Activate space rats! Mobile gaming and L2 pronunciation

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ABSTRACT

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Oral fluency development, the automatization or fluidity of speech (Derwing et. al., 2009), is recommended as one of the last steps in the development of oral skills (Nation & Newton, 2008). However, because fluency development activities focus on speeding up and automatizing language use rather than introducing language new structures, they are often avoided by teachers (Nation & Newton, 2008).

Spaceteam ESL, a team-building game for smartphones and tablets, provides L2 learners with the opportunity to practice English by giving and receiving time-sensitive instructions; the game, therefore, has the potential to motivate fluency development (via speed) by lowering pronunciation anxiety and increasing willingness to communicate (WTC). While players must be in the same room to play, communication is mediated via mobile devices.

The current study examines the effect of Spaceteam ESL on oral fluency development, pronunciation anxiety, and WTC. The participants were from two classes (groups 1 and 2) of high-beginner ESL students at a college in Quebec, Canada. Group 1 played the game for 15 minutes as a classroom warm-up activity for a period of six weeks while group 2 acted as the control. Participants were recorded telling a short story about their summer vacation as a pre-test, post-test, and delayed post-test to measure gains in fluency, measured by syllables produced per minute and judges' ratings. Pronunciation anxiety and WTC were examined qualitatively via semi-structured interviews. Randomly selected participants also participated in interviews to gain insight into their views about the use of the game as a pedagogical tool to reduce anxiety and increase WTC. Results suggest that, overall, gameplay has the potential to assist in fluency development and may contribute to lower levels of anxiety in language students.

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Table of Contents

LIST OF FIGURES

LIST OF TABLES

Chapter 1

Introduction

The development of fluency for second language learners "is important at all levels of proficiency" (Nation & Newton, 2008, p. *x*), as it encourages learners to speed up and automatize language use. However, activities which promote fluency development are often excluded from the language classroom due to time constraints; these activities also involve repeating structures that students have already acquired (e.g., vocabulary and grammar structures), and so do not introduce any new language structures (Nation & Newton, 2008). Fluency development may be further hindered by language learning anxiety and/or low levels of willingness to communicate (WTC) in learners (Horwitz, Horwitz & Cope, 1986), as these factors reduce output production (Gregersen & MacIntyre, 2014). There is, therefore, a need for fluency development activities which do not consume class time, are easy to implement, and help to relax and motivate students to practice language.

The current study aims to investigate the use of a digital collaborative mobile game, Spaceteam ESL, in second language learning and its effect on fluency development, speaking anxiety and learners' WTC. To play the game, players must engage in real-time computer-mediated interaction with other players, intelligibly producing and carrying out time-sensitive oral instructions to navigate a spaceship. A four-week pilot study was conducted in which Spaceteam ESL was used as a warm-up activity in an English conversation class (see Grimshaw, Cardoso & Waddington, 2016). The study showed promising results: participants indicated that they felt more energised after playing the game and that it helped to "open up [the mouth]", preparing articulators for use in the conversation class. Their teacher noted that a positive mood carried over from gaming sessions, "creating an overall pleasant atmosphere" (p. 105). Participants also commented that they

felt more comfortable and familiar with classmates after gameplay, suggesting that gameplay may influence student anxiety and WTC. They were also reportedly more active during the normal lesson following gameplay. In addition to these perceived benefits, one participant pointed out that the game helped to remind him of previously acquired vocabulary; word recall (and corresponding pronunciation) is another aim of fluency development activities.

In the current study, a mixed methods quasi-experimental design was adopted with pre-/post-/delayed post-tests to measure oral fluency development. Qualitative interviews were also included to gauge learners' perceptions of Spaceteam ESL as a tool to reduce anxiety and increase WTC. Participants were stratified among two groups: (1) an experimental group (n=11), which played the game for 15 minutes as a warm-up in class for a period of 6 weeks (see http://spaceteamesl.ca for an example of typical game playing); and a control group (n=9), which engaged in "traditional" classroom activities such as info gap, story re-telling, and other interactive activities for the same period of time. It was hypothesized that the combination of in-game and peer feedback (observed in group 1) provides students with the necessary scaffolding to develop pronunciation skills (Chapelle, 2003) and oral fluency while also reducing pronunciation anxiety and raising WTC.

The following literature review provides an overview of fluency development, and will address how anxiety and WTC impact language acquisition. The review proposes how these issues can be remedied via computer-mediated communication and teamwork, and provides a background on computer- and mobile-assisted language learning. It also addresses how digital gaming is being used in second language education in order to contextualize the goals and scope of the current study.

Literature Review

Fluency Development

Development of oral fluency, or the fluidity of spoken language, is largely concerned with the temporal aspects of speech, such as rate of speech and pause length (Derwing, Munro, Thomson & Rossiter, 2009). Nation and Newton (2008) summarise the features of fluency as language use which involves real-time processing and "does not require a great deal of attention and effort" (p. 151) from the learner. In addition to encouraging fluency development, a language course should ideally have "an appropriate balance of [the] four strands," (p. 2), consisting of language learning via meaning-focused input, meaning-focused output, and intentional attention to aspects and features of language, in addition to fluency development.

This last strand, fluency development, involves the use and practice of what students already know across "the four skills of listening, speaking, reading and writing" (Nation & Newton, 2008, p. 2), with the explicit purpose of speeding up production (speaking and writing) and perception (listening or reading), and consequently encouraging automaticity. An example of an oral fluency development activity is the "4/3/2" storytelling model; in this activity, students must tell a story in 4 minutes, then repeat the same story in 3 minutes, and finally in 2 minutes, speeding up their communication of the tale with each retelling. According to the authors, fluency development activities should also include previously acquired language structures and/or vocabulary to encourage automatization: if a new language item is introduced, it is not considered to be a fluency development activity. Because of this, language teachers often prefer to devote classroom time to teaching new vocabulary or other language features rather than spending time on automatization.

While perception and non-verbal aspects are both important components in overall language fluency (Gotz, 2013), output plays a vital role in oral fluency development (Nation & Newton, 2008). According to Swain (2000), learners use output production to test their hypotheses about language: if learners do not produce output, they cannot learn from error, see how the target language functions, or automatize previously acquired language items. Producing output and learning through interaction is therefore vital for fluency development. Additional barriers, such as speaking anxiety and/or a low WTC, may further reduce chances for oral fluency development: learners experiencing high levels of anxiety and/or low WTC typically produce less output, and therefore may not be able to fully engage in language development (Gregersen & MacIntyre, 2014), as is discussed further on in this review.

Measures of Fluency Development. As mentioned above, oral fluency development is largely defined in terms of temporal elements. Measures of temporal aspects of oral fluency, such as speech rate and pause duration, are therefore commonly used in second language acquisition (SLA) research (e.g., Hird & Kirsner, 2010; Taguchi & Iwasaki, 2008), presumably because they relate to the speed and fluidity of native-like language production. However, as oral fluency consists of a variety of characteristics, studies in the literature typically combine several measures to obtain a more holistic understanding of fluency. Blake (2009), for example, used several combined temporal measures such as speech rate, phonation time ratio, articulation rate, mean length of run, and average length of pauses to evaluate oral fluency.

For the current study, a combination of common measurements is used, including syllables produced per minute (SPM) and judges' ratings of overall fluency and speech rate / frequency and duration of pauses. For the measurement of judges' ratings, a Likert-scale, found in appendix D, was generated based on the results of a pilot study. While the rating scales include temporal and

prosodic features of language, only temporal measures are examined for the purposes of the current study. Although temporal measures do not account for all aspects of oral fluency, they provide insight into the role of mobile gaming in fluency development.

Anxiety and WTC

Anxiety can have a significant impact on learners' language production and acquisition (Baran-Łucarz 2014; Dörnyei, 2005; Gregersen & MacIntyre, 2014; Horwitz et al., 1986). Dörnyei (2005) differentiates state anxiety from trait anxiety: whereas trait anxiety expresses a "predisposition to become anxious" in a variety of situations, state anxiety is more of a "moment-to-moment experience of anxiety as an emotional reaction to the current situation" (p. 198). State anxiety, which is common in the L2 classroom, has the potential to be reduced: Gregersen and MacIntyre (2014) therefore suggest that second language teachers should acknowledge and address anxiety in the L2 classroom, taking it into consideration when planning classroom activities to reduce student anxiety when possible.

Anxiety has also shown to have a negative impact on student WTC (Dörnyei, 2005; Gregersen & MacIntyre, 2014; MacIntyre, Dörnyei, Clément & Noels, 1998; Piechurska-Kuciel, 2014), particularly when the student experiences pronunciation anxiety (Baran-Łucarz, 2014). Contrary to popular belief, WTC does not simply transfer from the learner's first language (L1) to the L2 (MacIntyre et al., 1998; Piechurska-Kuciel, 2014): for instance, a student who has a high WTC in his or her L1 may not experience the same level of WTC in his or her L2. Low WTC is commonly caused by the reduced rate of self-confidence experienced by students in the L2 classroom. This state of low self-confidence in turn reduces WTC (MacIntyre et al., 1998). Students who experience pronunciation anxiety often feel as though they have a bad accent, causing embarrassment when speaking, therefore lowering WTC orally (Baran-Łucarz 2014).

Related to pronunciation anxiety is communication apprehension: students who experience communication apprehension feel "stage fright" when speaking or listening in their L2 (Horwitz et al., 1986). This apprehension also contributes to a reduced WTC, as students do not wish to "perform" in front of peers.

As anxiety and feelings of apprehension lower WTC, so too will these low levels of WTC have a negative impact on language output (Gregersen & MacIntyre, 2014). Without opportunities for language output, students cannot advance their language skills (Swain, 2000; Nation & Newton, 2008). There have been many methods suggested to help reduce anxiety in L2 learners and/or increase their WTC; two of these methods are outlined in the next section in relation to the scope and goals of this study.

Methods to reduce anxiety and increase WTC

There have been a variety of techniques proposed in the literature to reduce communication anxiety and consequently increase WTC. These include, but are not limited to: introducing relaxation techniques and explicitly addressing anxiety in the classroom (Gregersen & MacIntyre, 2014), identifying sources of anxiety (Baran-Łucarz, 2014), engaging in teamwork activities (Dornyei & Kormos, 2000), and using technology as a medium of communication (AbuSeileek, 2012; Arnold, 2007; Baralt & Gurzynski, 2011; Bradley & Lomicka, 2000; Reinders & Wattana, 2012). The latter two methods were implemented in this study via Spaceteam ESL and are further described in this section.

Teamwork. Group cohesiveness has been shown to increase verbal performance in students, encouraging students to participate in conversations and discourse (Dornyei & Kormos, 2000), which in turn encourages WTC. Dornyei and Kormos (2000) suggest that "individuals [who] spend extended time together, pursuing shared goal-directed behaviour in a context with

well-defined boundaries" are more likely to feel as though they belong to a group (p. 279), and are therefore more likely to communicate and experience a positive level of WTC. Through teamwork, participants also have the opportunity to get to know one another: as the degree of acquaintance with an individual can have an impact on learner WTC (MacIntyre et al., 1998), cooperation may help to increase student WTC.

A study conducted by AbuSeileek (2012) combined teamwork with computer-mediated communication (CMC; to be further discussed in the following section): tasks were given to groups to see if positive interdependence or individual accountability influenced teamwork more while using computers as a medium of communication. Students in the individual accountability group were responsible for completing their own tasks, but worked towards a common goal; students in the positive interdependence group, on the other hand, worked together to complete tasks as a group. Results suggest that participants in individual accountability group significantly outperformed those in the positive interdependence group, as participants felt more responsible for their own role in their team's success. These factors may also contribute to feelings of group solidarity and teamwork. As will be described later, *Spaceteam ESL* also encourages individual accountability: while all team members must work together to succeed, each player has his or her own role to carry out. As suggested by the pilot study mentioned (Grimshaw et al., 2016), the author anticipates that these factors contribute to a sense of group solidarity within the class, thereby increasing comfort to raise learner WTC and lower communication anxiety.

Computer-assisted language learning (CALL) and computer-mediated communication (CMC). Recent efforts to incorporate digital technologies into language education have shown that CALL-related tasks can be pedagogically beneficial, but must be carefully regulated. CALL tasks should ideally provide opportunities for input exposure,

interaction, and output production to be considered well-rounded language learning activities (Chapelle, 2003). Research has shown that properly structured CALL resources not only help to improve grammar, vocabulary, and pronunciation (Chapelle, 2003), but may also increase student motivation (Ducate & Lomicka 2009; Hew & Ohki 2004; Seferoglu 2005). Similarly, various forms of computer-mediated communication (CMC) may decrease learner anxiety (Arnold, 2007; Baralt & Gurzynski, 2011; Bradley & Lomicka, 2000) and increase WTC (Reinders & Wattana, 2012). In these studies, technology acts as a medium of communication which removes the pressures presented by face-to-face (FTF) communication (Arnold, 2007; Baralt & Gurzynski, 2011; Bradley & Lomicka, 2000) to encourage learner interaction (Reinders & Wattana, 2012).

In studies conducted by Arnold (2007) and Baralt and Gurzynski (2011), groups of students engaged in either CMC or face-to-face (FTF) communication. In both studies, CMC was introduced in an attempt to reduce communication anxiety. Participants in CMC groups either communicated through chat-rooms (Arnold, 2007) or social media (via Facebook or MySpace; Baralt & Gurzynski, 2011). Participants in FTF groups completed similar tasks, but interacted with each other directly. While the CMC groups showed decreased nervousness and increased self-confidence, one participant pointed out that the CMC tasks lacked the necessary pronunciation practice that builds confidence in language learning. A participant in Baralt and Gurzynski (2011) made a similar observation: she "felt that she was not really forced to address or correct her mistakes in the CMC modality as much as she was in the FTF modality" (p. 215). While written CMC can provide students with extra time to think about written answers, it does not give them the chance to communicate orally. CMC should therefore ideally provide the opportunity for oral production (with feedback) as well. Spaceteam ESL has the potential to address this issue, as will be discussed further on.

CMC has also been used to determine the effect of "disclosing/blinding the participants' identities while interacting around computers on their achievement in communication skills" (AbuSeileek, 2012, p. 233), suggesting that students who remained anonymous in group CMC interaction outperformed students who were identified by name. AbuSeileek theorizes that the anonymous students were not worried about making mistakes and being associated with those errors, and so were able to focus more on their performance rather than their errors. As will be discussed further on, although participants in the current study were not anonymous to their classmates, individual contributions (successes/failures) were. The author anticipates that by maintaining the anonymity of achievements and failures, participants may feel less negative pressure to perform in game, lowering communication anxiety.

Reinders and Wattana (2012) also suggest that CMC may increase learner WTC. In their study, a massive multiplayer online role-playing game (MMORPG) was used as a platform for student interaction. Participants interacted via text- or voice-based chat and worked together to complete tasks. Results showed that student participation (measured by the number of turns taken) and the word-count of text and oral interactions all increased over time. Results also revealed that student WTC increased after each gaming session. The effects of digital gaming on learning are discussed in more detail later in this literature review.

Although results suggest that the method presented in Reinders and Wattana (2012) was effective in increasing learner WTC, the game playing described in their research is not practical to implement in a typical second language classroom. Many classrooms do not have access to the technology necessary to participate in MMORPGs, as all students would need access to a computer. In addition, computer access typically "occurs in isolated bursts in the computer lab" and does not allow for continuous learning (Stockwell, 2007, p. 366). This method is also time-

consuming to prepare and implement in the classroom, potentially taking up vital class time. The ideal tool for students and teachers would be something that is easily accessible and involves short, but effective, communication. Mobile-assisted language learning may offer a solution to this problem.

Mobile-Assisted Language Learning: Increasing accessibility

With the increasing popularity of smartphones and other mobiles devices, mobile-assisted language learning (MALL) may offer a more accessible alternative (Ogata & Yano, 2003; Stockwell, 2007). Mobile devices "[increase] learners' capability to physically move their own learning environment with them" (Ogata & Yano, 2003, p. 2), unlike desktop computers needed for platforms such as MMORPGs in Reinders and Wattana (2012). These "mobile devices can connect to Internet with wireless communication technologies, and enable learning at anytime and anywhere" (Ogata & Yano, 2003, p. 2; also discussed in Kukulska-Hulme, 2009; Stockwell, 2007, 2010). Also, as the popularity of mobile devices increases, so does the amount of learners who possess tablets and smartphones; students can, therefore, use their own devices for language learning without needing to resort to using computer labs and other static learning environments (Stockwell, 2007).

The pedagogical use of MALL has shown promising results in terms of language development in vocabulary acquisition (Stockwell, 2007) and aspects of pronunciation (Liakin, Cardoso & Liakina, 2013; Sundberg & Cardoso, 2015). However, little research has yet been conducted into using mobile gaming as a tool for language development, despite the many language applications (apps) for mobile devices available for download around the world. The next section will provide more detail on digital gaming in second language education in general, and will discuss how it can be used in a MALL environment.

Gaming and mobile-assisted language learning. Digital gaming has been used in education for a variety of disciplines, including history, language learning, physical education, science and math (Girard, Ecalle & Magnan 2013; Young, Slota, Cutter, Jalette, Mullin, Lai, ... & Yukhymenko, 2012). Thus far, the literature addressing digital gaming in education has focused largely on students at primary and secondary levels, presumably because these age groups are the target audience of existing games. Professional training games, on the other hand, have been used for professional training with adults (Girard et al., 2013). The effectiveness of digital gaming as a learning tool, however, is currently under debate (e.g., Girard et al., 2013; Young et al., 2012), and is still viewed as simply a means of entertainment. Nevertheless, digital gaming has great potential in the field of education, particularly for second/foreign language learning (Godwin-Jones, 2014).

Interestingly, not all games used as language-learning tools were developed with clear pedagogical purposes. Indeed, games developed solely for entertainment purposes have been gaining popularity in L2 education with teacher / researcher guidance. For example, gaming has been used to aid with L2 writing (Allen, Crossley, Snow & McNamara, 2014; Hattem, 2014), grammar (Hattem, 2014), oral proficiency (Kim 2014; Lan, 2014), or to increase willingness to communicate in students (e.g., Reinders & Wattana, 2014, as discussed earlier), to name a few. Commercial games that involve multiplayer interaction, such as *World of Warcraft* and *Second Life*, have also found a place in L2 practice (Godwin-Jones, 2014), as these games create an immersive language environment accessible from anywhere with a reliable internet connection. With the high volume of English-language multiplayer games, students often choose to play these games on their own time with little intent, if any, to learn from the experience (Chik, 2014).

While non-mobile digital games have been used successfully in classroom studies, they are not easily accessible in most L2 environments, as discussed above: in-class use would require

access to a computer lab, a resource that is not always found in L2 education contexts. Gaming for language learning outside of the class can also be difficult for the average language teacher to manage and regulate. Mobile gaming, on the other hand, offers a more accessible alternative to traditional desktop and console gaming for the average student, thus offering a solution to the problems of portability and accessibility.

Despite encouraging preliminary results, gaming in MALL has not yet received sufficient attention in the literature as a tool for pedagogical practice (Liakin, Cardoso, & Liakina, 2015). In addition, it has the "potential […] for creating advanced, immersive games that do not require a room full of computers" (Godwin-Jones, 2014, p. 10): by removing limitations presented by traditional CALL activities, students may be more motivated to continue their learning experiences outside the classroom. Mobile gaming in the L2 classroom also has the potential to revitalize the language learning experience as it "create[s] learning opportunities that move out of the classroom and combine virtual and real worlds into a uniquely compelling learning experience" (Godwin-Jones, 2014, p. 10). Gaming on mobile devices presents a unique way to capture the attention of students and encourage them to engage in a different method of learning.

Mobile gaming as a means to promote fluency development, reduce speaking anxiety and increase WTC. As mentioned earlier, Nation and Newton (2008) suggest that L2 activities should include four strands for effective language learning: access to meaningful input, opportunities for meaningful output, a language focus, and fluency development, all of which should receive equal practice in the L2 classroom. While the three former strands receive most attention in the language classroom, as the authors point out, the development of oral fluency is often neglected. These activities involve putting into practice previously acquired language

features (e.g., known vocabulary and pronunciation features) in a fast but comprehensive manner (e.g., speed speaking and listening without a language focus in mind).

Little research thus far has investigated the use of mobile devices and/or digital gaming in oral fluency development. While Papadima-Sophocleous (2015) examined the use of iPads on the development of *reading* fluency, results cannot be generalized to other aspects of fluency outlined by Gotz (2013) such as spontaneous production, perception, and non-verbal fluency.

The current study uses Spaceteam ESL, a game that is portable and easily accessible, to examine its role in oral fluency development. It combines the abovementioned features afforded by the game (e.g., communication mediated by technology, recycling and practice of known vocabulary, time-sensitive interactions) to examine the effectiveness of accessible, easy-to-implement classroom-based game-playing, with the potential to create a fun, non-threatening learning environment (via teamwork and CMC) for students to practice language use. By creating a safe atmosphere via gameplay, participants potentially experience a lower level of speaking anxiety and an increased level of WTC, and will, in theory, be more able to produce the output necessary for fluency development. A more detailed description of Spaceteam ESL will be provided in the next chapter. Because this is manuscript-based MA thesis, Chapter 2 consists of a research paper ("a full submittable draft of a manuscript", as indicated in the MA thesis guidelines) in which parts of this chapter are repeated in condensed form.

Chapter 2

The development of fluency for second language learners "is important at all levels of proficiency" (Nation & Newton, 2008, p. *x*), as it encourages learners to speed up and automatize language use. However, activities which promote fluency development are often excluded from language classrooms possibly due to time constraints or to the fact that these activities involve repeating structures that students have already acquired and do not teach anything new (Nation & Newton, 2008). Fluency development may be further hindered by language learning anxiety and/or a low level of willingness to communicate (WTC) in learners (Horwitz, Horwitz & Cope, 1986).

This study aims to investigate the use of a digital collaborative mobile game, Spaceteam ESL, in second language learning, and its effect on fluency development and on reducing speaking anxiety and increasing learners' WTC. To play the game, players must engage in real-time computer-mediated interaction with other players, during which they must intelligibly produce and carry out time-sensitive oral instructions to navigate a spaceship.

A four-week pilot study was conducted in which the game was used as a warm-up activity in an English conversation class (see Grimshaw et al., 2016). The study showed promising results: participants indicated that they felt more energized after playing the game and that it helped to "open up [the mouth]", preparing articulators for use in the conversation class. Their teacher also noted that a positive mood carried over from gaming sessions, "creating an overall pleasant atmosphere" (p. 105). Participants also commented that they felt more comfortable and familiar with classmates after gameplay, and the instructor reported that students were more active in class.

In the current study, quantitative data were used to examine the influence of Spaceteam ESL on fluency development; interviews were also examined to explore student perceptions of the game as a tool to reduce anxiety and raise their WTC. It was hypothesised that the combination of

in-game interaction and peer feedback provides students with the necessary scaffolding to develop pronunciation skills (Chapelle, 2003) while also reducing pronunciation anxiety and raising WTC.

The following literature review provides an overview on the importance of fluency development, and addresses how anxiety and WTC impact language acquisition. The review then discusses how these issues can be remedied via computer-mediated communication and teamwork, and how they can be implemented via mobile gaming in the context of Spaceteam ESL.

Literature Review

Fluency Development

Development of oral fluency, or the fluidity of speech, is largely concerned with temporal aspects of speech, such as rate of speech and pause length (Derwing, Munro, Thomson & Rossiter, 2009). Nation and Newton (2008) summarise the features of fluency as language use which involves real-time processing and "does not require a great deal of attention and effort" (p. 151). A language course which encourages fluency development should have "an appropriate balance of [the] four strands" (p. 2), which consist of language learning via (1) meaning-focused input, (2) meaning-focused output, (3) intentional attention to aspects and features of language, in addition to (4) fluency development activities.

This fourth strand, fluency development, involves the use and practice of what students already know across "the four skills of listening, speaking, reading and writing" (Nation & Newton, 2008, p. 2), with the explicit purpose of speeding up production and encouraging automaticity. Fluency development activities should also include previously acquired language structures and/or vocabulary to encourage automatization. If a new language item is introduced, it is not considered a fluency development activity. Because of this "repeat and recycle" nature of

these activities, language teachers prefer to use classroom time to teach new vocabulary or other language features rather than spending time on automatization.

While perception and non-verbal aspects are both important components in overall language fluency (Gotz, 2013), production (or output) plays a vital role in oral fluency development. According to Swain (2000), learners use language production to test out their hypotheses to learn from error and to see how the target language functions. Without producing output, language learners cannot practice language, nor can they automatize their language skills; producing output and interacting with other speakers is therefore vital for oral fluency development as learners experiment with pronunciation, vocabulary, oral grammar, and so on.

Studies which measure fluency rely strongly on temporal measures (e.g., Blake, 2009; Hird & Kirsner, 2010; Taguchi & Iwasaki, 2008), presumably because these measures relate closely to Derwing et al.'s (2009) definition of fluency (above; e.g., rate of speech and pause length), and to the speed and fluidity of native-like language production. Temporal measures, therefore, appear to be the most common for rating oral fluency and will be the one used in the current study.

Language learners who do not have the opportunity to develop fluency in class may also experience a reduction in output production when faced with additional barriers such as speaking anxiety and/or a low WTC. If learners are unable to produce output as a result of high levels of anxiety and/or low WTC, they cannot fully engage in language development (Gregersen & MacIntyre, 2014). These two important issues are addressed in the following section.

Anxiety and WTC

Anxiety can have a significant impact on learners' language production and acquisition (Baran-Łucarz 2014; Dörnyei, 2005; Gregersen & MacIntyre, 2014; Horwitz et al., 1986), and often has a negative impact on learner WTC (Clément & Noels, 1998; Dörnyei, 2005; Gregersen

& MacIntyre, 2014; Piechurska-Kuciel, 2014), particularly when the student experiences pronunciation anxiety (Baran-Łucarz, 2014). Students who experience this type of anxiety often feel as though they have a bad accent, which causes embarrassment when speaking and consequently lowers their oral WTC (Baran-Łucarz 2014). Related to pronunciation anxiety is communication apprehension: students who experience communication apprehension feel "stage fright" when speaking or listening in their L2 (Horwitz et al., 1986). Low WTC is also commonly caused by the reduced rate of self-confidence experienced by students in the L2 classroom (MacIntyre et al., 1998).

As discussed earlier, anxiety and similar feelings of apprehension lower WTC and negatively influence output production (Gregersen & MacIntyre, 2014); without opportunities for language output, students cannot advance their language skills (Nation & Newton, 2008; Swain, 2000). There have been many methods suggested to help reduce anxiety in L2 learners and/or increase their WTC, two of which, teamwork and computer-mediated communication, are addressed in the current study (via the pedagogical use of digital gaming) and are described below.

Teamwork. Group cohesiveness has shown to increase verbal performance in students, encouraging them to participate in conversations and discourse, which may increase WTC: in group tasks, "individuals spend extended time together, pursuing shared goal-directed behaviour in a context with well-defined boundaries," contributing to the feeling of belonging to a group (Dornyei & Kormos, 2000, p. 279). Through teamwork, participants also have the opportunity to familiarise themselves with teammates. As the degree of acquaintance with an individual can have an impact on learner WTC (MacIntyre et al., 1998), cooperation in tasks may increase student WTC.

As suggested by the results of the pilot study (Grimshaw et al., 2016), it was anticipated that the game's teamwork component contributes to a sense of solidarity within the class, raising learner WTC, lowering communication anxiety and consequently increasing students' overall oral fluency.

Computer-mediated communication. Various forms of computer-mediated communication (CMC) have been shown to potentially decrease learner anxiety (Arnold, 2007; Baralt & Gurzynski, 2011; Bradley & Lomicka, 2000) and increase WTC (Reinders & Wattana, 2012). In these studies, technology acts as a medium of communication which removes the pressures presented by face-to-face (FTF) communication (Arnold, 2007; Baralt & Gurzynski, 2011; Bradley & Lomicka, 2000) to encourage learner interaction (Reinders & Wattana, 2012).

Studies examining the effects of CMC on levels of learner anxiety (Arnold, 2007; Baralt & Gurzynski, 2011) showed decreased levels of nervousness and increased self-confidence in participants. However, participants felt that the CMC tasks lacked the necessary pronunciation practice that builds confidence in oral communication, nor did they provide feedback on mistakes. While the written CMC used in these studies can provide students with extra time to think about written answers, it did not provide them with the opportunity to communicate orally; CMC should therefore ideally provide opportunities for oral output as well.

A study conducted by Reinders and Wattana (2012) suggests that massive multiplayer online role-playing games (MMORPG), played on desktop computers, may be effective in increasing learner WTC when used as the medium of communication. However, the use of such a tool is not practical to implement in a typical second language classroom. Many classrooms do not have access to the technology necessary to implement these types of games, as all students would need access to a computer. In addition, computer access typically "occurs in isolated bursts in the

computer lab" and does not allow for continuous learning (Stockwell, 2007, p. 366). This method is also time-consuming to prepare and implement in the classroom, potentially taking up vital class time. The ideal tool for students and teachers would be something that is easily accessible and involves short, but effective, communication. Mobile-assisted language learning may offer a solution to this problem, as is discussed next.

Mobile-Assisted Language Learning: Increasing accessibility

With the increasing popularity of smartphones and other mobiles devices, mobile-assisted language learning (MALL) may offer a more accessible alternative to learning with standard desktop computers (Ogata & Yano, 2003; Stockwell, 2007). Mobile devices "[increase] learners' capability to physically move their own learning environment with them" (Ogata & Yano, 2003, p. 2), unlike desktop computers needed for platforms such as MMORPGs. These "mobile devices can connect to Internet with wireless communication technologies, and enable learning at anytime and anywhere" (Ogata & Yano, 2003, p. 2; also discussed in Kukulska-Hulme, 2009; Stockwell 2007). As the popularity of mobile devices increases, so does the number of learners who possess tablets and smartphones; students can therefore use their own devices for language learning (Stockwell, 2007).

MALL has also shown promising results in terms of language development in vocabulary acquisition (Stockwell, 2007) and certain aspects of pronunciation (Liakin, Cardoso & Liakina, 2013; Sundberg & Cardoso, 2015). However, little research has yet been conducted into using mobile gaming as a tool for language development. This study will therefore attempt to contribute to the understanding of the role of digital gaming in MALL.

Gaming and mobile-assisted language learning. Digital gaming has been used in education for a variety of disciplines, including history, language learning, physical education,

science and math (Girard, Ecalle & Magnan 2013; Young, Slota, Cutter, Jalette, Mullin, Lai, ... & Yukhymenko, 2012). While these games are entertaining for students, their overall effectiveness as learning tools is currently under debate (e.g., Girard et al., 2013; Young et al., 2012). Nevertheless, digital gaming has great potential in the field of education, particularly for second/foreign language learning (Godwin-Jones, 2014).

Digital gaming has been used in a variety of contexts in L2 education: to aid writing (Allen, Crossley, Snow & McNamara, 2014; Hattem, 2014), to improve grammar (Hattem, 2014), to develop oral proficiency (Kim 2014; Lan, 2014), and to increase willingness to communicate in students (e.g., Reinders & Wattana, 2014). Commercial games that involve multiplayer interaction, such as *World of Warcraft* and *Second Life*, have also provided additional input and output opportunities for student practice (Godwin-Jones, 2014), as these games create immersive language environments which are accessible from anywhere with a good internet connection. With the large number of English-language multiplayer games, students often choose to play on their own time with often little intent to learn from the experience (Chik, 2014).

However, gaming for language learning purposes can present a number of shortfalls. For example, gaming outside the classroom can be difficult for the average language teacher to manage and regulate. Gaming on mobile devices, on the other hand, offers a more accessible alternative to traditional desktop and console gaming for L2 learner use, thus offering a solution to the problems of portability and accessibility discussed earlier.

Despite encouraging preliminary results, gaming in MALL has not yet received sufficient attention toward its full potential as a pedagogical practice (Liakin, Cardoso, & Liakina, 2015), especially considering its "potential […] for creating advanced, immersive games that do not require a room full of computers" (Godwin-Jones, 2014, p. 10). Mobile gaming in the L2

classroom also "create[s] learning opportunities that move out of the classroom and combine virtual and real worlds into a uniquely compelling learning experience" (Godwin-Jones, 2014, p. 10). Mobile gaming therefore has great potential in second language education.

Mobile gaming as a means to promote fluency development, reduce speaking anxiety and increase WTC. As mentioned earlier, Nation and Newton (2008) suggest that L2 activities should include a balance of all four strands for effective language learning: access to meaningful input, opportunities for meaningful output, a language focus, and fluency development. In practice, however, fluency development is often neglected in language teaching for a variety of reasons (see earlier discussion). This possibly explains why the topic is underexplored in L2 literature, particularly in the context of mobile technology and/or digital gaming. While a recent study by Papadima-Sophocleous (2015) examined the use of iPads on the development oral reading fluency, her results cannot be generalized to the other components of fluency as outlined by Gotz (2013), such as spontaneous production, perception, and non-verbal fluency. Further research must be conducted with mobile devices to examine their potential for encouraging fluency development.

The current study uses Spaceteam ESL, a game that is portable and easily accessible, to examine its role in oral fluency development. It combines the abovementioned features afforded by the game (e.g., communication mediated by technology, recycling and practice of known vocabulary, time-sensitive interactions) to examine the effectiveness of accessible, easy-to-implement classroom-based game playing, with the potential to create a fun, non-threatening learning environment, via teamwork and CMC, for students to practice language use. By creating a safe atmosphere through gameplay, participants may experience lower levels of speaking anxiety and increased levels of WTC, and may be able to produce the output necessary for fluency

development. A more detailed description of Spaceteam ESL and the methodology adopted in the study are provided in the following section.

Methodology

Spaceteam ESL: The Current Study

Spaceteam ESL is a free digital, interactive gaming application (app) played on mobile devices. The game was developed by David Waddington and Walcir Cardoso, and is based on the original Spaceteam mobile game created by Henry Smith of *Sleeping Beast Games* (SleepingBeastGames.com). In the game, players, in teams of 2-4, must shout instructions at each other to achieve an end goal: to pilot a spaceship. Each team member is presented with a unique panel of buttons and dials, and is provided with a unique set of instructions; an individual's instructions correspond with one of the team member's panels. In order to complete a series of tasks, players must interact orally with team members to communicate instructions. Players have a limited amount of time to communicate these instructions and/or carry them out. An illustration of the interface of Spaceteam ESL is provided in Figure 1.

Figure 2. Spaceteam ESL: The interface

The instructions that players must convey in Spaceteam ESL are randomly generated following verb + modifier/noun + prepositional phrase/noun combinations using vocabulary from most frequently-used word lists (e.g., “save brown space chicken”, “set astro-cat to 1” – the latter example is illustrated in Figure 1); this allows for practice using more familiar words, a requirement of fluency development activities. As game levels increase, so does the complexity of the vocabulary (in terms of word-level frequency and pronunciation difficulty). Players must therefore be fluent (i.e., both intelligible and fast in speaking) so that their teammates can successfully receive and interpret the instructions within a pre-specified timeframe (usually a few seconds, depending on the level of difficulty).

It is essential that players work together as a team to succeed in the game: each player is individually accountable for carrying out his/her actions to ensure the team’s success. However, actions by individuals remain anonymous, therefore potentially removing some performance anxiety. The format of the game allows players to interact via computer-mediated communication: while still in the same room, the game and mobile device ideally helps to remove the pressures of face-to-face communication and provides opportunities for oral production with peer feedback. The most common form of peer feedback observed in the pilot study appeared in the form of recasts. For example, when a misunderstanding occurred, the student-interlocutor often repeated a mispronounced word to confirm whether it was the intended one, such as “*shut* down” instead of “*shoot* down”. The written commands on the screen provide additional clues to the student-interlocutor for interpreting their teammate’s commands; the student-interlocutor can then provide peer feedback based on what is heard and read. The command-giver would then ideally recognise and repeat the correct form, as the vocabulary should already be familiar to them.

Spaceteam ESL fulfils the requirements of a fluency development activity as outlined by Nation and Newton (2008), as it encourages players to interact through meaningful activity (working together to pilot a spaceship) and speed up language use. The main goal of the game is focused "on receiving or conveying meaning" and provides "a large amount of input or output" (p. 7). As Spaceteam ESL does not explicitly target a specific language feature, the game fulfills another requirement of Nation's (2008) fourth strand of fluency development: "where all language items are within their previous experience," and provides players with "support and encouragement […] to perform at a higher than normal level" (pp. 152-153). The game also fulfils the requirements of a well-rounded CALL task, as outlined in Chapelle (2003): it provides enhanced input (via the practice feature), interaction (via game-play), and ample chance for production.

The study addresses the following two research questions:

1. Does playing Spaceteam ESL affect fluency development in English as a second language learners?
2. What are learner perceptions of Spaceteam ESL as a tool to reduce anxiety and/or increase WTC?

To answer the first research question, quantitative data were analysed to measure fluency development. Qualitative data, collected from semi-structured interviews, were used to create categories (based on the scope of this study) for analysis to answer the second research question. When used as a warm-up activity for L2 classes, it was predicted that the game would be perceived as fun and engaging, with the potential to provide a variety of learning opportunities in second language education. More importantly, it was hypothesized that game playing would have a positive effect on oral fluency development. Although not created as a tool to teach language,

Spaceteam ESL can be considered a pedagogical game in that it allows students to practice L2 interaction in an entertaining and non-threatening manner.

Method

Participants. The participants were 20 English as a second language students attending a college in Quebec (M = 10, F = 10). Mean participant age was 21.4 (SD = 0.69), and all spoke French as their L1 (only one had a different first language; however, French was a common language used in his country of origin, so his fluency was native-like). All participants were placed at the same proficiency level (high-beginner) by the institution. The participant pool was comprised of two different ESL classes at the same school, both of which had the same instructor. The instructor was a Canadian native English speaker who specializes in teaching beginner students. Four additional students from the treatment group (not computed in the total above) were included in the qualitative analysis: although all students in the treatment group participated in gameplay and testing sessions, these participants were not included in the fluency development analysis because they had also participated in extracurricular conversation groups, which may have affected their fluency development scores. However, as their interviews provided interesting insight into the pedagogical uses of the game, their qualitative data were included in the analysis.

Institution and Location. Students who originate from Quebec begin studying English as a second language when they enter the first grade at six years old. After completing secondary school in Quebec, Canada, at sixteen years old, many students attend college, or *cégep*, for an additional two-year period before pursuing studies at other post-secondary institutions. Here, students must complete a minimum of two English language credits: even though most students have been studying English as a second language for more than eight years (for approximately 2-

3 hours per week), many students lack confidence in their language skills when they enter *cégep*, and are typically not highly proficient.

The institution participating in the study is situated in a city in Southern Quebec. It is the largest city in the area, and the college attracts students from surrounding rural areas: in this context, English should be considered a "foreign" language. Accordingly, these students often experience high levels of anxiety and low levels of WTC when communicating in English as they have had limited exposure to native speakers. The instructor mentioned that these students typically felt more confident when speaking English with a native speaker, but felt less confident and less willing to communicate with peers as they did not wish to "lose face"; accordingly, they often avoided participating in class.

Design

An experimental design was used, consisting of two groups (an experimental and a control), randomly assigned. The independent variable was the treatment: whether participants played Spaceteam ESL as a warm-up activity or whether they completed a conversation activity designed by the researcher. The dependent variable was oral fluency development. The study followed a mixed-methods, between-groups design. Quantitative measures were presented in the form of pre-, post-, and delayed post-tests (found in appendix B) that were used to measure the dependent variable. These tests were measured via syllables per minute calculations, and judges' assessment of speech recordings. Syllables per minute (SPM) were coded manually twice by the researcher. An intra-rating reliability analysis using the Kappa statistic was performed to determine consistency between ratings. Any scores with a difference of more than 2 SPM were examined a third time; any differences, if not significant, were then averaged.

Ten native speakers and ten non-native speakers, all of whom were teachers of English as a second language, also rated 10-second speech samples (n=60, one for each participant for each test) on a 6-point Likert scale, ranging from, for example, “not natural” to “natural” (see appendix D). Samples were rated based on a number of measures related to oral fluency; however, only ratings for overall oral fluency and temporal measures (speech rate/pauses) were analysed for the current study.

For the qualitative analysis, the transcripts of the seven semi-structured interviews were analysed to generate categories based on topics that emerged in discussion related to themes in the literature and the scope of the study. These categories are further analysed in the proceeding section to answer the second research question: What are learner perceptions of Spaceteam ESL as a tool to reduce anxiety and/or increase WTC?

Results

Syllables per minute

A repeated measures factoral design test was conducted to measure the difference between the treatment and control groups from pre-test to delayed post-test, in which the independent variable was the treatment and the dependent variable was SPM produced (for the pre-/post-/delayed post-test). Results indicate that there was not a significant difference in improvement between groups over time (table 1), as $p = .395$. The intra-rater reliability between calculations of SPM was found to be 36.67%.

Paired-samples t-tests were also conducted, one for the treatment group and one for the control group; see Table 1 for the means for each group across the three tests. On average, the treatment group improved from pre-test (M = 108.27, SE = 8.36) to post-test (M = 111.09, SE = 8.76). However, this difference, −2.82, BCa 95% CI [−17.64, 12.01], was not significant $t(10) =$

−.42, p = .68, and represented a small-sized effect, r = 0.13. The control group, on the other hand, decreased in performance from pre-test (M = 112.67, SE = 10.21) to post-test (M = 101.78, SE = 7.71). This difference, 10.89, BCa 95% CI [-4.71, 26.48], was also found to be not significant $t(8)$ = 1.61, p = .146, but represented a large effect size of r = 0.5.

Table 1. SPM for storytelling task.

Group	**Pre-test**		**Post-test**		**Delayed Post-test**	
	M	SD	M	SD	M	SD
Treatment	108.27	27.72	111.09	27.71	120.27	25.82
Control	112.67	30.63	101.78	23.13	123.78	29.59

Judges' Ratings

Twenty trained judges (10 native speakers, 10 non-native speakers) rated speech samples for the storytelling task (about their summer vacation) from pre-test, post-test, and delayed post-test. The intraclass correlation coefficient was for overall fluency was calculated at 96.1%, and 95.1% for ratings of speech rate / pauses, suggesting a high correlation between judges' ratings.

Overall Fluency: judges' ratings. Judges' ratings for the category of "overall fluency", based on a 6-point Likert scale ranging from very dysfluent to very fluent (see appendix D), were examined at the pre-, post-, and delayed post-tests. A repeated measures factoral design test was conducted for each test and results indicate that there was not a significant difference in improvement between the treatment and control groups over time (see table 2), as p = .113.

Paired-samples t-tests were also calculated, one for the treatment group and one for the control group. On average, judges rated the treatment group higher from pre-test (M = 3.5682, SE = .1541) to post-test (M = 3.7136, SE = .1391). However, this difference, -.14545, BCa 95% CI [-.46815, .17724], was not significant $t(10) = -1.004$, p = .339, and represented a small-sized effect, r = .3348. The control group, on the other hand, decreased in performance from pre-test (M =

3.511, SE = .1524) to post-test (M = 3.1444, SE = .1130). This difference, .36667, BCa 95% CI -.06943, .80276], was also found to be not significant $t(8) = 1.939$, $p = .089$, but represented a large effect size of $r = .5654$. Table 2 illustrates the overall results obtained.

Table 2. Overall fluency ratings for storytelling task.

Group	**Pre-test**		**Post-test**		**Delayed Post-test**	
	M	SD	M	SD	M	SD
Treatment	3.57	0.54	3.71	0.51	3.85	0.51
Control	3.51	0.49	3.14	0.36	3.52	0.70

Speech rate/pauses: judges' ratings. A repeated measures factoral design test was conducted and results indicate that there was no significant difference in improvement between groups over time, according to judges' ratings of rate/pauses (see table 3), as $p = .122$.

Paired-samples t-tests were also calculated, one for the treatment group and one for the control group. On average, judges rated the treatment group higher from pre-test (M = 3.3227, SE = .18183) to post-test (M = 3.5136, SE = .17698). However, this difference, −.19091, BCa 95% CI [−.53929, .15747], was not significant $t(10) = -1.221$, $p = .250$, and represented a large-sized effect, $r = .4857$. The control group, on the other hand, again decreased from pre-test (M = 3.3489, SE = .14074) to post-test (M = 3.00, SE = .10240). This difference, .34889, BCa 95% CI [.06411, .63367], was found to be significant $t(8) = 2.825$, $p = .022$, and represented a very large effect size of $r = 0.706678$.

Table 3. Speech rate/pause ratings for storytelling task.

Group	**Pre-test**		**Post-test**		**Delayed Post-test**	
	M	SD	M	SD	M	SD
Treatment	M = 3.32	SD = 0.60	M = 3.51	SD = 0.59	M = 3.72	SD = 0.55
Control	M = 3.34	SD = 0.42	M = 3.00	SD = 0.31	M = 3.26	SD = 0.93

Learner Perspectives

To answer the second research question regarding learners' perceptions of Spaceteam ESL as a pedagogical tool to reduce anxiety and increase WTC, categories were created based on analyses from the semi-structured interviews that participants from the treatment group completed after the post-test in week 6. While relevant comments are included below, a more extensive selection (organised by participant and theme) can be found in appendix F. Interviews were conducted with a total of seven participants; some additional participants were included in this group (n = 3) that were not included in the fluency development analysis. As mentioned earlier, these students participated in gameplay and testing sessions, but were excluded from the fluency development analysis because they were also involved in extracurricular conversation groups, which may have influenced their fluency scores in the oral production tests.

Anxiety. Most participants noted that they felt less anxious than usual in class after playing the game: "[I feel] a little more [comfortable] than I am normally", "I feel good, it's funny. For this I feel relaxed." Some participants commented that the game helped to reduce the level of embarrassment they felt in class: "it's more embarrassing before I play the game, but after ... I am [embarrassed] but it's slowly less"; "I just have to read, I think it's not embarrassing, you just game in group." In addition, participants also perceived that the game reduced feelings of anxiety, allowing them to practice their pronunciation with peers: "I feel relaxed, the game is funny, and to [speak] with other people at the same level, it's ok", "[I] feel good ... because we practiced to tell the word we don't know". In other words, although the oral output was forced during gameplay, the "fun" aspect of the experience helped to reduce anxiety and therefore encouraged pronunciation practice. The CMC element of gameplay also appears to have reduced

communication anxiety: “It's more easy to speak to other people when I don't see this, when I see the screen.”

WTC. With regard to WTC, some participants suggested that they felt the same in class after playing the game, and experienced no change in WTC. As one student stated, “I'm comfortable if I don't speak [in class]”, and therefore did not participate in class. For others, the game appeared to be more engaging than other classroom activities: “it's fun, it's more fun than English class, we can learn when you play so it's fun”. Interestingly, the time constraints on output production imposed by the game also seems to have encouraged students to produce more output than in normal classroom activities: “I use more English in [a short period of] time ... because in class I never speak because I don't like”. However, any higher levels of WTC experienced during gameplay did not appear to have an effect on WTC in class.

Teamwork. Participants readily recognised that success in the game was dependent on successful teamwork. Not only do players need to work together to succeed, but they are reliant on each other for feedback on their pronunciation: if a player’s teammate misunderstands a command, then they know that they have made a pronunciation error: “If you tell a sentence and the other people don't understand … you need to have a good [speaking] and a good [listening].” When players recognise their errors, they would often repeat the words, playing with or modifying their pronunciation: “If it's my word that not are completed, I will repeat ... if I don't understand that another person tell, yes, I will ask him to repeat.” One participant found the teamwork aspect of the game to be particularly motivating, stating that success in the game “[is] not for me, it's for team spirit, it's not just me, it's all my team to try to learn English”. In this particular gameplay, each team member contributes to the learning experience of their peers.

Familiarity. Some participants reported that playing Spaceteam ESL helped them to familiarise with their classmates: “It made me work with a people I never talked, so we are laughing and that's fun.” Players also mentioned that the experience helped to facilitate interaction with peers to create a comfortable learning environment: “I talk when I play on the iPads … and after we talk [about] the game. [It helps me] to have communication with other people in my class”; “I was probably more comfortable to talk with them [during the game].” It is unclear, however, if this had an impact on their interactions in class after gameplay.

Discussion

This study investigated the effects of playing the mobile teambuilding game Spaceteam ESL on fluency development and examined participants’ perceptions of the game as a tool to reduce anxiety and increase WTC. Two research questions were addressed: Does playing Spaceteam ESL affect fluency development in English as a second language learners? What are learner perceptions of Spaceteam ESL as a tool to reduce anxiety and/or increase WTC?

For the first research question, results showed no significant difference between the treatment and control groups. However, evidence shows a trend in which the treatment group outperformed the control group from pre-test to post-test. For the second research question, data collected from participant interviews revealed that the game was positively perceived as a means to lower anxiety and encourage pronunciation practice; results regarding WTC were inconclusive. A discussion of the findings with respect to the two research questions follows.

Fluency Development

While results suggest that there was no significant difference in improvement between the treatment and control group between pre-test, post-test, and delayed post-test, the results do show a general trend favouring the group engaged in game playing. This trend, shown in SPM results

for the storytelling task (table 1) and in judges' ratings (tables 2 and 3), suggests that although there was no significant improvement over time, the treatment group did appear to improve slightly between pre- and post-tests, whereas the control group remained the same or even decreased in performance between the tests. Participants in the treatment group continued to improve through the delayed post-test; the control group, interestingly, also improved from pre-test to delayed post-test, despite their decline in performance at the post-test.

Judges' ratings for overall fluency and speech rate/pauses suggest a similar trend: while participants from both groups perform similarly on the pre-test and delayed post-test, the treatment group shows steady improvement while the control group's performance decreases again for the post-test. These results reiterate Derwing et al.'s (2009) suggestion that speech rate and pauses play a significant role in the definition of fluency: judges' ratings for overall fluency and rate of speech / pauses between tests reflected one another: as fluency ratings increased (or decreased), so did scores for speech rate / pauses as rated by judges. Therefore, as students increased their fluency, their speech rate and pauses became more natural, and vice versa.

These trends in fluency development observed for the treatment group may correlate to the predictions of Swain's output hypothesis. As discussed earlier, Swain (2000) suggests that students learn through output/production practice in their L2 as they need to experiment with their hypotheses regarding the language and its structures, to see how the language functions, and to learn from trial and error. When engaging in Spaceteam ESL, players were forced to produce output: if they did not say their commands orally, their team would not be successful. Players were therefore held accountable for their actions, and were thus more likely to work harder because of this (AbuSeileek, 2012). This "forced" output also allowed players to experiment with

pronunciation and receive peer feedback based on success or errors, thereby supporting Swain's output hypothesis.

Output (oral production) is also a requirement for fluency development (Nation & Newton, 2008). Not only are players required to produce output to be successful, but they must do so in a limited amount of time. In the current study, participants were encouraged to increase the game speed as they progressed through the weeks. This attention to the speeding up of language use may have contributed to the treatment group's progressive increase in SPM scores, as well as judges' ratings for overall fluency and speech rate / pauses. While participants in the control group also had to produce output in a limited amount of time to complete their tasks, there was not the same amount of time pressure or need for feedback as in Spaceteam ESL. These students may therefore not have felt the need to perform efficiently. However, as the results for the treatment and control groups were not significant, a longer treatment period for both groups is required to help better understand the relationship between mobile gaming and fluency development.

The timing of the post- and delayed post-tests may provide an explanation for the insignificant results for the treatment group and the decline in performance for the control group. There were a number of factors that were out of the researcher's control. Most significantly, there was a week's break between the treatment session in weeks 5 and 6 for the *cégep*'s spring break, during which participants had little exposure to English. Participants also had a mid-term oral evaluation which preceded testing in weeks 6 and 7, further distracting them from their testing performance. Due to a number of extraneous circumstances (e.g., the oral evaluation), the length of the last treatment in week 6 was also reduced to 5-10 minutes.

Despite the unfortunate timing of the post- and delayed post-tests, participants in the treatment group displayed an overall pattern of improvement, albeit non-significant, as mentioned

earlier. This suggests that Spaceteam ESL has the potential to be used as an effective warm-up, comparable to standard warm-up activities. Contrary to traditional classroom activities, Spaceteam ESL offers students and teachers a "pre-packaged" fluency development activity (as outlined by Nation & Newton, 2008), as it encourages players to speed up their use of familiar language items. It also requires little preparation and planning, unlike paper-based or conversation activities prepared by the teacher. Spaceteam ESL does not require access to a computer lab, and is readily available on mobile devices; this increases the portability and accessibility of the game as a fluency development activity, following recommendations by Ogata and Yano (2003), Stockwell (2007), and Godwin-Jones (2014).

In addition, the game may be used by students outside of the class to continue oral production practice with friends and/or family members. According to the Cambridge English Support Site, the average English as a second language student requires more than 600 hours of instruction/practice to reach the intermediate level, or over 1,000 hours to reach the advanced level. However, language students at the *cégep*, which are fairly representative of young English language learners in Quebec, received three hours of in-class time a week (during the school year), with an additional hour or two of homework (averaged, based on classroom observation during the study), resulting in a generous amount of 180 hours of contact with the L2 in a school year (Grimshaw & Cardoso, 2015). Summer vacation time (3-4 months, depending on the level) is also detrimental in L2 learning, as students forget much of what was learned during the school year. As mentioned earlier in the methods section, although the participants have been studying English for an average of eight years, they often do not make significant progress over the course of their language learning training, possibly due to their limited number of exposure to the target language and the lack of distributed and retrieval practice, as recommended by Roediger and Pyc (2012).

Nation and Macalister (2010) call for teachers and curriculum developers to "work within the constraint" or "[overcome] the constraint" of time in the classroom to maximize the learning experience (p. 20). By encouraging and motivating students to continue practicing the L2 outside the classroom, language teachers can compensate for limited class time and learners can become more proficient and fluent in a shorter period of time. Spaceteam ESL may therefore offer a tool to encourage students to practice oral production outside the classroom, contributing to their fluency development and compensating for gaps in class time.

Learner Perspectives

Interviews with participants suggest that Spaceteam ESL was positively perceived by the class, and participants generally experienced feelings of comfort while engaging in gameplay. For a participant, for example, gameplay made him "feel a little more [comfortable] than [he is] normally". As seen in the literature, the CMC element of the game may have contributed to the creation of a comfortable atmosphere, reducing the pressure and anxiety of face-to-face communication by allowing students to focus on the device's screen, gameplay, and giving and receiving input/output rather than on how others may perceive their performance. Another participant expressed this idea clearly: "It's more easy to speak to other people when I don't see this, when I see the screen", corroborating the findings of other studies addressing anxiety and CMC (e.g. Bradley & Lomicka, 2000; Arnold, 2007; Baralt & Gurzynski, 2011). The fun and familiar aspect of mobile gaming may also help to reduce anxiety: "good, it's [fun], for this I feel relaxed".

Participant comments also suggest that the teamwork aspect of the game was beneficial in two different ways: it helped to increase familiarity between peers and provided players with peer feedback. This corroborates Dornyei and Kormos (2000) and MacIntyre et al. (1998) notion that

group tasks can contribute to a sense of belonging and increase familiarity between group members, which in turn should increase student WTC. As one of the participants pointed out, “I was probably more comfortable to talk with [my peers]” during gameplay, suggesting that WTC levels were higher during gameplay than in other tasks. The fun aspect of gameplay, as suggested earlier, may also encourage players to participate and use English, as admitted by a participant, for whom the game was “more fun than English class, we can learn when you play so it's fun”. Warschauer and Healey (1998) suggest this “fun” aspect of gameplay may be motivating for language learners, encouraging participation.

It is not clear, however, if the benefits of game play influenced student WTC in other contexts, in or outside of the classroom. While participants expressed feeling more comfortable and less anxious after the experience, they did not admit to speaking more often in class. It is possible then that the predictions for raised WTC in the classroom after game play may have been misplaced: Jeffery Steele (University of Toronto; personal communication) pointed out that while WTC may have increased while participants played the game, WTC levels could not be expected to carry over into a completely different task setting. Players may have been more willing to produce language during gameplay, but the gaming environment is very different from the classroom and/or testing environments. It is therefore unclear whether the WTC experienced during gaming sessions carried over into class, contrary to what was suggested by the pilot study. Despite this, participants still experienced the forced output required by Spaceteam ESL, which required them to produce and use language in an intelligible manner in a constrained period of time.

Conclusions

Spaceteam ESL offers a combination of features to encourage fluency development: not only does it address all requirements for a fluency development activity as outlined by Nation and Newton (2008), but it also provides the safety of CMC with opportunities for oral output and immediate feedback, addressing the missing component of previous CMC studies (e.g., Baralt & Gurzynski, 2011). The game also offers a fluency development activity which is pre-prepared and ready for use in the language classroom, requiring little preparation from the classroom teacher. Although results in fluency development between the treatment and control groups were not significant, the data suggest that playing Spaceteam ESL as a warm-up activity may affect fluency development and related aspects of speech such as rate of speech as well as frequency and duration of pauses. Further research, under more controllable circumstances, is needed to determine how much the game can truly have an effect on the development of oral fluency.

A number of factors contributed to reduced levels of anxiety. As participants reported in the interviews, gameplay increased feelings of comfort with English in general and encouraged familiarity among peers, contributing to a favourable learning environment. Participants were also able to practice their pronunciation and receive feedback from peers in a non-threatening manner as a result of the teamwork aspect of the game: players are not judged for errors, and teammates frequently help one another. Unlike the results we see for anxiety, further investigation is required to determine the impact, if any, on student levels of WTC after gameplay, as this was not clearly addressed in the data extracted from participant interviews.

There were several limitations in the study, some of which were technical in nature, others methodological. Focusing on the technical limitations first, there were some difficulties at the institution where the data were collected (e.g., the malfunctioning of some iPads), resulting in

some delays during class. Also, because of the limited number of iPads available (n=15), not all students were to play at the same time; while all students were still able to participate, the instructor commented that it was distracting to have two groups completing two different activities at the same time. Another significant limitation was the timing of the post- and delayed post-test, mentioned earlier. Because the testing took place after a week of vacation and following mid-term oral evaluations, some participants commented that they were tired and were not eager to participate. This is reflected in the quantitative results, as the performance of some individuals (in both groups) reduced from pre-test to post-test. In future studies, the researcher is keen to replicate this investigation over a longer period of time (i.e., a full school semester) under more controllable circumstances.

As seen in previous studies (Liakin et al., 2013; Papadima-Sophocleous, 2015; Stockwell, 2007; Sundberg & Cardoso, 2015), the implementation of mobile devices has demonstrated success when used by language learners. Digital gaming has also shown promise, and has been used to develop a variety of language skills (Allen et al., 2014; Hattem, 2014; Kim 2014; Lan, 2014; Reinders & Wattana, 2014). Despite the limitations faced in the study, results suggest that mobile "shouting" games such as Spaceteam ESL may be beneficial to encouraging oral fluency development while reducing learner anxiety. Spaceteam ESL, like many other mobile applications, offers a ready-made language practice activity which can be used anywhere by anyone. With endless possibilities, the use of mobile gaming in second language education may prove to be invaluable to language learners and teachers alike.

Chapter 3

This chapter first expands upon the conclusions drawn in the previous section and examines related phenomena that emerged during analysis. It will then discuss future directions, including insight into how the data may be further analysed and suggestions for future studies based on Spaceteam ESL.

General conclusions

As discussed in the previous chapter, trends in the data suggest that Spaceteam ESL shows potential to be used as a tool to increase fluency development, reduce anxiety, and raise WTC in language learners. Although SPM scores for the treatment and control group were not significantly different, nor was there a significant difference between tests, these trends suggest that Spaceteam ESL may, at the very least, be as effective as traditional classroom activities. Both groups faced the same issues with the timing of the post- and delayed post-tests; however, the treatment group still managed to slightly (but not statistically significantly) outperform the control group on the post-test. This suggests that Spaceteam ESL has the potential to be an effective fluency development activity in comparison with traditional classroom tasks. Whereas traditional activities take time to plan and prepare, however, Spaceteam ESL offers a ready-to-go activity which saves time for both teachers and students. The game also presents teachers with a fluency development activity that will not consume a significant amount of class time. However, in order for a successful implementation of the game (or similar mobile device-based activities), it is imperative that teachers and/or the institute's technical services department gain proper training. As both the teacher and the institute were new to using iPads in such a manner, we faced several technical difficulties which occasionally delayed use of the game in class; these difficulties were due to issues related to the devices and network connectivity, not the game itself.

According to the interviewees, Spaceteam ESL creates a comfortable environment in which they feel relaxed enough to practice and experiment with pronunciation. Although some participants reported feeling "stressed" during gameplay, they agreed that it was a positive type of stress, which encouraged them to perform well and speed up language use. For example, one participant commented that he "[felt] relaxed, the game is funny, and to [read words aloud] with other people at the same level, it's ok". The "fun" aspect of the game and the fact that the other players were at the same English level helped this student to feel more relaxed and experiment with pronunciation. As posited by Gregersen and MacIntyre (2014), if students feel less anxious, they are more likely to be willing to process input and produce output, factors which are necessary for fluency development (Swain, 2000). Another participant mentioned that the game "helped [him] to talk more", therefore making him producing more output, and that it also helped him practice the pronunciation of select vocabulary words.

Not only did the game encourage players to feel more relaxed to practice their pronunciation, but it also helped to engage a particular student demographic. The instructor, in an interview with the researcher, reported that young male learners around the ages 17-21 were previously difficult to engage in classroom activities. These male students, however, became absorbed in the game and were far more engaged in this activity than in others: "it brought up their sense of involvement … they seemed more involved. The girls are usually quite involved in the classes. … In some classes, it's a concern, how do we get them more involved in language classes?" By using the game as a warm-up activity in the language classroom, we see involvement and engagement from students who were previously perceived as passive.

As seen in the above example involving young male learners, individual differences can have an impact on how students perceive and benefit from the game. Individual differences

"identify attributes on which people differ (e.g., aptitude) and then relate such attributes to different performances in, for example, learning" (Skehan, 1991, p. 275). These differences may help us to understand our results. They may explain, for example, why some participants demonstrated a clear improvement while others plateaued. For example, one participant improved from pre-test to delayed post-test in SPM scores as follows: 148, 160, and 172, showing a clear progression. Another participant, on the other hand, showed very little change across the three tests: 95, 96, and 105 respectively. There are many individual differences which may have affected these outcomes, as each participant had their own past personal experience as well as their own levels of motivation, preferences for learning, and preconceived notions about digital gaming. Indeed, when Poels, De Kort, and Ijsselsteijn (2007) surveyed a focus group about their gaming habits, they discovered that even within the group, participants expressed a wide variety of preferences with regards to game types, with whom they play, when they play, and so on. This alone suggests that playing digital games in class may not appeal to everyone, regardless of other individual differences. Chapelle (2003) suggests that implementing tools which observe human-computer interaction is essential "for identifying individual differences in learners' behaviour that have implications for design and use of the environment" (p. 104). This information can aid researchers in creating improved tasks which are appealing and beneficial for more students.

The following section examines the future directions to further explore the implications of using Spaceteam ESL (and other digital games) as a tool for language learning.

Future directions

Mobile-assisted language learning and digital gaming offer endless possibilities for second language education. This section proposes future research to further delve into the understanding of Spaceteam ESL (as a pedagogical tool) and fluency based on the findings of the current study.

Replication. A replication of the current study in a more controllable environment is necessary to further understand the relationship between Spaceteam ESL, fluency development, and levels of anxiety and WTC. Firstly, the treatment period should ideally last the duration of a school semester, and secondly, there should limited interruptions in the treatment or testing phases. As mentioned in the previous chapter, the post- and delayed post-tests took place at inconvenient times during the semester, and some adjustments had to be made which were not ideal (e.g., a shortened set of activities for the last session). By repeating the study in a more controllable environment with minimal extenuating circumstances, the researcher anticipates that results regarding fluency development may be more conclusive.

Other language skills. Spaceteam ESL has the potential to be used as a tool to develop other language skills. For example, as players are exposed repeatedly to vocabulary and grammar structures (i.e., imperative mood), it would be worthwhile to investigate if exposure to these language items implicitly carries over into uses outside of gameplay. It would also be beneficial to investigate the impact of the game on other types of fluency: while the current study measured fluency in speaking/pronunciation, listening fluency, or the processing of aural communication, may also be influenced by gameplay as players must quickly interpret orders received from other teammates. Finally, it is believed that reading fluency (measured in tasks 1 and 2, not analyzed in the current study; see appendix B for task descriptions), a skill that involves the automatized reading of a written text, may also be influenced by gameplay; analysis of tasks 1 and 2 may shed light on the game's role in reading fluency.

Listen-and-repeat: additional pronunciation practice. Pronunciation instruction has changed significantly over the years, particularly with recent technological advances. Although the listen-and-repeat drill exercise has received criticism over the years, it has still been shown to

be beneficial in pronunciation training (Jones, 1997). One benefit of such a task is that students may repeat the recordings as much as they wish, a task which they cannot ask a human speaker to do, particularly when none are available.

As part of her doctoral thesis, Aufderhaar (2004) implemented a listen-and-repeat task in which participants repeated after tracks on a CD. Comments from participants show that the task may have a positive impact on fluency. Participant comments reveal that the task assisted them in the perception and production of language features. One student commented that "if you improve your listening and pronunciation, of course you can improve your English fluency" and that "all three [perception, production, and fluency] are related" (as quoted in Aufderhaar, 2004, p. 71). When used in conjunction with other fluency development activities, the listen-and-repeat task may complement these tasks to encourage further development.

Spaceteam ESL also offers a practice feature that could be used as a technology-enhanced "listen-and-repeat" activity. This feature allows players to select vocabulary lists based on the level of difficulty (1-5) and listen to a computer-generated recording of the selected words. Players also have the option to record themselves saying the words, allowing them to compare their recordings with the computer-generated voice (see figure 2 for an illustration of the listen-and-repeat interface on Spaceteam ESL). While no feedback is provided, players can practice these words as many times as they wish, allowing them to self-monitor their own pronunciation. In addition, this practice feature can provide players with a more individualized practice which can be completed inside or outside the classroom.

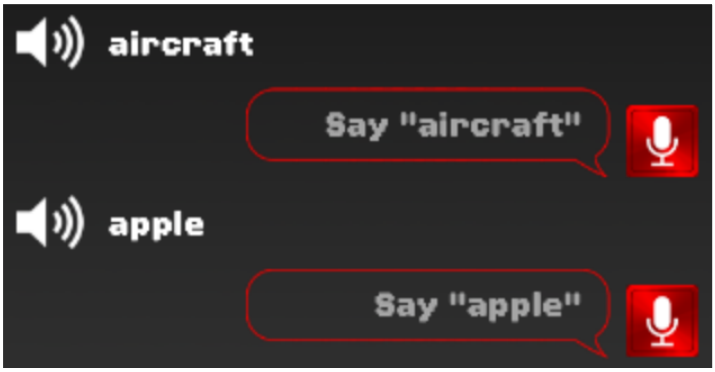

Figure 3. Listen-and-repeat practice feature

In future research, it would be worthwhile to pair Spaceteam ESL with additional text-to-speech (TTS) and automatic speech recognition (ASR) software. The study could then use TTS and ASR to provide additional input and output opportunities (respectively) to complement the foreign language classroom. Spaceteam ESL would then act as a fluency development activity for students to practice the knowledge gained from TTS and ASR.

Fluency measures and related concepts. In this study, participants produced recordings for two other tasks for the pre-test, post-test, and delayed post-test in which they read a list of words (task 1) and phrases (task 2; see appendix B). To examine these data, syllables per second (SPS) and judges' ratings will be analysed to further compare and investigate the influence of the game on reading fluency versus free speaking activities (as in the storytelling task). Pause length and duration will also be measured for all speech samples to continue the investigation into fluency development using additional measures. Additional segmental and suprasegmental features will also be rated.

The two groups of judges included in this study (10 native and 10 non-native speakers of English) also rated recordings based on the participants' production of stress patterns (a prosodic element of fluency), and on their levels of comprehensibility and accentedness (features related to fluency, according to Derwing & Munro, 1997). Preliminary results suggest that the treatment

group showed more improvement on word stress and were ranked as being less accented from pre-test to post-test than the control group. These results regarding accentedness reiterate findings from the literature: as Trofimovich and Baker (2006) discovered, speech rate and pause duration are more likely to contribute to a foreign accent than other suprasegmentals. As participants from the treatment group showed more improvement in SPM, speech rate, and pause length/duration, it is natural that their speech would be perceived as less accented in the post- and delayed post-tests. Data collected from these judges will also be used in a study that will examine how individuals from different L1s rate fluency and related features, and which factors they take into consideration when completing these ratings. By conducting this research in a more comprehensive manner, we hope to contribute to the understanding of measures of fluency, as a consistent method of measurement is required for consistency (Kormos & Denes, 2004).

French speech samples were also recorded for the storytelling task so that we could verify whether aspects of the L1 such as speech rate were transferred to the target English language (see Bell, 1995 for a similar approach focusing on young learners). In the scope of the current study, for example, a participant's speech rate in his/her L1 may influence his/her speech rate in the L2. However, findings from Derwing et al. (2009) suggest that while there is variability in L1 fluency, L1 fluency does not appear to influence L2 fluency development. We wish to further examine this phenomenon by comparing participant oral fluency between L1 French and L2 English. These data will be used in a future study to examine the differences between L1 and L2 fluency, and how this may explain increases in L2 SPM and/or oral fluency over time.

Concluding remarks

Modern communication has shifted from face-to-face interaction to more computer-mediated interaction. "Given the central importance that mobile phones play in the lives of many

of our students," Godwin-Jones suggests that it is vital for teachers to have "an understanding of the possibilities for using them in our teaching" (2015, p. 14). While many teachers prefer to continue with familiar classroom methods, language teachers must answer Godwin-Jones' (2015) call to be more technologically aware and evolve with the times. Instead of banning mobile devices from the classroom, teachers should embrace the wealth of resources available at the touch of a finger; these include "vocabulary flashcards, audio files, or short readings," (p. 15) among a variety of other applications and web resources. In addition to practicing specific language skills, mobile devices also open up communication, providing opportunities for authentic interaction. With its many possibilities for language learning and its current role in society, mobile technology can no longer be ignored.

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Appendices

APPENDIX A: DEMOGRAPHIC QUESTIONNAIRE

PART A - Participant data

Contact information

1. Name (first and last): _____
2. E-mail (optional): _____

Biographical information

1. How old are you? _____
2. Gender: Male | Female | Prefer not to say
3. What is your first/native language? _____

PART B - English language information

1. How old were you when you started learning English? _____

2. How many years have you been studying English? _____

3. Have you ever studied English in another province or country?
   ( ) Yes ( ) No

   If yes, in which province(s) or country(ies) did you learn English?
   _____

   If yes, and how many days were you there?
   _____

4. Currently, how often do you use English in your life? Circle **one**:
   ( ) Every day ( ) A few times per week
   ( ) Rarely ( ) Never

5. How would you rate your proficiency level in English? Circle **one**:
   ( ) Basic ( ) Intermediate
   ( ) Advanced ( ) Native-like

6. Do you play video games: ( ) Yes ( ) No

   If yes, how often do you play video games? Circle **one**:
   ( ) Every day ( ) A few times per week
   ( ) Rarely ( ) Never

APPENDIX B: SAMPLE PRE/POST/DELAYED POST TEST

Sample Test

1. Record yourself saying the following words. Do not practice the words before recording.
    - starfish
    - activate
    - chicken
    - increase
    - turn on
    - decrease
    - monkey
    - flying
    - shield
    - planet
    - asteroid
    - wormhole

2. Record yourself saying the following sentences. Do not practice the sentences before recording.
    - Quick! The spaceship is going to crash.
    - Last year, the students bought their computers at the store around the corner.
    - You can lead a horse to water, but you can't make him drink.
    - He suggested that we watch the new movie that came out last week.
    - Have you ever been to Cuba? I hear it's a great place to go on vacation.
    - My friends asked me to help them move into their new apartment.
    - You shouldn't throw that in the garbage. One man's trash is another man's treasure!
    - From our window you can see the CN Tower far away in the distance.
    - Teamwork can be difficult, but it can also be very rewarding. Two heads are better than one!
    - You really shouldn't lie. Honesty is the best policy.

3. Record yourself telling a short story about your summer vacation. Try to speak for a minimum of one minute. You will have 3 minutes to prepare your story.

APPENDIX C: SAMPLE ACTIVITY FOR CONTROL GROUP

SHEET A Giving Directions

Giving Directions
It's on King Street.
It's on 3rd Avenue.
It's on the corner of 3rd and King.
It's across from the grocery store.
It's next to the bank.
It's opposite the library.

For example…
A: Where can I get coffee?
B: At Tim Horton's, of course!
A: Where is Tim Horton's?
B: It's on King Street.
A: Is that across from the school?
B: Yes, and it's beside the bank.

Where can I…

Ask your partner where you can do the following things:

…mail a letter?	…get a book?	…go dancing?
…see a doctor?	…see a movie?	…listen to some music?
…go swimming?	…workout?	…buy a CD?
…buy a bikini?	…play some pool?	…eat Mexican food?

Now, fill in the name of the buildings that belong in the blanks:

1.	2. Pierre's Poutine	3.	4. Esso Gas Station
5.	6. Convenience Store	7.	8. Sunshine Bakery
9.	10.	11.	12.
13.	14.	15.	16.

SHEET B Giving Directions

Giving Directions
It's on King Street.
It's on 3rd Avenue.
It's on the corner of 3rd and King.
It's across from the grocery store.
It's next to the bank.
It's opposite the library.

For example…
A: Where can I get coffee?
B: At Tim Horton's, of course!
A: Where is Tim Horton's?
B: It's on King Street.
A: Is that across from the school?
B: Yes, and it's beside the bank.

Where can I…

Ask your partner where you can do the following things:

…eat poutine?	…get a book?	…go dancing?
…fill up on gas?	…see a movie?	…listen to some music?
…buy toilet paper?	…workout?	…buy a CD?
…buy some bread?	…play some pool?	…eat Mexican food?

Now, fill in the name of the buildings that belong in the blanks:

1. Post Office	2.	3. Hospital	4.
5. Community Pool	6.	7. Bikini Hut	8.
9.	10.	11.	12.
13.	14.	15.	16.

SHEET C Giving Directions

Giving Directions
It's on King Street.
It's on 3rd Avenue.
It's on the corner of 3rd and King.
It's across from the grocery store.
It's next to the bank.
It's opposite the library.

For example…
A: Where can I get coffee?
B: At Tim Horton's, of course!
A: Where is Tim Horton's?
B: It's on King Street.
A: Is that across from the school?
B: Yes, and it's beside the bank.

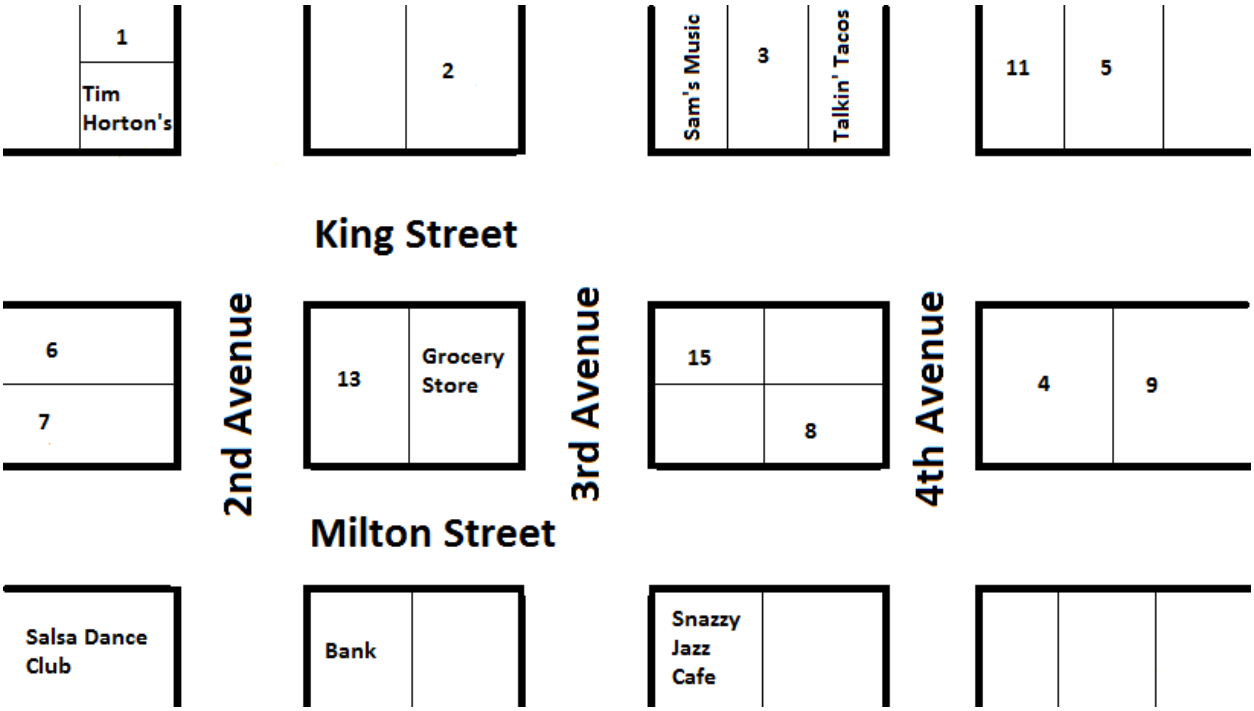
Where can I…

Ask your partner where you can do the following things:

…eat poutine?	…get a book?	…mail a letter?
…fill up on gas?	…see a movie?	…see a doctor?
…buy toilet paper?	…workout?	…go swimming?
…buy some bread?	…play some pool?	…buy a bikini?

Now, fill in the name of the buildings that belong in the blanks:

1.	2.	3.	4.
5.	6.	7.	8.
9.	10. Sam's Music	11.	12. Snazzy Jazz Cafe
13.	14. Salsa Dance Club	15.	16. Talkin' Tacos



SHEET D Giving Directions

Giving Directions
It's on King Street.
It's on 3rd Avenue.
It's on the corner of 3rd and King.
It's across from the grocery store.
It's next to the bank.
It's opposite the library.

For example…
A: Where can I get coffee?
B: At Tim Horton's, of course!
A: Where is Tim Horton's?
B: It's on King Street.
A: Is that across from the school?
B: Yes, and it's beside the bank.

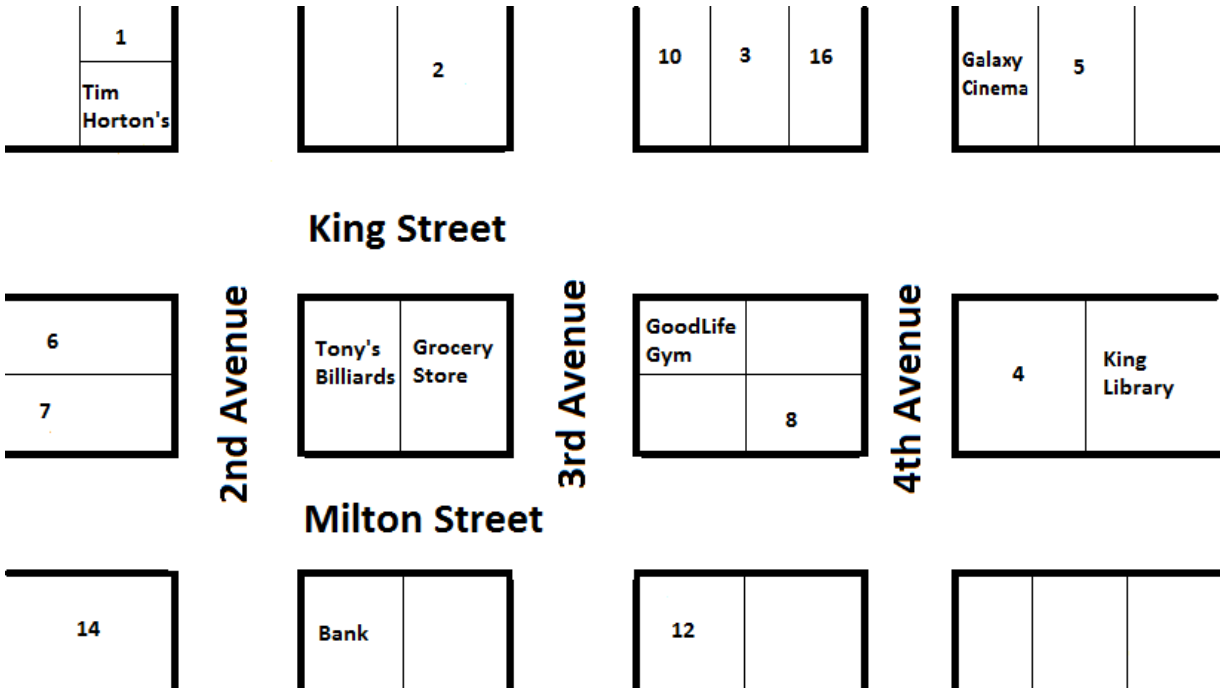
Where can I…

Ask your partner where you can do the following things:

…mail a letter?	…eat poutine?	…go dancing?
…see a doctor?	…fill up on gas?	…listen to some music?
…go swimming?	…buy toilet paper?	…buy a CD?
…buy a bikini?	…buy some bread?	…eat Mexican food?

Now, fill in the name of the buildings that belong in the blanks:

1.	2.	3.	4.
5.	6.	7.	8.
9. King Library	10.	11. Galaxy Cinema	12.
13. Tony's Billiards	14.	15. GoodLife Gym	16.



APPENDIX D: RATING SCALES

Overall fluency

Very **dysfluent** Very **fluent**

1 2 3 4 5 6

Are the words you heard correctly stressed?

Very **unnatural** stress pattern Very **natural** stress pattern

1 2 3 4 5 6

Are the speech rate and length/frequency of pauses natural?

Very **unnatural** Very **natural**

1 2 3 4 5 6

How easy was it for you to understand the speech?

Very **hard to understand** speech Very **easy to understand** speech

1 2 3 4 5 6

How accented is the speech?

Very strong **non-native accent** **Native accent**

1 2 3 4 5 6

APPENDIX E: SAMPLE INTERVIEW QUESTIONS

1. In general, how do you feel about your English pronunciation? Do you feel self-conscious, or are you comfortable?
2. Do you often participate in class or communicate with native speakers? How does it make you feel?
3. How well did you know your classmates before playing the game? Did you feel comfortable using English in front of them? Did your feelings change after playing the game?
4. What is your favourite thing about the game? What is your least favourite?
5. Do you have any suggestions/recommendations for the game developers?
6. How did you feel while playing the game? (frustrated, excited, etc.)
7. Did you have to work as a team or as an individual?
8. How did you feel in class after playing Spaceteam ESL?
9. Did Spaceteam change how you feel about your pronunciation?
10. Do you think Spaceteam helped to improve your English?
11. What do you think the benefits of Spaceteam could be for language students?
12. Did you learn anything new? (pronunciation, vocabulary, etc.)

APPENDIX F: SELECTED PARTICIPANT INTERVIEW EXCERPTS

Participant	Category	Comment
1	Familiarity	"[I talk to] maybe 2 or 3 people ... a little because it made me work with a people to I never talked, so we are laughing and that's fun"
	Anxiety	"I'm not stressed ... I'm relaxed [while playing the game]"
	Anxiety	[in class, after gameplay] "[I feel] comfortable, just a little more than I am normally"
	Pronunciation	"yeah maybe, but that's not a big help, but it's a little help ... with the pronunciation of words, but only specific words like asteroid or wormhole"
	Teamwork	"because if we only read the thing we need to do we can't do all the job because sometimes the things is on the other iPad"
	Pronunciation	"we repeat the word [when a misunderstanding occurs]"
2	Pronunciation	"The game is very good and I think it's best practice for [repeating] the same words."
	Anxiety	"I feel good, it's funny. For this I feel relaxed."
	Anxiety / Pronunciation	"I feel relaxed, the game is funny, and to spell with other people at the same level, it's ok"
	Pronunciation	"I like practice and repeat the words"
	Anxiety / WTC	"It's more easy to speak to other people when I don't see this, when I see the screen"
	Teamwork	"It's a team, it's very team because if you tell a sentence and the other people don't understand, it's very team, you need to have a good telling and a good reception."
	Pronunciation	"[If there's a problem] I repeat the word"
	Pronunciation/ Anxiety	"The pronunciation, and remove the [embarrassment]"

3	Familiarity	“The contact with the people”
	WTC	“It's fun, it's more fun than English class, we can learn when you play so it's fun”
	Pronunciation	“The word, the new word, and the pronunciation”
	Teamwork	“Because we can practice communication and that's it, so you can speak in English”
	Pronunciation	“I say that if he can repeat”
	WTC / Anxiety	“I'm comfortable if I don't speak [in class]”
	Pronunciation	“With the new words, and the team”
4	Familiarity	“Yes, I know them, because I talk when I play on the iPads”
	Familiarity	“Because the game, and after we talk [about] the game and all this to have communication with other people in my class”
	Other	“It's a game, it's the same to play with my phone on another game, it's just talking in English with another person”
	Anxiety	[regarding comfort, stress] “it's just fun”
	Anxiety	“it's more embarrassing before I play the game, but after it's... I am [embarrassed] but it's slowly less”
	Teamwork	“because it's spirits, it's game spirts, it's not for me it's for team spirit, it's not just me it's all my team to try to learn English”
	Pronunciation	“I try to help ... I try to search the word, or try another [way of pronouncing]”
	Pronunciation	“it's the same word but yes, it helped me to talk more, but not only to talk more, it's the word we have in the game, my pronunciation is more good, but the other words don't help me to explain, to say the other words, it's just the word in the game that I pronunciate more”
	Other	“I like the movement and it's easy so it's fun ... it's not complicated”

5	Other	“but I really like to speak in English and play this game, it's really fun”
	Pronunciation / WTC	“I use more English in more small time ... because in class I never speak because I don't like”
	Familiarity	“I just play the game with them”
	Anxiety	“I didn't pay attention about my nervousity in English”
	Other	“I really like this game, it's easy it's not hard”
	Teamwork	“it's not a solo game, it's a spaceship team”
6	Anxiety	“I was probably more comfortable to talk with them [through the game]”
	Anxiety	“comfortable, relaxed, you just had to read [in the game]”
	Teamwork	“it's teamwork, you know, you need to work to do it in team, to go to the next level and advance”
	Pronunciation	“first of all I repeat the sentence, and after if he make a mistake, it happened”
	Teamwork	“we work in team to advance”
	Pronunciation	[English improvement] “yes, a little bit, for the pronunciation of some words”
	Anxiety / Pronunciation	“It will help you to become more comfortable in English, it will help you to pronounce some words”

7	Anxiety / Teamwork	“Good. Very good, I just have to read, I think it's not embarrassing, you just game in group, it's ok, it's very good.”
	Anxiety / Pronunciation	“Feel good [i.e. comfortable after gameplay] ... yes because we practiced to tell the word we don't know so it's good to practice English”
	Other	“because it's simple, so we just have to read and the other person just have to complete, so I think it's simple, so if we're not good in English it's easy”
	Teamwork	“because if you tell the words, the person complete, and if you don't tell... and if I tell the word, and my team don't put the button, so the time runs out, so I think it's a team”
	Pronunciation	“we repeat... if it's my word that not are completed, I will repeat but because my time... if I don't understand that another person tell, yes I will ask him to repeat”
	Pronunciation	“we take more time to pronunciate words, because like individual, in the game you practice how to separate the word, so it's helped to do it again with other words”