweets were tagged as ‘descriptive’ due to their linguistic nature, yet a discourse analysis that reads into the intertext would have qualified this as ‘directive’.²⁸ This likely weakened some of the distinctiveness of functions displayed in the frequency distributions. Thus, a more strictly rule-based approach to coding could be followed by a more in-depth, single-blinded discourse-analytic approach. This procedure could help fork future work in two useful and complementary directions: more in-depth qualitative studies as well as supervised topic-modelling and coding for larger datasets.

In addition, and as done by Hahmann, Purves and Burghardt (2015), multiple, collaborating annotators would have greatly benefitted the manual classification endeavour. Not only can this collaboration be useful for the conversations, shared reflections and decision making that it brings, but a measurable ‘inter-coder agreement’ index with regard to how a tweet was coded can be measured as a way of establishing how repeatable a methodology may be (Gasher 2009, 107). With many of these improvements established, linguistic features from certain categories (especially communicative functions since they are more likely scalable) should be surveyed to devise a tentative ‘gold-standard’ for more automated classification techniques that could be tested on multiple urban sites. From this, there could emerge a map of urban places.

This study revealed how the site was promoted within certain spheres and experienced by others. Within the theme of entertainment, since there was more of a complementary relationship between promotion and attendance as manifested by descriptive and expressive tweets and geotweets, this theme, as it appears on Twitter, can be further explored to reveal the interplay

²⁸ LeoneKerry [leoneaskerry]. (2016, May 13). It's summer in Montreal: Jardins Gamelin kicks off 2nd year in a row <https://t.co/2q3IgmNI7m> [Tweet]. Retrieved from <https://twitter.com/leoneaskerry/status/730966358893170688> (Last accessed August 7 2017)

between the dissemination of place images and their integration by users as places. Future work with this goal could also build off work by Zimmerman et al. (2016), yet with an interest in promotional material regarding sites and their events as opposed to ‘buzz’. Like these authors, a temporal analysis at the minute or hour – instead of day – level would help to more precisely evaluate how place is made or unmade by events by establishing clearer relationships between event-driving and event-driven tweets. Since “testing Twitter’s capacity as an anticipatory medium” (Rogers 2013, 8) has been a long-time concern, an urban informatics take on it could be applied to places through an analysis of directive tweets to better understand how mediated places influence spatial practice.

And while such a subject of study may be more enjoyable to those specialized in tourism and the cultural industry, there is no reason why the influence of place image dissemination on social media should remain unexplored within digital urban geography and geosocial media studies, especially given the extent to which it could be put in relation with and potentially *explain* the presence of geotweets and tweets indicative of on-site presence. Future work would also have to take certain contexts into account, as demonstrated by a relative lack of promotional, place-making material for Pride events at *Place Émilie-Gamelin*. These would also have to control for the communication power of users since, as demonstrated in Section 7.4, some Twitter accounts may emit large quantities of tweets and distort the overall representation of a place. Yet these tweets may not always be powerful. Indeed, the quantity of tweets captured by the Twitter API does not necessarily reflect the impressionability of a mediated place on an audience. Measures that account for this may be warranted in future studies of the *communication power* of place representations by, say, controlling for the number of followers that user has or the amount of user-engagement their tweets are receiving.

An investigation of social media through this kind of a discursive lens could also potentially be used for measuring urban gentrification. Zook, Shelton and Poorthuis (2017) considered several avenues of research using social media geodata, bringing up, notably, the issue of user-mobility and the trouble of fixing users to the coordinates they emit (Zook, Shelton, and Poorthuis 2017). Understanding places by way of discourse could help to resolve some of these issues. An elaboration of this work in this direction could involve an expansion and systematic comparison with coarser spatial statistics and known indicators of gentrification, potentially enabling a place-by-place and more fine-grain, dynamic indicator.

Lastly, to more critically engage with the possibility of “studying society through place” (Section 2.5), and to, by extension, explore sites as anchors for multiple places, as suggested might be the case for *Place Émilie-Gamelin*, what remains to be seen is how connected the populations that produce such representations are to each other. A network analysis of users based on their either interactions or follower-networks may be warranted in this way to compare between thematic and communicational modes. For example, Sevin (2013, reviewed in Section 4.2.4), in their study of the place marketing of American cities on Twitter, revealed that promoters tended to retweet each other, forming an arguably dense network of collaborative disseminators. This could also be carried out with a specific focus on the dissemination of place images and its effect on the total representational corpus of places in social media. Yet more fundamentally, as was carried out for regions within cities (Hristova, Williams, and Panzarasa 2016), this could potentially reveal the extent to which such diverging places are socially cohesive, connected, or socially distant, and whether they breed parochialism or cosmopolitanism (Lofland 1998).

8 Conclusion

This concluding section will begin with a summary of what this experiment has taught us specifically about *Place Émilie-Gamelin*, followed by a discussion on what the findings suggest about social media today and how to more effectively study places through them.

8.1 What This Says About Place Émilie-Gamelin

The results presented in Section 7 tell a story about *Place Émilie-Gamelin*. During summer months, the plaza was first and foremost an amplified entertainment hub, with promotional, widely disseminated, locally-sourced and mostly French-language content taking up the most representational space. Complementing this was a more international, communicationally-receptive ‘audience’ of users, many of whom used Instagram to produce more English-language yet less widely-disseminated observational, experiential and affective accounts of the place that were also more likely to be geotagged. This was however not so throughout the whole year, as more politically-charged representations of the site took hold during fall and spring, with a proportionally larger yet more local user-base generating widely-disseminated and mostly

French-language, mobilizing calls for action toward various causes. But unlike entertainment-oriented promotion, these were not always complemented by on-site, more experiential accounts.

On top of political and leisure representations of the site being mutually exclusive in a temporal sense, they also diverged in their naming of the site. In the off-season, *Jardins Gamelin* existed solely through promotion of its summertime existence, during which *Place* and *Parc Émilie-Gamelin* dominated. In the summer, the latter's instances occurred especially during the more rooted Pride events. In brief, these representations illustrate two places whose rhythms took hold of the site at distinct times throughout the year. *Jardins Gamelin* was a place of festivity characterized by warm weather and a more international crowd, yet which was actively being 'imagineered' through the dissemination of place images attuned to the cultural and economic goals of Montreal's governance regime (Paul 2004): a 'placemaking' project that was nevertheless trying to be inclusive of the site's history. Social media users performed their reception of this image through 'meformative' manifestations of the 'spatial self': publicly acknowledging and personally integrating the *Jardins* as a place within their own path and shared spaces. Meanwhile, the *Parc* or *Place* was a more political, local, queer and marginalized place overshadowed by an accumulated and multifaceted history.

As discussed in Section 3, like politics, homelessness and drug trade have characterized the history of this place: representations which are now hidden by ample and continuously-refreshed digital content largely triggered by entertainment-related events. While an historical analysis was not possible given Twitter's API limitations, it is likely that the discourse found in this project differed greatly from that found on Twitter years ago (cursory historical searches can be performed using Twitter's advanced search online, yet it's fidelity is inconsistent and unknown and is less easily accessed programmatically). Searching Twitter's online web platform brings up an obvious glut of protest-related content from the years between 2012 and 2015 when the student movement was particularly active. Marginality may have also been more present: a cursory search on Google, for example, brings up 'Google reviews' left by internet users since 2011 which show an exponential upswing in both the volume of reviews and overall sentiment in more recent years (Appendix 10). Like the relatively few tweets collected that were 'marginal' in theme, the oldest reviews manifest much more 'marginality', yet always from the position of someone outside of it: as complaints and comments, they are hardly coming from marginalized urban individuals or actors who work with them. With few alternative narratives emerging

beyond an active, entertainment and politically-oriented, articulate online sphere, we are reminded of a persistent, urban digital divide. This divide distorted geotweets especially, since none of them had anything to do with the presence of marginality or even politics. Only content-based retrieval was able to link these themes to the site in question. During the same summer of 2016, a team of ethnographers carried out interviews with 100 individuals circulating and living on the site, revealing far more depth about the plaza than Twitter did as a place for marginalized groups (Amplifier Montréal 2016). Work by Pazarelli and colleagues (Parazelli et al. 2014), who looked specifically at representations of street youth in this area from news media, is a good example of how traditional media studies may still be pertinent for questions of geographic representation of marginalized urban dwellers.

Finally, while it was suspected that an adoption of a new place name may have been apparent over time based on cursory initial searches,²⁹ *Jardins Gamelin* does not seem to be having an effect on how the site is regarded for other uses during the off-season, so far, based on user-mentions within Twitter over a single year. Longitudinal studies with an even larger time-span may still be able to reveal such changes, however.

8.2 Socio-Spatial Media as Platial Media

The results of this thesis, albeit taken from a local case study, present important insight into a recent fundamental shift in how places are communicated on Twitter, and therefore how they can be studied. As we have seen, aside from a volunteered possibility for users to share precise device-level coordinates, which contrasts with an account-level default-sharing that more prevalent in earlier years (recall Section 4.3.1), the options accessible to Twitter users currently revolve around a selection of nearby ‘Foursquare places’. Tweets, when geolocated today, are therefore first and foremost a *platial* source of data. Unlike before, these geolocated messages mediate places via their place tag. Yet they are nowhere nearly as important as Instagram posts.

²⁹ Misenheimer, S. [sofsilvaml]. (2015, Nov 15). Montreal #JardinsGamelin and surrounding buildings in are lit in remembrance of lives lost during the #ParisAttacks <https://t.co/Jwvvnv2fFif> [Tweet]. Retrieved from <https://twitter.com/sofsilvaml/status/666023735623856128>

8.2.1 *Studying Instagram*

The profound dependence that geotweets have on Instagram is a concern, since their very substance is not native to the Twitter platform itself. Twitter acts as a vehicle in this way for insight into Instagram, but only into an unknown fragment of the Instagram user-base that chooses to share to Twitter. There is, however, virtually no mention of Instagram in geotweet studies reviewed in the present work. Why this is may be a question of time, since Instagram was never as popular as it is today (even though in 2013, Leetaru et al. reported a higher proportion of geotweets with URLs to Instagram than ordinary tweets, indicating its prominence among geotweets as early as 2012). It may also have to do with the fact that virtually none of the geotweet studies reviewed in this thesis handle data that was sourced more recently than spring 2015, when Twitter updates likely increased the share of locally-geotagged tweets from Instagram within the total geotweet output significantly. Then again, maybe it has never been discussed because so few perform small-data studies and close readings of the data. After all, big data analyses with more regional scope can put up with the majority of their tweets tagged at a municipal-level, therefore overlooking the overwhelming presence of Instagram at the local level. In 2017, beyond what has been revealed by this study, a glimpse at *Mapd*³⁰ showed that Instagram is a minority at the global scale, but when zooming into specific cities, its share takes a strong majority at the local scale. This has to do with the locational coarseness of native geotweets, being more commonly associated at the city or country-level nowadays.

Difficulties with harvesting Instagram as freely as can be done with Twitter were well-known before 2016 (Quesnot and Roche 2015, 1980), yet the API change of spring 2016 further reduced its existing allowances for those interested in research, with all such access redirected to third-party paid intermediaries (This 2016). And while batch access to Instagram posts is possible through Twitter, as previously mentioned, the exact relationship in terms of how many of its users share from Instagram to Twitter is unclear. Small data studies of place should take intense interest to studying Instagram directly as a constructor and mediator of urban places, while being mindful of the representational limitations of the platform (i.e. largely entertainment-focused), as concluded in the present work. The study of Instagram is very nascent (Schwartz and Hochman 2015; Boy and Uitermark 2016; Jayarajah and Misra 2016; Honig and MacDowall 2017;

³⁰ “Tweet Map” by MapD: <https://www.mapd.com/demos/tweetmap/> (last accessed 7 August 2017)

MacDowall and de Souza 2017), and it requires more attention from geography than it has already received (Cateridge 2015). Currently, however, only Twitter has batch access to large amounts of Instagram posts. When viewed together as interfaces, they both facilitate similarly platial ways of manifesting place.

8.2.2 *Implications of Platialization on Geotweets*

As reviewed in Section 4.4.3, Schwartz and Hochman (2015) did a spatial reading of multiple public spaces in New York City and noted that Instagram post metadata contained “the exact location from which it was uploaded” (p. 56). This is no longer so, as was made clear by Instagram-sourced geotweets harvested in this project (Appendix 8). Even when using Instagram’s own proprietary API, as a cursory harvesting of Instagram posts revealed, only the location of the ‘Facebook place’ is shared, not the location of the photo’s posting, or even the location at which the photo was taken (as is the case for Flickr). This, on top of Twitter’s own place-tagging (as opposed to coordinate-tagging) technique, has important implications on how we study places through social media.

With ‘spatial readings’ of local sites no longer possible, we can no longer study ‘mediatization’ spatially (recall Section 2.4), since messages shared with a ‘device location’ are so rare. Studying the influence of a site on the spatial practice of mediation, or how and where individuals choose to share information, is fundamentally reduced to where individuals *choose to place* their message.

While we cannot study why users may choose to share at a specific location, we can, however, gauge with which places they choose to share, when they place these messages and to what ends (which in this study was shown to relate especially to moments of festivity and to manifest leisure and general enjoyment). In this way, many of the issues regarding the semantic association between location and message advanced by Hahmann et al. (2014, Section 4.4.2), could be resolved if a careful geotweet collection is undertaken (Section 7.5).

But in doing so, the issue of why individuals choose to share, in what places and at what times, arises. As noted by McKenzie and Adams (2017, 11, reviewed in Section 4.4.2), they posited that the limited social acceptability of bars may have explained individuals’ higher likelihood of sharing activities related to beaches when nearby a beach, and fewer and more platially-irrelevant posts in bar regions (then again, this experiment took place before Twitter’s

and Instagram's important changes). Indeed, the performativity associated with the 'spatial self' becomes an even greater concern when the geo-located place is part of the message. Today, tweets that come from both Instagram and Twitter are thus more like 'check-ins' from traditional LBSNs than ever before, as was also noted in a recent assessment of geotweets (Tasse et al. 2017). Work on geotweets will therefore need to source from a wealth of research on 'check-in' applications such as Swarm, since they are host to years of place-based social media posts.

Yet some considerations will need to be made for the very different discursive environments that 'tweet-ins' and 'check-ins' occupy (Section 4.2.2). And while it may have formerly been regarded that "Twitter's georeferenced tweets were not substantively different than the non-georeferenced short-form/micro-content (140 characters) that is typically produced by participants in the application" (Kelley, 2013, 190), this study showed that geotweets that are meaningful at a local scale were actually *very* different from most tweets captured by query. With most of them being not only less articulate and sourced from Instagram, but also universally more expressive, descriptive and entertainment-related. Such phatic expressions of leisure, especially those which are less articulate, will require different tools of textual analysis than for tweets that relate to place via in-text toponyms.

The relatively recent nature of this new Twitter paradigm limits the amount that is known on this feature in comparison to traditional geotweets, and has only been sparsely noted (Tasse et al. 2017). Tasse et al. aside, virtually all reviewed literature was using Twitter data sourced from before spring 2015, so it remains to be seen how frequently this option will be used and whether 'tweet-ins' will contribute to a growing number of a new kind of geotweet or will mark their mortal decline. On top of confirming this study's findings by stating that "place-tagging, not coordinate geotagging, is now the default" (p. 252-253), Tasse et al. found that there was a significant drop in the proportion of tweets geotagged at the device level after Twitter's user-interface changes in spring 2015 (p. 253). They further noted that many geotagged tweets were from bots, and that users tended to geotag when they were travelling and in unusual places outside their routine activity space. This rings true with the present findings, whereby Sample B contained tweets from more international users (Section 7.2).

The fundamentally platial nature of Twitter and Instagram has implications in geography in regard to how they should be considered epistemologically. The platial binning of content on both platforms means that place-based studies must prioritize content-based approaches. Spatial

approaches to reading social space are not only missing the point (Section 4.4.1), but they are not even possible any longer at a local scale. A sea of expression that once required spatio-semantic organization is now being pre-emptively placed into bins of human-readable association by the authors of those messages. This will have a serious influence on spatial science applications to Twitter. The present study, having been carried out directly following this change, presents preliminary insight into the trend.

The mechanisms of power underlying these places (recall UGPDBs, Section 4.3.1) will also need unpeeling. On Instagram, place-creation isn't entirely intuitive (i.e. it must be done through Facebook). Changing or adding a place to Twitter is also not directly doable from within the environment since it is provided by Foursquare. With the user needing to choose from a selection of pre-contributed places, this predetermines the naming of the site, potentially stalling the discursive appropriation of that place by that user. Indeed, by platializing the geosocial web in this way, we may have foreclosed an opportunity to dynamically redefine the sites that our paths intersect by way of the expression-enabling digital interface. To platialize, in this sense, is to transform the interfaces of spatial self-representation into a selection of premade places.

8.3 A Content-Based Approach to Studying Place

Devices are increasingly producing data 'about' users rather than 'by' users (Andrejevic and Burdon 2015). Though that which is available 'about' users is increasingly in the hands of the companies that own these interfaces, while that which is produced 'by' users is both visible to each other and to researchers. It is increasingly an accepted premise that by using such interfaces, we are revealing ourselves in ways beyond our knowing to the owners of those interfaces. Meanwhile, and as Twitter's transition can illustrate, users are being given more power over what they are revealing to each other. Researchers must navigate this two-tiered exposure cautiously: privileged access to company-held data will enable experiments which are not reproducible by others and can be ethically burdensome, while public API access to information that is largely controlled by those users requires methods that are mindful of their premediated content. This socially-mediated constitution of place and its associated geodata is what constitutes place as seen on social media, and thus requires a communications framework for studying. By thematically and linguistically coding a year's worth of tweets on a single, highly complex public plaza in Montreal, I could not only understand and learn about a place, but make sense of what I

could not learn about it. Certain elements of discourse revealed voids at times where discourse may have been expected, some geo-located, some not. This *way in* to geodata on Twitter should persist as a realm of interest, with content-based data collection (entering place by way of its utterance and voluntary association) as a primary means since, as revealed by this study, it is the only way to access its full representational scope. Rather than inferring place from activity, place exists first and foremost via its mediation. Only a multi-dimensional place-as-corpus approach which considers as much the conversational buzz of a place as well as proxies for bodily presence (and the functions of their on-site presence) can be used to fully research place by-way of social media. While geo-located messages remain important, they are nowhere near as frequent as geo-textual ones; and un-located tweets, if properly coded by function, can often explain the absence or presence of geolocated ones. In addition, the at-times high proportion of tweets from third-party apps should not warrant their removal, but rather a differential accommodation during coding and analysis. This study is a first to point this out, and makes it clear that geosocial media have effectively entered a new era.

9 Bibliography

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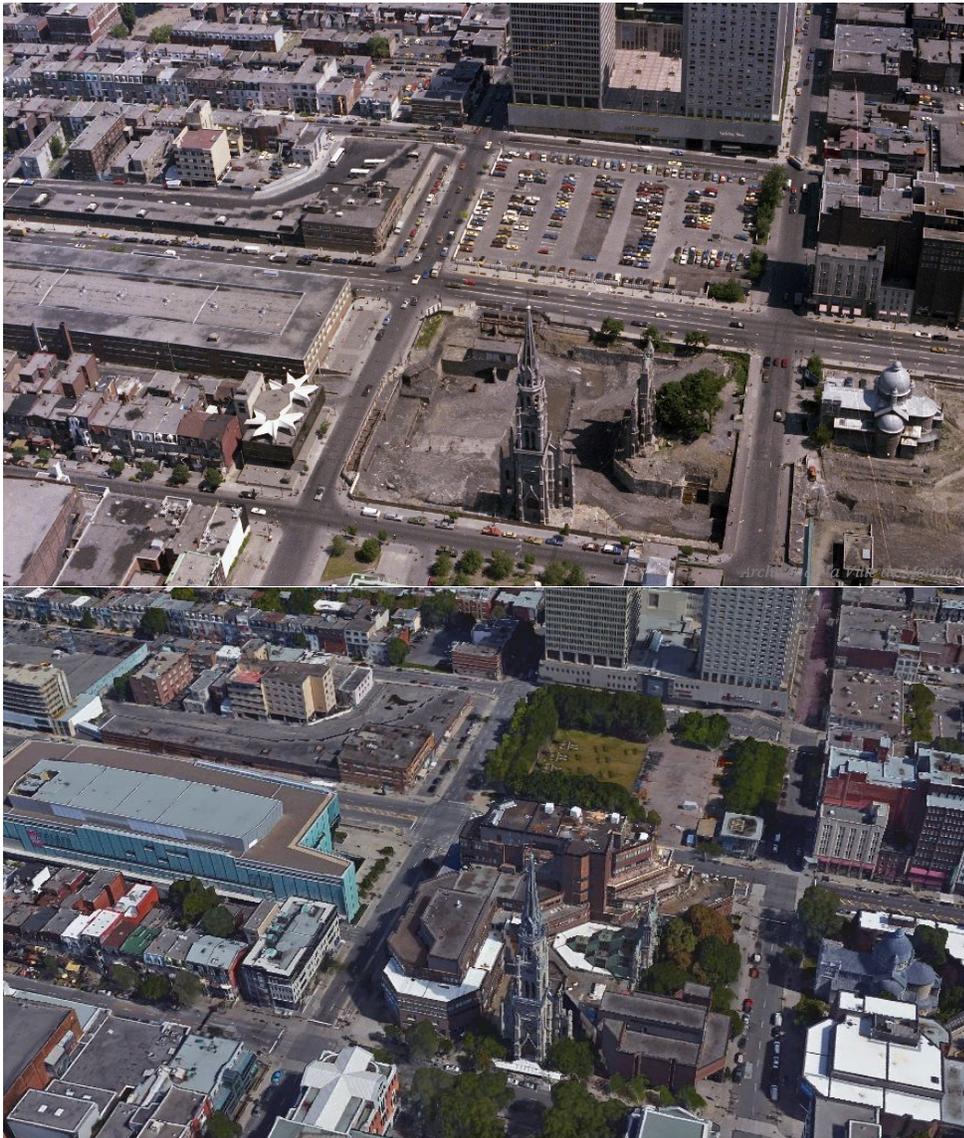
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10 Appendices



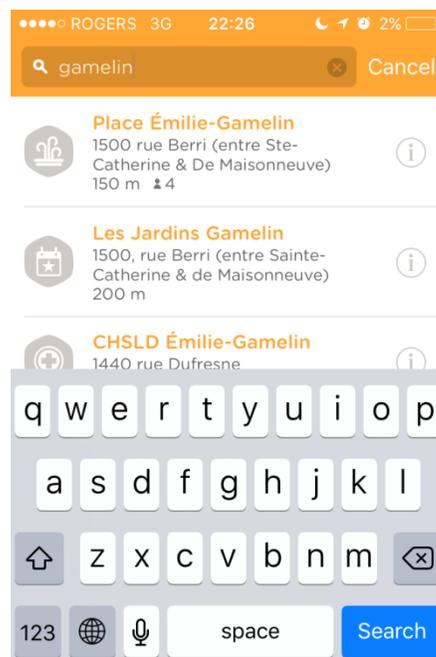
Appendix 1. Northwestward view from the paved part of the plaza onto the grassy incline which guides the water down miniature canals from three statues by Melvin Charney (Source: retrieved on 5 May 2016 from Garrand, J-P. 2012. Parc Émilie-Gamelin. <http://montrealjemesouviens.blogspot.ca/2012/07/parc-emilie-gamelin.html>)



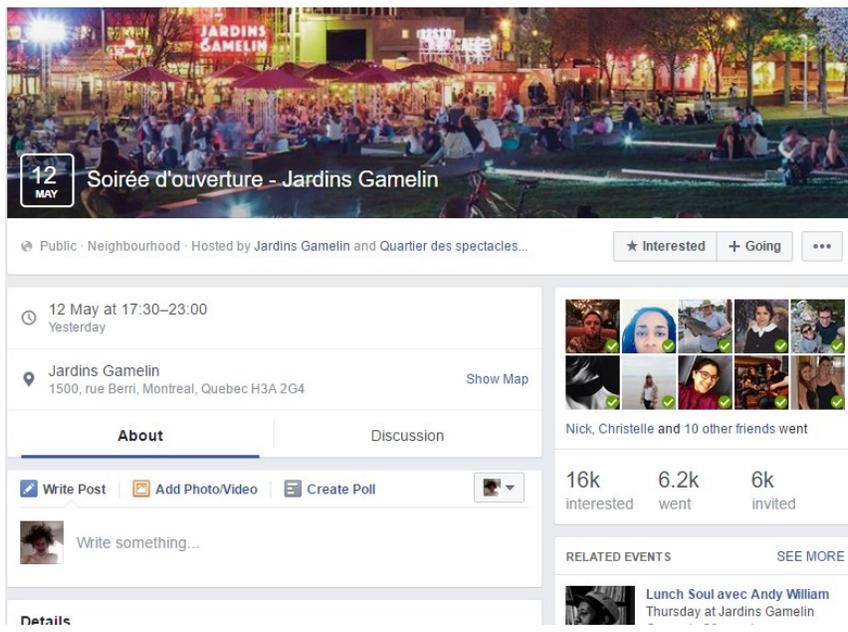
Appendix 2. [Top] An aerial view of the study site in 1976 when it was a parking lot surrounded by the construction site present-day UQAM (Source: Archives de Montréal, retrieved on 5 May 2016 from Noakes, T. 2015. Yesterday and Today. <http://www.tayloroakes.com/tag/place-emilie-gamelin/>); [Bottom] An aerial view of the study site in 2016 as seen on Google Earth.



Appendix 3. An example of a ‘tweet-in’ (Notice the hyperlinked place tag below the photo).³¹

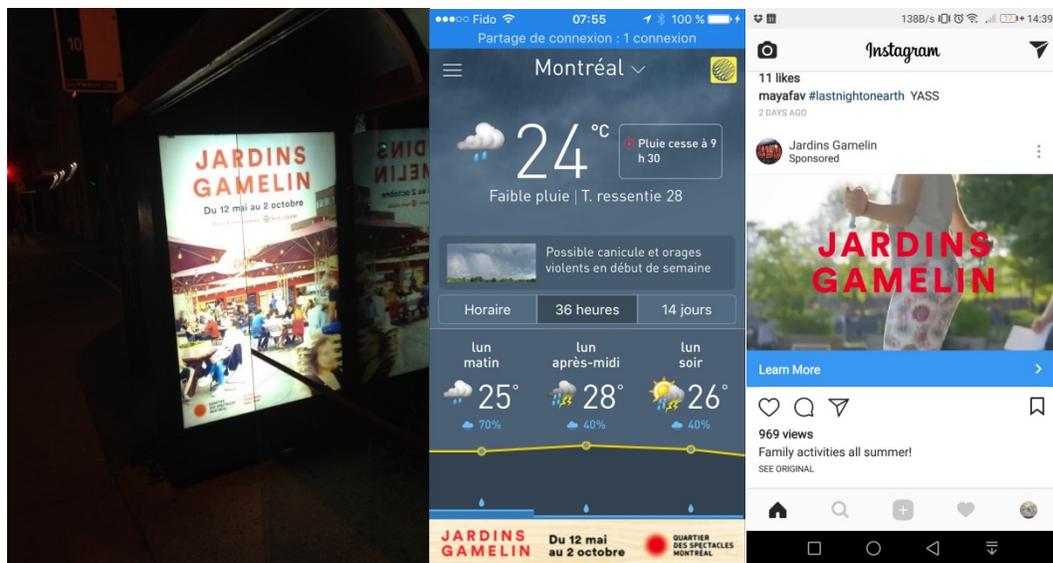


Appendix 4. Two places (a plaza, and an ‘event’), one site, as seen on Foursquare’s Swarm App (Source: Author, June 2016)



Appendix 3. A Successful Opening Night for Jardins Gamelin. As seen on Facebook (Source: Author, May 2016).

³¹ MuKaM, L. [Louna_2M]. (2016, May 20). En ce moment, Métro Berri Uqam, #JardinsGamelin, un Dj mix des sons naija. Quelle surprise!! C trop bien! 🌞👍 <https://t.co/VXQEpJWKOE> [Tweet]. Retrieved from https://twitter.com/Louna_2M/status/733450187709001728 (last accessed 7 August 2017)



Appendix 4. [Left] An advertisement for Jardins Gamelin in a bus shelter on De Lorimier Street (Source: Author, July 2016). [Centre] An advertisement for *Jardins Gamelin* as an app banner for the *Météo Média* weather app (Source: Zachary Patterson, May 2016). [Right] An advertisement for *Jardins Gamelin* as seen on the author's personal Instagram feed. Indeed, as seen in the image's caption, family activities became more central to the place's branding in Summer 2017 (Source: Author, July 2017)



Appendix 7. [Clockwise from top-left] A sign indicates the site's closing for two weeks prior to *Jardin Gamelin's* launch on May 13; trucks used in the assembly of Jardins Gamelin terraces and gardens; both the concrete plaza and the grassy hill were off-limits; the area with picnic tables at the north-end of the site, where marginalized groups often assemble, was left accessible (Source: Author, April 2016)



Alexandria Lane
@lfalexan

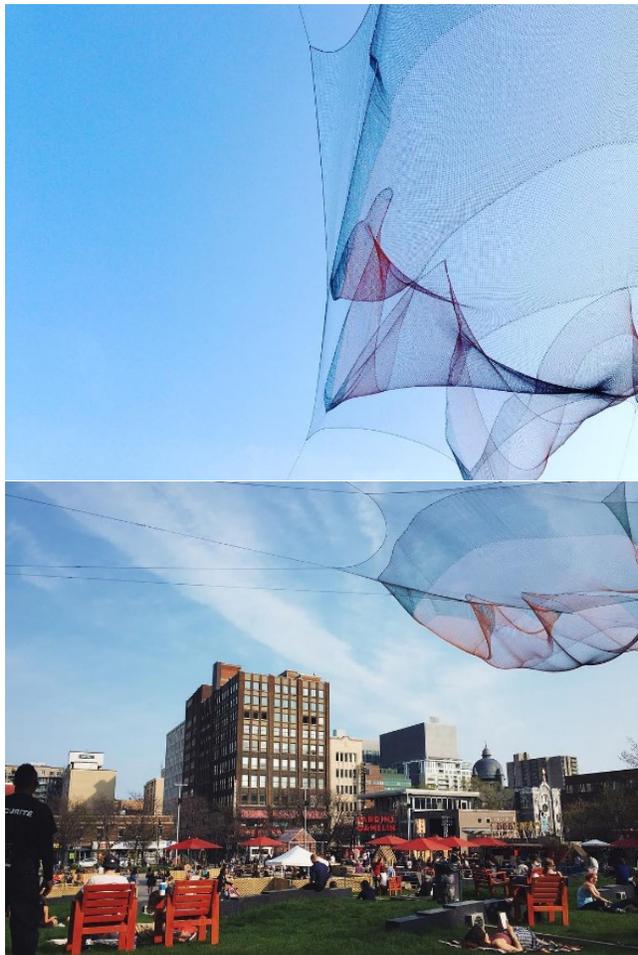
Follow

Gorgeous #art made of netting over a park in #Montreal. @ Jardins Gamelin
[instagram.com/p/BFnJDpuy6T8/](https://www.instagram.com/p/BFnJDpuy6T8/)

10:02 PM - 19 May 2016 from Montréal, Québec



Appendix 8. A tweet posted from Instagram. Note the 'Facebook Place' attribute contained in-text preceded by an ampersand, as well as Twitter's own attribution of a much coarser 'Montreal' place attribute below. The Search API, however, captures the exact coordinates associated with Facebook's 'Jardins Gamelin' POI.



emmorrice • Follow

emmorrice Summer sky /// Jardins Gamelin

emmorrice .

#montreal#plateaumontroyal#montréaljeta
ime#montrealcity#montrealife#montrealph
nto#montrealmoments#vul#inercm#iners



88 likes

MAY 22, 2016

Add a comment...



antwhat_ • Follow
Jardins Gamelin

antwhat_ Le soleil brille sur Montréal ☀️



26 likes

MAY 12, 2016

Add a comment...

Appendix 9. Two examples of Instagram posts depicting Janet Echelman's public art piece hanging over the site during the Jardins Gamelin.



Jeffrey Said

1 review · 2 photos

★★★★★ 2 years ago



Lisette Turgeon

1 review

★★★★★ 2 years ago

Jai bien hate de visiter

(Translated by Google) Jai much forward to visit

👍 Helpful?



Martin Legault

1 review

★★★★★ 3 years ago

endroit de vente de dope et de violence

(Translated by Google) place selling dope and violence

👍 Helpful?



Jean Laffèche

★★★★★ 3 years ago



A Google User

★★★★★ 4 years ago

Beside it there is greyhound bus station to Ottawa

👍 Helpful?



Max duval

19 reviews

★★★★★ 4 years ago

Remplis de drogués et de sans abris

(Translated by Google) Full of junkies and homeless

👍 Helpful?



Diane st-onge

★★★★★ 5 years ago



Charles Mercure

1 review

★★★★★ 5 years ago

Paradis de la vente de drogue. À éviter.

(Translated by Google) Paradise selling drugs. To avoid.

👍 Helpful?

Appendix 10. [Left] A screenshot of the eight oldest Google Reviews available on *Place Émilie-Gamelin* (802 in total as of October 2017). The timestamps jump from 5 to 2 years ago in a single viewframe. Indeed, since 2015, there has been an exponential increase in reviews accompanied by a generally more 'positive' sentiment (as understood by higher ratings and a lack of complaints regarding marginalized individuals).