DEVELOPMENT OF ENGLISH AS A SECOND LANGUAGE IN THE CONTEXT OF MASSIVELY MULTIPLAYER ONLINE ROLE-PLAYING GAMES

A Dissertation

by

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ABSTRACT

This dissertation examined the affordances of commercially developed massively multiplayer online (role-playing) games (MMOGs) for second language (L2) development. It comprises three self-contained but related studies.

The first study, as a scoping review, synthesized 32 empirical papers, which investigated different aspects of L2 development in the context of these games. It sought to find out what aspects of L2 learning have been examined and how, and what the findings suggest regarding L2 learning opportunities and outcomes. This study highlighted that empirical research in this area is mainly qualitative and that L2-related affective factors, vocabulary, and communicative competence have been the most widely investigated topics. It concluded that MMOGs afford socially supportive and emotionally safe environments, which encourage L2 learners to use multiple opportunities for enriching their L2 vocabulary and enhancing their communicative competence in the target language.

The second study was an exploratory research. It adopted an interactionist approach to characterize the nature of the negotiations of meaning that occurred in the conversational exchanges between native (NES) and non-native English speakers (NNESs) playing World of Warcraft. The data consisted of 63 hours of audio-recorded, in-game conversations over a 5-month period. The participants consisted of an NES and 6 NNESs who were divided into two groups (low and high intermediate) according to their English language proficiency. This study identified and characterized the most

frequently occurred triggers, indicators, responses and reaction to the responses in three types of dyadic conversational exchanges.

The third study examined L2 development through "usage-based" theories of language learning. It was a time-series (longitudinal) research that examined the trend of changes in the linguistic complexity of the NNESs' spoken discourse during a 5-month period of gameplay. This examination involved repeated (in three equally-distributed time intervals) calculations of fourteen syntactic complexity indices and the indices associated with three components of lexical complexity (diversity, sophistication, and density). Overall, the results turned out to be more promising for the low intermediate than the high intermediate group of the NNESs. More detailed findings are presented and discussed in light of the current literature.

DEDICATION

To Mina who inspired me to look beyond my limitations.

To Zavash who filled me with love, joy and happiness.

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All work for this dissertation was completed by the student, under the advisement of Dr. Zohreh Eslami of the Department of TLAC.

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CHAPTER I

INTRODUCTION

This chapter provides a brief introduction to the dissertation topic and its significance in the field of second language acquisition (SLA). It also provides a brief overview of the three dissertation studies that addressed questions concerning the development of second language (L2) skills in the context of commercially developed or off-the-shelf (OTS) massively multiplayer online games (MMOGs). Here, the overall purpose, significance, and design of the three studies are discussed separately.

Second Language Development in the Context of Massively Multiplayer Online Games

Recent years have witnessed a growing number of people around the globe being involved in one or more forms of social media as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content" (Kaplan & Haenlein, 2010, p. 61). Kaplan and Haenlein (2010) classified social media into six different types including "collaborative projects," "blogs," "content communities," "social networking sites," "virtual game worlds" and "virtual social worlds." The increasing popularity of various types of social media has inevitably influenced different aspects of people's lives such as their learning habits and strategies. Ubiquitous access to these emerging social settings has made it possible for individuals to connect with potentially an infinite number of people located in different parts of the world and enjoy a repertoire of shared

knowledge and information. Being immersed in these highly social and interactive environments can provide natural informal learning opportunities for individuals and push their boundaries of knowledge and information. The emergence of social media in the world of communication underscores the possibilities of "informal education" in these digitally-mediated communication settings. In Coombs and Ahmad's (1974) terms, informal education is:

> […] the lifelong process by which every person acquires and accumulates knowledge, skills, attitudes and insights from daily experiences and exposure to the environment—at home, at work, at play; from the example and attitudes of family and friends; from travel, reading newspapers and books; or by listening to the radio or viewing films or television. (p. 8)

As "digital citizens" (Mossberger, Tolbert, & McNeal, 2007) of one or more communities in the world of social media, individuals have the luxury to exchange knowledge and information with a vast variety of people in digital settings. Similar to real-life situations, learning is hypothesized to occur in online social environments as individuals get involved in authentic social interactions to perform a broad range of real-life, meaningful tasks. This form of learning is well grounded in Lave and Wenger's (1991) Situated Learning Model, positing that learning takes place as an individual gets actively involved in performing a meaningful task situated in an authentic socio-cultural context. According to Lave and Wenger (1991), learning is experienced, and meaning is co-constructed during social interactions within "communities of practice" (Wenger, 1998), which are characterized by "joint enterprise," "mutual engagement," and "shared

repertoire" of communal resources (Wenger, 1998). Lave and Wenger's (1991) concept of "situated learning" and Coombs and Ahmed's (1974) notion of informal education is well embedded in Beatty's (2010) definition of computer-assisted language learning (CALL) and Chik's (2013) notion of "*Naturalistic* CALL" (p. 835, original emphasis). Beatty (2010) defined CALL as "*any process in which a learner uses a computer and, as a result, improves his or her language*" (p. 7, original emphasis). Naturalistic CALL, according to Chik (2013), "refers to students' pursuit of some leisure interest through a second or foreign language in digital environments in informal learning contexts, rather than for the explicit purpose of learning the language" (pp. 835-836). This brief introduction leads us to the focus of this dissertation—that is studying second language (L2) learning opportunities in the context of an emerging type of social media, massively multiplayer online role-playing games (MMORPGs).

Combining the features of digital games and online communities (Zhao & Lai, 2009), commercial MMORPGs provide virtual communication settings that support—from cognitive, sociocultural and motivational perspectives—the conditions crucial for SLA. The unique combination of some key technical features and characteristics in these types of network-based games has made them stand out as promising venues for SLA. Fantasy themes, customizable role-playing characters (known as avatars), real-time (chat and voice) communications with other gamers, interactions with non-playing characters (henceforth NPCs), team-work, and leveling up through the completion of goal-oriented, in-game tasks (known as quests) are just a few of these characteristics. To complete quests and progress (or level up) in the game hierarchy fosters individual game players

to join small or big game-based organized teams wherein each member has specific skills and a complementary role. The completion of quests (especially in higher levels of the game) demands team members to initiate and maintain a reasonable amount of coordination and collaboration. Goal-oriented collaborations push individuals to get involved in purposeful interactions through text- and voice-based chat channels.

Commercial MMORPGs (such as *World of Warcraft* and *EverQuest*) have recently attracted the attention of many SLA scholars (e.g., Reinders, 2012; Sykes, Reinhardt, & Thorne, 2010; Peterson, 2010a, 2010b, 2012; Cornillie, Thorne, & Desmet, 2012; Sykes & Reinhardt, 2012; Sundqvist & Sylvén, 2014; Zhao & Lai, 2009). Researchers have explored the affordances of these games for SLA from different theoretical standpoints such as sociocultural (e.g., Dixon, 2014; Peterson, 2010a, 2010b; Rama et al., 2012), ecological (e.g., Newgarden et al., 2015; Zheng et al., 2009a; Zheng et al., 2015), and interactionist (e.g., Peterson, 2012b) perspectives. Studies show a promising picture of MMOGs as digitally-mediated social environments that can provide ample opportunities for L2 development. In particular, they show that MMOG play can improve L2 vocabulary (Bytheway, 2014; Miller & Hegelheimer, 2006; Rankin, Gold, & Gooch, 2006; Rankin, Morrison, McKenzie, Gooch, & Shute, 2009; Sylvén & Sundqvist, 2012), develop L2 learners' skills to perform a range of authentic pragmatic moves in the TL (Palmer, 2010; Peterson, 2012), and enhance their communicative competence and strategies (Rama, Black, van Es, & Warschauer, 2012).

Despite many efforts to explore the potentials of MMOGs for L2 development, there are still much to discover about this type of social media. More specifically, a

more comprehensive literature review is required to give a clearer picture of what has been conducted in this area, how, and what the findings are. Furthermore, more empirical studies are warranted to critically examine the nature of in-game verbal interactions—between native and non-native speakers of the TL—to find out if these interactions involve what is supported in theory as facilitative in SLA. Of the same importance are the longitudinal studies that examine any changes in the quality of the discourse L2 users produce in the TL after playing MMOPGs with native speakers of the TL for an extended period. These longitudinal studies can elucidate how far in-game interactions (with peers and native speakers of the TL) can contribute to the generation of more syntactically and lexically complex discourse. This brief explanation serves as an introduction to the three independent but related studies conducted in this dissertation.

Overarching Purpose of the Dissertation

This dissertation intends to investigate L2 development in the context of commercially developed MMOGs. To this end, I conducted three different studies. The first study was a scoping review (of published and unpublished empirical studies) on L2 learning in the context of non-educational (or commercially developed) MMOGs. The purpose of this review was to provide a clear picture of what has (or has not) been researched in this area and how. The second study was an exploratory research that sought to describe in detail the characteristics of the participants' conversational (oral) interactions during the MMOG play. This study intended to identify and describe the interactional conditions that are hypothesized—in the interactionist perspective—as fostering interlanguage development. To meet this aim, I identified, described, and

quantified aspects of meaning negotiation episodes that followed instances of communication breakdowns during in-game conversational exchanges. The third study is a time-series (longitudinal) research designed to monitor the trend of linguistic (lexical and syntactic) complexity in the NNES participants' L2 production during a 5-month period of gameplay. Below, I have outlined the purpose, the significance, and the design of each study.

Dissertation Studies

Scoping Literature Review

Purpose

The goal of this study is to conduct a scoping review of the empirical research focused on L2 learning in the context of commercially developed MMOGs. This review addresses the following research questions:

Q1: What theoretical perspective(s) are adopted to examine SLA in the context of MMOGs?

Q2: What aspects of SLA have been investigated to date in the context of MMOGs?

Q3: What approaches (or research paradigms) and methodologies (including sampling procedure, data collection, and data analysis) have been implemented?

Q4: What are the significant findings in this area of research?

Significance

Several scholars have reviewed empirical studies that focused on computer games in general and their contribution to the development of different sets of skills and

knowledge (e.g., Chiu, Kao & Reynolds, 2012; Connolly, Boyle, MacArthur, Hainey, & Boyle, 2012; Cornillie et al., 2012; Peterson, 2010c). Peterson (2010c), for example, examined the key findings from seven studies that focused on digital games and simulations in language education. In his review of Thorne's (2008) study, which investigated language-learning opportunities provided by playing World of Warcraft (WoW), Peterson concluded that participation in MMORPGs affords L2 learners with extensive exposure to the TL in a motivating and learner-centered environment—a setting that encourages negotiation of meaning, collaborative dialog, and interpersonal relationships. In a systematic literature review, Connolly et al. (2012) found that "playing computer games is linked to a range of perceptual, cognitive, behavioural, affective, and motivational impacts and outcomes" (p. 661). They concluded that knowledge acquisition (or content understanding), as well as affective and motivational outcomes, was the most significant results of gameplay.

Overall, the reviews conducted to date have a general focus on learning and engagement in the context of computer games. However, very few of them (e.g., Peterson, 2010c) adopted a more focused lens into the role of computer games—and, more specifically, MMOGs—in the field of SLA. In contrast, by adopting a more focused lens, the current review provides insights into the empirical evidence concerning the role of non-educational, off-the-shelf, recreational MMOGs in the field of L2 learning and teaching.

Design

This study adopts a scoping review method (Arksey & O'Malley, 2005) and investigates the extent, range, and nature of L2 research in the context of MMOGs. This research seeks to identify relevant empirical research in this area, regardless of study design, as a scoping study "tends to address broader topics where many different study designs might be applicable …. [and] is less likely to seek to address very specific research questions nor, consequently, to assess the quality of included studies" (Arksey & O'Malley, 2005, p. 20).

MMORPG-Mediated Negotiated Interactions: A Study of NS-NNS and NNS-NNS Conversations

Purpose

Using the interactionist approach (Gass & Mackey, 2007) framework, the main purpose of this research is to describe the frequency and types of interactional modifications native (NESs) and non-native English speakers (NNESs) applied as they encountered communication problems during World of Warcraft (WoW) gameplay. The study also intended to find out how far the conversational adjustments helped to improve discourse comprehensibility between the interlocutors in the game context. This study aims to discover: (a) the extent to which WoW-mediated task-based oral communications in English language foster negotiation of meaning between the participants, (b) the nature of the linguistic modifications (or adjustments) the participants make in their language output, and (c) the effectiveness of negotiated interactions in the comprehensibility of the on-going discourse during the gameplay.

Significance

From the psycholinguistic account of interactionist perspective (Long, 1996), conversational exchanges, and especially those that promote negotiations of meaning are facilitative in the process of L2 development (Smith, 2003a; Tudini, 2003). This notion has inspired a rich body of research that empirically examined the effects of negotiated interactions on the quality and quantity of L2 production in face-to-face (e.g., Ellis, Tanaka, & Yamazaki, 1994; Mackey, 1999; Mackey & Goo, 2007; Pica, 1994) as well as online and computer-mediated communication settings (e.g., Blake, 2000; Fernández-García & Martínez-Arbelaiz, 2002; Petersen, 2010; Sauro, 2011; Smith, 2003a, 2003b, 2004, 2005). This line of research, however, is not pursued as rigorously in the highly interactive social context of MMOGs. Only a few studies (e.g., Dixon, 2014; Peterson, 2012a, 2012b) showed that conversational exchanges during MMOG play provide L2 learners with opportunities for negotiating meaning and utilizing some communicative strategies (e.g., confirmation check, clarification requests) to repair communication problems. The current research examined the negotiation routines—taking place during in-game conversations—and their constructing elements (i.e., trigger, indicator, response, and reaction to the response). In particular, it sought to allocate the interactive discourse features that are claimed, in the psycholinguistic account of interactionist perspective to SLA, as fostering interlanguage development. The research attempted to find out if playing an MMORPG provided an optimal condition necessary for L2 development; and if the answer is affirmative, what is the nature of the underlying processes that lead to the creation of such optimal conditions?

Design

As a mainly descriptive research (Seliger & Shohamy, 1989), this study adopted interactionist approach framework (Mackey, Abbuhl, & Gass, 2012) to characterize the nature of the negotiations of meaning that happened within the naturally-occurring conversational exchanges during the gameplay. The study consisted of two major stages: the identification of meaning negotiation episodes, and the detailed description and quantification of the components of the negotiation routines. To this end, Varonis and Gass's (1985a) "Negotiation of Meaning Sequences Model" and Smith's (2003a) "Model of Computer-Mediated Negotiated Interaction" were used. The data consisted of 63 hours of audio-recorded conversation generated by the participants during the gameplay over a 5-month period. The participants consisted of 6 NNESs (based in Iran) and a NES (based in the USA). The NNESs were divided into two homogenous groups of different L2 proficiency. The basic unit of analysis was the negotiation of meaning episodes initiated by both the NES and NNESs.

The Development of Second Language Lexical and Syntactic Complexity in the Context of an MMORPG

Purpose

The goal of this study was to monitor the level of linguistic—including lexical and syntactic—complexity in the NNES participants' L2 oral production during a 5-month period of MMOG play with a NES. It was hypothesized that there would be a growing trend in the linguistic complexity of the participants' utterances as they were involved in MMOG-mediated interactions with the native speaker of the TL.

Considering the subcomponents of lexical complexity—or "lexical richness" in Lu's (2012) term—including "lexical density," "lexical sophistication," and "lexical variation," this study was designed to address the following research questions:

Q1: Will the NNES participants produce syntactically more complex L2 discourse as they spend more time playing World of Warcraft with their peers and the NES?

Q2: Will the NNES participants produce lexically denser L2 discourse as they spend more time playing World of Warcraft with their peers and the NES?

Q3: Will the NNES participants produce lexically more sophisticated L2 discourse as they spend more time playing World of Warcraft with their peers and the NES?

Q4: Will the NNES participants produce lexically more varied L2 discourse as they spend more time playing World of Warcraft with their peers and the NES?

Significance

From psycholinguistic interactionist perspective (Peterson, 2010a), verbal interactions with more competent speakers of the TL are claimed as linguistically beneficial to L2 users. The reason resides in the opportunities that verbal interactions can provide for the negotiations of meaning and form, which in turn create opportunities for obtaining enhanced input, producing modified output, receiving corrective feedback, and directing attention to form-focus interconnection (Long, 1996; Pica, 1994; Chapelle, 2005; Swain, 2005). The emergence of MMOGs, as highly interactive social settings, has recently attracted the attention of SLA scholars, who are curious to find out if, and

how far, interactions in these idiosyncratic social environments can contribute to L2 development. They realized that collaborative interactions in the TL within and beyond MMOG contexts helped L2 learners improve their communicative competence (e.g., Peterson, 2012a; Rama et al., 2012; Palmer, 2010) and communicative "performance" (Rankin et al., 2009) as well as vocabulary knowledge (e.g., Patat, 2015; Rankin et al., 2006; Rankin et al., 2009; Sylvén & Sundqvist, 2012). On the contrary, researchers (e.g., Rama et al., 2012; Reinders & Wattana, 2011) found that L2 interactions did not improve the accuracy and complexity of the learners' discourse. Some (e.g., Rankin et al., 2009) argue that quantitative measures especially those that are designed to assess L2 development in formal educational settings fail to explain the nature of L2 socialization and determine its impacts on L2 development in MMOG settings. Attempting to address this concern, the current research examined longitudinally the quality of L2 discourse (produced by the NNESs) by looking at specific indices representing syntactic and lexical complexity.

Design

The current research is a longitudinal study. As Menard (2008) explained, in this type of research "data are collected on one or more variables for two or more time periods, thus allowing at least measurement of change and possibly explanation of change" (p. 3). The current study involves the collection of data (game-mediated, audio-recorded discourse samples) from two different groups of homogenous NNESs (in low and high intermediate L2 proficiency levels) over a 5-month period. This research involves repeated observations of the indices related to syntactic complexity and the

three components of lexical complexity (i.e., lexical density, sophistication, and variation) in the NNSs' oral discourse generated during the gameplay. Also, as a quasi-experimental research, this study shares some characteristics of a single case time-series design. According to Menard (2008), "A time series is a set of repeated measurements of the same variable taken on the same unit of analysis (e.g., an individual, city, nation; more generally, a subject or a case) for two or more points in time" (p. 579). As in time-series design, each participant (NNES in the current research) was observed a number of times in equal time intervals and their performance (game-mediated oral discourse) was compared with their own prior performance. The only point that the current research design may divert from a conventional time-series design is that the intervention (i.e., MMOG play in the TL) is introduced from the beginning of data collection phase. That means the baseline phase (no treatment or no intervention) is apparently omitted in the design of the current research; however, considering the fact that linguistic development of L2 discourse is not distinguishable over a short period of time (Ortega, 2003), the first six or eight hours of gameplay (completed during the first two months of the current project) was considered as the baseline. Thus, contrary to time-series research design, no interruption is expected to occur in the line (or curve) of change over the period of 5 months. Instead, due to the introduction of intervention from the inception of the project, a growing trend (or at least a plateau) was expected to emerge in the patterns of change established by linguistic complexity indices. The data was collected in three data points distributed in equal time intervals (i.e., the first, the mid, and the last two hours of gameplay).

Study Setting: World of Warcraft

As the context of the current research, WoW is one of the most widely-played MMORPGs around the globe. It is a commercially designed game launched in 2004 by Blizzard Entertainment. Like any other MMORPGs, thousands of WoW players—located in different parts of the world—interact, cooperate and compete simultaneously to progress in the game levels. WoW contains elements of fantasy and science fiction and provides a dynamic virtual world in a highly graphical 3-D setting.

Before starting the game, WoW players need to select the realm (or server) in which they would like to play the game. WoW provides different types of realms with specific characteristics. They include normal or player versus environment (PVE), role-play (RP), and role-play-PvP (RP-PvP). The participants in the current study played mostly in the normal or player-versus-environment realm that is the most appropriate realm for novice gamers. This realm's primary focus is defeating game-controlled monsters and completing quests (or in-game missions) alone or in collaboration with other players. In this realm, players are not attackable by non-playing characters (NPCs) or other real playing characters (PCs). Of course, players on these realms can also opt to "flag" themselves that technically means making themselves attackable by the players in the opposing faction.

After selecting the realm of the game, the participants need to choose and then customize their in-game characters known as avatars. An avatar is a three-dimensional, customizable character through which a player interacts with the game and performs various activities. WoW is based on a constant warfare between two opposing factions

named the *Alliance* and the *Horde*. For the purpose of the current research, the participants—as members of a team—need to align with only one of the factions. Since the Alliance is considered the calm, peaceful and "civilized" faction compared to the Horde, participants preferred to play as members of a team in the Alliance faction. When creating an avatar within the faction they choose, the participants selected their avatars' race and class and customized them regarding gender and appearance.

Much of the gameplay in WoW involves the completion of various types of quests (also referred to as tasks or missions) to gain higher levels. Quests are usually assigned by NPCs, who are controlled by the game. Quests cover a broad range of activities such as killing computer-controlled monsters (known as mobs), gathering resources, and finding and delivering items to NPCs. Players have the option to complete quests on their own. Nevertheless, as the game progresses, quests grow too complicated and challenging to complete alone. Tough challenges are commonplace in dungeons (or instances). A typical dungeon (made available around level 15) allows a group of five characters to enter. Some dungeons (made available around level 60), however, require a higher number of players (e.g., 10, 25, or 40) to collaborate in a "raid" to complete quests. Therefore, players have to band together and form persistent groups (technically referred to as Guilds) to complete quite formidable quests and accomplish in-game targets. For the purpose of the current study, two groups of participants--each consisting of four players (one NES and three NNESs)--formed two teams in the Alliance faction that entered dungeons and completed the quests.

The medium of communication in WoW is primarily synchronous text chat. The game provides players with different chat channels technically referred to as "say," "yell," and "whisper." Each chat channel provides gamers with various levels of privacy in communication. For instance, trade and general chat channels are the most public channels that allow all online members in a gamer's faction to read the message and respond back. As two other examples of chat channels are "guild" and "party" chat channels that are available only for the members of the online guild and questing party respectively. "Whispers" or "tells," on the other hand, are the most private messages that can be shared only between two gamers. In addition to text chat channels, participants can communicate via third-party voice communication software (e.g., TeamSpeak) or simply use SKYPE whenever required. The participants can interact through both channels. However, their oral interactions—made possible through TeamSpeak—are of particular interest in the current research.

Dissertation Outline

This dissertation is organized into five chapters. In the introductory chapter, I provide an overview of the topic under study and describe the three studies proposed here. In the second chapter, I present a scoping literature review that synthesizes published and unpublished empirical studies on the topic of L2 development in the context of commercially developed (non-educational) MMOGs. The third chapter is dedicated to a descriptive study that identifies and characterizes the negotiations of meaning episodes within the naturally-occurring, in-game conversational (oral) exchanges among the participants (NES and NNESs) allocated in two teams of different

proficiency levels. The fourth chapter comprises a longitudinal, quasi-experimental research (with a time-series design), which examines the trend of linguistic complexity in the NNESs' target language output by measuring some indices—representing syntactic and lexical complexity—in three equally distributed points of time. Chapter five consists of conclusions, practical and theoretical implications, as well as recommendations for future research.

CHAPTER II

SECOND LANGUAGE LEARNING IN THE CONTEXT OF MASSIVELY MULTIPLAYER ONLINE GAMES: A SCOPING REVIEW

Introduction

Being involved in "virtual world games" (Kaplan & Haenlein, 2010), as a form of social media, has become a part of people's daily lives around the globe (Yee, 2006). These games, known as massively multiplayer online games (MMOGs), provide highly interactive two- or three-dimensional persistent virtual worlds within which thousands of players can interact, collaborate, and compete simultaneously. They provide gamers with "access to theme-based virtual worlds, real-time communication through text chat, opportunities for role-play, guild membership, status advancement, problem solving, and content creation" (Peterson, 2010b, p. 57).

Due to their particular characteristics, commercially developed off-the-shelf or "vernacular" (Reinhardt & Sykes, 2012) MMOGs have increasingly been considered as promising venues for L2 learning and socialization (Peterson, 2010a; Thorne, Black, & Sykes, 2009). The notion of L2 learning in the context of MMOGs is well grounded in the definition of computer-assisted language learning (CALL) as "any process in which a learner uses a computer and, as a result, improves his or her language" (Beatty, 2010, p. 7). Aligned with Beatty's definition of CALL is the concept of "Naturalistic CALL," which refers to "students' pursuit of some leisure interest through a second or foreign language in digital environments in informal learning contexts, rather than for the

explicit purpose of learning the language" (Chik, 2013, pp. 835–836). This conceptualization of CALL underlines the opportunities social media in general and MMOGs in particular can afford for "informal education," defined by Coombs and Ahmed (1974, p. 8) as "the lifelong process by which every person acquires and accumulates knowledge, skills, attitudes and insights from daily experiences and exposure to the environment—at home, at work, at play." In the same vein, the rationale for incorporating recreational MMOGs in L2 learning and pedagogy can be provided by Lave and Wenger's (1991) Situated Learning Theory (or Legitimate Peripheral Participation Model), which suggests that learning takes place in its non-educational form as one is involved in performing meaningful tasks situated in an authentic sociocultural context. According to this argument, "learning is situated; learning is social; and knowledge is located in communities of practice" (Brouwer & Wagner, 2007, p. 33), the latter being characterized by "joint enterprise," "mutual engagement," and a "shared repertoire" of communal resources (Wenger, 1998).

Through players' configuration of them, MMOGs provide L2 learners with access to a vast number of native or more competent interlocutors of the target language (TL), who will have real-life interactions with the learner for a genuine purpose. Due to their design, massively multiplayer adventure/role-playing games afford more player-player and player-computer interactions and their contents include more narratives and language use compared to other game genres (Reinhardt & Sykes, 2012). Kaplan and Haenlein (2010) positioned "virtual game worlds" (e.g., *World of Warcraft*) and "virtual social worlds" (e.g., *Second Life*), among other forms of social media, at the highest

level concerning “social presence” and “media richness.” They defined “social presence” as “the acoustic, visual, and physical contact that can be achieved ... between two communication partners” and “media richness” as “the amount of information they allow to be transmitted in a given time interval,” asserting that virtual game and social worlds “try to replicate all dimensions of face-to-face interactions in a virtual environment” (Kaplan & Haenlein, 2010, p. 61).

As “unorthodox language-learning tools” (Rankin et al., 2006), MMOGs have attracted the attention of SLA scholars (e.g., Cornillie et al., 2012; Peterson, 2010a, 2010b, 2010c, 2012a, 2012b; Sundqvist & Sylvén, 2014; Sykes & Reinhardt, 2013), who have investigated MMOGs’ potential for L2 improvement. Although research in this area is still in the embryonic stage of development (Piirainen-Marsh & Tainio, 2009), findings have been promising so far. However, notwithstanding various findings concerning off-the-shelf MMOGs’ L2 learning affordances, the literature lacks an integrated conception that can describe (a) which aspects of L2 learning have been researched in MMOG contexts, (b) which approaches and methodologies have been adopted to investigate these aspects, and (c) what the findings suggest concerning the interrelationships among salient features underlying L2 learning processes within and beyond the MMOG context. Accordingly, the current study was conducted as a scoping review (Arksey & O’Malley, 2005) of prior empirical studies to discover how this broad topic has been approached in the literature and what the findings suggest in relation to the wider framework of L2 learning processes.

Previous Reviews on Computer Games

Several scholars (e.g., Chiu, Kao, & Reynolds, 2012; Connolly et al., 2012; Cornillie et al., 2012; Peterson, 2010c) have reviewed computer games and their contribution to the development of different sets of skills and knowledge. For example, Peterson (2010c) examined the key findings from seven studies (published between 2001 and 2008) that focused on digital games and simulations in language education. He categorized the studies according to whether they analyzed "web-based simulated virtual worlds," "3D web-based simulated virtual worlds,' "stand-alone commercial simulation games," "massively multiplayer online role-playing games" (MMORPGs), and/or "game- and simulation-based training systems." For the MMORPG category, Peterson reviewed Thorne's (2008) study, which investigated language-learning opportunities in *World of Warcraft* (WoW), and found that participation in MMORPGs affords L2 learners with extensive exposure to the TL in a motivating and learner-centered environment—a setting that encourages negotiation of meaning, collaborative dialog, and interpersonal relationships.

Connolly et al. (2012) undertook a systematic literature review encompassing 129 papers (published between 2004 and 2009) with empirical evidence regarding the effects of playing computer games on learning and engagement. The results indicated that "playing computer games is linked to a range of perceptual, cognitive, behavioural, affective, and motivational impacts and outcomes" (Connolly et al., 2012, p. 661). The review also showed that knowledge acquisition (or content understanding), as well as affective and motivational outcomes, was the most significant result of gameplay.

Cornillie et al. (2012) carried out a database search to identify general trends in digital game-based language learning research over three decades, and found that, between 2001 and 2010, most of the research on digital gaming was design based—that is, studies mainly focused on the conceptual design or development of a particular type of game-based language-learning environment. They also reported a growing number of empirical studies investigating the use of digital games in the domain of language learning.

Chiu et al. (2012) completed a meta-analysis of 14 studies that investigated the overall effects of digital game-based learning in an English-as-a-foreign-language (EFL) setting. They examined the effects of "drill and practice" games versus "meaningful and engaging" ones. In the former, players modify actions through trial and error to improve their scores, whereas the latter type of game involves higher-order thinking activities such as exploration, hypothesis testing, and constructing objects. Chiu et al. (2012) found a medium positive effect size in favor of digital game-based learning in the EFL setting. Their analysis also yielded a large effect size for meaningful and engaging games, but a small effect size for drill and practice games.

Overall, the reviews conducted to date have a general focus on learning and engagement in the context of computer games. However, very few of them (e.g., Peterson, 2010c) have emphasized the effect of computer games—and, more specifically, MMOGs—on L2 learning. In contrast, by adopting a more focused lens, our review provides specific insights into the empirical evidence concerning the role of non-educational, off-the-shelf, recreational MMOGs in the field of L2 learning and teaching.

Method

The current study is a scoping review. This type of review aims to "map *rapidly* the key concepts underpinning a research area and the main sources and types of evidence available, and can be undertaken as stand-alone projects in their own right, especially where an area is complex or has not been reviewed comprehensively before" (Mays, Roberts, & Popay, 2001, p. 194). Unlike a systematic literature review, which "might typically focus on a well-defined question where appropriate study designs can be identified in advance," a scoping review "tends to address broader topics where many different study designs might be applicable" (Arksey & O'Malley, 2005, p. 20). Moreover, while a systematic literature review seeks to answer questions from "a relatively narrow range of quality assessed studies," a scoping review "is less likely to seek to address very specific research questions nor, consequently, to assess the quality of included studies" (Arksey & O'Malley, 2005, p. 20). As a scoping review, our study proposes to discover the extent, range, and nature of L2 research in the context of MMOGs.

Search Procedure

First, five electronic databases—the U.S. Department of Education's Education Resources Information Center, EBSCO's Academic Search Complete and its Communication Source, ProQuest's Linguistics and Language Behavior Abstracts, and the American Psychological Association's PsycINFO—were searched using the combinations of keywords listed below. Some key journals were also hand-searched, to ensure the effectiveness of the search procedure, including *CALICO Journal*, *Computer*

Assisted Language Learning, *International Journal of Game-Based Learning*, *Journal of Computer Assisted Learning*, *Language Learning & Technology*, and *ReCALL*. Next, a manual search was undertaken of the reference lists of the papers identified in the first step. Then, Google Scholar and Thomson Reuters' Web of Science were used to locate articles that have cited the studies found in the first step. Finally, the abstracts and, in some cases, the main body of all papers were scanned to shortlist them for the review.

Search Terms

The following composition of search terms was used by an expert to search the five electronic databases listed above:

> (DE "Video Games") OR (DE "Computer Games") OR AB ((game* or gaming) n2 (digital or online or video or simulation or computer* or mobile or multiplayer* or immersive or massive* or multiuser)) or mmorpg* or muds or moos or mmog or muve)
>
> AND
>
> (DE "Second Language Learning") OR (DE "Bilingual Education" OR DE "College Second Language Programs" OR DE "English (Second Language)" OR DE "English for Special Purposes" OR DE "English Language Learners") OR ((AB (language W1 (learn* OR acquisition OR second))) OR TI (language W1 (learn* OR acquisition OR second))) OR AB (esl OR efl OR ell) OR TI (esl OR efl OR ell) OR DE "Second language acquisition"))

The keywords were used independently and combined in order to locate as many publications as possible. The search was completed on December 4, 2015, and resulted in an initial selection of 348 papers.

Inclusion Criteria

To be selected, the papers had to (a) be published in the English language; (b) include empirical evidence (quantitative, qualitative, or mixed method) about L2 learning within or beyond the contexts of commercial, off-the-shelf MMOGs; and (c) be published after 2000. We excluded the studies conducted in the context of (a) synthetic immersive environments, or "visually rendered spaces which combine aspects of open social virtualities with goal-directed gaming models to address specific learning objectives" (Sykes, Oskoz, & Thorne, 2008, p. 529); (b) online virtual worlds (e.g., *Second Life*), which are more open-ended and predominantly socially oriented virtual settings; and (c) simulation video games (e.g., *The Sims*).

Thirty-two studies (25 journal articles, 3 conference proceedings, 2 dissertations, 1 master's thesis, and 1 book chapter) met the inclusion criteria. An overview (including author(s)/year, focus, participants, and major findings) of the studies is provided in Appendix A.

Coding of Papers

The papers were coded according to their (a) purpose, (b) research paradigm (e.g., quantitative, qualitative, or mixed method), (c) theoretical (or conceptual) framework, (d) data collection procedure, (e) data analysis techniques, and (f) findings. To evaluate the quality of coding, a sample of 5 papers (15% of 32 articles) was coded

independently by the second coder. A simple percent agreement calculation found the inter-rater agreement between the two coders to be 96%.

Findings

Research Goals

Most of the studies had multiple research foci. As Table 1 shows, L2-related motivational and affective outcomes, L2 skills (predominantly vocabulary) acquisition, communicative competence (or discourse management strategies), and L2 production were the most frequently addressed topics in the papers. Other topics (including L2 literacy practices, skilled linguistic action and values realizing, practicing autonomy, L2 learning strategies, opportunities for negotiation of meaning, and the linguistic complexity of game-presented texts and game-external websites) were dealt with by one or two studies and accounted for 20% of the total frequency (i.e., 53).

Table 1 Research goals of the papers

Research foci	**Frequency**	**%**
L2-related motivational and affective factors	16	30
L2 skills	11	21
Communicative competence/strategies	7	13
Affordances for second language and culture learning	5	9
L2 production (the quantity and quality of L2 interactions)	4	7

N = 32.

Research Paradigms, Theories, and Methodologies

Most (20 or 62.5%) of the studies were qualitative; there were only 4 quantitative and 8 mixed-method studies. The qualitative works were mainly case studies that

utilized a virtual ethnography approach, while the quantitative ones chiefly comprised quasi-experimental research.

Ten studies did not refer to any theoretical assumptions underlying their hypotheses or choice of research methods. Some (e.g., Dixon, 2014; Palmer, 2010; Zheng, Wagner, Young, & Brewer, 2009a) adopted more than one theoretical perspective to frame their research. In 22 studies, we identified 13 theoretical frameworks, of which Vygotsky's (1978) sociocultural theory was the most frequently cited.

We also examined two significant features of research methodology—data collection and data analysis—within the papers. Thirteen data collection tools (see Table 2) were applied, with interviews (21%), observation (18%), chat logs (16%), and questionnaires (12.6%) the most widely utilized. We also pinpointed 16 different data analysis techniques, among which discourse analysis (19%), descriptive statistics (16%), paired/independent samples *t* tests (16%), and constant comparative analysis (12%) were the most frequently used.

Table 2 Data collection tools used in the papers

Data collection tools	**Frequency**	**%**
Interviews	20	21
Observation/field notes	17	18
Chat logs	15	16
Questionnaire	12	12.6
Recorded live gaming sessions	8	8.5
Language tests	5	5.2
Email texts/telegrams/skype instant messages	4	4.2

Table 2 Continued

Data collection tools	Frequency	%
Diaries/journal entries	4	4.2
Text samples from quests and game-related websites/community documents	4	4.2
Survey	3	3.1
Focus group discussion	1	1.0
Simulated recall sessions	1	1.0
Recorded interactions during face-to-face activities	1	1.0
	95	**100**

[a]*N* = 32.

Findings of the Papers

To synthesize the findings of the 32 studies, we borrowed the data analysis strategy from the grounded theory approach (Strauss & Corbin, 1990). We combined the papers' main findings—as reported in the original papers—and created a textual database of approximately 20 pages. We implemented open-coding and axial-coding techniques to code the findings. Then, we allocated codes with a similar focus to a single category. Due to their multiple research foci and naturally different results, some papers were assigned to more than one category. The coding led to the identification of five main categories: (1) the characteristics of MMOGs' environments, (2) the L2-related motivational and affective drives promoted in these settings, (3) linguistic complexity of the discourse used within and beyond MMOG contexts, (4) opportunities afforded for second language and culture learning, and (5) L2 learning outcomes.

MMOGs' Environments and Positive Affective Drives Within Them

The review highlighted various features of MMOGs' environments (designed and social), which are discussed in the papers as seamlessly integrated with the L2-related affective and motivational factors they promote. Some studies considered a range of MMOG designed features that allow gamers to remain anonymous, to use multiple routes and modes of communication, to practice autonomy, and to connect verbal utterances with avatar-embodied actions. The papers also elaborated on features of the MMOG social environments (e.g., peer mentoring, interdependence and collaboration among players, affiliative social bond, and teamwork) in which a gamer is actively involved. It appears that the combination of MMOGs' well-engineered features and the social/interactive environments these features promote has created a setting that supports positive, L2-related, affective and motivational driving forces.

Bytheway (2014, p. 9) observed that *WoW* provides highly semiotic interactive contexts characterized by particular in-game cultures that "encourage creativity, decrease anxiety, force interaction, demand cooperative and autonomous learning, increase motivation, and reward curiosity." Her findings are supported by Peterson (2010b, 2012a), who studied linguistic and social interactions in the context of two MMOGs. Participants in Peterson's studies affirmed that interactions through personalized avatars increased the level of immersion in and engagement with the games' social environments. Peterson found that interacting through personalized avatars, which offer gamers the opportunity to remain anonymous throughout gameplay, reduces identifying social cues, facilitates gamers' self-expression, enhances risk-taking

in TL use, and motivates the gamers to socialize actively with other players. In the same vein, Reinders and Wattana (2014, 2015b) contended that anonymity due to the absence of an open, public sphere in the game helped to lower language learners' communication anxiety and increased their self-perceived communicative competence. They concluded that the affective affordances of the game environment were the main reasons that participants felt more willing to use English in the game setting. Zheng, Young, Brewer and Wagner (2009b) also recognized that MMOG players, compared with non-players, developed higher levels of self-efficacy toward using English with native English speakers (NESs) and exhibited a more positive attitude with respect to learning the TL.

The studies also revealed that MMOGs' social context encourages communal L2 learning practices (Chik, 2014), inspires expert–novice interactions (Rama et al., 2012; Thorne, 2008), affords multiple routes for and modes of communication in the game world (Rama et al., 2012), and creates an "affiliative social bond" among participants in that sphere (Thorne, 2008). These affordances help to create emotionally secure and socially dependable environments in which L2 learners can partake in collaborative game activities and socialize confidently in the TL. Chik (2014), for example, observed that experienced gamers provided novice players with advice on both gaming strategies and using L2 gaming for language-learning purposes. As she noted, more experienced players regularly shared helpful resources such as walkthroughs, video tutorials, fan fiction, and fan art on interest-driven websites. Thorne's (2008) research on intercultural communication within *WoW* also highlighted the establishment of an "affiliative social

bond" between the gamers that sustained the participants' in-game collaboration and expanded their social interactions to out-of-the-game contexts.

Linguistic Complexity Within and Beyond MMOGs' Contexts

As the only study in the sample, Thorne, Fischer and Lu's (2012) examination of the texts used in *WoW*'s quests and three of the most frequently visited *WoW*-related websites attested to the richness of the language in terms of readability, lexical sophistication, lexical diversity, and syntactic complexity. They argued that these linguistically complex texts "are attended to because they are highly relevant to the actions, decisions, and problem-solving at hand" (Thorne et al., 2012, p. 298), reasoning that such texts are functionally tied to the game's activities and serve the players' immediate and situated gameplaying needs. Their argument corroborates the "multimodal," "text," and "situated meaning" principles advanced by Gee (2003) in relation to video games.

The multimodal principle posits that, "in video games, meaning, thinking, and learning are linked to multiple modalities (words, images, actions, sounds, etc.) and not just to words" (Gee, 2003, p. 108). Drawing on the similar construct, Hattie and Yates (2013, p. 115) asserted that "we all learn well when the inputs we experience are **multi-modal** or conveyed through different media." According to text principle, "Texts are not understood purely verbally (i.e., only in terms of the definitions of the words in the text and their text-internal relationships to each other) but are understood in terms of embodied experiences" (Gee, 2003, p. 107). Moreover, according to the situated meaning principle, "The meanings of signs (words, actions, objects, artifacts, symbols,

texts, etc.) are situated in embodied experience. Meanings are not general or decontextualized. Whatever generality meanings come to have is discovered bottom up via embodied experiences" (Gee, 2003, p. 107). Correspondingly, the eco-dialogical model developed by Zheng (2012) supports the notion that interactions in such contexts, where multiple modalities are at work in tandem to construct and communicate meaning, provide more affordances for L2 learners to develop their L2 skills (Newgarden, Zheng, & Liu, 2015).

L2 Learning Opportunities

Sixteen papers highlighted different opportunities afforded within and beyond MMOGs contexts for practicing and developing L2 skills. Listed according to the frequencies they have been acknowledged, they include opportunities for (a) negotiation of meaning, (b) discourse management practices, (c) producing L2 in interactions with playing characters (PCs) and non-playing characters (NPCs), (d) traditional and modern literacy practices, (e) socialization in the TL, (f) practicing conversational skills, and (g) improving cultural knowledge in the TL.

Researchers have found that verbal interactions in the world of MMOGs promote opportunities for negotiations of meaning, which is shown in the SLA literature (e.g., Smith, 2004, 2005) as being facilitative of L2 learning processes. Dixon (2014), in his observation of negotiations of meaning, which were triggered mostly by player-produced and game-environmental inputs, identified "requesting" and "checking" as the two most commonly implemented communication strategies in the negotiation of meaning episodes. Peterson (2012a), too, identified that L2 learners overcame in-game

communication challenges through involvement in the co-construction of meaning, observing that learners employed "continuers" (e.g., confirmation check, requests for assistance, and requests for clarification) as negotiation-of-meaning tools in order to maintain interactions. In addition, Thorne's (2008, p. 321) analysis of naturally occurring dialogs in the context of *WoW* showed that "both participants provided expert knowledge, language-specific explicit corrections, made requests for help, and collaboratively assembled successful repair sequences." These findings appear promising in view of Interaction Hypothesis (Long, 1981) or Approach (Gass & Mackey, 2007) suggesting that conversational modifications between an L2 learner and other interlocutor(s) to resolve a communication breakdown are beneficial for L2 development. As Gass and Mackey (2007, p. 176) noted, "it is now commonly accepted within the SLA literature that there is a robust connection between interaction and learning."

Additionally, some scholars (e.g., Peterson, 2010b, 2012b; Rama et al., 2012; Reinders & Wattana, 2011) underlined the opportunities for utilizing adaptive discourse management strategies to communicate effectively during gameplay. Peterson (2010b, 2012b) identified various approaches—such as the use of acronyms and contractions, combinations of keyboard symbols, strings of dots to signal a pause or show uncertainty, quotation marks to attract attention and display emphasis—and inferred that the application of these strategies "facilitated the consistent production of coherent TL output" (Peterson, 2012b, p. 89). Through an analysis of learners' in-game utterances, Rama et al. (2012) also observed the occurrence of frequent pauses and use of

abbreviated and orthographically and stylistically non-standard language. They believed that, “For language learners, this affords valuable leeway for pauses to formulate utterances and inculcates an acceptance of errors, qualities that may facilitate the performance of communicative competence within this context” (Rama et al., 2012, p. 332). Such studies suggest that learners adopt innovative discourse management strategies to meet the demands of in-game communication, such as focusing on meaning, catching up with the rapid pace of communication, and compensating for the absence of paralinguistic features.

The amount of L2 produced within game interactions can indicate how far the learners are comfortable and confident in their social interactions with other PCs (Rankin et al., 2006). It also indicates the degree of opportunities a game context provides for L2 learners to produce language output that is, according to Swain’s (1985) Output Hypothesis, crucial in the process of L2 development. Reinders and Wattana (2011, 2015a) showed that gameplay had positive effects on the quantity of L2 interaction (as measured by the number of words and length of turns) via text- and voice-based chat. These results may differ for students possessing different levels of L2 proficiency. For example, in Rankin et al.’s (2006) study, advanced English-as-a-second-language (ESL) students generated 6 and 2.5 times more chat messages than the high-level beginners and the intermediate students, respectively. Rankin, Morrison, McNeal, Gooch and Shute (2009) also revealed a non-significant difference between advanced ESL students and NESs as regards the number of chat messages produced.

This suggests that, unlike low proficiency L2 learners, advanced students are highly encouraged in the game to initiate and sustain social interactions with other gamers.

Studies (e.g., Li, 2011; Ryu, 2011; Steinkuehler, 2007) also acknowledged the opportunities that MMOGs offer for developing traditional and modern literacies. By drawing on the contemporary definition of literacy as "'sense making' within a multimodal, socially situated space" and referring to its more restricted, traditional definition as "the 'ability to read and write print text'" (Steinkuehler, 2007, p. 301), Steinkuehler realized that gameplayers are consistently involved in a variety of language and literacy practices within the game's virtual context. With a similar research focus, Li (2011, p. 147) conceptualized literacy from a sociocultural perspective, defining it as "effective functioning in situated social practices through meaning making across various modalities (texts, images, symbols, numerals, sound, movement and so forth) in a multimodal environment." He observed that reading and decision making were respectively the first- and second-most frequently occurring literacy activities, and information seeking was the only literacy practice that took place both within and around *WoW* gameplay. Ryu (2011) also sought to discover how non-native English speakers (NNESs) develop multi-literacies as they communicate asynchronously in the context of *CivFanatics*, a beyond-game affinity space for players of *Civilization*. Ryu observed that participants had a chance to improve their traditional literacy through using different types of text (e.g., descriptive, argumentative, narrative) to describe their experiences, argue for their gaming strategies, and create stories based on gameplay. Ryu's study also highlighted the opportunities for practicing other types of literacy, including

“multimodal literacy,” “gaming literacy,” “multilingual literacy,” and “multicultural literacy.”

L2 Learning Outcomes

Communicative competence and vocabulary knowledge were the most frequently acknowledged L2 learning outcomes achieved through involvement in collaborative interactions within and beyond MMOG environments. Conversely, very few studies reported L2 learners’ improvement in other language-related skills, such as reading, writing, listening and speaking (e.g., Kongmee, Strachan, Montgomery, & Pickard, 2011; Reinders & Wattana, 2011; Sylvén & Sundqvist, 2012), and L2 awareness (Lee & Gerber, 2013).

The review suggests that meaning-oriented verbal interactions in MMOGs help L2 learners to become resourceful and effective communicators through taking advantage of multiple routes and modes of communication. Peterson (2012a) discovered that L2 learners managed their in-game communications through the appropriate use of positive politeness strategies, informal language, small talk, humor, and lengthy leave-takings. Rama et al. (2012) found that playing *WoW* prioritizes sociolinguistic competence (i.e., socially appropriate language use) and strategic competence (i.e., proper use of communication strategies) as the two salient components of communicative competence (Canale & Swain, 1980). As they asserted, “Play in MMOGs favors these forms of communicative competence, which places emphasis on contextualized meaning rather than grammatical and lexical correctness of standard language forms” (Rama et al., 2012: 330). Palmer (2010) realized that L2 learners

improved their abilities to socialize in Spanish virtual communities of *WoW* by performing a range of appropriate pragmatic moves. As with Palmer (2010), Peterson (2012a), and Rama et al.'s (2012) studies, Rankin et al. (2009) also found that social interactions in the game environment helped ESL students improve their communicative performance. Similarly, Reinders and Wattana (2011) recognized that, although L2 interaction during gameplay did not improve the accuracy and complexity of the students' discourse, it encouraged them to utilize various discourse functions (e.g., greetings, clarification requests, confirmation checks, and self-corrections) and communicate effectively within the game.

On the topic of improvement in L2 vocabulary as a key learning outcome, Alp and Patat (2015) reported an improvement in students' language acquisition in terms of vocabulary (selection and match), sentences in context, guessing unknown words in context, and students' production in context. Additionally, Rankin et al.'s (2006) study revealed that the students achieved a higher level of accuracy in defining L2 vocabulary words when the words were introduced more frequently in the conversations with NPCs. Rankin et al. (2009) undertook a more complicated investigation of the issue, with 18 advanced ESL students randomly assigned to three conditions (i.e., attending class instruction, playing *Ever Quest II* (*EQ2*) on their own, and playing *EQ2* with NESs). As they evaluated the participants' recognition of the correct meaning of L2 vocabulary in the context of game tasks, the authors found a significant difference in post-test scores for the three groups. The students who collaborated with NES players performed better than the other two groups, who performed pretty much the same. However, the post-test

scores for sentence usage revealed a significant difference for the students who received traditional classroom instruction. Sylvén and Sundqvist's (2012) research confirmed Rankin et al.'s (2009) findings concerning the positive impact of gaming on the learners' receptive L2 vocabulary knowledge, but their results depart from what Rankin et al. (2009) discovered about the impact of gaming on L2 learners' vocabulary usage (or production) skills. Specifically, Sylvén and Sundqvist (2012) found significant differences between non-gamers, moderate gamers, and frequent gamers in terms of L2 vocabulary recognition and production skills.

Discussion

Our review sought to ascertain how SLA is researched in the context of MMOGs, and what prior research findings suggest with regard to the affordances of these unconventional settings as venues for L2 learning and pedagogy. Figure 1 provides a conceptual framework that depicts projected relationships among the themes identified through our analysis: the MMOG environment, the L2 learning opportunities and positive affective forces promoted in this environment, and, finally, the second language and culture learning outcomes. It is worth noting that there are many overlaps among the elements illustrated in Figure 1, and that the relationships between them should not be conceived of as merely linear and directional.

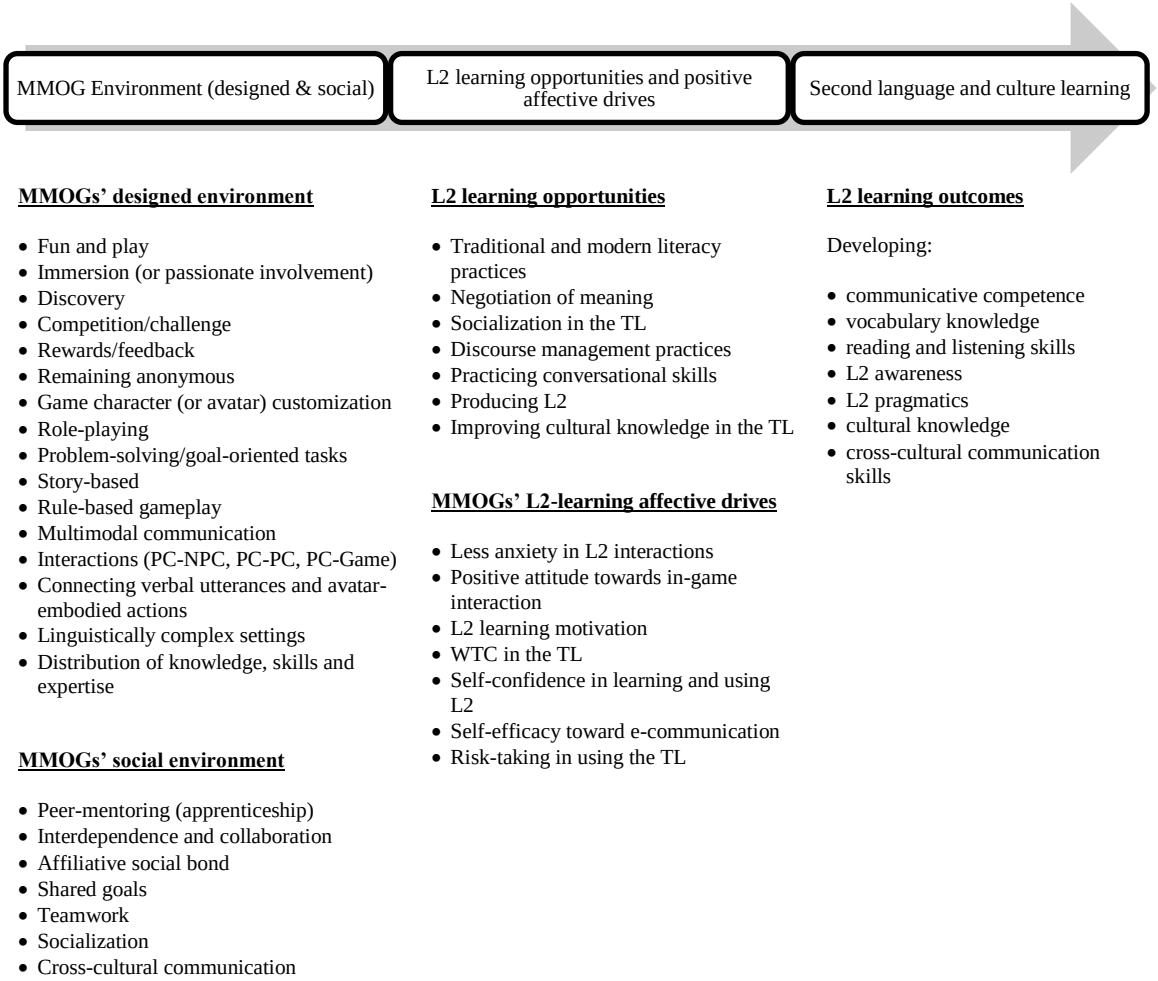

Figure 1. Hypothetical relationships among the themes in the papers' findings.

MMOGs' designed features were found to help to provide learning environments that are fun, collaborative (Voulgari & Komis, 2011), socially interactive (Cole & Griffiths, 2007), semiotically rich (Thorne & Fischer, 2012), linguistically complex (Thorne et al., 2012), and emotionally safe (e.g., Reinders & Wattana, 2014, 2015b). Performing a broad range of activities using the TL, learners get involved in different types of interactions (with other PCs, NPCs, and the game context), which seem to hold opportunities for L2 learners to develop L2 literacies and increase their cross-cultural

communication skills. Furthermore, small and large “communities of practice” (Wenger, 1998) emerge to accomplish increasingly challenging targets that warrant a high level of collaboration among PCs. Socializing and interacting with native or more competent speakers of the TL in an “affinity group” that is “bonded primarily through shared endeavors, goals, and practices” (Gee, 2003, p. 197) appears less or non-intimidating for learners.

As Reinders and Wattana (2015b, p. 50) speculated, gameplay in such an environment appears to initiate “a virtuous cycle of lowered anxiety, resulting in a more L2 production, leading to greater self-satisfaction, and resulting in more motivation, which in turn led to a further lowering of affective barriers.” We further infer that a similar relationship can be found between the affective factors and the L2 learning opportunities identified in the context of MMOGs. L2 learners will likely take greater advantage of the possibilities as they grow increasingly self-confident in using the TL. Moreover, the more opportunities they seize to enhance their L2 skills, the more competent they can become in their L2 communications. In a logical sequence, this process can result in developing higher levels of self-efficacy beliefs, willingness to socialize, and positive attitudes towards L2 learning and gameplay. This chain of theorized impacts can be justified in light of Willingness to Communicate (WTC) theory (MacIntyre, Dörnyei, Clément, & Noels, 1998), suggesting that “interaction in a non-threatening environment conducive to authentic language use, will lead to increased self-confidence, decreased anxiety, and increased willingness to practice and use the L2” (Reinders & Wattana, 2015b, p. 43–44).

In addition to developing positive affective and motivational drives toward L2 learning and socialization, we found that L2 learners can enrich their repertoire of vocabulary knowledge and enhance their communicative competence. Conversely, in spite of a large quantity of L2 interactions and production during gameplay (Rankin et al., 2006; Rankin et al., 2009; Reinders & Wattana, 2011, 2015a), no significant improvement was observed in the learners' discourse in terms of accuracy and complexity (e.g., Reinders & Wattana, 2011; Palmer, 2010; Zheng et al., 2009b). This finding appears to partly contradict assumptions underlying interactionist approach theorizing that "[n]egotiation for meaning, and especially negotiation that triggers interactional adjustments by the native speaker or more competent interlocutor, facilitates acquisition because it connects input, internal learner capacities, particularly selective attention, and output in productive ways" (Long, 1996, p. 451). The first hypothesis is that very few if any communication breakdowns occur during interactions, and, when they do occur, they are not negotiated, as in Peterson's (2012b) study. The second hypothesis is that even when negotiations of meaning do take place, they do not entail interactional adjustments; or, in some cases of interactional adjustments, the learners may fail to notice the gap in their interlanguage. The role of "noticing" or "selective attention" in the process of L2 learning is emphasized in Schmidt's (1990, 1993) Noticing Hypothesis, and also reflected in a learning principle established by Hattie and Yates (2013, p. 115), which states that "When the mind *actively* does something with the stimulus, it becomes memorable." Finally, the third hypothesis concerns the lack of opportunity or motivation for reviewing, practicing, and eventually

internalizing new forms of language having been provided (through interactional adjustments) and noticed by the learners.

MMOGs afford multiple routes and modes of communication that can inspire the liberal and innovative use of language. During gameplay, language is utilized parsimoniously—through using the least morphological characters—for communicating in the most efficient manner. This likely explains, at least partially, why vocabulary and communicative competence were identified as the most frequently developed L2 skills in the context of MMOGs, yet L2 development falls way behind in terms of accuracy and complexity. Highly time-sensitive and goal-oriented verbal interactions—or in Reinders and Wattana's (2011, p. 16) terms, "the demands for simultaneous communication flow"—during gameplay encourage a form of communication that is unorthodox in language form, succinct in nature, and innovative in style. Replacing letters with numbers and symbols, the innovative spelling of words, the omission of articles, and the use of contractions and abbreviations are a few features of this communication style. Thus, L2 research in immersive multiplayer games cannot be addressed comprehensively (Palmer, 2010; Rankin et al., 2009) when *language* is perceived strictly as "the only linguistic mode instead of part of a multimodal ensemble of modes" (Newgarden et al., 2015, p. 23) of communication. Adopting a more liberal perspective toward the concept of language is warranted. For example, "from an ecological perspective, 'movement, process, and action,' things that people do … are inextricably integrated with language, i.e., they are part of languag*ing*" (Newgarden et al., 2015, p. 23). This view aligns with Complexity and Dynamic Systems Theory (Larsen-Freeman

& Cameron, 2008a), which rejects the SLA research approaches that conceive of L2 development as merely the mastery of a set of grammar rules. As Larsen-Freeman and Cameron (2008a, p. 135) have elaborated:

Learning is not the taking in of linguistic forms by learners, but the constant adaptation of their linguistic resources in the service of meaning-making in response to the affordances that emerge in the communicative situation, which is, in turn, affected by learners' adaptability.

Future Research

Considering that most of the studies (20 or 62.5%) were qualitative, adopting an optimum combination of different research paradigms appears warranted. We contend that qualitative work has set the stage well for more quantitative investigations, which could present quantifiable indicators of L2 learning in MMOG settings. That is, future research needs to invest more in quantitative (e.g., controlled experimental or quasi-experimental) studies in order to substantiate what has been explored in earlier qualitative work and verify SLA scholarly theory concerning the affordances of MMOGs for second language and culture learning.

The quality of research in the current literature is the second issue that needs to be addressed. Our review revealed that about 57% of qualitative studies failed to report (or implement) measures ensuring the "credibility," "neutrality or confirmability," "consistency or dependability," and "applicability or transferability" (Lincoln & Guba, 1985) of their data analysis and findings. In some cases, the researchers did not even mention the approach they adopted to analyze their qualitative data. Similarly,

quantitative studies were found to suffer from methodological deficiencies such as inappropriate sampling procedures and failure to implement measures required to ensure the validity and reliability of their data collection and data analysis tools and methods.

Related to concerns about the quality of the studies is the absence of a theoretical or conceptual framework. Ten (about 31%) of the 32 studies reviewed did not refer to any theoretical framework (or assumptions) underlying their hypotheses and choice of research methods. Correspondingly, a general limitation that applies to the whole body of research in this area is that a very limited range of theories has been drawn upon to examine L2 learning behavior in MMOG settings. Vygotsky's (1978) sociocultural theory was cited in 10 (circa 31%) of the studies, with some researchers simply citing the theory without actually incorporating its principles, constructs, or methodology. Due to the interdisciplinary nature of L2 research in the MMOG environment, adoption of an eclectic range of theoretical perspectives is warranted to encompass multiple aspects of the phenomenon, which are in constant and dynamic interaction with one another in a complex system.

Finally, it is noteworthy that along with distinctive MMOG-related variables (e.g., type and genre, the quality and quantity of interaction opportunities, types and variety of multimodal communication channels), there also exists a range of different factors associated with L2 learners (e.g., age, gender, personality, L2 learning and gameplay motivation, L2 learning self-efficacy beliefs, learning styles, and L2 proficiency). To capture the dynamics of L2 learning in MMOG ecologies, a reasonable approach might be to incorporate all variables into a learning model particularly

formulated to explain how, to what extent, and under what circumstances playing an MMOG can contribute to one's L2 development. Such an approach echoes Complexity and Dynamic Systems Theory that "aims to account for how the interacting parts of a complex system give rise to the system's collective behavior and how such a system simultaneously interacts with its environment" (Larsen-Freeman & Cameron, 2008a, p. 1).

Limitations

A scoping review "can provide a rigorous and transparent method for mapping areas of research" (Arksey & O'Malley, 2005, p. 30). Adopting this methodology allowed us to present an overview of the current research on "vernacular" MMOGs in the field of SLA, and determine the volume, variety, nature, and characteristics of the primary research conducted so far. Equally, though, the current study also features some limitations due to the nature of scoping reviews. Arguably, the most serious issue is that the quality of evidence in the primary research included in our study is not critically assessed. Results from different types of sources (e.g., peer-reviewed academic papers, conference proceedings, postgraduate theses and dissertations) were grouped and reported without allocating more weight to one particular source over another. Therefore, the current study, as a typical scoping review, "cannot determine whether particular studies provide robust or generalizable findings" (Arksey & O'Malley, 2005, p. 27).

Moreover, the small number of quantitative studies inevitably removed from consideration the meta-analysis research method. The four quantitative studies and the

quantitative sections of the eight mixed-method studies differed in terms of, for example, their design, focus, and participants. They covered a wide range of topics, too. There were only a few studies that investigated similar topics such as vocabulary acquisition, quantity of L2 production, self-efficacy toward L2 use, and communication strategies.

Conclusion

MMOGs have ignited some degree of optimism—among SLA scholars—that such socially and semiotically rich contexts can afford learners with authentic opportunities to socialize in the TL. This perspective has inspired researchers to investigate how the affordances of MMOGs might be harnessed for the improvement of L2-related skills. This review revealed that MMOGs' environmental (designed and social) features encourage learners to get actively involved in L2 socialization and collaborative interactions with other PCs to perform a variety of goal-oriented tasks within and beyond game contexts. The findings do appear to suggest that playing MMOGs in the TL helps improve receptive L2 vocabulary knowledge and transform L2 learners into more resourceful communicators who venture to utilize various discourse functions to communicate effectively in their interactions. The current review also showed that most of the studies are qualitative, very limited aspects of L2 learning have been researched, the quality of studies needs to be improved, and that more innovative research models need to be designed to explore the cognitive processes underlying SLA in such dynamic and complex environments. Second language and culture learning within and beyond MMOGs' settings needs to be studied more thoroughly by conducting a balanced combination of research paradigms and adopting more diverse

theoretical perspectives within a dynamic system that encompasses both game- and learner-related variables.

CHAPTER III

MMORPG-MEDIATED NEGOTIATED INTERACTIONS: A STUDY OF NS-NNS AND NNS-NNS CONVERSATIONS

Introduction

According to the online statistics portal *Statista* (www.statista.com), as of July 2014, there were an estimated 23.4 million active monthly MMOG subscribers worldwide. Only one game – World of Warcraft (*WoW*) – had around 10 million global subscribers in the fourth quarter of 2014. Studies (e.g., Steinkuehler, 2004; Yee, 2006) showed that massively multiplayer online role-playing games (MMORPGs), the most common subgenre of MMOGs, are popular across different genders, age groups, and ethnicities. These games, as referred to by some scholars (e.g., Kaplan & Haenlein, 2010) as a form of social media, have attracted the attention of several researchers in the field of second language acquisition (SLA).

It is strongly held that commercially developed or off-the-shelf (OTS) MMOGs provide opportunities for L2 learners to interact and socialize in the target language (TL) and thereby develop some critical L2 skills in an authentic communication setting (e.g., Dixon, 2014; Palmer, 2010; Peterson, 2010b, 2012b; Rama et al., 2012; Thorne, 2008). Some studies (e.g., Bytheway, 2014; Peterson, 2010b, 2012a; Reinders & Wattana, 2014, 2015b) highlighted that MMOGs' environmental features (designed and social) create anxiety-free and socially supportive communication environment that can positively affect the processes underlying SLA. Research has also underscored the

opportunities that MMOG play can afford for SLA. They include the opportunities for negotiations of meaning (Dixon, 2014), discourse management practice (Peterson, 2010b, 2012b; Rama et al., 2012; Reinders & Wattana, 2011), interactions with playing characters (PCs) and non-playing characters (NPCs) in the TL (Rankin et al., 2006), traditional and modern literacy practices (Li, 2011; Ryu, 2011; Steinkuehler, 2007), socialization in the TL (Palmer, 2010; Peterson, 2010b, 2012b; Wu, Richards & Saw, 2014), practicing conversational skills (Rankin et al., 2006), and enriching cultural knowledge in the TL (Zheng, Wagner, Young, & Brewer, 2009a). Studies also examined the direct influences of MMOG play on developing L2 skills. Their findings suggest that getting involved in the gameplay and game-related activities (beyond MMOG environments) enriches L2 learners' vocabulary knowledge (e.g., Alp & Patat, 2015; Sylvén & Sundqvist, 2012; Rankin et al., 2006; Rankin et al., 2009) and improves their communicative skills in the TL (e.g., Rama et al., 2012; Palmer, 2010; Rankin et al., 2009; Reinders & Wattana, 2011). A very small number of studies also investigated the effects of MMOG play on L2 learners' improvement in reading, writing, listening, and speaking skills (e.g., Kongmee et al., 2011; Reinders & Wattana, 2011; Sylvén & Sundqvist, 2012).

Despite an increased interest in MMOGs as potential venues for L2 development, no exploratory research—as far as the researcher is informed—has been conducted to examine carefully the participants' verbal interactions within the game context from the psycholinguistic account of interactionist perspective (Long, 1996). From this theoretical standpoint, conversational exchanges, and especially those that promote negotiations of

meaning are facilitative in the process of L2 development (Smith, 2003a; Tudini, 2003). This notion has inspired a rich body of research that empirically investigated the effects of negotiated interactions on the quality and quantity of L2 production in face-to-face (e.g., Ellis et al., 1994; Mackey, 1999; Mackey & Goo, 2007; Pica, 1994) as well as online and computer-mediated communication settings (e.g., Blake, 2000; Fernández-García & Martínez-Arbelaiz, 2002; Sauro, 2011; Smith, 2003a, 2003b, 2004, 2005). This line of research, however, has not been pursued as rigorously in the context of MMOGs, as highly interactive social settings. Only a few researchers (e.g., Dixon, 2014; Peterson, 2012a, 2012b) confirmed that conversational exchanges during MMOG play provided L2 learners with opportunities to negotiate meaning in the TL and utilize some communicative strategies (e.g., confirmation check, clarification requests) to bridge the communication gaps in the discourse.

Adopting a process-oriented approach to the study of SLA in the context of an MMORPG, the current research intended to analyze the participants' in-game conversational behaviors to identify and characterize the interactional features that are hypothesized in the psycholinguistic account of interactionist perspective as facilitative in the process of L2 development. To this end, six non-native English speakers (NNESs) (3 low and 3 high-intermediate) and a native English speaker (NES) were recruited through purposeful sampling. Then, two teams of gamers each consisting of 3 NNEs and a NES were set up. The NES participated as the fourth member of each team. The configuration of the participants allowed the researcher to examine the effect of the NNESs' level of L2 proficiency on their verbal (oral) behavior as far as negotiation

meaning is concerned. The current study consisted of two main stages. First, in-game conversational (oral) exchanges between the NES and NNESs were examined to locate the instances of negotiations for meaning. Then, the constructing elements of negotiation routines (i.e., trigger, indicator, response, reaction to the response) were described in detail using Varonis and Gass's (1985a) "Negotiation of Meaning Sequences Model" and Smith's (2003a) "Model of Computer-Mediated Negotiated Interaction." More specifically, this research intended to find out the extent to which conversational (oral) exchanges during the gameplay encountered breakdowns due to the incomprehensibility of the discourse, how these communication breakdowns were signaled and attended to by the interlocutors, and finally how far the negotiations of meaning were successful in bridging the communication gap. This research described the frequency and types of interactional modifications the NES, and the NNESs applied as they encountered communication problems during the gameplay. It also explored how far conversational adjustments (or modifications) helped to improve the discourse comprehensibility. Through detailed description and quantification of negotiation episodes taking place during the gameplay, this study provided some explanations for the key findings reported in the current empirical studies on the affordances of MMOGs for SLA. It demonstrated how and why processes underlying MMOG-mediated communications serve as mechanisms for the development of some aspects of the L2 in this highly interactive social setting.

Theoretical Underpinnings

Second language learning in the context of MMOGs can be explained well through social constructivist's perspective. Social constructivism emphasizes the need for mediation and social interaction as two essential factors in the processes of developing meaning (Vygotsky, 1978). According to Vygotsky's social constructivism or sociocultural theory, interactions with individuals and cultural artifacts—in one's physical, social and cultural environment—play a fundamental role in one's cognitive development. From the social constructivist point of view, "Learning is viewed primarily as a social product yielded by the processes of conversation, discussion, and negotiation" (Woo & Reeves, 2007, p. 18).

Incorporating MMOGs in L2 learning and teaching can also be framed in Jean Lave and Etienne Wenger's Situated Learning Model (Lave & Wenger, 1991). This model suggests that learning takes place in its non-educational form as an individual is engaged in performing meaningful tasks situated in an authentic social and cultural context. According to this model, learning is experienced, and meaning is co-constructed as a person is actively engaged in jointly sharing and developing practices within a "community of practice" (Lave & Wenger, 1991). This model proposes that learning involves a process of engagement in a community of practice, which is characterized by "joint enterprise," "mutual engagement," and "shared repertoire" of communal resources (Wenger, 1998).

In the case of social media in its general sense and MMOGs in particular, joint enterprise or shared domain of interests implies that MMOG online communities are

organized on the basis of common interests and shared goals. All users who are identified by their communities seek to communicate their thoughts and share their knowledge with other members of their group. More clearly, online communities develop around goals, interests, concepts, and values that matter to each one of their members. As another essential characteristic of every community, mutual engagement suggests that MMOG players are always engaged in meaningful collaborations to accomplish a set of collective goals. Gamers share and discuss ideas within game-related forums. They invite people to join their networks and participate in a multitude of different activities and social events. These meaningful mutual engagements involve shared meaning-making efforts that are consistently contributing to a user's sociopragmatic awareness (Blattner & Fiori, 2011) and sociocultural learning (McBride, 2009). The shared repertoire of communal resources is developed by communities over a period of collaboration and participation. In the case of MMOG online communities, shared repertoire of communal resources refers to a vast collection of resources that are regularly shared and developed within the communities of gamers. These resources include a broad range of communal assets including a system of trust and commitment, a set of accumulated technical knowledge and skills, a repertoire of well-discussed ideas, sensibilities as well as cultural and social artifacts (see Thorne et al., 2009; Zheng, Young, Wagner, & Brewer, 2009a; Zheng et al., 2009b).

Literature

There is a rich body of literature acknowledging the benefits of interaction in the process of L2 development. A part of this body of research has examined the

interactional features and their impacts on L2 learning in face-to-face contexts (Ellis et al., 1994; Keck, Iberri-Shea, Tracy-Ventura, & Wa-Mbaleka, 2006; Loschky, 1994; Mackey, 1999; Mackey & Goo, 2007; Pica, 1994; Pica, Young, & Doughty, 1987). The other part of this literature has demonstrated the efficacy of interactions in the context of synchronous (e.g., Blake, 2000; Fernández-García & Martínez-Arbelaiz, 2002; Petersen, 2010c; Sauro, 2011; Smith, 2003a, 2004, 2005; Toyoda & Harrison, 2002; Tudini, 2003) and asynchronous (e.g., Abrams, 2003; Sotillo, 2000) computer-mediated communications.

Research suggests that interactions in the target language can provide an optimal condition for L2 development; especially when these interactions involve negotiations of meaning during which interlocutors are collaboratively engaged in improving the comprehensibility of the ongoing discourse (Gass & Varonis, 1985, 1986; Pica, 1994; Pellettieri, 2000; Pica & Doughty, 1985; Pica, Kanagy, & Falodun, 1993; Scarcella & Higa, 1981; Smith, 2003a, 2003b; Varonis & Gass, 1985a; 1985b). Findings of this body of research are aligned with the fundamental notions of input, output, and attention underlying the interaction hypothesis (Long, 1996). In Long's (1996) term, "negotiation for meaning, and especially negotiation work that triggers interactional adjustments by the NS or more competent interlocutor, facilitates acquisition because it connects input, internal learner capacities, particularly selective attention, and output in productive ways" (pp. 451-452). From this theoretical perspective, negotiations of meaning, which seek to maintain the flow of the discourse through improving its comprehensibility, are viewed as beneficial for L2 development as they enhance TL input and foster modified

TL output (Pellettieri, 2000). The study of negotiated interactions in computer-mediated communication (CMC) settings revealed that task-based synchronous computer-mediated communication (SCMC) is potentially useful for L2 learning (e.g., Chen & Eslami, 2013; Eslami & Kung, 2016; Kung & Eslami, 2015; Smith, 2004, 2005; Blake, 2000; Fernández-García & Martínez-Arbelaiz, 2002; Lee, 2001, 2002; Pellettieri, 2000). Pellettieri (2000), for example, found that chatting—as a form of task-based synchronous network-based communication (NBC)—fostered negotiation of meaning among L2 learners. She realized that the learners negotiated different aspects of the discourse as they communicated through the chat channel. Being involved in negotiations of meaning, as she observed, L2 learners were pushed to apply form-focused linguistic modifications. They also provided each other with corrective feedback, which resulted in the incorporation of TL forms in their succeeding conversational turns.

Although the features of negotiated interactions and their impacts on L2 learning have been widely studied in FTF and SCMC contexts, this line of research has not been pursued rigorously in the context of MMOGs. The current literature on SLA in the context of MMOGs is mainly focused on four major topics including: L2-related motivational and affective forces promoted in MMOGs (Lee & Gerber, 2013; Peterson, 2010a, 2010b; Zheng et al., 2009b), L2 vocabulary acquisition (e.g., Bytheway, 2014; Rankin et al., 2009), development of communicative competence (or discourse management strategies) (Alp & Patat, 2015; Peterson, 2010b; Dixon, 2014), and the quality and quality of L2 interactions (Reinders & Wattana, 2011, 2015a). Negotiation of

meaning (within and beyond game settings) is among other topics (e.g., L2 literacy practices, L2 learning strategies, and practicing learning autonomy) that are scantly touched in such socially interactive (Cole & Griffiths, 2007) and semiotically rich (Thorne & Fischer, 2012) environments.

Dixon (2014), for example, addressed this topic by studying the number and types of the opportunities that playing Guild Wars II provided for negotiations of meaning. Dixon found that the gameplay offered English as a second language (ESL) students with opportunities for negotiations of meaning that were mainly triggered by player-produced input (i.e., text messages exchanged during the gameplay conversations) and game-environmental input (i.e., computer-generated texts). His research also showed that "requests" for information and "checks" were the most frequently applied communication strategies during negotiations of meaning. By "checks," strategy, he meant requests for clarification (or "clarification check" in his term) as well as confirmation and comprehension checks, which are the elements of negotiation routines.

Peterson (2012a) investigated the significant features of English as a foreign language (EFL) learners' interactions in the context of *Wonderland*—that is an MMORPG. He didn't make a direct reference to the occurrence of negotiation of meaning. Instead, he highlighted the participants' use of "continuers" during text-chat interactions. Peterson's (2012a) results echoed Dixon's findings to a great extent, as he identified three types of continuers including confirmation checks for signaling interest and eliciting feedback (from other players), requests for assistance, and requests for

clarification in occasions of communication problems. In his classification, the last form of continuer (i.e., request for clarification) shows evidence of negotiation of meaning in the participants' conversational exchanges. It is important to note, though, that as confirmation checks in Peterson's (2012a) research were "designed to signal interest and elicit feedback" (p. 373), they cannot be considered as indicators of incomprehension in a negotiation of meaning routine (Pica, Doughty, & Young, 1986). As Foster and Ohta (2005) emphasized, signals of communication breakdowns should be distinguished carefully from signals of interest and encouragement, which function as continuers helping to maintain states of intersubjectivity among interlocutors.

In another study, Peterson (2012b) investigated the participants' interaction management strategies in the context of an MMORPG—that was *NineRift*. He intended to realize if the participants were involved in the TL interactions, which are assumed in the interactionist perspective to SLA as beneficial for L2 development. The analysis of in-game text chat transcripts revealed that communication was halted infrequently, but it didn't result in negotiation of meaning. Peterson (2012b) believed that successful use of "adaptive" discourse management strategies (e.g., emoticons, suspension dots, quotation marks, and split turns) "facilitated the consistent production of coherent TL output" (p. 89). He also speculated that the limited duration of gaming sessions, the real-time nature of the interactions, the need to keep up with scrolling messages, and the participants' shared L1 and cultural background could have been the reasons for the non-occurrence of negotiations of meaning. Peterson also explained that for the participants, who were Japanese, it was crucial to maintain their status among peers by avoiding to display

ignorance. This behavior, as Peterson speculated, can partially explain why the participants in his study avoided negotiating meaning despite communication breakdowns. Peterson's (2012b) findings can also be explained partly by drawing on Varonis and Gass's (1985a) assertion that incidence of nonunderstanding (and presumably negotiations of meaning afterward) occur the least frequently when the interlocutors have the most in common (such as L1, L2 proficiency, or cultural background).

Zheng et al. (2009a) developed the concept of negotiation for meaning into a broader concept of "negotiation for action" (NfA) by adopting concepts from ecological psychology and ecological linguistics. They analyzed the interactions between native and non-native English speakers in the context of Quest Atlantis. They found that intercultural collaboration for quest completion provided the participants with ample resources for co-construction of meaning. They affirmed that: "Fundamental to the acquisition of pragmatics, syntax, semantics, and discourse practices during the collaboration was the dyad's socialization in framing and structuring their development of both linguistic and cultural knowledge and the codetermination of context and language" (p. 504). Negotiation for action, according to Zheng et al. (2009a), can provide even more affordances for L2 learners to establish comprehensibility compared to linguistic negotiation for meaning.

Methodology

By incorporating some insights from the Interactionist approach to SLA (Mackey et al., 2012; Peterson, 2010a) and discourse-analytic perspective, the current study

sought to characterize the nature of the negotiations of meaning that happened within the naturally-occurring conversational exchanges during the gameplay. This study can be considered as descriptive—in Seliger and Shohamy's (1989) conceptualization of the term 'descriptive'—as conducted to "describe naturally occurring phenomena without experimental manipulation" (p. 124). The study was carried out in two major phases. First, the episodes of negotiation for meaning were identified in the discourse generated collaboratively during the gameplay. Second, the main components of each negotiation routine (including a trigger, an indicator, response, and the reaction to the response) were characterized in detail and quantified using frequency measures. To complete the phases mentioned above, Varonis and Gass's (1985a) "Negotiation of Meaning Sequences Model" and Smith's (2003a) "Model of Computer-Mediated Negotiated Interaction" were used as guiding frameworks for analysis. The data consisted of 63 hours of audio-recorded conversations taking place between 6 NNESs (based in Iran) and a NES (based in the USA) during the gameplay over a 5-month period. The basic unit of analysis was the negotiation of meaning routine (or episode). According to Varonis and Gass (1985a), negotiation routines are defined as the exchanges that "push down" the participants from the main line of discourse to resolve a communication breakdown and "pop" them "up" back to the main stream of discourse when the problem is resolved. The minimum components of a negotiation routine are a trigger as the cause of the communication breakdown, an indicator (of misunderstanding, non-understanding, or incomplete understanding) that signals this temporary interruption in

the flow of the discourse, and response as an attempt to repair the communication problem.

Participants

Six NNESs (based in Iran) and one NES (based in the USA) participated in this research. To recruit the NES, an invitation-to-participate letter (see Appendix E) was emailed—through TLAC list serve—by TLAC academic advisor to invite both graduate and undergraduate students to participate. The email included a short survey asking if the potential participants were experienced *WoW* players, were between 18 and 30 years old, and can play the game for at least three hours a week over the course of three months with some NNESs. The letter was also posted on the researcher's Facebook page to recruit participants via personal connections. Additionally, the researcher's colleagues at Texas A&M University were informed of the project and asked to introduce those who they thought would meet the criteria to participate in this research.

To recruit the NNESs, an invitation-to-participate letter (both in English and in Farsi) (See Appendix E) was posted on the researcher's Facebook page. The letter contained a brief survey that helped with the initial screening. The researcher also used his connections in Iran to share the invitation letter—through email—with those who would supposedly meet the criteria to participate. Those who were interested in participating were asked to email the researcher.

Upon receiving emails from those who demonstrated an initial interest to participate (3 NESs and 23 NNESs), the researcher contacted them—through Skype, Viber, or phone—to share more detailed information through reviewing the consent

form and ask more detailed questions. Two NESs refused to participate. One of them did not accept to be audio-recorded while playing the game, and the other one could not handle the time difference between Tehran, Iran, and Texas, the USA (that is about 8 hours and 30 minutes). Finally, an expert *WoW*-player, who was 30 years old, accepted to participate in the project from San Antonio, Texas.

The recruitment of the NNESs (from Iran) was a little more complicated. Their initial screening resulted in 12 (out of 23) participants, who seemed to meet the criteria to participate. The rest of them were screened out because they (a) thought they would play the game on their cellphone, (b) did not like the game due to its cruel content, and (c) could not handle the time difference between the USA and Iran. After the initial screening, the researcher traveled to Iran to finalize the recruitment process, mainly by (a) checking the accessibility of the technical infrastructure required for playing the game on a European server and (b) administering the English language placement test. The technical requirements included a suitable PC (or laptop) with a microphone, a battle.net account, an internet connection of at least 256 kb/s, and a ping between 100-200 milliseconds. In online MMOGs, ping refers to the amount of time (in milliseconds) it takes for a "packet" of data or information to travel from a player's computer (i.e., client) to the game "server" on the internet and get back. The lower a gamer's ping is, the lower the latency is, therefore, the less lag the player will experience in his gameplay. At this phase, three out of twelve candidates did not meet the technical requirements necessary for the gameplay. The English language placement test was administered to the remaining 9 participants. Three of the participants were placed at the

advanced level of English language proficiency. Therefore, they were screened out from the project. Finally, 6 male participants (with 23-25 age range) signed a consent form (see Appendix D) and agreed to play *WoW* until they completed a total of 30 hours of collaborative gameplay in their teams.

The NNESs were equally divided into two groups (of three) according to their level of English language proficiency determined by English Unlimited Placement Test (Cambridge University Press 2010). This test consists of written and oral sections (see Appendix B). The written section comprises 120, and the oral section contains 30 questions. The questions are calibrated for six different levels of English language proficiency according to The Common European Framework of Reference for Languages (CEFR). All the participants in group 1 were experienced *WoW* players. Their level of L2 proficiency was determined as threshold or intermediate, approximately level B1 according to the CEFR. The NNESs in group 2 had extensive experience playing other MMORPGs such as *Clash of Clans* but little or no experience playing *WoW*. They were placed at Vantage or upper intermediate level, approximately at level B2 according to the CEFR. As an expert *WoW* player, the NES participated in both groups (henceforth referred to as teams denoted by T).

Data Collection

The data consist of the participants' conversational (oral) exchanges during the gameplay. The participants played *WoW* for six months that added up to 60.38 hours of gameplay (30 hours in T1 and 30.38 hours in T2). In-game conversations were audio-recorded using TeamSpeak 3, which is a proprietary voice-over-Internet Protocol (VoIP)

software. TeamSpeak 3 was utilized by the participants to have oral conversations during the gameplay. T1 completed 30 hours of gameplay during 14 sessions—that is 2.14 hours on average per session. T2 completed 30.38 hours during 15 in-game meetings—that is 2 hours on average per session. During the data-collection period, the participants were required to enter the game world simultaneously and play the game collaboratively as a team. They could play the game as long as the whole team could stay together. Throughout the project, the participants were involved in questing and co-questing, completing a variety of in-game tasks. Also, both teams participated in different group dungeons, which sometimes took an hour to complete. They also participated in team PvP (player versus player) in a number of battlegrounds, competing against other similarly capable teams of game players from the opposite faction (the Horde in the current research). At the end of the project, with two or three level difference, the participants in T1 reached level 40, and the participants in T2 reached level 43.

Data Analyses

This section presents a microanalysis of the participants' in-game verbal (oral) interactions that occurred in three different forms of dyadic conversational exchanges. These forms include: (a) $NS_{trigger} \rightarrow NNS_{indicator}$, in which an element in the NS's utterance triggered the communication breakdown and the NNS initiated the negotiated interaction by explicitly or implicitly indicating non-, mis-, or incomplete understanding, (b) $NNS_{trigger} \rightarrow NS_{indicator}$, which is the opposite of the previous dyad, and (c) $NNS_{trigger} \rightarrow NNS_{indicator}$, wherein the negotiated interaction took place between two NNS participants. The main purpose of the current analyses was to examine (a) the nature of

MMOG-mediated verbal communications, (b) the frequency of communication problems the participants encountered during the gameplay, (c) the characteristics of the negotiations of meaning between the participants, and (d) if the NNSs' level of L2 proficiency could make any difference with regard to the nature of in-game verbal communications, the frequency of communication problems, and the characteristics of the negotiations of meaning.

Data Coding System

Varonis and Gass's (1985a) "Negotiation of Meaning Sequences Model" (see Figure 2 below) and Smith's (2003a, p. 50) "Model of Computer-Mediated Negotiated Interaction" were applied to identify, describe and quantify aspects of negotiated interactions in the participants' game-mediated conversational exchanges. Smith's (2003a) model is an adapted version of Varonis and Gass's (1985a) most widely used model. Smith (2003a) expanded their model by incorporating some new patterns he observed in the task-based, synchronous computer-mediated interactions in NN-NN dyads through the text chat channel.

Varonis and Gass (1985a, p. 72) proposed their model "[…] to account for the form of meaning negotiation in non-native discourse, suggesting the function of these negotiations in the discourse, as well as their function as part of the acquisition process." According to this model, negotiation routines are defined as the exchanges that "push down" the participants from the main line of discourse to resolve a communication breakdown and "pop" them "up" back to the main stream of discourse when the problem is resolved. According to Varonis and Gass (1985a), a communication failure has its

root in a conversational exchange in which there is a misunderstanding, no understanding, or incomplete understanding. Their model comprises four main functional components (see Figure 2 below) that form a negotiation routine. They include a trigger (T), an indicator (I), a response (R), and a reaction to the response (RR).

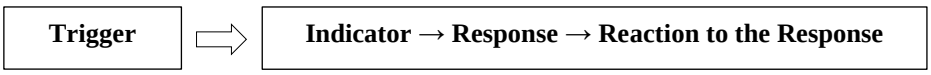

Figure 2. "Proposed model for non-understandings" (Varonis & Gass, 1985a, p. 74).
Note. From "Non-native/non-native conversations: A model for negotiation of meaning," by E. Varonis and S. Gass, 1985a, *Applied Linguistics, 6,* p. 74. Copyright 1985 by *Applied Linguistics*. Reprinted with kind permission of Oxford University Press.

Triggers

A trigger is the initiator of a negotiation routine. Varonis and Gass (1985a) defined it as "[…] that utterance or portion of an utterance on the part of the speaker which results in some indication of non-understanding on the part of the hearer" (p. 74). By drawing on the interactionist literature, Smith (2003a) classified triggers into "lexical/semantic, structural (morphological/syntactic), content- and task-related, discourse, and pragmatic" (p. 43) types.

In lexical triggers, as Smith (2003a) explained, the communication problem is attributed to a particular lexical item in an utterance. In the case of syntactic triggers, an utterance is problematic or incomprehensible by the hearer due to its structural or grammatical construction. In his terms, discourse triggers are "related to the general coherence of the discourse or conversation" (Smith, 2003a, p. 43). Failure of the hearer

to reference a pronoun correctly to its antecedent in an utterance is an example of discourse triggers. Finally, content triggers refer to the cases in which the communication breakdown occurs due to the incomprehensibility or vagueness of the entire content of the preceding utterance. Smith (2003a) did not provide any definition or example of "pragmatic" type of triggers. Presumably, he used the term "discourse" to refer to an overarching concept that, according to Ellis, Basturkmen, and Loewen (2001), involves "textual relations, such as text cohesion and coherence, and pragmatics, such as the appropriate use of specific forms according to social context" (p. 424). Fernández-García and Martínez-Arbelaiz (2002) used the label "pragmatic negotiation" that is triggered by the "connotative value" of a term. It can be inferred that pragmatic or "intercultural-pragmatic triggers" in Tudini's (2007, p. 581) term, are indicative of L2 users' pragmatic failure due to limited pragmalinguistic and/or sociopragmatic knowledge.

In the current research, some new types of triggers were identified and operationally defined below. They were (a) *rapid pace of utterance* (or *speech rate*) and *unexpected pronunciation* of some linguistic elements (e.g., a single word or a phrase) in the NS's utterances, and (b) *mispronunciation* and *unclear pronunciation* of some discoursal elements in the NNSs' utterances. Other types of triggers including *unknown names*, *distracted attention*, and *sudden shift in the topic of discourse* were identified in both the NS's and the NNSs' utterances.

Rapid pace of utterance applied when the NS articulated an utterance so fast that was challenging for the NNS to process phonologically, syntactically and semantically.

Due to a fast speech rate, the NNSs failed to decode the constructing elements of the utterance. In such cases, the discourse was semantically clear. Furthermore, the syntactic and lexical complexity of the discourse did not seem to have imposed any challenges considering the NNSs' level of L2 proficiency. The triggers coded as *unexpected pronunciation* refer to cases in which the NNSs failed to decipher some words (in the NS's discourse) due to their different (or native-like) pronunciation. Presumably, in these cases, the NNSs were not expecting to hear a different pronunciation.

In the NNSs' utterances, there were two types of pronunciation-based triggers that inflicted some interruptions in the flow of discourse between the NNSs and the NS. These triggers were coded as *mispronunciation* and *unclear pronunciation*. *Mispronunciation* applied when the NNSs' incorrect pronunciation (e.g., of a word or a phrase) triggered the communication breakdown. *Unclear pronunciation* referred to the cases wherein the NNSs' vague and unclear pronunciation prompted a communication problem. Unclear (and sometime completely inaudible) could be an indication of some degrees of uncertainty about the way a linguistic element should be pronounced accurately. This hesitance seems to have led to a lackluster and barely audible pronunciation of a single word or part of an utterance.

Triggers coded as *unknown names* (or proper nouns) applied when the name of a character, a place, or an object was unknown to the interlocutors during on- or off-task conversational exchanges. Triggers coded as *distracted attention* applied only when the participants' attention was temporarily distracted from the topic of the on-going discourse partly due to their focus on gaming. Finally, s*udden shift in topic*, as its name

suggests, applied when the topic of an on-going discourse changed unexpectedly without any prior notice.

Indicators

Varonis and Gass (1985a) defined an indicator as "[…] an utterance on the part of the hearer that essentially halts the horizontal progression of the conversation and begins the downward progression, having the effect of 'pushing down' the conversation rather than impelling it forward" (p. 75). They introduced seven types of indicators under two overarching categories of explicit and implicit. They include: "explicit indication of non-understanding," "echo word or phrase from the previous utterance," "non-verbal response," "summary," "surprise reaction," "inappropriate response," and "overt correction" (Varonis & Gass, 1985a, pp. 76-77).

According to Smith (2003a), indicators can also take the form of *clarification request* (CR) and *confirmation checks* (CC). Following Rost and Ross (1991), Smith (2003a) proposed a different type of classification for indicators: "global," "local," or "inferential." Using a global indicator, an interlocutor signals the communication problem but does not provide any specific clue about the trigger (e.g., the question "what?" or the statement "I don't understand."). In using local strategies, however, an interlocutor indicates nonunderstanding by referring explicitly to the trigger in the preceding discourse. For example, when an interlocutor asks "What does *geologist* mean?" after another interlocutor finished describing his job as a geologist; or, asking

"Do you mean we should fly to [1]*Ironforge*?" after the team leader explained what the team was required to do in the game). Finally, using inferential strategy lets interlocutors test their deductions about the preceding utterance. As an example, when a participant asked "Well, so, you can't log in to Steam? I get right?" after the other gamer mentioned that he couldn't emotionally connect to a game they both knew.

Responses

As the third main component in a negotiation routine, a response follows a signal, which indicates a communication breakdown in the flow of discourse. Responses seek to bridge a communication gap between the interlocutors. Varonis and Gass (1985a, p. 77) identified five different response strategies including: "repetition," "expansion," "rephrasing," "acknowledgment" or "reductions." In a different classification, which bears many similarities to what Varonis and Gass (1985a) suggested, Smith (2003a) introduced four types of responses. They are: "(a) minimal responses, (b) simply repeating the trigger with or without lexical or syntactic modifications, (c) stating an inability to respond, and (d) rephrasing or elaborating (expansion of) the problematic element" (p. 44). Smith (2003a) put these four types of responses into three categories: "minimal responses, modification responses, and elaborative responses" (p. 44). *Minimal responses* are characterized by short, one- or two-word response types that provide little or no new information. Repeating the trigger or simply responding "yes" are examples of minimal responses. In *modification responses*, the respondent tries to

[1] The great city of dwarves and gnomes, Ironforge is the main Alliance city in northern Eastern Kingdoms in the World of Warcraft.

clarify the intended meaning by repeating the trigger accompanied by mostly lexical modification. Finally, by providing *elaborative responses*, the respondent elaborates on the prior utterance to "[…] better illustrate the nature of the problematic lexical item" (Smith, 2003a, p. 44). In such cases, the respondent elaborates on the problematic utterance attempting to provide more semantic context.

In the current research, responses are coded according to Varonis and Gass's classification since it is more fine-tuned compared to Smith's (2003a). For example, in Smith (2003a), the mere repetition of the problematic utterance (with no lexical, syntactic or phonological modification) and repetition of the utterance with some sort of modification are both classified under a single category. Furthermore, unlike Varonis and Gass, Smith put "elaboration" (or expansion) and "rephrasing" under one category—that is "elaborative responses." Finally, "reduction" type of response is missing in Smith's classification.

New categories of response strategies emerged in the present data. The strategies used by the NS included: (a) the repetition of the preceding utterance with slow pace, (b) the repetition of the preceding utterance with emphatic pronunciation of the trigger—that was often a word or a short phrase (See Example 1 below), (c) slowing down the speech rate in the subsequent modified utterance, and (d) referring to a relevant event, location, a character, or an object in the game setting (See Example 2 below). As a complementary response strategy, strategy c was implemented in tandem with other types of strategies such as rephrasing, expansion, or reduction. In these cases, the NS seemed to have concluded that his speech rate was also a part of the comprehension

challenge for the NNS. So, in addition to the implementation of some adjustments (e.g., expanding and rephrasing), he articulated his modified output with a much slower pace.

Example 1 (MM.21.4.3)

NNS_1: What do you want to do guys? Do more quests or do battle ground?

NNS_2: I say battle ground.

NNS_1: And what do you say NS?

NS: Well, we can give it a shot. (T)

NNS_1: What? (I)

NS: <u>We can give it a SHOT</u>. (R)

NNS_1: A SHOT?

NS: Ya, to try it out.

NNS_1: OK. So, NS, you can join the battleground as a group because you are the leader.

Example 2 (B.19.6.6)

NS: All right, now you can learn how to ride the Gronnling. (T)

NNS: What? (I)

NS: I gave you one … back when we were in Alderman. (R)

NNS: Ah, let me find it.

NS: Ya, should be in your bag somewhere.

NNS: Ha ha!

NS: There you go.

NNS: Wow! These are really horrible.

NS: (Laughing)

The new categories of response strategies that emerged in the NNSs' utterances include: (a) the repetition of the preceding utterance with clear, or (b) correct pronunciation of the trigger (that is usually a word), and (c) writing the problematic linguistic form in the text chat channel. It is worth noting that in cases of repetition with clear or correct pronunciation of the trigger, there was no error correction or corrective feedback involved. In other words, these cases involved self-correction moves initiated by the NNSs seeking to resolve the communication problem.

In addition to the new categories of response strategies mentioned above, there were also some responses that involved various configurations of two or more types of adjustment strategies; for example, the combination of expansion and rephrasing (see Example 3), reduction and rephrasing (see Example 4), and repetition with slow pace and expansion (see Example 5).

Example 3 (MH.6.5.1)

NNS_1: … can you help me which talent is better for me?

NNS_2: I don't know. I never I didn't play hunter. NS, do you know about that?

NS: Umm … with my hunter … the spec [i.e., specialization] that I went with was a beast master I think. Umm … I don't remember the first … the fifteenth level picks. Tell me what the picks are.

NNS_1: It's a post haste, narrow scape and crouching tiger, hidden chimaera.

NS: And what are <u>the effects</u>? (T)

NNS_1: Umm … what? (I)

NS: What are the effects of different powers? What do they do? (R)

In Example 3, the NS's question "And what are the effects?" triggered the communication problem that was signaled explicitly and globally by NNS_1. Seeking to repair the communication breakdown, the NS implemented expansion and rephrasing strategies in combination. He expanded his previous utterance by adding "… of different powers?" and rephrased his question by asking "What do they do?" at the end.

Example 4 (MM.6.3.1)

NNS: NS, do you have priest this discipline … Max level? (T)

NS: Ya, I'm playing priest for our game here. (I)

NNS: No, no, do you have a Max level, 100? (R)

NS: I don't have any characters that're level one hundred yet. (RR)

In Example 4, the NNS's question seems a little vague that triggered misunderstanding, which in turn led to an inappropriate response by the NS. Attempting to resolve the misunderstanding, the NNS shortened his question (through the implementation of reduction strategy) and rephrased "Max level" lexically by using numerical (i.e., 100) representative of the same concept.

Example 5 (F.4.6.3)

NS: Have you guys heard umm that song *Flight of the Valkyries*?

NNS: The song umm no. What is a song? Is a for a band? What umm the song's umm singer name?

NS: It's a umm orchestra piece. (T)

NNS: What? Can you repeat? (I)

NS: An orchestra … (pause) piece. It uses classical instruments. (R)

NNS: Oh. (RR)

In Example 5, the NS's fast speech rate seems to have triggered incomprehension, which is explicitly indicated by the NNS. Attempting to repair the communication interruption, the NS slowed down repeating his utterance (by adding a seemingly intentional pause between "orchestra" and "piece") and expanded his discourse by adding a semantically related sentence "It uses classical instruments." to his former sentence.

Reaction to the Responses

As the fourth component of a negotiation routine, *the reaction to the response* (RR) is an optional unit that serves as a signal that the comprehension gap is bridged successfully, and the interlocutors are ready to get back to the mainstream of the temporarily-interrupted discourse (Varonis & Gass, 1985a). Smith (2003a) identified four types of RR. One is explicit statements of understanding (e.g., "OK," "Good," or "I understand"), which he referred to as "minimal responses." Two is the RRs that are metalinguistic in nature. In this type of RR, the interlocutors "comment explicitly on what the cause of the problem had been" (Smith, 2003a, p. 44). "Task appropriate responses" (TAR) and "testing deductions" (TD) were the other two types of RR that emerged in his data. He defined TARs as "[…] 'utterances' that are contextually relevant to the preceding stretch of discourse and that implicitly show a degree of understanding of the target element" (p. 44); and TDs occur when an interlocutor makes some inferences about the meaning of the problematic part of the discourse.

New categories of RR strategies, termed here as *responding back* and *performing an action* (within the game context), emerged from the current data. Responding back applied when the interlocutors figured out the meaning of the formerly-problematic utterance and responded accordingly (by answering a question or proceeding with the ongoing discourse) (see Example 6 below). It must be noted that short forms of responding back strategy (including words such as 'yes,' 'OK,' and 'fine') should not be confused by "minimal responses," which are considered as "explicit statement[s] of understanding" (Smith, 2003a, p. 44). In other words, in cases coded as responding back, the interlocutor used short or extended forms of discourse to provide an answer to an enquiry, a request, or a suggestion raised in the previous utterance. In some cases, though, responding back strategy is accompanied by minimal response strategy (see Example 7). Performing an in-game action, as its term suggests, occurred when an interlocutor (NNSs in the current data) reacted non-verbally by performing an action—in the game setting—as requested, suggested or commanded in the preceding utterance (see Example 8 below).

Example 6 (MM.6.8.2)

NS: You all wanna do this one more time. (High speech rate) (T)

NNS_1: Repeat again please. (I)

NS: We could do this dungeon one more time. (Low speech rate) (R)

NNS_1: <u>OK! If we can do it so fast, I can. I try to big pool</u>. (RR)

NNS_2: OK! Let's try it again.

NS: Yep!

In Example 6, after the NNS_1 managed to comprehend the NS's adjusted utterance, he reacted by responding to the NS's suggestion to do the dungeon one more time.

Example 7 (MM.21.4.5)

NS: We can go kill bunch of those black bores and stuff just outside of the South of the town. That'll level him [one of the gamers] up pretty fast. (High speech rate) (T)

NNS: Really, this is very fast you say it and I can't understand what do you … what do you say it. (I)

NS: Sorry about that! We can go kill some bores … south of … south of town here and that'll level him up. (Low speech rate) (R)

NNS: Ahan! It's a good idea. (RR)

In Example 7, the NNS reacted by first using the minimal response "Ahan!" that is an explicit indication of understanding; then, he agreed with the NS's suggestion stating "It's a good idea."

Example 8 (B.30.4.1) (*The participants were preparing to enter the battle ground.*)

NS: Hey NNS, I'm gonna request a signature from you real quick. (High speech rate) (T)

NNS: Sorry? (I)

NS: NNS, I'm requesting a signature. (R)

NNS:… [he signed an agreement to enter the battle ground.] (RR)

NS: Perfect! Alright! We just need M's [signature]. C+

B: Ya! OK. Thanks!

In Example 8, after the NN comprehended the NS's request (for signing an agreement to enter the battle ground), he signed the agreement—that is performing an action—without telling anything. In the following move, the NS confirmed the NN's reaction (to his response) positively by using the expressions "Perfect! Alright!" followed by the NN's reconfirmation. Such cases are difficult to identify through merely listening to the participants' recorded conversational exchanges. Because, the identification of non-verbal reactions to responses such as performing an action in the game setting requires the interlocutor's explicit confirmation, which are absent in most cases. Direct observation of the participants' gameplay is required to capture the occurrence of such reactions to responses.

As Smith (2003a) explained "[…] not all reactions to the response bring the routine to a clean and appropriate finale" (p. 49). Some RRs serve as indicators of continued failure in grasping the meaning of a problematic utterance. Smith (2003a) referred to such reactions to responses as "negative reaction to the response" (denoted by RR-). Negative RRs can take the form of an explicit or implicit indication of mis-, non- or incomplete understanding. In such cases, a negative RR is usually followed by a negative confirmation (denoted by C-). After providing a negative confirmation, the respondent may reinitiate the response phase (denoted by R^2) or simply quit and abandon the negotiation routine. In former cases, the re-initiation of response represents the respondent's second attempt to clarify the meaning of the negotiated element. The

second response can in turn be followed by another reaction to the response (denoted by RR[2]) that can be either positive or negative. This sequence can re-occur until the meaning of the problematic utterance is fully clarified and understood.

Comprehension Checks

In Varonis and Gass's (1985a) model, "comprehension check" is an element that can optionally follow each component in a negotiation routine (see Figure 3 below). Simply put, an interlocutor utilizes comprehension check strategy seeking to reassure that his or her message is communicated successfully.

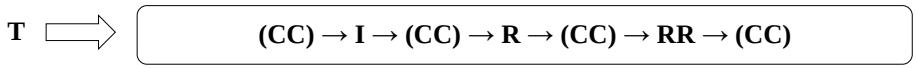

Figure 3. "Expanded model" (Varonis & Gass, 1985a, p. 75).
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Phases of Analyses

The analyses were completed in four consecutive phases described below:

Phase 1: In the first step, all conversational [2]turns were tallied and classified depending on the topic of the discourse they appeared in, on-task and off-task. The on-task conversational turns refer to the turns that focused on the gameplay and game completion tasks. The off-task ones relate to the conversational turns that dealt with a wide variety of other topics, which strayed from game-oriented topics. Then,

[2] A *turn* was operationally defined "as a transfer of the *floor* from one participant to the other" (Smith, 2005: 44).

communication breakdowns were identified and counted. All cases of negotiated communication problems were tallied in both on- and off-task turns. Important to note is that instances of communication breakdowns were determined by drawing on the "explicit" or "implicit" indicators (Varonis & Gass, 1985a) signaling them. Negotiated routines were identified as involving an indicator of incomprehension followed by a response that sought to repair the comprehension problem. As outlined in Varonis and Gass's (1985a) model, a negotiated routine consists of three core components including a trigger (T), an indicator (I), and response (R). This phase of analysis also involves an examination of the association between types of conversational turns (i.e., on- and off-task) on the one hand and the frequency of communication problems, and the rate of their negotiations on the other hand.

Phase 2. In the second phase of analysis, the rates of on- and off-task turns, communication breakdowns, negotiation episodes, as well as the complexity level of negotiation routines were compared between T1 and T2.

Phase 3: In the third phase, total frequencies of communication breakdowns were calculated separately for each type of dyadic conversational exchanges. The results were then compared between T1 and T2.

Phase 4: In the fourth and last phase, the frequencies of different types of triggers (T), indicators (I), responses (R), and reaction to the responses (RR) were calculated for each type of dyadic interactions. At this stage, the most frequently occurred Ts, Is, Rs, and RRs were compared between T1 and T2.

Some of the analyses consist of descriptive (frequencies and percentages) statistics. When we examined the associations between two variables (with two or more categories), Pearson's Chi-Square ($\chi 2$) tests were utilized using Statistical Package for the Social Sciences (SPSS 20.0). The alpha level was set at $p < .05$. The statistical package R (Version i386 3.3.2) was also used to calculate confidence intervals (95%) for all 2×2 Pearson's $\chi 2$ Tests.

Reliability of Coding

A random sample of 10% of all the negotiation of meaning episodes was selected for the second rater to code. The interrater reliability—using Cohen's Kappa (Cohen, 1960)—was calculated for the four components of a negotiation episode: trigger (κ = .85), indicator (κ = .97), response (κ = 85), and reaction to the response (κ = .90). Cases of disagreement were discussed and resolved with the second coder. After reaching a consensus, the researcher revised his coding accordingly.

The Ts and RRs were sometimes difficult to code due to lack of enough evidence in the data. Therefore, the researcher contacted the participants (through email and Telegram) and asked them for some clarification on triggers (as causes of communication breakdown) and RR (to determine if the communication problem was resolved). The researcher sent the participants a few short (about 20 seconds) audio clips of their in-game conversations and asked them to explain what caused the communication breakdown (T) and if their RR represented their comprehension of the discourse.

Results

Conversational Turns, Communication Breakdowns, and Negotiations of Meaning

The first set of analyses sought to (a) investigate the extent to which the participants in each team were involved in on- and off-task conversational exchanges during the gameplay, (b) tally the frequencies of the communication breakdowns they faced during these conversations, and (c) calculate the rate of negotiation of meaning they were involved in. The researcher also examined the association between type of conversational turns (i.e., on- and off-task) on one hand and (a) the frequencies of communication breakdowns and (b) the rate of negotiated interactions on the other.

The results, as shown in Table 3, indicate that 71% of the participants' conversational turns in T1 were dedicated to on-task (or game-related) topics. The participants encountered communication problems in 2.1% of the on-task and in 2.8% of the off-task turns. The SPSS output showed a significant association between the type of turns and whether or not the interlocutors faced any communication breakdown (χ^2 [1, N = 8432] = 4.33, p = .037). Although the p value turned out to be statistically significant ($p < .05$) (probably due to a large sample size), the effect size (*Phi* coefficient) of -0.023, 95% CI [-.044, -.0012], suggested a negligible relationship between the two variables. On the other hand, the Proportion Test (using *R* program) showed that although p value is significant, the 95% CI [-1.499, 8.659] entails the value of zero. This suggests that there was no statistically significant association between types of conversational turns and the frequency of communication breakdowns in T1. It is important to note that the

sensitivity of chi-square test to sample size may make a weak relationship statistically significant if the sample is large enough.

Further analysis showed that 87.2% of the interrupted on-task turns and 92.9% of the interrupted off-task turns were negotiated in T1; but there was no significant association between where the interrupted turns occurred (i.e., during on- or off-task discourse) and whether or not they were negotiated (χ^2 [1, N = 195] =1.494, p = .22).

Table 3 Frequencies of turns, communication breakdowns and negotiations of meaning in T1

Source	Frequency of turns	Frequency of breakdown	Negotiated	
			Yes	No
On-task turns	5970 (71%)	125 (2.1%)	109 (87.2%)	16 (12.8%)
Off-task turns	2462 (29%)	70 (2.8%)	65 (92.9%)	5 (7.1%)
n	8432	195	174	21
df		1	1	
X^2		4.33	1.49	
p		**0.037**	**0.22**	
**d*		0.7%	5.7%	
CI (95%)		-1.49 (low)	-0.140 (low)	
		8.65 (high)	0.027 (high)	

*The percentage difference between frequencies in each comparison

Following similar pattern as in T1, 72% of the participants' conversational turns in T2 were dedicated to on-task interactions (see Table 4 below). The participants in T2 encountered communication breakdowns in 0.8% and 1.5% of their on-task and off-task conversational turns respectively. But unlike T1, there was a significant association between the type of turns and whether or not the interlocutors faced communication

breakdown (χ^2 [1, N = 10066] = 11.2, p = .001). This value is highly significant (p < .001), indicating that the type of turns had a significant effect on whether the interlocutors in T2 would face communication breakdown. The effect size (*Phi* coefficient) is -0.033, 95% CI [-0.053, -0.013] representing a negligible relationship between the two variables. The standard residual for *off-task turns by breakdown* cell is significant (z = 2.8). That means the association between the two variables is driven mainly by the cases in which the participants were involved in conversational turns with off-task topics. In other words, more turns than expected were interrupted when the interlocutors were involved in off-task conversational turns. Based on the odds ratio, when the participants took part in off-task conversations, the odds of facing a communication breakdown were 1.97 times, 95% CI [1.31, 2.93], higher than if they had been involved in on-task conversational interactions.

As Table 4 demonstrates, 96.4% of the interrupted on-task turns and 100% of interrupted off-task turns were negotiated in T2. There was a small difference (3.6%) between on- and off-task turns in terms of their negotiation rates. The independence of association could not be tested because the frequencies of not-negotiated turns in both on- and off-task conversational exchanges were too small to meet the expected cell counts necessary for performing χ^2.

Table 4 Frequencies of turns, communication breakdowns and negotiations of meaning in T2

	Frequency of Turns	Frequency of Breakdown	Negotiated	
			Yes	No
On-task turns	7269 (72%)	56 (0.8 %)	54 (96.4%)	2 (3.6%)
Off-task turns	2797 (28%)	42 (1.5 %)	42 (100%)	0 (0.0%)
n	10066	98		
df		1		
X^2		11.20		
p		**0.001**		
d		0.7 %		
Confidence		-0.012 (low)		
interval (95%)		-0.002 (high)		

T1 and T2 in Comparison

The second phase of the analyses sought to investigate the association between the participants' level of L2 proficiency and (a) the frequencies of conversational turns (on- and off-task), (b) the frequencies of communication breakdowns, and (c) the proportion and the complexity of the negotiation episodes (see Table 5 below).

The first comparison between T1 and T2 examined the frequency of turns that occurred during on- and off-task discourse. This comparison aimed at finding out which team was involved in more on-task conversational exchanges during the gameplay. The analysis revealed a statistically significant association (χ^2 [1, N = 18498] =4.49, p = .034) between the participants' level of L2 proficiency and the types of turns they were involved in. This significant p value ($p < .05$) indicates that the interlocutors' level of L2 proficiency had a significant effect on their frequency of involvement in on- or off-task conversational interactions. The effect size (*Phi* coefficient) of -0.016, 95% CI [-0.027, -

0.001] represents a negligible relationship between the two variables. In other words, there is a 95% chance between 0.1% and 2.7% for T2 to partake in conversational turns with on-task topics. The odds ratio suggests that getting involved in on-task conversational interactions were 1.07 times, 95% CI [1.00, 1.14], greater for the higher than lower proficiency participants.

The second comparison between T1 and T2 sought to realize if there was any difference between them regarding the frequency of communication breakdowns. The analysis showed a statistically significant association (χ^2 [1, N = 18498] = 52.77, p = .000) between the participants' level of L2 proficiency and the frequency of communication breakdowns. This highly significant p value ($p < .01$) indicates that the interlocutors' level of L2 proficiency had a significant effect on the frequency of communication breakdowns they encountered in conversational interactions (on-task or off-task) during the gameplay. *Phi* coefficient of 0.053, 95% CI [.038, .068], however, shows a small value that represents a negligible positive relationship. Despite statistically significant result (probably due to a large sample size of 18498), the effect size is very small. It can be concluded that the association between the participants' L2 proficiency and the frequency of communication breakdown (either during on- or off-task conversations) is very small. Based on the odds ratio, the odds of facing communication breakdown are 2.4 times, 95% CI [1.88, 3.07], greater for T1 than T2.

Concerning the rate of meaning negotiations, the analysis showed a significant association (χ^2 [1, N= 293] = 6.86, p = .009) between level of L2 proficiency and the frequency of negotiated turns. This highly significant p value ($p < .01$) indicates that the

participants' level of L2 proficiency had a significant effect on whether or not they were involved in negotiated interactions. The effect size (*Phi* coefficient) of -0.153, 95% CI [0.038, 0.263], signifies a low association between the two variables. The statistically significant standard residual ($z = -2.1$, $p < 0.05$) for non-negotiated turns in T2 indicates that the significant association between L2 proficiency and frequency of negotiated turns is mainly driven by the cases in which T2 did not negotiate the interrupted turns. In other words, the participants in T2 ignored the interrupted turns less frequently than expected. The participants in T2 negotiated almost all (about 98%) the interrupted turns compared to the participants in T1, who negotiated 89.2% of the interrupted turns. The odds ratio shows that the odds of ignoring (i.e., not negotiating) a communication breakdown were 0.17 times, 95% CI [0.0396, 0.752], higher in T1 than in T2.

Finally, the complexity of negotiated interactions was determined following Ellis et al. (2001a) definition of complexity in a negotiated routine. According to Ellis et al. (2001a), a focus-on-form episode is considered as complex (or "multiturn") when it involves several exchanges, and simple when it consists of a single exchange. Majority of the negotiation episodes in both teams were simple. Further analysis revealed that the difference (8.4%) between T1 and T2 concerning the frequency of complex and simple negotiation episodes is not statistically significant (χ^2 [1, N= 270] = 3.63, p = .057). This indicates that there was no significant association between the negotiations' level of complexity and the participants' level of L2 proficiency.

Table 5 T1 and T2 in comparison

	Turns		Breakdown		Negotiated		Complexity	
	On-task	Off-task	Yes	No	Yes	No	Simple	Complex
Team 1	5970	2462	195	8237	174	21	145	29
	(70.8%)	(29.2%)	(2.3%)	(97.7%)	(89.2%)	(10.8%)	(83.3 %)	(16.7%)
Team 2	7269	2797	98	9968	96	2	88	8
	(72.2%)	(27.8%)	(1.0%)	(99%)	(98%)	(2%)	(91.7%)	(8.3%)
n	18498		18498		293		270	
df	1		1		1		1	
X^2	4.49		52.77		6.86		3.63	
p	**0.034**		**0.000**		**0.009**		**0.057**	
d	1.4%		1.3%		8.8%		8.4%	
CI (95%)	-0.027 (low) 2.7%		0.009 (low)		-0.139 (low)			
	-0.001 (high) 0.1%		0.017 (high)		-0.035 (high)			

Rate of Communication Breakdowns in Three Types of Dyadic Interactions

The third phase of the analysis aimed at discovering the relationship between the frequencies of communication interruptions in three types of dyadic conversational exchanges and the participants' level of L2 proficiency (see Table 6 below). As noted earlier, the participants' negotiated interactions were classified depending on whose (the NS's or the NNSs') utterance triggered the communication problem. Accordingly, three types of negotiated focus-on-form episodes (NFFEs) emerged: $NS_{trigger} \rightarrow NNS_{signal}$, $NNS_{trigger} \rightarrow NS_{signal}$, and $NNS_{trigger} \rightarrow NNS_{signal}$.

Table 6 Frequencies of communication breakdowns in 3 types of dyadic interactions

	$NS_{trigger} \rightarrow NNS_{signal}$	$NNS_{trigger} \rightarrow NS_{signal}$	$NNS_{trigger} \rightarrow NNS_{signal}$	Total
Team 1	109 (55.9%)	54 (27.7%)	32 (16.4%)	195
Team 2	40 (40.8%)	44 (44.9%)	14 (14.3%)	98
n		293		
df		2		
X^2		8.87		
p		**0.012**		

The analysis revealed a significant association between level of L2 proficiency and type of dyads (χ^2 [2, N = 293] = 8.877, p = .012). The value of *Cramer*'s statistic is 0.174 (out of a possible maximum value of 1), representing a low association between the two variables. The adjusted p value (p = 0.0037) (using *Bonferroni* correction) was significant ($p < 0.0083$) for the negotiation episodes triggered by the NNSs in $NNS_{trigger} \rightarrow NS_{signal}$ dyadic conversations in both T1 and T2. In T1, less, and in T2, more negotiations than expected were triggered by the NNSs' utterances.

The Frequencies of Triggers, Indicators, Responses, and Reaction to the Responses

The fourth phase of the analyses was performed to find out: (a) what verbal and non-verbal discoursal elements triggered the meaning negotiations in each type of dyadic conversational exchanges, (b) how the communication interruptions were signaled, (c) what types of responses were provided, (d) to what extent the responses contributed to bridge the communication gap, and (e) if there was any association between types of triggers, indicators, responses, and reaction to the responses on one hand and the participants' level of L2 proficiency on the other.

Triggers

In $NS_{trigger} \rightarrow NNS_{signal}$ dyadic interactions, *fast pace* (or high speech rate) of the NS's utterance was the most prominent trigger that inflicted interruptions in the flow of discourse between the NS and the NNS participants (see Table 7 below). The speed with which the NS produced his utterances made it difficult, and sometimes impossible, for the NNSs to process the discourse phonologically and morphosyntactically. Further analysis showed no significant association between types of triggers and the participants' level of L2 proficiency (χ^2 [2, N=129] = 1.18, p = 0.55). That means the distribution of the three most frequent triggers (i.e., *fast pace, vocabulary, and content*) in the NS's utterances was similar for T1 and T2. In other words, types of triggers in the NS's utterances (within $NS_{trigger}$-NNS_{signal} conversational exchanges and the participants' L2 proficiency levels were two independent variables. From the total cases (129) of communication breakdowns in T1 and T2, 77 (59.7%), 33 (25.6%), and 19 (14.7%) cases were triggered by *high speech rate* (of the NS's utterance), *vocabulary*, and *content* respectively.

Table 7 Types of triggers in 3 types of dyadic interactions

	$NS_{trigger} \rightarrow NNS_{signal}$			$NNS_{trigger} \rightarrow NS_{signal}$		$NNS_{trigger} \rightarrow NNS_{signal}$			
	pace	vocab	content	[3]pronunciation	content	[4]pronunciation	Content	vocab	[5]other
T1	59	22	14	23	22	13	9	5	5
	62.1%	23.2%	14.7%	51.1%	48.9%	41%	28%	16%	16%
T2	18	11	5	14	10	4	3	5	2
	52.9%	32.4%	14.7%	58.3%	41.7%	29%	21%	36%	14%
n		129		**69**			46		
df		2		1					
X^2		1.18		0.32					
p		**0.55**		**0.56**					
CI				-0.17 (low)					
(95%)				0.31 (high)					

There were also some other types of triggers that disrupted the flow of discourse in this type of dyadic conversations. In T1, 14 out of 109 cases (12.8%) of communication interruptions were triggered by *unexpected pronunciation*, *pragmatic (idiomatic expressions)*, *unfamiliar proper nouns* (e.g., game and movie characters), *discourse*, *distracted attention*, *sudden shift in the topic of discourse*, and *syntax* (or structure). In T2, 6 out of 40 cases (15%) of communication failures were triggered by *unexpected pronunciation*, *unfamiliar proper nouns*, *discourse*, and *distracted attention*.

[3] Here, *pronunciation* encompasses two subcategories: *mispronunciation* and *unclear pronunciation.* Due to their small frequencies, these two types of triggers were combined.
[4] Here, *pronunciation* includes three subcategories: *unclear pronunciation*, *mispronunciation*, and *unexpected pronunciation*.
[5] This category of triggers includes *discourse*, *pragmatic (idioms)*, *syntactic*, and *sudden shift in topic* in T1, and *discourse* and *pragmatics* in T2.

In $NNS_{trigger} \rightarrow NS_{signal}$ negotiated interactions, *pronunciation* and *content* stood out in both teams as the most recurrent triggers (in the NNS's utterances) (see Table 7 above). Further analysis showed no significant association between these two types of triggers and level of L2 proficiency (χ^2 [1, N= 69] = 0.328, p = .567), suggesting that the distribution of these two types of triggers was similar in T1 and T2. In this type of dyadic conversations, from the total cases of communication breakdowns in both teams (69 cases), 37 (53.6%) and 32 (46.4%) cases were triggered by problematic pronunciation and vague content respectively. Other types of triggers including *lexical errors, discourse, distracted attention, pragmatics (figurative meaning), syntax,* and *unfamiliar proper nouns* accounted for 16.6% (9 cases) of the total (54) in T1. In T2, other types of triggers accounted for 45.4% (20 cases) of the total frequency (44). These triggers included *lexical errors, syntax,* [6]*pragmatics (first language or L1 idiomatic expressions), unfamiliar proper nouns, using L1, discourse, distracted attention,* and *sudden shift in the topic of discourse*.

Finally, the $NNS_{trigger} \rightarrow NNS_{signal}$ negotiated interactions were mostly triggered—in order of magnitude—by *pronunciation, content*, and *vocabulary* (see Table 7 above). It is important to note that *pronunciation* triggers in T1 consisted of 3 subcategories: *unclear pronunciation* (10 cases), *mispronunciation* (2 cases), and *unexpected pronunciation* (1 case). All 4 cases of negotiations in T2 were triggered by

[6] The NNS participants used some culturally-bound expressions that did not embody the same entity or transfer the same meaning in English language; thus they caused some comprehension problems for the NS.

unclear pronunciation. Due to small frequencies of the triggers in this form of dyadic conversations, the independence of association could not be tested.

Indicators

The analysis of indicators (or signals of incomprehension) revealed that *explicit, global, clarification request (CR)* and *explicit, local, CR* were the first and the second most frequently occurred types of indicators in almost all three forms of dyadic interactions in both T1 and T2 (see Table 8 below).

Table 8 Frequencies of indicators

		$NS_{trigger} \rightarrow NNS_{signal}$		
	explicit, global, CR	explicit, local, CR	Other	Total
T1	82 (75%)	13 (12%)	14 (13%)	109
T2	22 (55%)	16 (40%)	2 (5%)	40
		$NNS_{trigger} \rightarrow NS_{signal}$		
T1	29 (54%)	12 (22%)	13 (24%)	54
T2	20 (45.5%)	20 (45.5%)	4 (9%)	44
		$NNS_{trigger} \rightarrow NNS_{signal}$		
T1	27 (84.5%)	4 (12.5%)	1 (3%)	32
T2	11 (79%)	2 (14%)	1 (7%)	14

To examine the association between the frequencies of these two types of indicators (in three forms of dyadic negotiated interactions) and level of L2 proficiency, three Chi-squared tests were conducted (see Table 9 below). The results showed a significant association between the use of these two types of indicators and level of L2 proficiency (χ^2 [1, N = 133] = 12.85, p = .000) in $NS_{trigger} \rightarrow NNS_{signal}$ negotiations. This

highly significant ($p < .001$) value indicates that the NNSs' level of L2 proficiency had a significant effect on the types of indicators they used to signal incomprehension. The effect size (*Phi* coefficient) of 0.311, 95% CI [0.137, 0.466], represents a moderate relationship between the two variables. As the standardized residual for *explicit, local, CR* (z = 2.7) is significant ($p < 0.05$) in T2, it can be concluded that the relationship was mainly driven by the frequency of *explicit, local, CR* indicators, which were applied—by the NNSs in T2—significantly more frequently than expected. Based on the odds ratio, the odds of NNSs using *explicit, global, CR* type of indicator were 4.58 times, 95% CI [1.92, 10.95], higher for the NNSs with lower level of L2 proficiency.

This association, however, was not significant in $NNS_{trigger} \rightarrow NS_{signal}$ negotiated interactions (χ^2 [1, N = 81] =3.64, p = .056), suggesting that the distribution of the two types of most frequently applied indicators (by the NS) was similar in T1 and T2.

Finally, in $NNS_{trigger} \rightarrow NNS_{signal}$ negotiations, the independence of association between the two variables could not be tested because the low frequencies of *explicit, local, CR* in T1 and *explicit, global, CR* in T2 did not meet the expected cell counts necessary for performing χ^2.

Table 9 Most frequently used indicators

	$\mathbf{NS_{trigger} \rightarrow NNS_{signal}}$		$\mathbf{NNS_{trigger} \rightarrow NS_{signal}}$		$\mathbf{NNS_{trigger} \rightarrow NNS_{signal}}$	
	explicit, global, CR	explicit, local, CR	explicit, global, CR	explicit, local, CR	explicit, global, CR	explicit, local, CR
T1	82 (86.3%)	13 (13.7%)	29 (70.7%)	12 (29.3%)	27 (87.1%)	4 (12.9%)
T2	22 (57.9%)	16 (42.1%)	20 (50%)	20 (50%)	11 (84.6%)	2 (15.4%)
n	133		81		44	
df	1		1			
X^2	12.859		3.641			
p	**0.0003**		**0.056**			
Phi coefficient	0.311					
Confidence interval (95%)	0.112 (low) 0.455 (high)		-0.001 (low) 0.415 (high)			

Responses

In the current research, only the first response move (R1) in each negotiation routine was analyzed. Types and frequencies of response strategies were reported in two different ways. First, each response move was reported the way it appeared in the data. This way, each response move may contain a single or a combination of two or three different response strategies. In the second form of reporting, the total frequency of each individual response strategy—as it appeared in all the response moves throughout the data—was calculated.

Responses in $NS_{trigger} \rightarrow NNS_{signal} \rightarrow NS_{response}$ Negotiation Routines

The response rate was high in both teams (87% in T1 and 95% in T2); and combinations of different strategies (see Table 10 below) were applied by the NS to improve the comprehensibility of the discourse. Among these strategies, *expansion* and

rephrasing (without any other strategies attached to them) were the most prominent strategies the NS applied in both teams.

Table 10 Cases of R1 strategies in $NS_{trigger} \rightarrow NNS_{signal} \rightarrow NS_{response}$ negotiation routines

R1 strategies in T1	**F (%)**	**R1 strategies in T2**	**F (%)**
expansion	17 (16%)	Expansion	11 (28%)
NR	14 (13%)	Rephrasing	4 (10%)
rephrasing	14 (13%)	repetition of T, expansion	3 (8%)
repetition with slow pace	11 (10%)	repetition with slow pace, expansion	3 (8%)
expansion, rephrasing	9 (8%)	expansion, slow pace	2 (5%)
repetition with slow pace, expansion	9 (8%)	expansion, reduction	2 (5%)
repetition with exaggerated pronunciation	5 (5%)	expansion, repetition	2 (5%)
reduction, rephrasing, slow pace	4 (4%)	expansion, rephrasing	2 (5%)
reduction, slow pace	4 (4%)	NR	2 (5%)
repetition, expansion	4 (4%)	referring to the game context	2 (5%)
rephrasing, slow pace	4 (4%)	repetition with slow pace	2 (5%)
expansion, rephrasing, slow pace	3 (3%)	Reduction	1 (3%)
reduction, expansion, slow pace	3 (3%)	repetition with emphatic pronunciation of T	1 (3%)
repetition	3 (3%)	repetition with emphatic pronunciation of T, rephrasing	1 (3%)
expansion, slow pace	2 (2%)	repetition with slow pace, rephrasing	1 (3%)
minimal response	1 (1%)	rephrasing, expansion, repetition	1 (3%)
reduction	1 (1%)		
reduction, rephrasing, expansion, slow pace	1 (1%)		
Total	**109**	**Total**	**40**

Total frequency for each individual response strategy (as it appeared alone or in combination of other strategies in a single response move) revealed that *expansion*, *rephrasing*, and [7]*repetition with pace modification* were the most frequently utilized response strategies by the NS (see Table 11 below).

Table 11 Total frequencies of R1 strategies in $NS_{trigger} \rightarrow NNS_{signal} \rightarrow NS_{response}$ negotiation routines

R1 strategies in T1	**f**	**%**	**R1 strategies in T2**	**f**	**%**
expansion	48	29%	Expansion	26	45%
rephrasing	35	21%	Rephrasing	9	16%
repetition with pace modification	25	15%	repetition with pace modification	8	14%
slow pace	21	13%	Reduction	3	5%
NR	14	9%	repetition (with no modification)	3	5%
reduction	13	8%	repetition of T	3	5%
repetition (with no modification)	7	4%	slow pace	2	3%
minimal response	1	1%	NR	2	3%
Total	164	100%	referring to the game context	2	3%
			Total	58	100%

To investigate the association between type of R1 strategies and level of L2 proficiency, the three most frequent strategies (i.e., *expansion*, *rephrasing*, and *repetition with pace modification*) were included in a Chi-squared test. The test did not show any significant association (χ^2 [2, N= 151] =3.29, p = 0.193), suggesting that the NNSs' level

[7] *Repetition with pace modification* encompasses two different strategies: (a) *repetition with slow pace*, in which the problematic utterance was repeated but with a much slower pace, and (b) *repetition with emphatic pronunciation of the trigger*, in which the only problematic element(s) in the utterance was/were repeated with exaggerated pronunciation.

of L2 proficiency did not have any significant effect on the NS's choice of R1 strategy to improve the comprehensibility of his discourse.

Responses in $NNS_{trigger} \rightarrow NS_{signal} \rightarrow NNS_{response}$ Negotiation Routines

There were 54 and 44 cases of this type of dyadic negotiations in T1 and T2 respectively. The analysis showed that the NNSs were creative in using various strategies—alone or in combination—to modify and thereby improve the comprehensibility of their output. In T1, the NNSs utilized a combination of *repetition* and *expansion* (12 cases, 22%), and *repetition* (without any sort of modification) (7 cases, 13%) to adjust their output. In the rest of the cases, 5 additional types of strategies were applied (alone or in combination). They include: *rephrasing*, *reduction*, [8]*repetition with modified pronunciation*, *minimal response*, and *writing in the text chat channel*. In only 5 out of 54 cases (9%), the NNSs ignored the signals of incomprehension by their NS interlocutor. In T2, the NNSs used *expansion* (14 cases, 32%), the combination of *repetition* and *expansion* (9 cases, 20%), *repetition with clear pronunciation* (8 cases, 18%), and *rephrasing* (8 cases, 18%)—as the most predominant strategies—to modify, correct, or enrich their L2 output. In all cases of communication breakdown (44 cases), the NNSs attempted to bridge the communication gap by being responsive to the signals they received from their NS interlocutor. With regard to the total frequency of each type of R1 strategy (used by the NNSs), the results revealed that *expansion*, *repetition without*

[8] *Repetition with modified pronunciation* strategy includes two slightly different sub-strategies: (a) *repetition with clear pronunciation* and (b) *repetition with correct pronunciation*. In the former, the NNSs pronounced the problematic element(s) much clearer and easier to decipher. In the latter, the NNSs self-corrected the formerly-mispronounced element in their output.

modification, repetition with modified pronunciation, and *rephrasing* accounted for 81% and 98% of the total frequency in T1 and T2 respectively (see Table 12 below).

Table 12 Total frequencies of R1 strategies (provided by the NNSs in $NNS_{trigger} \rightarrow NS_{signal}$ dyads)

NNS's response strategies	**T1**	**T2**
expansion	23 (30%)	23 (43%)
repetition (without modification)	22 (29%)	12 (23%)
repetition with modified pronunciation	10 (13%)	9 (17%)
rephrasing	7 (9%)	8 (15%)
Other	15 (19%)	1 (2%)
Total	**77 (100%)**	**53 (100%)**

There was no significant association between the use of the four types of R1 strategies and level of L2 proficiency (χ^2 [3, N= 114] = 2.2, p = .532), showing that the distribution of these strategies was similar in both teams. In other words, the NNSs' level of L2 proficiency seems to have no significant effect on their choice of R1 strategies to bridge the communication gap.

Responses in $NNS1_{trigger} \rightarrow NNS2_{signal} \rightarrow NNS1_{response}$ Negotiation Routines

The least cases of negotiations (32 in T1 and 14 in T2) were recorded in this type of dyadic conversational exchanges. In T1, the first three most commonly utilized response strategies were *expansion* (8 cases, 25%), *repetition and expansion* combined (7 cases, 22%), and *rephrasing* (5 cases, 16%). In T2, they were *repetition with clear pronunciation* (4 cases, 29%), *repetition and expansion* combined (3 cases, 21%), and *expansion* (3 cases, 21%).

Total frequency for each individual response strategy showed that *expansion* was the most frequently applied strategy accounting for 37.5% (15 cases) and 42% (8 cases) of the total frequency in T1 and T2 respectively (see Table 13 below). This pattern is similar to the one identified in $NNS_{trigger} \rightarrow NS_{signal} \rightarrow NNS_{response}$ negotiations.

Table 13 Total frequencies of R1 strategies (provided by the NNSs in $NNS_{trigger} \rightarrow NNS_{signal}$ dyads)

NNS's response strategies	**T1**	**T2**
expansion	15 (37.5%)	8 (42%)
repetition (without modification)	8 (20%)	3 (16%)
rephrasing	6 (15%)	3 (16%)
repetition with clear pronunciation	4 (10%)	4 (21%)
reduction	4 (10%)	1 (5%)
no response	2 (5%)	0
translation to L1	1 (2.5%)	0
Total	**40 (100%)**	**19 (100%)**

Reactions to the Responses

Types and frequencies of the first reaction to the response (RR1) are reported here separately in three different dyadic interactions.

Reaction to Responses in $NS_{trigger} \rightarrow NNS_{signal} \rightarrow NS_{response} \rightarrow NNS_{reaction}$

There were 95 and 38 cases of negotiated interactions (in T1 and T2 respectively) that could involve the NNSs' reaction to the NS's response. The analysis showed a variety of NNSs' reactions to the NS's response. Among them, *responding back*, *minimal response*, and the combination of both accounted for 70% (66 cases) and 74% (28 cases) of total number of cases in T1 and T2 in order. In cases of *responding back*

strategy, qualitative (semantic) examination of the NNSs' responses indicated that all the responses aligned semantically and pragmatically with the context of the ongoing discourse. There were only 10 (11%) cases in T1 and 2 (5%) cases in T2 wherein the NNSs did not show any verbal reaction to the NS's responses.

Total frequency of RRs revealed that *responding back* and *minimal response* strategies were the most frequently occurred verbal reactions. *Responding back* accounted for 47% and 50% of total frequency and *minimal response* accounted for 26% and 27% of the total frequency in T1 and T2 respectively. In 10 (11%) and 3 (8%) cases of negotiations in T1 and T2 respectively, the communication problems were not resolved in the first round of negotiations. In these cases, the first RRs served as indicators (of incomprehension) for the second round of negotiations. Further analyses revealed that the NS actively followed up these cases by providing the second or even the third response. The participants' cooperative endeavor to repair the communication problems in such cases can represent the fact that successful communication of meaning was vital for the survival and more importantly for the success of the team in those particular situations.

The result of the chi-square test showed no significant association between types of the first RRs (provided by the NNSs) and the NNSs' level of L2 proficiency (χ^2 [1, N= 115] = 0.003, p = .954). That means the distribution of the two forms of most frequently occurred RRs was similar in T1 and T2.

Reaction to Responses in $NNS_{trigger} \rightarrow NS_{signal} \rightarrow NNS_{response} \rightarrow NS_{reaction}$

There were 49 and 44 cases of negotiated interactions (in T1 and T2 respectively) that could involve the NS's reactions to the NNSs' responses. In 19 (39%) cases in T1 and 16 (36%) cases in T2, the NS reacted by *responding back*. In 10 (20%) and 6 (14%) cases of negotiation episodes in T1 and T2, however, the NS did not provide verbal reaction to the NNSs' responses. Furthermore, 8 (16%) and 1 (2%) cases of meaning negotiations in T1 and T2 respectively were unsuccessful in the first round. In these cases, the NS's reactions served as indicators of incomprehension for the subsequent round of negotiations. Further analyses showed that all these cases were attended meticulously by the NNSs through making more adjustments to their output in the second round of responses (R2).

Total frequency for each RR strategy revealed that *responding back* accounted for 44% and 45% of the total frequency in T1 and T2. In the second place, *minimal response* strategy accounted for 11% and 31% of the total frequency of RRs in T1 and T2. The chi-square test did not show any significant association between these two RR strategies and level of L2 proficiency (χ^2 [1, N= 76] =3.44, p = 0.064), suggesting that the distribution of these strategies was similar in both teams.

Reaction to Responses in $NNS_{trigger} \rightarrow NNS_{signal} \rightarrow NNS_{response} \rightarrow NNS_{reaction}$

There were 30 and 14 cases of negotiated interactions in T1 and T2 that could potentially involve the NNSs' reactions to the responses. The analysis revealed that *responding back* was similarly the most common form of RR in both teams. It accounted for 43% of the cases (13 cases in T1 and 6 cases in T2). The total frequency for each RR

showed that *responding back* (44% in T1 and 47% in T2) is followed by *minimal response* (24% in T1 and 26% in T2). The NNSs' reactions here followed the same pattern observed in $NS_{trigger} \rightarrow NNS_{signal} \rightarrow NS_{response} \rightarrow NNS_{reaction}$ negotiated interactions. In T1, there were 5 (out of 30) cases of negotiation episodes wherein the NNSs did not show any verbal reaction to the responses. In T2, however, all responses received a single or a combination of two or three types of RRs. Furthermore, 3 (10%) cases of negotiations in T1 and only 1 (7%) case of negotiation in T2 was extended to the second round of negotiations. All these negotiations led finally to the resolution of the communication problems in the second round.

Discussions

This study intended to identify and describe the opportunities that arise for negotiations of meaning within the conversational exchanges taking place during playing a popular MMORPG--that is *WoW*. The current research sought to characterize the negotiations of meaning episodes, which are considered--from the psycholinguistic account of interactionist perspective--as facilitative in the process of L2 development. This study looked closely into the verbal (oral) interactions that occurred naturally between native and non-native English speakers during the gameplay. In particular, the current research attempted to realize how frequently in-game oral interactions were interrupted due to communication breakdowns, what discoursal elements triggered these interruptions, and how the interruptions were acknowledged and sorted out cooperatively. In this section, the results are briefly explained, and their significance is discussed in the context of the current literature and in light of the relevant SLA theories.

Communication Breakdowns and Their Negotiation Rate

The results suggested that the participants' conversations in both teams were focused mainly on the gameplay. Observations of the participants' gameplay also confirmed that the game mechanism warrants the participants—as team members—to initiate and maintain mutual interactions to perform a broad range of tasks involving activities such as problem-solving, decision-making, planning, sharing opinions, discussing options, and evaluating the team performance. During off-task conversational turns, which accounted for 29% and 28% of total turns in T1 and T2 respectively, the participants led discussions with a broad range of topics (e.g., social, cultural and political). These discussions took place as the participants were in non-critical stages of the game performing some routine tasks such as walking or flying to a destination using the map or getting their avatars trained by NPCs. Intercultural communication between the participants as well as their enthusiasm to share social and cultural knowledge provided unique opportunities for them to develop their intercultural competence. The significance of these opportunities for L2 development is well established in the literature (e.g., Thorne, 2006, 2008).

The results also showed no significant association between type of turns (on-task vs. off-task) and the frequency of communication breakdowns in T1. Despite the absence of any relationship, the smaller rate of communication problems during on-task (2.1% in T1 and 0.8% in T2) compared to off-task (2.8% in T1 and 1.5% in T2) conversational exchanges is of great interest here. The possible explanation for this finding resides in the semiotic ecology of the game (Thorne, Fischer, and Lu, 2012),

which comprises multiple verbal and non-verbal contextual features (e.g., PCs' and NPCs' actions and utterances, quests' texts, and virtual locations). These contextual elements presumably assisted NNSs to communicate successfully despite their limited L2 proficiency. This argument corroborates Gee's (2003) "Multimodal Principle," positing that "in video games, meaning, thinking, and learning are linked to multiple modalities (words, images, actions, sounds, etc.) and not just to words" (Gee, 2003, p. 108). This speculation is also in line with Gee's "Situated Meaning Principle," suggesting that: "The meanings of signs (words, actions, objects, artifacts, symbols, texts, etc.) are situated in embodied experience. Meanings are not general or decontextualized. Whatever generality meanings come to have is discovered bottom up via embodied experiences" (Gee, 2003, p. 107). Accordingly, the higher rate of communication breakdowns during the conversations that pursued off-task topics appears quite reasonable. The absence of contextual clues (like those prevalent throughout MMORPGs' virtual environments) in abstract off-task conversations and lack of shared social and cultural knowledge between the NS and the NNS participants could have increased the probability of communication breakdowns during such conversations.

Similarly, higher rates of meaning negotiations in off-task compared to on-task interrupted turns (in both teams) can be discussed in light of the contexts these conversational exchanges took place in and how critical the negotiations were within each context. During the gameplay, there were occasions wherein bridging communication gaps was not regarded as vital. In other words, failing to grasp the

precise meaning of the discourse would not inflict irreparable damages on the team's performance. On the contrary, there were situations in which the negotiation of meaning was critical for the fulfillment of the team's goals; however, the participants probably avoided negotiating for meaning to catch up with the fast pace of the gameplay. And in some other circumstances, the participants could figure out the meaning of the interrupted discourse by drawing on various verbal and non-verbal clues present in the game environment (e.g., quests' texts, PCs' and NPCs' actions and utterances, and virtually represented locations). Thus, the higher rate of meaning negotiations during off-task interrupted turns can be explained by the absence of multimodal contextual clues and lack of common social and cultural backgrounds between the native and non-native interlocutors. Another possible explanation for the higher rate of negotiations during off-task interrupted turns lies in the similarity between the game-mediated off-task oral conversations in the current research and face-to-face interactions. The sequence of conversational turns involving indications of nonunderstanding (especially in the forms of clarification requests and confirmation checks) and the turns that include responses shaped question-answer adjacency pairs (Schegloff, 2007; Schegloff & Sacks, 1973) in which the turns are functionally interdependent. That means, the occurrence of the former turn (i.e., the indication) establishes an expectation for the following turn (i.e., response) to occur in the discourse. Being involved in off-task conversations, the interlocutors seemed to have felt more obliged—compared with game-mediated, and on-task conversations—to observe this adjacency pair and provide responses to the

indicators of nonunderstanding. Possibly, the violation of this conversational norm could be regarded as breaching politeness principles in conversation.

Comparing T1 and T2 showed that T1 produced a little more off-task conversational turns. That seems counterintuitive considering T1's lower level of L2 proficiency and the fact that partaking in conversations with off-task topics demands a wider range of lexical and syntactic knowledge. Although this difference is negligible (1.4%), this finding can represent the fact that the establishment of an "affiliative social bond" (Thorne, 2008) among team members created an emotionally safe and socially supportive environment for the NNSs (in T1) to take risk and use the TL despite their limited L2 proficiency (Peterson, 2012a; Rama et al., 2012; Rankin et al., 2006). Comparing teams also revealed a higher rate of communication breakdowns in conversational turns (on- and off-task) among the participants in T1. This finding seems reasonable considering the NNSs' low level of L2 proficiency. More challenges for the participants in T1 for comprehension during the gameplay can be interpreted as more opportunities for the NNSs to get actively involved in the co-construction of meaning through negotiations. That means ample opportunities for NNSs to receive comprehensible input and be pushed to adjust and produce more comprehensible L2 output--the primary prerequisites for L2 development claimed in Krashen's (1985) Input Hypothesis, and Swain's (1985) Pushed Output Hypothesis. The high rate of meaning negotiations in both teams (98% in T2 and 89.2% in T1) is also important—through interactionist perspective—for facilitating L2 development in the context of an MMORPG. Furthermore, most of the negotiation episodes turned out to be simple in

both teams. Despite a non-significant association between the participants' level of L2 proficiency and the negotiation episodes' level of complexity, the results showed that complex negotiated interactions occurred more frequently in T1 (16.7%) than in T2 (8.3%). Again, this result can be related to T1's limited L2 proficiency, which imposed more challenges for both sides of the interaction to clarify and decipher the meaning of the problematic discourse. That means more L2 processing time for the NNSs in T1 as they were actively involved in receiving and producing more comprehensible output.

As the results revealed, the communication breakdowns in T1 were triggered more by the NS's utterances; whereas, in T2, the negotiations were triggered more by the NNSs' problematic utterances. This finding can represent the fact that the NNSs in T1 benefited more from obtaining comprehensible input (from their NS interlocutor) and the NNSs in T2 were provided more opportunities to adjust and produce more comprehensible TL output. Some studies (e.g., Rankin et al., 2006) found that playing an MMORPG is more beneficial for advanced and intermediate level ESL learners. Rankin et al. (2006) argued that lower-level ESL students (i.e., high-level beginner defined by the Basic English Skills Test) were cognitively overloaded by multiple competencies required to navigate the game, comprehend the information displayed on the screen and look up unfamiliar vocabularies. However, the analyses of the participants' negotiated interactions in the current research suggested that participation in the MMOG play is also beneficial for those with limited L2 proficiency (i.e., low intermediate defined by CEFR) by exposing them to more comprehensible TL input. It should be noted, though, that besides level of L2 proficiency, a range of different learner-related variables (such

as level of game experience, willingness to communicate in the TL, self-efficacy beliefs, language learning anxiety) work in tandem to determine the participants' language learning behavior and outcome in the game context.

Negotiations of Meaning

Triggers

The close examination of constructing elements of negotiation routines (i.e., Ts, Is, Rs, and RRs) in three types of dyadic conversational exchanges provided valuable insights into the nature of triggers (of communication breakdowns) and the strategies the interlocutors adopted to indicate and repair the broken discourse during the gameplay. Findings suggest that in $NS_{trigger}$→NNS_{signal} negotiated interactions, where the NS's pace of utterance and use of difficult vocabulary triggered interruption in the flow of discourse, the NNSs were constantly challenged to decode messages by drawing on the semantic and syntactic clues in the co-text of the NS's discourse and the context of the game. It can be speculated that being exposed to the NS's utterances featuring salient components (e.g., accent, pitch, intonation, and speech rate) can afford opportunities for the NNSs to gradually develop the skills necessary for decoding and comprehending naturally used English language in particular native English speaker accent. In addition, being involved in negotiating unknown vocabularies can presumably provide NNSs with opportunities to enrich their repertoire of L2 vocabulary. The identification of vocabulary as the second most prominent trigger of negotiated interactions in $NS_{trigger}$-NNS_{signal} dyadic conversations can partially explain what the literature suggest concerning the positive impact of playing MMORPGs on L2 vocabulary development

(Alp & Patat, 2015; Bytheway, 2014; Rankin et al., 2006; Rankin et al., 2009; Sylvén & Sundqvist, 2012; Zheng et al., 2015). For example, Rankin et al. (2009) discovered the positive impact of playing *Ever Quest II* (with native English speakers) on the learners' receptive vocabulary knowledge. As they evaluated the participants' recognition of the correct meaning of English vocabularies within in-game tasks, they realized that the participants who collaborated with NES players performed significantly better than those who attended class instruction or played the game on their own. Sylvén and Sundqvist (2012) also found significant differences between "non-gamers," "moderate gamers," and "frequent gamers" regarding both L2 vocabulary recognition and production skills. The examination of $NNS_{trigger} \rightarrow NS_{signal}$ negotiations revealed that the NNSs' pronunciation stood out as the main reason for the NS's comprehension failure. The same proved to be true in the negotiated interactions between NNSs. Such negotiations of meaning—triggered mostly by the NNSs' problematic pronunciation—can raise NNSs' awareness about the phonetic aspects of L2 production. As the results suggest, syntax did not cause any critical challenge in the comprehension of discourse produced either by the NS (in NS-NNS dyads) or by the NNSs (in NNS-NS dyads). Despite the syntactic complexity of the NS's discourse and the prevalence of erroneous structures in NNSs' utterances, the participants managed to decipher and interpret the messages correctly. This finding can partially explain other researchers' (e.g., Rama et al., 2012; Rankin et al., 2009; Reinders & Wattana, 2011; Zheng et al., 2009b) findings that participation in MMORPGs did not make significant contributions to the development of L2 learners' syntactic knowledge.

Indicators

In 75% of the $NS_{trigger} \rightarrow NNS_{signal}$ negotiated interactions in T1, the NNSs used explicit, global, clarification request strategy to address a communication difficulty. It can be inferred that for NNSs in T1, not a single element but a combination of different factors could have caused the communication breakdown. Accent, intonation, syntactic and lexical complexity, and speech rate can be named among many others. Using global indicators (of incomprehension) by the NNSs could have presented a challenge for the NS who needed to adjust his output in the absence of any clue concerning the source of unintelligibility in the discourse. A similar pattern emerged in $NNS_{trigger} \rightarrow NS_{signal}$ negotiations in T1. Compared with the NNSs' utterances in T2, the NNSs' utterances in T1 appeared to be harder to understand and thus more difficult to figure out where the problem is located. The results demonstrated that the NS was more specific (using explicit, local, clarification request) signaling communication problems in T2 (45.5%) than in T1 (22%). Therefore, due to the overall vagueness of the NNSs' discourse in T1, the NS failed to identify and address the precise nature (and location) of the problem in the discourse. Not knowing about the exact locus of the problem could have brought some challenges for the NNSs who were pushed to modify their output and make it more comprehensible. These interactional occasions are considered as crucial in the process of L2 development according to Swain's (1985) Output Hypothesis. From this theoretical perspective, being pushed to generate more comprehensible output is essential for L2 development as it "(a) gives learners the opportunity to practice and thus to automatize the production of the language; (b) allows learners to test hypotheses concerning the L2;

(c) forces learners to focus on structure of the language; and (d) draws learners' attention to gaps in their interlanguage" (Mackey et al., 2012, p. 8). This finding can also explain, though partially, why the development of communicative competence has stood out in the literature as a major L2 learning outcome of playing MMORPGs (e.g., Peterson, 2012a; Rama et al., 2012; Palmer, 2010; Rankin et al., 2009; Reinders & Wattana, 2011). To communicate successfully in the game context, L2 users would have to develop some communicative competence (and strategies) that could assist them to compensate for their limited repertoire of lexical and syntactic knowledge.

Responses

The results concerning the rate and diversity of response strategies are of great importance since they showed how far the participants got involved in bridging the communication gap and what strategies they applied to transform their output to make it more comprehensible. The results reflect the participants' high level of attendance to the communication breakdowns during the gameplay.

The NS attended to 87% and 95% of the NNSs' indications of incomprehension in T1 and T2. And the NNSs reacted to 91% and 100% of the NS's signals of communication failure in T1 and T2 respectively. These results can be explained by drawing on the nature of the tasks the participants—as team members—were involved in. The literature (e.g., Foster, 1998; Smith, 2003b) confirms that negotiation of meaning is more likely to happen during the tasks in which the exchange of information is required rather than optional. Being well aware that successful completion of in-game tasks requires consistent collaboration and coordination among team members, the

participants attended to the signals of communication breakdowns quite meticulously. They were also involved in the conversations in which they eagerly exchanged information and shared their views on different topics (e.g., social, cultural, and political). These conversational exchanges bear some similarities to culturally specific types of tasks that are proved to be conducive to the occurrence of negotiations of meaning (van der Zwaard & Bannink, 2016). Another explanation resides in the similarities between oral synchronous MMORPG-mediated communications and face-to-face, real-time conversations. It appeared that the interlocutors felt obliged to adhere to the principles of question-answer adjacency pair (Schegloff & Sacks, 1973; Schegloff, 2007). According to this principle, the first move involving an implicit or explicit request for clarification necessitates (or demands) the occurrence of the second move that involves a response.

Furthermore, as the results indicate, the NS was quite creative and resourceful in utilizing different combinations of response strategies to bridge the communication gaps (triggered by his utterances). The majority of the signals he received from his NNS interlocutors were global indications of nonunderstanding. By drawing on available contextual clues in the game setting, the NS attempted to improve the comprehensibility of the discourse through the implementation of a variety of response strategies, which in some cases were creatively engineered in a single response move. More specifically, expansion, rephrasing, and repetition with pace modification stood out in the response strategies the NS utilized. With the use of expansion strategy, the NS provided more semantic context; by adopting rephrasing strategy, he sought to simplify the language of

the ongoing discourse through substituting complex syntactic and semantic elements with simpler and supposedly more comprehensible elements; and by slowing down the pace of his utterance and clearer articulation, he attempted to reproduce a more comprehensible version of the discourse in which the constructing elements (e.g., morphemes and phonemes) were much easier to decipher and more manageable to process. These negotiations of meaning served to provide the NNS participants with a significant amount of comprehensible input that, according to Krashen's (1985) Input Hypothesis, is essential for successful SLA. The study showed that the application of these strategies helped to improve the comprehensibility of TL input. As Scarcella and Higa (1981) highlighted, this adjusted (or simplified) input is "optimal" and more impactful in the process of SLA since it develops as the result of negotiation work.

As creatively as the NS, the NNSs also applied different types of response strategies—combined and alone—to improve the comprehensibility of their output. Among these strategies, expansion, repetition, pronunciation modification, and rephrasing stood out. Negotiations of meaning pushed the NNS participants to produce more TL through expanding their preceding utterances. They were driven to draw on their limited repertoire of syntactic and lexical knowledge and generate more discourse that serves to provide more semantic context. Although the distribution of response strategies was not significantly different between T1 and T2, the NNSs in T2 used expansion strategy with a slightly higher frequency compared to T1. In contrast, the repetition of the same utterance without any modification (e.g., lexical, syntactic, or phonological) was more frequent in NNSs' responses in T1. These findings look

reasonable considering the NNSs' different L2 proficiency levels in T1 and T2. The NNSs' endeavor to modify their output regarding pronunciation looks promising, too. Upon receiving specific signals from their NS interlocutor, they seemed to have noticed that their unclear or incorrect pronunciation (of a word or a part of their utterance) resulted in the communication breakdown. Therefore, they attempted to improve the comprehensibility of their output by pronouncing the problematic element(s) correctly or more clearly. Finally, the application of rephrasing (lexical and syntactic) strategy represents the NNSs' high level of cognitive engagement in the reproduction of meaning through creative implementation of lexical and syntactic tools in the TL. Similar to expansion strategy, rephrasing strategy, which involves cognitively complex processes of reproducing meaning through alternative forms, was utilized more frequently by the NNSs in T2.

The scarcity of L1 use among the NNSs (in NNS-NNS interactions) as a response strategy for resolving communication problems is another important finding in the current research. The NNSs' first language was used only once in T1, where the NNS translated a word seeking to bridge the communication gap that was triggered by his mispronunciation of a word. This result contradicts sharply with what Fernández-García and Martínez-Arbelaiz (2002) found about the use of L1 in the negotiations of meaning in NNS-NNS synchronous computer-mediated communication. Although the learners were required to use only Spanish throughout the activity, they overwhelmingly resorted to their native language—that was English—to resolve the communication problems. This contrast can be discussed in light of the context of the study. In the

current research, the NNSs' oral conversational exchanges were taking place in the presence of the NS as a member of the team. Due to the collaborative nature of in-game activities, it was crucial for all team members to comprehend the meaning of the ongoing discourse. Sometimes, one or two team members were not directly involved in the ongoing conversations; however, they all knew that successful coordination needed every one of them to be in tune with the conversational exchanges taking place around them. Thus, the use of L1 among the NNSs (in NNS-NNS conversational exchanges) was automatically, and presumably subconsciously, banned in the interactions. Lack of tendency to use L1 is of crucial significance because the use of L1 in negotiated interactions does not result in producing modified TL, which is claimed—in Output Hypothesis (Swain, 1985)—as fundamental for SLA.

Reactions to the Responses

Finally, the examination of the participants' reactions to the responses uncovered more opportunities for the NNS participants to produce and be exposed to more TL. The results revealed that responding back stood out as the dominant type of RR strategy in all three types of dyadic interactions. In the process of responding back, after the participants (NS and NNSs) managed to comprehend the meaning of the formerly-incomprehensible utterance, they formulated a contextually-relevant response to the preceding statement, which provided opportunities for the NNSs to receive more TL input (from their NS and NNS interlocutors) and produce more TL output. The NNSs were actively involved in conversational exchanges that demanded more elaborate

reactions to the responses than merely using minimal responses such as “OK!,” “Good,” or “I understand.”

There were a few cases (in all three forms of dyadic conversations) in which the participants’ responses were not reacted to verbally. It would be simplistic to interpret these cases as indicative of the participants’ failure to understand the meaning of the formerly-interrupted discourse; and thus, it is not sensible to simply conclude that the negotiations in such cases were unsuccessful. Some possibilities can be speculated. A response might have failed to repair the communication gap but was ignored because communication of meaning was not crucial at that particular point. Or, a response might have clarified the meaning of the discourse but was not reacted to verbally because the interlocutor preferred (or was pushed) to continue with the gameplay without responding back verbally. Another possible explanation is that a response might have been received and reacted to non-verbally through performing an action in the game context. In some occasions, after the communication problems were resolved, the interlocutors acted accordingly in the game environment without any verbal response. In Example 9 below, the NS asked for the NNS’s signature. A communication problem arose due to the NS’s fast pace of utterance. After the communication gap was resolved by the NS—through slowing down and reducing the preceding utterance to its main semantic components—the NNS reacted non-verbally by signing an agreement in the virtual setting of the game. Afterward, the NS confirmed the NNS’s non-verbal reaction (i.e., signing the agreement) stating “Perfect. Alright.”

Example 9 (B.30.4.1) *(Setting: The team is preparing to enter the battle ground.)*

NS: "Hey NNS, I'm gonna request a signature from you real quick."

NNS: "Sorry?"

NS: "NNS, I'm requesting a signature."

NNS: … *(He signed the agreement to enter the battle ground).*

NS: "Perfect. Alright. We just need M."

NNS: "Ya. OK. Thanks."

Implications

The current research provides some insights into the affordances of playing off-the-shelf MMORPGs, as "transcultural spaces of non-institutional online environments" (Thorne, 2008, p. 323), for L2 development. Findings have some implications for L2 learners, educators, and researchers.

Second language learners and teachers need to know how far task-based synchronous verbal (oral) interactions in the context of MMORPGs can foster verbal interactions and especially the interactions that involve negotiations of meaning. They also need to realize how and to what extent negotiations of meaning in MMORPGs' dynamic social settings can facilitate the process of L2 learning. They need some empirical evidence to let them know if getting involved in MMORPGs is beneficial for practicing and developing L2 skills. The current investigation provided some evidence that can help L2 teachers and learners find out how to incorporate these unorthodox social settings—as potential venues for L2 learning—in their learning and teaching

practices. This study also supports L2 learners to know more about the context of MMORPGs—in particular, *WoW*—that inspire meaningful interactions for performing goal-oriented tasks in the game environment. The results elucidated how smoothly game-mediated communications took place; and in cases of communication breakdown, how frequently and actively the interlocutors got involved in collaborative verbal interactions to resolve the communication problems. Furthermore, this study provides learners, teachers, and researchers with a clear idea about the potentials of MMORPGs for L2 learning through understanding the nature of in-game interactions (with NPCs and other PCs). Moreover, by drawing on the findings, L2 learners and educators realize how strongly the negotiations of meaning during the gameplay can push the participants to adjust their output in the TL and improve discourse comprehensibility. Overall, the findings shed lights on the affordances of MMORPGs as unconventional venues for L2 socialization, intercultural communication, and consequently practicing and developing L2 skills.

This study also enriches L2 educators' knowledge base about MMORPGs. By reviewing the current research's findings, they can decide how to harness the potentials of MMORPGs for L2 education. In educational settings, L2 educators strive to simulate real-life situations in classrooms and thereby assist their students to put newly-taught L2 skills into practice. Within simulations, teachers have attempted to alleviate students' language anxiety by encouraging them to adopt and communicate through new identities. They have been engaged designing tasks in which learners are required to interact to complete the tasks collaboratively. They have been encouraging their students

to communicate with speakers of the TL face-to-face or online. This research helps L2 educators realize how far MMORPGs meet the criteria they have in mind regarding an optimum condition for L2 development. The findings indicated that MMORPG environments promote authentic conversational opportunities among the gamers, in particular between the native and non-native English speakers; the opportunities that are sought after in formal, educational contexts.

The current research also sets the stage for the SLA scholars who strive to explore more about the nature of verbal interactions in the context of MMORPGs and find out how these interactions can be facilitative in the process of L2 learning. In the SLA research, and in particular from psycholinguistic account of interactionist perspective, negotiation for meaning is described as an essential component for L2 development (e.g., Gass & Varonis, 1994; Long, 1996; Pica, 1994; Pica et al., 1987). Negotiation for meaning pushes interactants to get actively involved in generating more comprehensible output by utilizing a broad range of form-focused linguistic modification strategies. During a communication breakdown, according to Swain's (1985) output hypothesis, L2 learners attempt to fix the problematic discourse and improve its comprehensibility. By drawing on their limited lexical and syntactic knowledge, L2 learners apply different form-focused modification strategies and communicative approaches to repair the temporary communication problem. The current study attempted to provide a focused lens for SLA researchers to observe how frequently MMORPG-mediated verbal interactions can be interrupted and subsequently negotiated by the L2 users as gamers. Researchers can pursue this line of research by

addressing the same research questions in their examination of text-based verbal interactions. This follow-up research can elucidate how using a different mode of communication can change the results. Through adopting the same theoretical lens, researchers can also investigate the same phenomenon in the context of other network-based communication settings (see Pellettieri, 2000; Smith, 2003; Tudini, 2003). Finally, as a follow-up to the current investigation, SLA researchers can add some other relevant variables—such as the type of in-game tasks—and investigate if and how the existing pattern of negotiations for meaning can change.

Conclusions

Based on the psycholinguistic account of interactionist perspective to SLA, the occurrence of negotiations of meaning (in oral and written interactions) can provide opportunities for L2 learners to obtain more comprehensible TL input, produce more modified TL output, receive feedback from more competent TL interlocutors, and notice the gap in their interlanguage. These constitute the primary constructs underlying cognitive and metacognitive processes that are hypothesized to contribute to SLA. Through the analysis of the participants' interactional moves, the current research sought to realize if the nature of the negotiated interactions in the game context provided the necessary conditions—from interactionist perspective—for second language development.

The systematic examination of the quality and quantity of the participants' interactions (in three different types of dyadic conversational exchanges) revealed that playing an MMORPG provided non-native interlocutors with opportunities to use the TL

to communicate and perform a broad range of authentically contextualized tasks. The current research also revealed that the participants (both the NS and the NNSs) were actively involved in negotiations of meaning when communication problems occurred in their conversational exchanges. Moreover, the results indicated that such negotiations were highly successful at resolving the communication problems.

Detailed analyses of the negotiation routines revealed some distinctive features not clearly explained in the current models of negotiation of meaning proposed by Varonis and Gass (1985a), and Smith (2003a). The current research showed that communication breakdowns were sometimes triggered by a combination of different linguistic and non-linguistic elements. As a result, the indicators of incomprehension were mostly global, which, in turn, evoked responses that incorporated a combination of different types of phonological, lexical, and syntactic adjustments to the discourse. Another distinctive feature of negotiation routines during the gameplay was the occurrence of two forms of RR coded here as responding back and performing an action in the game context. These features of negotiation routines reflect the characteristics of a natural flow of discourse taking place in an authentic communication setting. The dynamic mechanism of these negotiated interactions seems to have the potential to prepare NNS participants for naturally occurring conversational interactions, which demand high levels of cognitive processing and linguistic flexibility.

Working collaboratively to resolve communication problems in the TL was another characteristic of negotiated interactions that emerged in the current study. Negotiations of meaning were opportunities for the co-construction of meaning not only

by the interlocutors who were originally involved in the negotiations but also by all those who were playing the game as a team. There were occasions when more than one interlocutor signaled incomprehension of the discourse, provided complementary responses to help repair the communication breakdown, or reacted to the responses provided. In other words, the participants were entering and exiting the ongoing negotiation process at different stages when necessary and appropriate. This phenomenon can partially be explained by drawing on the collaborative nature of the tasks the participants were involved in. The interdependence among the participants' activities within the game context and the necessity of information exchange apparently made it inevitable for the team members to care about the success of the interactions taking place around them and help it flow smoothly. This argument is in line with Foster's (1998) and Smith's (2003b) findings that negotiations of meaning are more likely to occur during the completion of the tasks in which information exchange is required not optional. The occurrence of multilaterally collaborative negotiations of meaning during the gameplay represents the fact that the participants were in tune with the meaning being co-constructed—through negotiations—by other interlocutors around them. The benefits of being exposed to or participating in such negotiations are well grounded in the sociocultural account of the interactionist perspective. This viewpoint suggests that "[…] second language learning is facilitated through the co-construction of meaning in the TL involving collaborative dialog and the creation of zones of proximal development (ZPDs)" (Peterson, 2010a, p. 431).

The results also indicated that a greater number of negotiations of meaning happened between the native and non-native English speakers. This result contradicts Varonis and Gass's (1985a) findings, showing that negotiations of meaning happened more frequently in NNS-NNS dyads than in any other dyads involving native speakers. They argued that the feeling of "shared incompetence" could have driven the NNSs to acknowledge non-understanding in their interactions with other NNSs. In contrast, the NNSs in the current research were eagerly participating in meaning negotiations with the NS without being overwhelmed by the feeling of inequality regarding L2 proficiency. A possible explanation is that the socially supportive and emotionally safe environment within MMORPGs (Reinders & Wattana, 2014, 2015b), could have helped the NNSs develop the self-efficacy beliefs necessary to take risks and use the TL. Furthermore, the participants' unyielding focus on meaning during the gameplay seemed to have relegated the significance of form (or metalinguistic knowledge) in their mind and thus freed them from the paralyzing fear of making form-related mistakes.

Another highlight of the current research is the high proportion of communication breakdowns that the NNSs with the lower level of L2 proficiency faced during their conversational exchanges. This finding could be related to more communicative and linguistic challenges this group of participants faced. Although there seemed to be a little more negotiation opportunities for lower level NNS participants, the study revealed that not all these opportunities were seized by this group of L2 users. Also, the lower level NNSs were involved in more episodes of complex (i.e., multi-turn) negotiation routines compared with more proficient NNSs. The

literature (e.g., Loewen, 2004; Ellis et al., 2001) suggests that getting involved in L2 processing for a longer period results in more chances for L2 development.

Finally, as the results suggest, the NNSs in both teams (with lower and higher levels of L2 proficiency) benefited from the opportunities the negotiations of meaning provided for obtaining more comprehensible input and generating more comprehensible output in the TL. In particular, the participants with the lower level of L2 proficiency benefited from more opportunities to receive comprehensible TL input whereas the more proficient NNSs were afforded more opportunities to improve the comprehensibility of their TL output through the implementation of various types of linguistic and non-linguistic modifications in their TL output.

The current study illustrated—through adopting interactionist perspective—that the participants in the gameplay were actively involved in conversational exchanges to perform a wide variety of game-mediated tasks. This study also provided empirical evidence indicating that the communication breakdowns during these conversational exchanges were well attended—by the NS and NNS participants—through negotiations of meaning. Finally, it showed that most of the negotiated interactions promoted the comprehension of the input and improved the comprehensibility of the output in the TL. This research managed--to some extent--to provide some empirical evidence concerning the first step in a systematic study of L2 learners' participation in conversational interaction proposed by Long (1985). To take the second step in Long's (1985) account, future studies are needed to investigate if the comprehensible input provided through negotiations of meaning and the opportunities to modify and produce more

comprehensible output promote L2 acquisition. The third and final step proposed by Long (1985) is deducing that the linguistic and conversational adjustments within negotiated interactions during the gameplay promote SLA.

CHAPTER IV

THE DEVELOPMENT OF SECOND LANGUAGE LEXICAL AND SYNTACTIC COMPLEXITY IN THE CONTEXT OF A MASSIVELY MULTIPLAYER ONLINE ROLEPLAYING GAME

Introduction

With the advent of technology and in turn the emergence of digitally-dependent generation, research in the field of second language acquisition (SLA) has undergone a fundamental paradigmatic shift. In addition to studying optimal second language (L2) teaching practices and learning activities in formal educational settings, scholars' attention is drawn to SLA research in the context of digitally-mediated communication. In the current digital age, L2 development is no longer regarded as taking place merely through formal educational practices in institutionalized settings such as schools wherein teachers and learners are the main players. Conceptually transformed, L2 development is considered as a life-long learning venture that occurs as a learner (or an L2 user) is actively involved in performing a wide variety of socially-driven, authentic activities in different forms of social media.

The introduction of World Wide Web and more precisely Web 2.0 tools (see O'Reilly, 2007; Halvorsen, 2009; Kaplan & Haenlein, 2010) to the world of communication pushed the borders of SLA research beyond the walls of educational settings. The introduction of various computer-mediated Web 2.0 communication tools (referred to as social media) opened up a new research horizon for SLA scholars, who

started to examine the process of L2 development as it happens in digitally-mediated social settings.

The investigation of SLA as a naturally occurring phenomenon within digitally-mediated social settings is aligned well with Beatty's (2010) definition of computer-assisted language learning (CALL). Beatty defined CALL as "*any process in which a learner uses a computer and, as a result, improves his or her language*" (p. 7, original emphasis). Based on Beatty's definition, language learning is considered as incidental and peripheral to the use of the computer (or other digital devices) for purposes other than language learning. This conceptual shift expands the concept of CALL beyond formal educational settings to involve informal learning contexts. Chik (2013) labeled this emergent concept of CALL as "*Naturalistic* CALL" (p. 835, original emphasis), referring to "students' pursuit of some leisure interest through a second or foreign language in digital environments in informal learning contexts, rather than for the explicit purpose of learning the language" (pp. 835-836).

This brief introduction leads us to the focus of the current study that is an investigation of English as a foreign language (EFL) development in the context of off-the-shelf (OTS) massively multiplayer online (role-playing) games (MMORPGs). Before elaborating on the specific goals of this research, three core concepts of "social media," "informal learning," and "L2 development" need to be defined.

Kaplan and Haenlein (2010) defined social media as "a group of Internet-based applications that build on the ideological and technological foundations of Web 2.0, and that allow the creation and exchange of User Generated Content" (p. 61). They classified

social media into six different categories including “collaborative projects, blogs, content communities, social networking sites, virtual game worlds, and virtual social worlds” (Kaplan & Haenlein, 2010, p. 59). They put MMORPGs (e.g., World of Warcraft) under the “virtual game worlds” category, asserting that this type of social media--and “virtual social worlds” (e.g., Second Life)--enjoy high levels of “social presence” and “media richness.” They described “social presence” as “the acoustic, visual, and physical contact that can be achieved ... between two communication partners” and “media richness” as “the amount of information they allow to be transmitted in a given time interval” (p. 61). MMORPGs, as graphically rich 3D spaces, are large-scale permanent virtual worlds in which a large number of players—located in different parts of the world—interact within a game world at any given time. Game players progress in the game by completing an increasingly challenging sequence of tasks known as quests. The game context requires game players to collaborate and form alliances to complete quests. Game players have real-time communication with other players and interact with non-player characters (NPCs) that are controlled by the game. Communication among gamers is made possible through text and voice chat channels. Gamers navigate the game environment through customizable 3D graphical characters known as avatars. Peterson (2010a) emphasized that “These 3D graphical agents enhance the sense of immersion experienced by players, supporting communication, social interaction, role-play, and the process of community formation between users” (p. 430).

Another fundamental concept in the current research is informal learning echoed in Chik's (2013) and Beatty's (2010) reconceptualization of CALL. Coombs and Ahmed (1974) defined informal learning as "the lifelong process by which every person acquires and accumulates knowledge, skills, attitudes, and insights from daily experiences and exposure to the environment" (p. 8). Aligned with this definition, Livingstone (2001) characterized informal learning as "any activity involving the pursuit of understanding, knowledge or skill, which occurs without the presence of externally imposed curricular criteria" (p. 30).

The third, and presumably the most elusive concept in SLA research, is L2 development. In SLA research, it is agreed that L2 development is a multifaceted phenomenon that undergoes consistent, dynamic changes across time and context (see Thorne & Tasker, 2011; Larsen-Freeman & Cameron, 2008a, 2008b), and involves an "ongoing emergence of complexity, fluency, and accuracy in learner language" (Larsen-Freeman, 2006, p. 590). Therefore, as Verspoor and Behrens (2011) highlighted: "There is not one single theory that deals with all aspects of what language is, how it is organized, how it is processed, how it is used, how it changes, how it is acquired and how it is learned as a second language" (p. 25). In this research, L2 development is examined through "usage-based" or "emergentist" theories of language learning. From this perspective, language learning is an iterative process and evolves as the result of extensive use in meaningful interactions with the environment. As the frequency of language use and the patterns that emerge are considered as important indicators of language development from this point of view, the current research was designed to map

developmental changes in the participants' TL use in the context of a MMORPG. To this end, changes in the linguistic (lexical and syntactic) complexity of the NNESs' spoken discourse were monitored during a five-month period of MMORPG play (with their peers and a native English speaker). Ortega (2003) used the construct linguistic complexity as synonymous with "syntactic complexity" and "syntactic maturity." According to Ortega, linguistic complexity "[…] refers to the range of forms that surface in language production and the degree of sophistication of such forms" (p. 492). Ortega emphasized that linguistic complexity is an important construct in L2 research "[…] because of the assumption that language development entails, among other processes, the growth of an L2 learner's syntactic repertoire and her or his ability to use that repertoire appropriately in a variety of situations" (p. 492).

Many scholars have probed the potentials of MMORPGs for L2 development (e.g., Bytheway, 2014; Miller & Hegelheimer, 2006; Palmer, 2010; Chik, 2014; Peterson, 2011, 2012a, 2012b; Rankin et al., 2006; Rankin et al., 2009; Rama et al., 2012). They found that getting involved in MMORPGs as "complex semiotic ecologies" (Thorne et al., 2012) provides opportunities for improving L2 vocabulary (e.g., Bytheway, 2014; Miller & Hegelheimer, 2006; Rankin et al., 2006; Rankin et al., 2009; Sylvén & Sundqvist, 2012), abilities to perform a range of authentic pragmatic moves (e.g., Palmer, 2010; Peterson, 2012a), communicative competence and strategies (Rama et al., 2012), and reading and listening comprehension skills (Sylvén & Sundqvist, 2012).

As the literature suggests, L2 development has been investigated—both qualitatively and quantitatively—in the context of MMOGs, but there is still a dearth of longitudinal studies that examine the patterns of L2 development by mapping subtle changes in the linguistic complexity of L2 users' game-mediated discourse. To address this gap, the current research examined—through the implementation of lexical and syntactic complexity measures—any small changes that occurred in the linguistic complexity of the discourse generated by two groups of NNESs (with low and high L2 proficiency) during five-month of MMORPG play in the TL. It was hypothesized that the linguistic complexity of the NNESs' spoken discourse would improve as a function of time getting involved in MMORPG-mediated verbal (oral) interactions.

Theoretical Framework

Informal second language learning in the context of MMORPGs can be explained well through the lenses of Interaction Hypothesis theory (Long, 1996) and Situated Learning (legitimate peripheral participation model) theory (Lave & Wenger, 1991).

According to Interaction Hypothesis theory (Long, 1996), verbal communications for performing interactive tasks promotes negotiation of meaning among interactants. Negotiation of meaning can, in turn, help L2 learners to improve their L2 skills. The mechanism is that as communication breakdowns happen in interactive language exchanges, L2 learners receive modified and supposedly more comprehensible input. As a part of this process, L2 learners are also pushed to produce interactionally modified and more comprehensible output (Swain, 1985). Throughout

these exchanges, L2 learners notice—deliberately or incidentally—the form of the language they receive as input (Schmidt, 1993) as well as the form of the language they produce as output. As a psycholinguistic approach to SLA (Chapelle, 2009), Interactionist theory focuses on "Psycholinguistic processes for language learning through noticing language during meaning-oriented tasks" (Chapelle, 2009, p. 744). Closely aligned with the Interactionist SLA Theory, noticing hypothesis (Schmidt, 1993) "hypothesizes the value of attention directed toward the key linguistic features during second language (L2) tasks" (Chapelle, 2005, p. 56). As Chapelle (2005) contended, this theory explains the process of SLA in the context of social media by describing three types of interactions. One is the interaction among users of social media, which can bring about the benefits of negotiations of meaning. Two is the interaction between a user and the computer with the benefit of "Obtaining enhanced, or modified, input" (Chapelle, 2005, p. 55). Three is the interaction within a users' mind that directs the learner's attention to the linguistic form of the language input they receive and the language output they produce.

Playing MMORPGs, interacting with other gamers in the TL, getting involved in various communal practices, sharing knowledge and skills with other players and inquiring about new insights in the "community of practice," and developing L2 skills can also be explained by Legitimate Peripheral Participation Model (Lave & Wenger, 1991). This model suggests that learning takes place informally in a non-educational setting as an individual is engaged in performing goal-oriented, meaningful tasks situated in authentic socio-cultural contexts. The theory claims that "learning is situated;

learning is social; and knowledge is located in communities of practice …. the theory is offered as a specific analytic approach to account for how learning actually happens in actual lived situations and communities" (Brouwer & Wagner, 2007, p. 33).

Literature Review

CMC settings are increasingly considered as potentially useful environments for L2 learners to develop and reinforce their TL skills (Chapelle, 2008). This trend is evident in viewing online digital games—particularly MMORPGs—as contexts that provide opportunities for L2 development. MMORPGs have been examined from different perspectives by several SLA scholars (e.g., Peterson, 2010a, 2010b, 2011, 2012a, 2012b; Palmer, 2010; Rama et al., 2012; Rankin et al., 2006; Rankin et al., 2009; Reinders & Wattana, 2014, 2015a, 2015b; Steinkuehler, 2004, 2007; Sundqvist & Sylvén, 2014; Thorne, 2008; Thorne et al., 2012; Zheng et al., 2009a; Zheng et al., 2009b; Zheng, Newgarden, & Young, 2012). Researchers have concluded that MMORPGs, as highly interactive social settings, incorporate substantial opportunities "[…] for language socialization and for acquisition of skills related to just-in-time linguistic tools and services" (Godwin-Jones, 2014, p. 12). Opportunities for goal-oriented, task-based interactions in the context of these games are considered as crucial in Interactionist Second Language Acquisition theory (Gass, 2003; Mackey, 2007), which highlights the significance of conversational interactions in the development of L2 skills.

The current literature advocates that MMORPGs have helped language learners develop autonomous language learning practices (e.g., Bytheway, 2014; Chik, 2014),

vocabulary knowledge (Rankin et al., 2006; Rankin et al., 2009; Sylvén & Sundqvist, 2012; Bytheway, 2014), and communicative competence (Palmer, 2010; Peterson, 2012a, 2012b; Rama et al., 2012). Some studies (e.g., Reinders & Wattana, 2011, 2014, 2015b) also revealed that MMORPGs' socially supportive and emotionally encouraging environments enhanced learners' willingness to communicate in the TL. Studies (e.g., Peterson, 2012a; Rama et al., 2012; Rankin et al., 2006) claimed that avatar-embodied interactions, which enabled L2 learners to remain anonymous, decreased learners' language anxiety and encouraged them to take the risk using the TL in their communications.

Getting immersed in game-mediated interactions within a multimodal context provided by MMORPGs, L2 learners are exposed to a plethora of meaningful language input that is richly contextualized. For playing the game and navigating its environment, L2 learners have to read in-game instructions, follow non-player characters' (NPCs) commands, and interact with other game players. More TL input is also provided through game-associated forums, fanfiction, email groups, and discussion boards for those L2 learners who are committed to participating in auxiliary game-related activities. Some scholars (e.g., Steinkuehler, 2007; Thorne et al., 2012) performed detailed analyses of the literary contexts a gamer gets involved in within and beyond MMORPG environment. The results indicated that MMORPGs are rich social settings wherein players are exposed to a plethora of language input and get involved in a vast variety of literary activities. Steinkuehler (2007) performed a comprehensive qualitative study in the context of Lineage I and II, as a popular MMOG. She conducted a two-year online

cognitive ethnography to explore the social and intellectual activities that gamers were involved in routinely. She investigated game-related language and literacy practices both within and beyond the game's virtual context. Her study revealed that game players were consistently participating in a variety of language and literacy practices within the game's virtual context. Steinkuehler asserted that MMOG gamers were involved in the language and literacy activities (both within and beyond the game context) that meet National Council of Teachers of English standards.

In an exploratory research, Thorne et al. (2012) assessed the linguistic complexity of the language input (texts) that World of Warcraft gamers are exposed to within the game (i.e., quest texts) and outside of the game (i.e., game-related web sites) contexts. They assessed the readability, lexical sophistication, lexical diversity, and syntactic complexity of the texts. They concluded that (a) *WoW* presents an environment with high level of linguistic complexity, and (b) the three most frequently visited *WoW*-related external web sites are rich in lexical sophistication and diversity, and high in syntactic complexity. The researchers argued that these linguistically complex texts "are attended to because they are highly relevant to the actions, decisions, and problem-solving at hand" (p. 298). They found that despite being linguistically complex, *WoW*-associated texts are comprehended and internalized well. They claimed that it is because these texts are functionally and directly tied to the game activities and serve the gamers' immediate and situated game-playing needs.

Current research indicates that L2 development as the result of playing MMORPGs has been investigated using different paradigms (e.g., quantitative,

qualitative, and mixed-method), data collection, and data analysis procedures. Doing a thorough literature search, I did not find any longitudinal study considering the trend of linguistic complexity in L2 learners' game-mediated discourse (written or spoken) as an indication of L2 development in the game environment. Some researchers (e.g., Sauro, 2012; Sauro & Smith, 2010; Sotillo, 2000), though, have examined L2 learners' discourse regarding linguistic complexity in written synchronous computer-mediated communication (SCMC). Although these studies have been carried out in a different context (computer-mediated rather than MMORPG-mediated) of communication utilizing a different medium (text rather than voice chat), their review can provide some valuable insights for the current research.

Sotillo (2000), for example, investigated the variety of discourse functions and the level of syntactic complexity in 25 ELLs' written output. The learners' output was obtained from two modes of CMC: asynchronous and synchronous discussions. The learners were 25 male and female students (with the age range of 18-31) from two advanced academic writing classes. Sotillo sought to find out if the discourse functions in the participants' synchronous discussions are different—both quantitatively and qualitatively—from those generated by their counterparts in asynchronous discussions. She also intended to discover if the learners' output produced in the two modes of CMC is different in terms of syntactic complexity. Sotillo defined discourse functions as "[…] categories of behavior in electronic discourse, such as requests, responses, apologies, greetings, complaints, and reprimands" and syntactic complexity as "[…] the ability to produce writing that shows how ideas and large chunks of information are represented

with the use of subordination and embedded subordinate clauses" (p. 84). To measure the syntactic complexity of the ELLs' output, Sotillo used eight indicators including error-free clauses, total clauses, error-free T-Units, total T-Units, the total number of words, total embedded clauses, total subordinate clauses, and T-Unit length. She found no significant difference between the two groups of outputs in seven of the eight indicators of syntactic complexity. The only difference was in the number of error-free T-units. The results also showed that the participants used a variety of discourse functions when they exchanged their ideas and information through the synchronous mode of CMC. On the other hand, the students' output in the asynchronous mode of CMC was lengthy and syntactically more complex. More precisely, Sotillo identified more subordinate and embedded subordinate clauses in the outputs produced through the asynchronous mode of CMC.

Methodology

The current research is a longitudinal study. As Menard (2008) explained, in this type of research "data are collected on one or more variables for two or more time periods, thus allowing at least measurement of change and possibly explanation of change" (p. 3). The current study involves the collection of data (game-mediated, audio-recorded discourse samples) from two different groups of NNESs (in low and high intermediate L2 proficiency levels) over a 5-month period. This research involves repeated calculations of the indices related to syntactic complexity and the three components of lexical complexity (i.e., lexical density, sophistication, and variation) in the NNSs' oral discourse generated during the gameplay. Also, as a quasi-experimental

research, this study shares some characteristics of a single case time-series design. According to Menard (2008), “A time series is a set of repeated measurements of the same variable taken on the same unit of analysis (e.g., an individual, city, nation; more generally, a subject or a case) for two or more points in time” (p. 579). Having recommended a time-series design, Larsen-Freeman (2006) stated that: “For a dynamical description, it is desirable to use a time-series design, that is a series of observations of participants that are frequent enough to capture the relevant properties underlying the developmental process” (p. 595).

Each participant (NNES in the current research) was observed three times (in equal time intervals), and their performance (game-mediated oral discourse) was compared in terms of syntactic and lexical complexity. The data was collected at three data points at equal time intervals (i.e., the first, the middle, and the last game sessions). The average gameplay time for these three sessions was 147 minutes for team 1 (T1) and 133 minutes for team 2 (T2). Important to note is a subtle difference between the design of the current research and that of a conventional time-series study. In this study, the intervention (i.e., MMOG play in the TL) was introduced from the very beginning of data collection phase, apparently without establishing any baseline. Considering the fact that linguistic development of L2 discourse is not distinguishable over a short period (Ortega, 2003), the first six or eight hours of gameplay (completed during the first two months of the current project) was considered as the baseline. Thus, contrary to time-series research design, no interruption is expected to occur in the line (or curve) of change over the period of 5 months. Instead, due to the introduction of intervention from

the inception of the project, a growing trend (or at least a plateau) was expected to emerge in the patterns of change established by linguistic complexity indices.

Participants

Six NNESs (based in Iran) and one NES (based in the USA) participated in this research. The NNESs were equally divided into two groups (of three) according to their level of English language proficiency determined by *English Unlimited Placement Test* (Cambridge University Press 2010). This placement test consists of written and oral sections (see Appendix B). The written section comprises 120, and the oral section contains 30 questions. The questions are calibrated for six different levels of English language proficiency according to *The Common European Framework of Reference for Languages (CEFR)*. All the NNESs in group 1 were experienced *WoW* players. Their level of L2 proficiency was determined as threshold or intermediate, approximately level B1 according to the CEFR. The NNESs in group 2 had extensive experience playing other MMORPGs such as *Clash of Clans* but little or no experience playing *WoW*. They were placed at Vantage or upper intermediate level, approximately at level B2 according to the CEFR. As an expert *WoW* player, the NES participated in both groups (henceforth referred to as teams, denoted by T). All NNESs had Persian as their first language (L1), and none of them used any other languages except Persian and English. They were college-level students who had studied English as a foreign language in mainstream education at school and college. In addition, they had some inconsistent English language learning experience at language schools.

Data Collection

The data consisted of the participants' naturally occurring, non-elicited conversational (oral) exchanges during the gameplay. The data used in this study is a part of a large corpus of data collected in connection with a larger research project. The participants played the game for five months that added up to 60.38 hours of gameplay (30 hours in T1 and 30.38 hours in T2). T1 completed 30 hours of gameplay during 14 sessions—that is 2.14 hours on average per session. T2 completed 30.38 hours during 15 in-game meetings—that is 2 hours on average per session. During the data-collection period, the participants were required to enter the game world simultaneously and play the game collaboratively as a team. TeamSpeak 3, which is a proprietary voice-over-Internet Protocol (VoIP) software, was set up so that the participants could have real-time conversations as they played the game. Using TeamSpeak 3, the participants were able to talk at the same time over each other's voice without having to wait for each other's turn to come to an end. TeamSpeak 3 was also used to record the participants' conversations. For this study, three chunks of data (the first, the middle, and the last game sessions) were analyzed. These pieces of data occurred at equal time intervals (about 11.3 hours of gameplay in T1 and 11.8 hours in T2). The average duration of gameplay for these three sessions was 147 and 133 minutes for T1 and T2 respectively.

Data Analyses

The analyses were conducted to assess the linguistic (i.e., lexical and syntactic) complexity of the NNESs' spoken TL output at three points of time: the beginning, the middle, and the end of data collection period. The objective was to observe the

developmental trends in the lexical and syntactic complexity of the NNESs' spoken TL during the 5-month period of gameplay addressing the following research questions:

Q1: Does the lexical density of the NNESs' spoken discourse increase during five months playing WoW?

Q2: Does the lexical sophistication of the NNESs' spoken discourse increase during five months playing WoW?

Q3: Does the lexical variation of the NNESs' spoken discourse increase during five months playing WoW?

Q4: Does the syntactic complexity of the NNESs' spoken discourse increase during five months playing WoW?

Lexical Complexity Measures

Following Read (2000), Lu (2012) conceptualized lexical complexity (or "richness") as "a multidimensional feature of a learner's language use that consists of the following four interrelated components: lexical density, lexical sophistication, lexical variation, and number of errors in vocabulary use" (p. 191). Accordingly, the first three components of lexical complexity—lexical density, lexical sophistication, lexical variation—were measured in the current data. This research did not focus on the number (and types) of lexical errors in the participants' utterances as it mostly indicates the level of accuracy in vocabulary use.

Lexical density was coined originally by Ure (1971). It refers to "the ratio of the number of lexical (as opposed to grammatical) words to the total number of words in a text" (Lu, 2012, p. 191). Although lexical density is "the kind of complexity that is

typical of written language" (Halliday, 1985, p. 62), it "plays more of a role in the analysis of spoken texts" (Read, 2000, p. 203). For this study, lexical (or content) words were defined as nouns, adjectives, verbs, and adverbs. Regarding verbs, modal verbs (including: must, shall, should, could, can, might, may, would, will and ought to) and auxiliary verbs including: have (also has and had), be (also am, is, are, was, were, being and been), do (also does and did) and will were considered as non-lexical (or function) words. *Analyze My Writing*[9], which is a free online text content and readability analyzer, was utilized to measure lexical density.

Lexical sophistication is "a measure of the proportion of relatively unusual or advanced words in the learner's text" (Read, 2000, p. 203). Kyle and Crossley (2015) explained that "the construct of lexical sophistication involves both the depth and breadth of lexical knowledge available to speakers, readers, and writers" (p. 3). Accordingly, they proposed some indices that measured the depth and breadth of lexical sophistication in L2 learners. They developed the Tool for the Automatic Analysis of LExical Sophistication (TAALES), which incorporated 135 indices for five areas of lexical sophistication including "lexical frequency," "range," "n-gram frequency," "academic vocabulary," and "psycholinguistic word properties."

Kyle and Crossley (2015) investigated the validity of these indices by examining how they can predict variance in holistic judgments of lexical and speaking proficiency. They used a corpus of unstructured free-writes written by English language learners and native English speakers that had been scored for holistic lexical proficiency. They also

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[9] *Analyze My Writing* is accessible through http://www.analyzemywriting.com/index.html

used a corpus of independent TOEFL speaking samples that had been given holistic speaking proficiency scores. Kyle and Crossley found that two of these indices ([10]BNC Written Trigram Frequency Logarithm, [11]SUBTLEXus Range [12]CW Logarithm) could explain 44.8% of the variance in holistic speaking proficiency scores. The first index was positively and the second index was negatively correlated with the speaking proficiency scores. Therefore, the speaking samples considered as reflecting higher levels of language proficiency contained more high-frequency trigrams (or multiword units), which are frequent in a written corpus and tend to have the content words that occur in fewer contexts.

Kyle and Crossley (2015) also found that two of the 135 indices (BNC Written Range index for all words, BNC Spoken Bigram Proportion) were able to explain, in total, 42.7% of the variance in holistic lexical proficiency scores. BNC Written Range scores were negatively and BNC Spoken Bigram Proportion was positively correlated with lexical proficiency scores. It indicates that the words that are used in fewer contexts (i.e., in a limited range) are considered more sophisticated than those that are widely used (i.e., in a wider range). BNC Spoken Bigram Proportion was positively correlated with lexical proficiency scores. The writing samples that reflect higher levels of lexical proficiency tend to include a higher percentage of bigrams that exist in the spoken portion of the BNC (see Table 14 below for more details about the indices).

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[10] British National Corpus
[11] The SUBTLEXus corpus (Brysbaert & New, 2009) comprises subtitles from 8,388 films and television series from the United States.
[12] Content Word

Table 14 The lexical sophistication indices strongly correlated with speaking and lexical proficiency
Note. Adapted from TAALES index guide, Kyle and Crossley (2015).

Index	Category	Description	Numerator	Denominator	Mode	*AW /CW
BNC Written Trigram Frequency Logarithm	Ngram Frequency	Mean Frequency Score	Sum logged trigram frequency score	number of trigrams in text with frequency score	*W	AW
SUBTLEXus Range CW Logarithm	Word Range	Mean Range (number of documents that a word occurs in) score	Sum of range scores	number of words in text with range score	*S	CW
BNC Written Range AW	Word Range	Mean Range (number of documents that a word occurs in) score	Sum of range scores	number of words in text with range score	W	AW
BNC Spoken Bigram Proportion 50k	Ngram Frequency	Proportion of bigrams in text that are within the most frequent 50,000 bigrams	Number of text bigrams in list	number of bigrams in text with frequency score	S	AW

Note. AW, CW, W, and S stand for All Word, Content Word, Written, and spoken in order.

To measure the lexical sophistication of the NNESs' spoken TL output in this research, I included the four indices that Kyle and Crossley (2015) found as the strongest predictors of speaking proficiency (i.e., BNC Written Trigram Frequency Logarithm,

[13]SUBTLEXus Range CW Logarithm) and lexical proficiency (BNC Written Range index for all words, and BNC Spoken Bigram Proportion).

In addition to the four measures mentioned above, a word frequency measure based on frequency bands (e.g., Laufer & Nation, 1995; Morris & Cobb, 2004) was also implemented. Word frequency scores were derived by rank-ordering words in a single master word frequency list of [14]British National Corpus and Corpus of Contemporary American English (BNC-COCA 1-25k). The scores were then categorized based on whether they were in the most frequent 1000 words (1K list), 2000 words (2K list), or much less frequent words up to 25000 words (25K list). Finally, the percentage of the participants' spoken discourse that occurred within each band was determined. The online tool *VocabProfile* (Cobb, 2013) was implemented to obtain these counts. The current development version of the tool, called [15]*VP-Compleat*, was used in the current research.

Lexical variation, which is also labeled as "lexical diversity" (e.g., Malvern, Richards, Chipere, & Durán, 2004; Yu, 2010) and "lexical range" (Crystal, 1982), refers to "the range of a learner's vocabulary as displayed in his or her language use" (Lu, 2012, p. 192) or "the number of different words in a sample of speech or writing of a set length" (Malvern et al., 2004, p. 3). In the current analysis, a new transformation of type-

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[13] The SUBTLEXus corpus (Brysbaert & New, 2009) comprises subtitles from 8,388 films and television series from the United States.

[14] BNC is a 100 million word collection of samples (of written and spoken language) from a wide range of sources. COCA is composed of more than 450 million words from more than 160,000 texts. To get more information about the BNC-COCA word family lists, visit http://www.victoria.ac.nz/lals/about/staff/publications/paul-nation/Information-on-the-BNC_COCA-word-family-lists.pdf.

[15] To access VP-Compleat visit http://www.lextutor.ca/vp/comp/

token ratio (TTR), the D measure, was utilized to measure the lexical diversity of the participants' spoken samples. The reasons behind using the D measure (Malvern et al., 2004; McKee, Malvern, & Richards, 2000) among other measures of lexical variation (e.g., Number of Different Words, TTR, Mean segmental TTR, Corrected TTR, Root TTR, Bilogarithmic TTR and the Uber Index) were that (a) it "provides a robust measure of lexical diversity which is not a function of sample size in the way raw TTR and its simple transformations are" (Malvern et al., 2004, p. 60), and (b) its validity has been investigated on samples of adult learners of English as a second language.

To calculate D from the transcribed spoken samples, the [16]VOCD command (or software) available in CLAN (Computerized Language ANalysis) program was run. CLAN program is designed and written by Leonid Spektor at Carnegie Mellon University. It is made available for free by the TalkBank community (http://talkbank.org/), the largest open repository of data on spoken language (see MacWhinney, 2000). CLAN is designed to analyze data that is transcribed and checked in the CHAT format. Therefore, the transcripts (of the spoken data) were prepared in correct CHAT format before running VOCD command in CLAN. High values of D indicates high levels of lexical diversity.

Syntactic Complexity Measure

For this study, the operational definition of "syntactic complexity" is borrowed from Kyle (2016), who made a distinction between "syntactic complexity" and "syntactic sophistication." He defined syntactic complexity as referring to "the formal

[16] The complete description of VOCD can be found in Malvern et al. (2004).

characteristics of syntax (e.g., the amount of subordination), which has been described as absolute complexity (Bulté & Housen, 2012)" (Kyle, 2016, p. 8). He defined syntactic sophistication as referring to "the relative difficulty of learning particular syntactic structures (i.e., what Bulté and Housen refer to as relative complexity), which (from a usage-based perspective) is related to input frequency and contingency" (Kyle, 2016, p. 8).

Several computational systems have been developed to perform automatic syntactic complexity analysis. Coh-Metrix (Graesser, McNamara, Louwerse, & Cai, 2004; Graesser, McNamara, & Kulikowich, 2011; McNamara, Graesser, McCarthy, & Cai, 2014), for example, is a text analysis tool that is designed to measure cohesion. The free online version of Coh-Metrix (available at http://cohmetrix.com/) incorporates 108 indices that measure text difficulty, cohesion, psycholinguistic word information, and syntactic complexity. Concerning syntactic complexity, Coh-Metrix includes ten indices including the *number of words before the main verb (of the main clause in a sentence)*, the *mean number of modifiers per noun phrase*, and *incidence counts of eight particular syntactic features*. Another example is the D-Level Analyzer developed by Lu (2009) for child language acquisition research. D-Level Analyzer is an automatic syntactic complexity analyzer, which is the revised version of Developmental Level scale (Rosenberg & Abbeduto 1987; Covington, He, Brown, Naçi, & Brown, 2006). This analyzer assigns each sentence of the text to one of eight increasingly complex developmental levels. It also tallies the number of sentences at each level. Finally, it calculates the average level of the sentences used in a text. Lu (2010) highlighted that

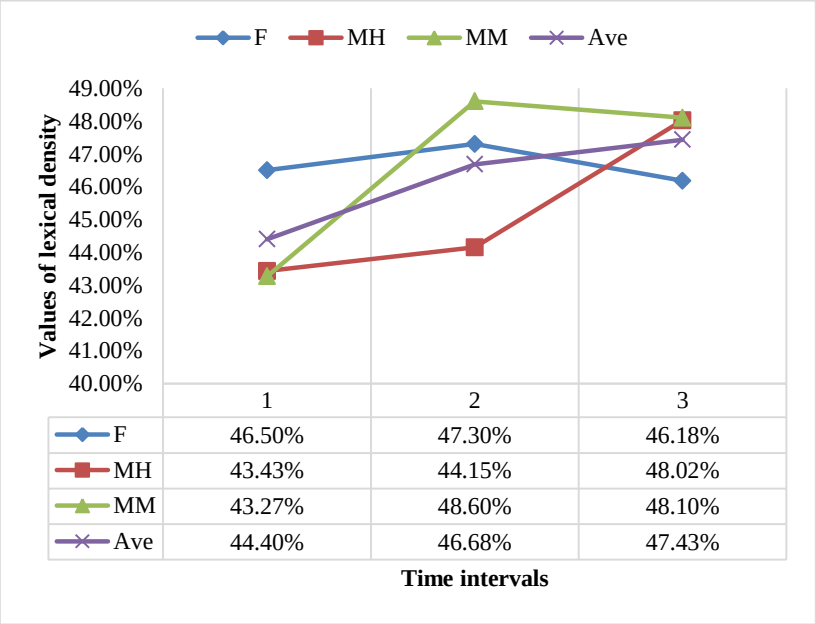
the measures incorporated in these systems were developed and employed primarily for first language acquisition research purposes. To address this gap, Lu (2010) designed a system for automatic analysis of syntactic complexity (L2 Syntactic Complexity Analyzer, or L2SCA) that incorporated fourteen different measures; the measures that, as Lu claimed, have been explored and proposed in the second language development literature. Lu selected these measures from a large set of measures reviewed in Wolfe-Quintero, Inagaki, and Kim (1998), and Ortega (2003). He categorized these measures into five types including "length of production unit," "sentence complexity," "subordination," "coordination," and "Particular structures." (see Appendix C for detailed information about each index and how it was computed). For the purpose of the current research, Lu's (2010) L2SCA was utilized through using the Tool for the Automatic Analysis of Syntactic Sophistication and Complexity (TAASSC) developed by Kyle (2016). TAASSC is freely available at http://www.kristopherkyle.com/taassc.html.

Results

Q 1: Does the Lexical Density of the NNESs' Discourse Increase During Five Months Playing WoW?

Lexical density indicates the proportion of content words to the total number of words. By calculating it, we receive a notion of "*information packaging*" (Johansson, 2008, p. 65). That means a text containing a higher proportion of content words carries more information than a text with a higher proportion of function words.

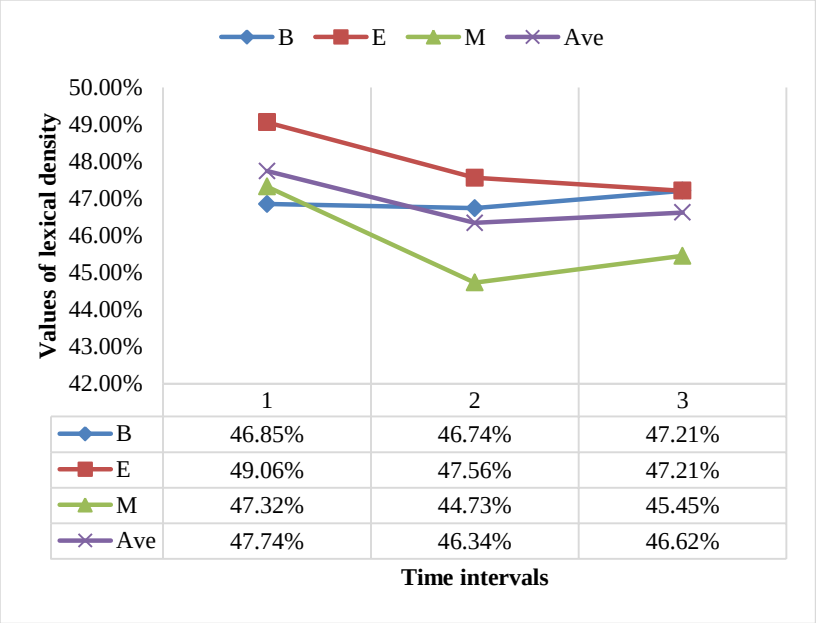
The average value of lexical density increased for the discourse samples in T1 (see Figure 4 below). More precisely, the values of this index improved for all the three NNESs' spoken discourse samples in the second compared to the first time intervals (0.8% for F, 0.7% for MH, and 5.33% for MM). This positive change, however, turned into a negative change for F (-1.12%) and MM (-0.5%) when the samples were compared across the third and the second time intervals. On the contrary, the lexical density of the MH's utterances continued to increase for about 3.87% reaching 48.02% in the third sample. Overall, the results suggest that the NNESs in T1 could generate discourse that is more informative by incorporating higher percentages of content words (e.g., verbs, nouns, adjectives, and adverbs) in their utterances.



	1	2	3
F	46.50%	47.30%	46.18%
MH	43.43%	44.15%	48.02%
MM	43.27%	48.60%	48.10%
Ave	44.40%	46.68%	47.43%

Figure 4. Changes in lexical density index over time in T1.

This trend was quite opposite in the samples collected from T2. As Figure 5 below illustrates, the values of lexical density decreased for the samples of discourse in the second compared to the first time interval (-0.1% for B, -1.5% for E, and -2.59% for M). These negative changes turned positive in the samples collected in the third time interval from B (0.47%) and M (0.72%) but remained negative for E whose discourse became lexically even less dense (0.35%). Considering the lexical density of B's spoken samples in the second and the third time intervals, it appears that he produced discourse of somewhat similar lexical density. Similarly, the negligible changes in the lexical density of M's spoken samples in the third compared to the second time intervals suggest that the samples remained lexically as dense as before.



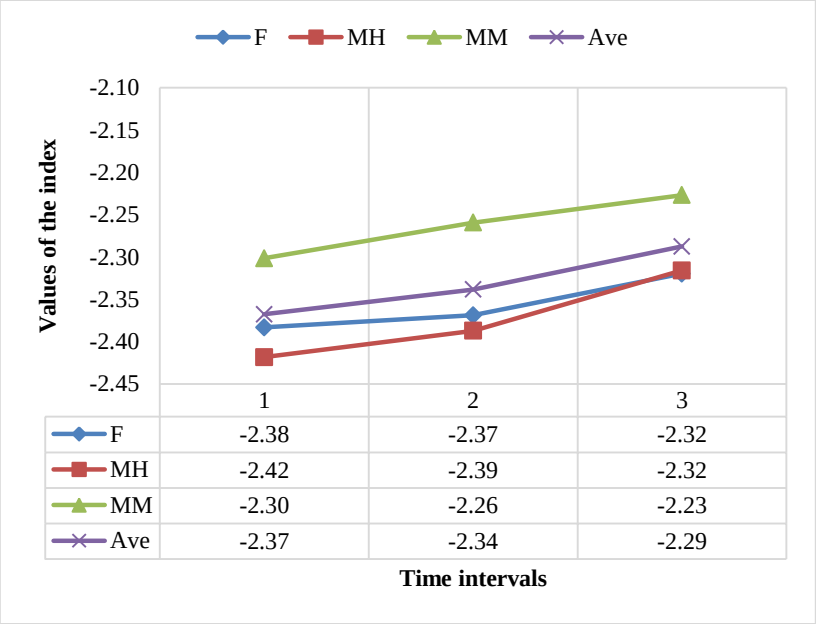
	1	2	3
B	46.85%	46.74%	47.21%
E	49.06%	47.56%	47.21%
M	47.32%	44.73%	45.45%
Ave	47.74%	46.34%	46.62%

Figure 5. Changes in lexical density index over time in T2.

Q 2: Does the Lexical Sophistication of the NNESs' Discourse Increase During Five Months Playing WoW?

BNC Written Trigram Frequency Logarithm and *SUBTLEXus Range CW Logarithm* were calculated for the three samples of data collected for each NNES in three different points of time. As noted earlier, these two indices of lexical sophistication could explain—in total—44.8% of the variance in holistic speaking proficiency scores in Kyle and Crossley's (2015) study. Therefore, they could be regarded as reliable indicators of change in the participants' speaking proficiency.

The calculation of BNC *Written Trigram Frequency Logarithm* for the discourse samples of T1 shows an increasing trend for all the three members (see Figure 6 below). The values of this index show a consistent, though small, improvement in the lexical sophistication of the NNESs' discourse. As this index accounted for 35% of the variance in holistic speaking proficiency scores in Kyle and Crossley's (2015) research, this result can be interpreted as an improvement in the NNESs' speaking proficiency with regard to lexical sophistication. It appears that NNESs tended to incorporate in their discourse higher proportions of multiword units that are frequent in a written corpus.

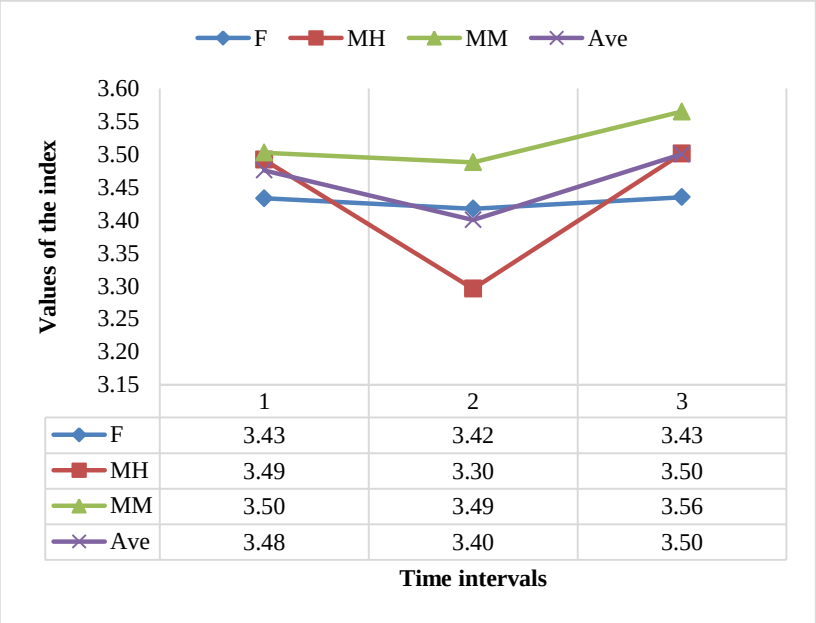


	1	2	3
F	-2.38	-2.37	-2.32
MH	-2.42	-2.39	-2.32
MM	-2.30	-2.26	-2.23
Ave	-2.37	-2.34	-2.29

Figure 6. Changes in BNC written trigram frequency normed logarithm over time in T1.

The calculation of *SUBTLEXus Range Content Word Logarithm* revealed no or minimal changes in the range of the content words the NNESs used in their discourse (see Figure 7 below). Variations in the value of this index followed roughly the same pattern for all the three participants—that is a decrease in the second and an increase in the third time intervals. That means, the samples in the second time interval contained the content words that occur in much fewer contexts and therefore are considered as lexically more sophisticated; and the samples in the third time interval contained content words that occur in much wider contexts and thus are considered as lexically less sophisticated. Accordingly, the second samples are lexically more sophisticated than the first samples; and the third samples are lexically less sophisticated than the second samples. Since the magnitudes of these changes are negligible, maybe it can be claimed

that there were no noteworthy changes in the range of the content words the NNESs used in their utterances throughout 5-month gameplay.

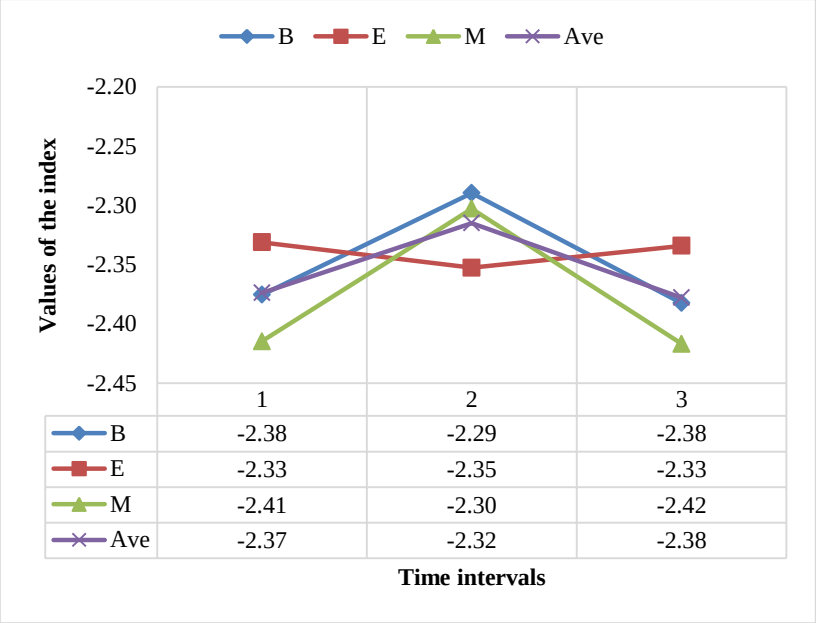


	1	2	3
F	3.43	3.42	3.43
MH	3.49	3.30	3.50
MM	3.50	3.49	3.56
Ave	3.48	3.40	3.50

Figure 7. Changes in SUBTLEXUS range CW logarithm over time in T1.

Mapping the values of *BNC Written Trigram Frequency Logarithm* and *SUBTLEXus Range CW Logarithm* for the samples of discourse in T2 revealed a different pattern (see Figure 8 below). The values of the former index increased marginally for two of the participants (0.09 units for B and 0.1 units for M) in the second time interval and then decreased to their initial values measured in the first time interval. For E, the values of this index show exactly an opposite pattern—a small decline (0.02) in the second and the same amount of increase in the third time intervals. Due to the tiny changes observed in E's samples of data, maybe it can be assumed that the frequency of

high-frequency trigrams (or multiword units) remained somewhat the same throughout the three samples of discourse. However, the results obtained from B's and M's discourse samples worth consideration. An increase in the frequency of high-frequency trigrams in the second samples for these two participants suggests that playing *WoW* provided an opportunity for them to improve the lexical sophistication of their spoken discourse with regard to the use of high-frequency multiword units.

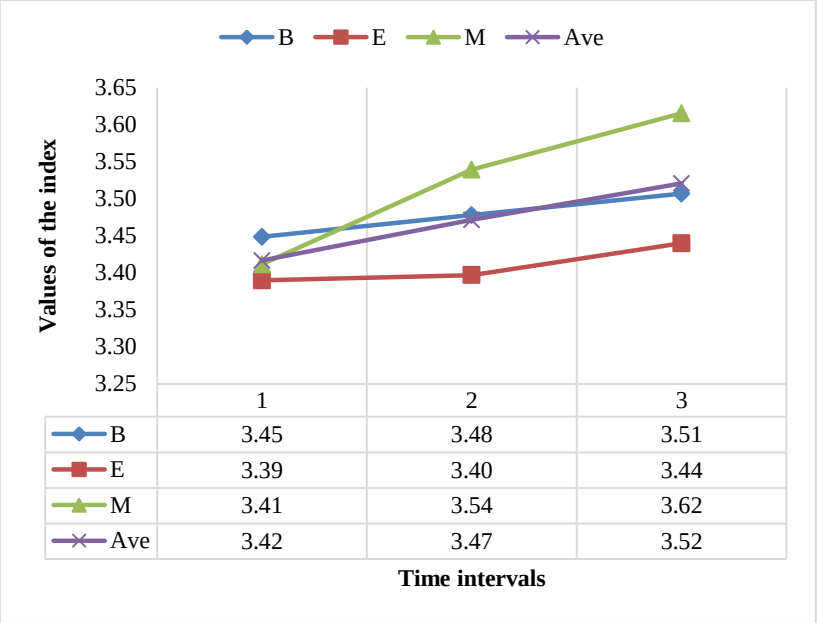


	1	2	3
B	-2.38	-2.29	-2.38
E	-2.33	-2.35	-2.33
M	-2.41	-2.30	-2.42
Ave	-2.37	-2.32	-2.38

Figure 8. Changes in BNC written trigram frequency normed logarithm over time in T2.

The values of *SUBTLEXus Range CW Logarithm* for all the NNESs in T2 show an increasing trend that was consistent throughout the second and third time intervals (see Figure 9 below). This result means the use of fewer content words that occur in fewer (or limited) range of contexts. In other words, the participants tended to use

content words that occur in a wider range of contexts. Therefore, their spoken discourse became lexically less sophisticated. It appears that the participants' spoken discourse grew less sophisticated—as a function of time—with regard to the use of limited-range content words (based on *SUBTLEXus Range CW Logarithm index*).



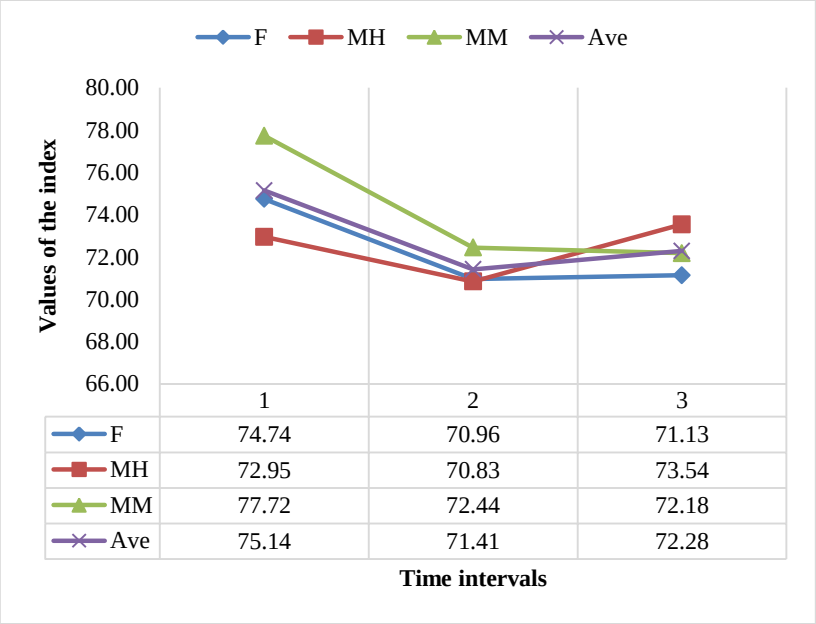
	1	2	3
B	3.45	3.48	3.51
E	3.39	3.40	3.44
M	3.41	3.54	3.62
Ave	3.42	3.47	3.52

Figure 9. Changes in SUBTLEXUS range CW logarithm over time in T2.

As noted earlier, the next two indices of lexical sophistication that could explain—in Kyle and Crossley's (2015) study—42.7% of the variance in holistic lexical proficiency scores were *BNC Written Range index for all words* and *BNC Spoken Bigram Proportion*.

The calculation of BNC Written Range AW for the samples in T1 shows a decline in the values of this index for all the three participants' second samples (-3.79 for

F, -2.11 for MH, and -5.28 for MM) (see Figure 10 below). Due to the negative correlation between BNC Written Range scores and lexical proficiency scores in Kyle and Crossley's (2015) study, the decline in the values of this index here means using more limited-range vocabulary. The participants produced discourse that contained the words that—according to BNC Written Range index for all words—are used in much fewer (or limited range of) contexts. Therefore, their spoken discourse in the second point of data collection is lexically more sophisticated. As the figure below shows, in the third samples, the values of this index rose for F and MH, indicating that they produced a little less sophisticated vocabularies in their spoken output. For MM, however, the value of this index continued to decline (-0.26 units). Overall, the results suggest that the values for this index decreased as a function of time playing *WoW*. In other words, the discourse grew lexically more sophisticated with regard to the use of limited-range vocabularies.



	1	2	3
F	74.74	70.96	71.13
MH	72.95	70.83	73.54
MM	77.72	72.44	72.18
Ave	75.14	71.41	72.28

Figure 10. Changes in BNC written range for AW over time in T1.

The calculation of *BNC Spoken Bigram Proportion* shows negligible changes throughout the three samples of data collected from each NNES in T1 (see Figure 11 below). That means the percentages of bigrams (that exist in the spoken portion of the BNC) did not change considerably in the course of five-month of gameplay.

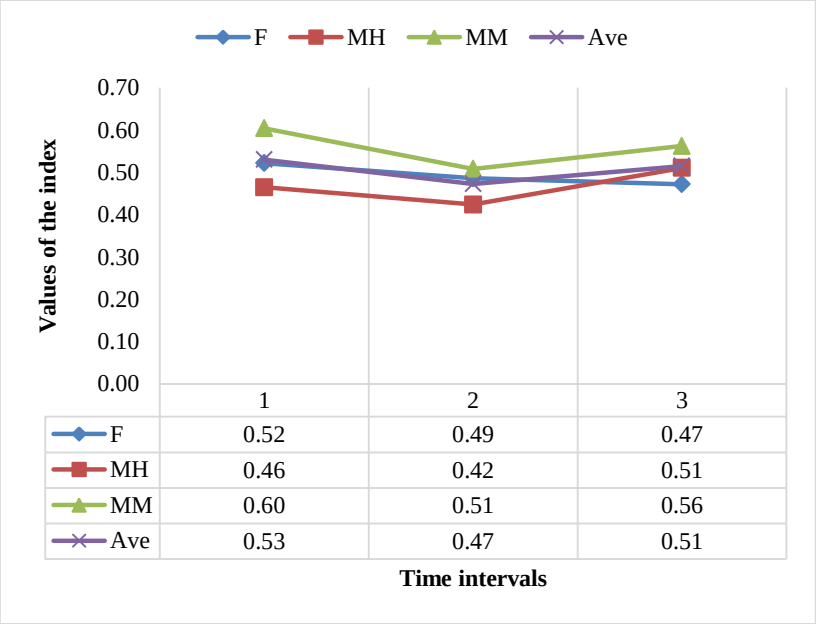
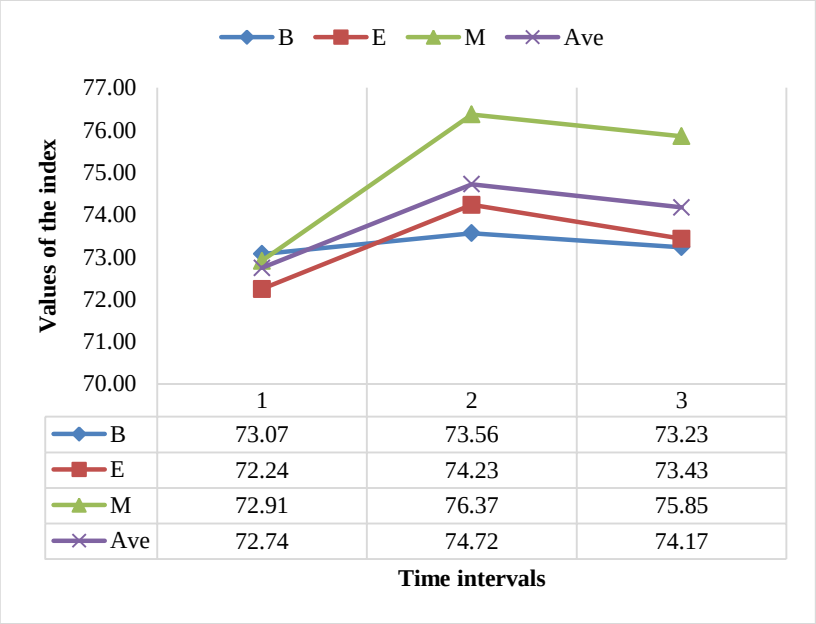


Figure 11. Changes in BNC spoken bigram proportion over time in T1.

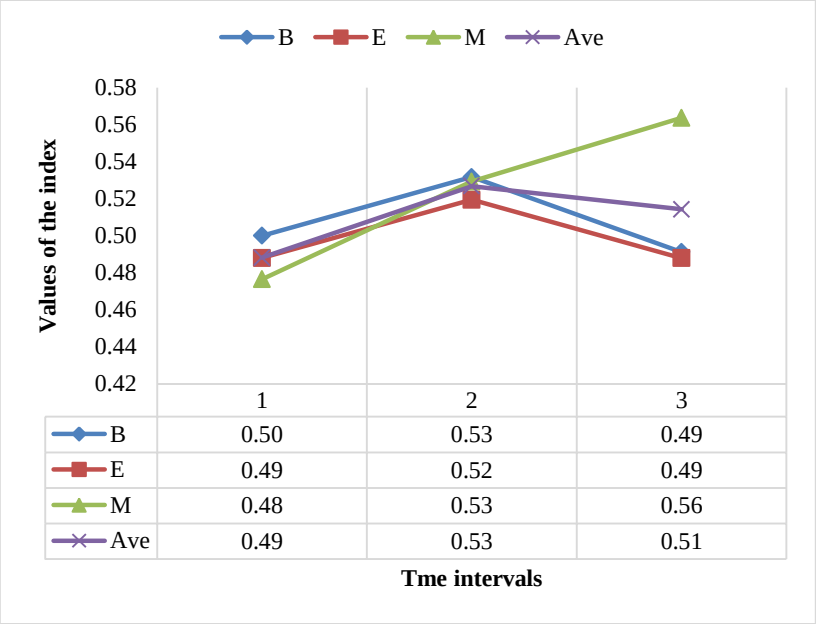
The values of BNC Written Range index for all words obtained from the samples in T2 show an opposite pattern when compared to their counterparts in T1 (see Figure 12 below). The values of this index increased in the second samples collected from all the three participants (0.49, 1.99, and 3.46 units for B, E, and M in order). The values then show a slight decrease in the third samples (-0.3, -0.8, and -0.5 units for B, E, and M in order). Overall, these figures suggest that the participants' spoken discourse in the second interval—compared to the first time interval—contain words that occur in wider contexts. Therefore, their spoken discourse became lexically less sophisticated with regard to the range of vocabularies used.



	1	2	3
B	73.07	73.56	73.23
E	72.24	74.23	73.43
M	72.91	76.37	75.85
Ave	72.74	74.72	74.17

Figure 12. Changes in BNC written range for AW over time in T2.

The calculation of BNC Spoken Bigram Proportion for the samples in T2 shows very small or no change for two of the participants (B and E) (see Figure 13 below). The values of this index increased slightly in the second samples of discourse generated by B and E (0.03 units). Then, the values decreased slightly in the third samples (-0.04 and -0.03 units for B and E in order). Due to minimal changes in the proportion of spoken bigrams in B's and E's discourse, it appears that the level of lexical sophistication did not change much in their discourse as a function of time. For M, however, the value of this index increased steadily from the first to the second (0.05 units), and from the second to the third time intervals (0.03 units). This slight increase (0.08 units in total) indicates that M produced a slightly higher percentage of bigrams as he spent more time playing the game.



	1	2	3
B	0.50	0.53	0.49
E	0.49	0.52	0.49
M	0.48	0.53	0.56
Ave	0.49	0.53	0.51

Figure 13. Changes in BNC spoken bigram proportion over time in T2.

As noted earlier, a word frequency measure—based on frequency bands—was also implemented to provide some insights into the lexical sophistication of the NNESs' game-mediated spoken discourse. Although this method provides limited information about lexical sophistication (Kyle & Crossley, 2015), it can determine the holistic quality and proficiency of the discourse as far as vocabulary usage is concerned. Overall, the results revealed the participants' most reliance on the first one thousand most common words (K1) throughout all three samples of data in both T1 (73.37% on average) and T2 (71.27% on average). Naturally, the proportion of vocabularies in the next thousand most common words (K2) was very small (8.62% and 10.14% on average in T1 and T2 respectively). The next bands have much less, or no proportion in the body of the vocabularies the NNESs incorporated in their spoken discourse. Therefore, the

examination of changes in the percentage of the first three thousand most common words (i.e., K1, K2, and K3) can provide some insights as to whether or not the participants' spoken discourse made any improvement regarding lexical sophistication.

The results show that on average the participants in T1 used less K1 vocabularies and slightly more K2 vocabularies as they spent more time playing *WoW* (see Figure 14 below).

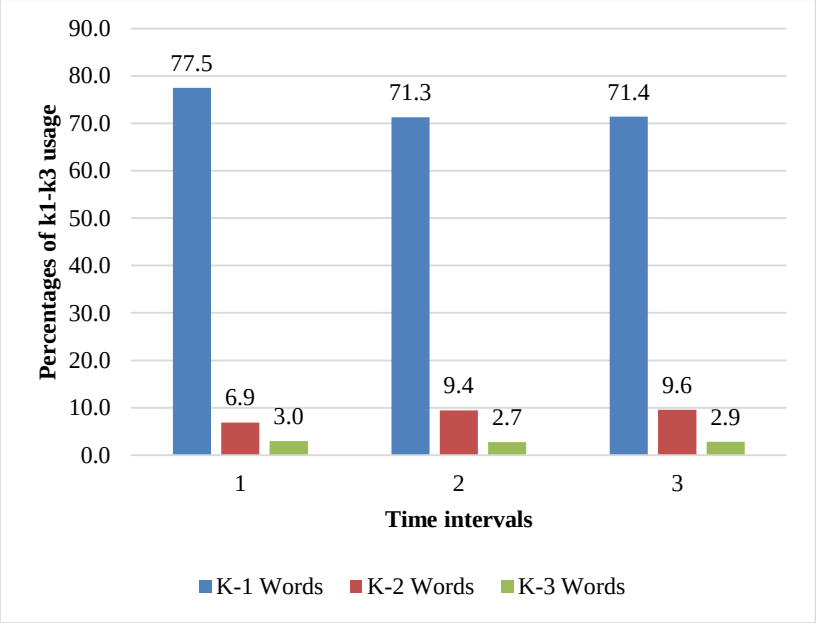


Figure 14. Average changes in the percentages of K1-K3 over time in T1.

Accordingly, the percentages of K2 vocabularies increased slightly in the second and the third samples of data. These changes are more evident in the samples collected from MH and MM (see Figures 15 and 16 below) than the samples of discourse produced by F (see Figure 17 below).

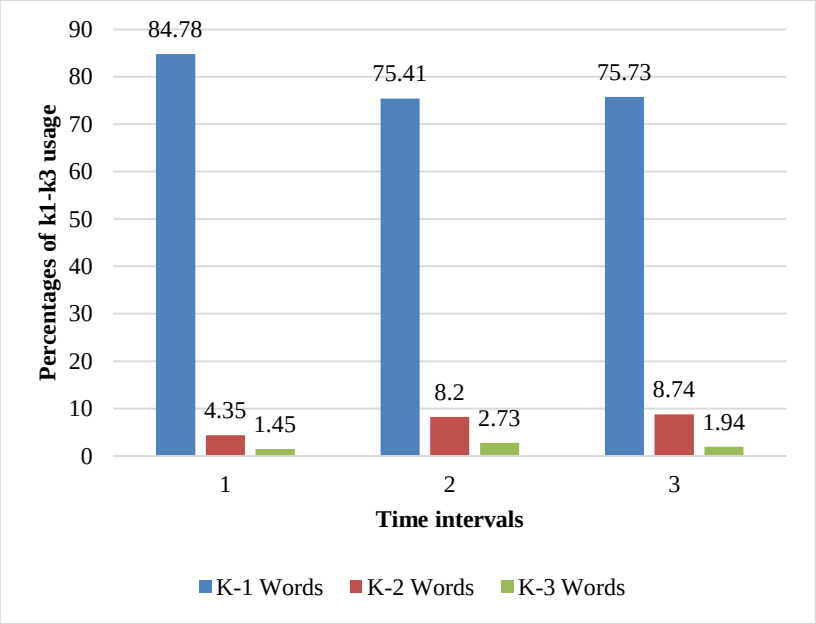


Figure 15. Changes in the percentages of K1-K3 in MH's discourse over time.

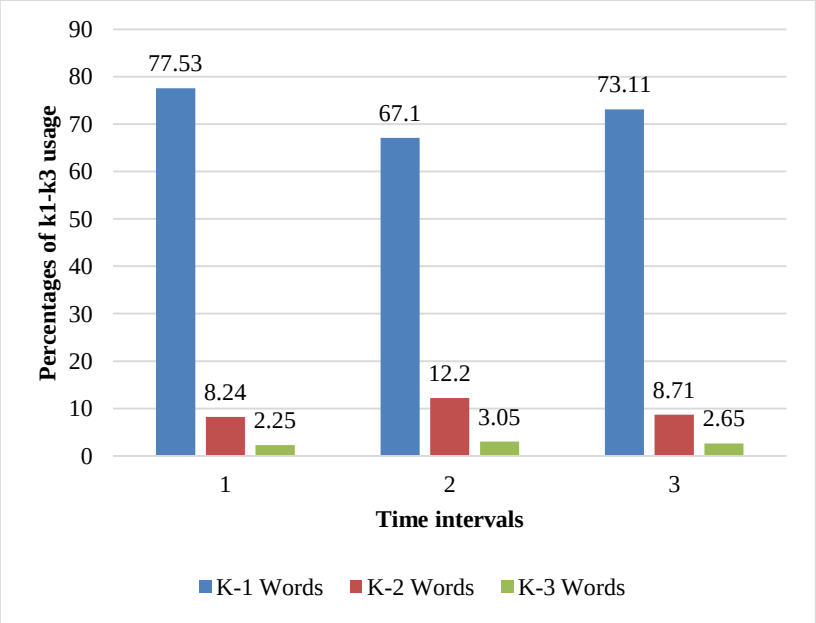


Figure 16. Changes in the percentages of K1-K3 in MM's discourse over time.

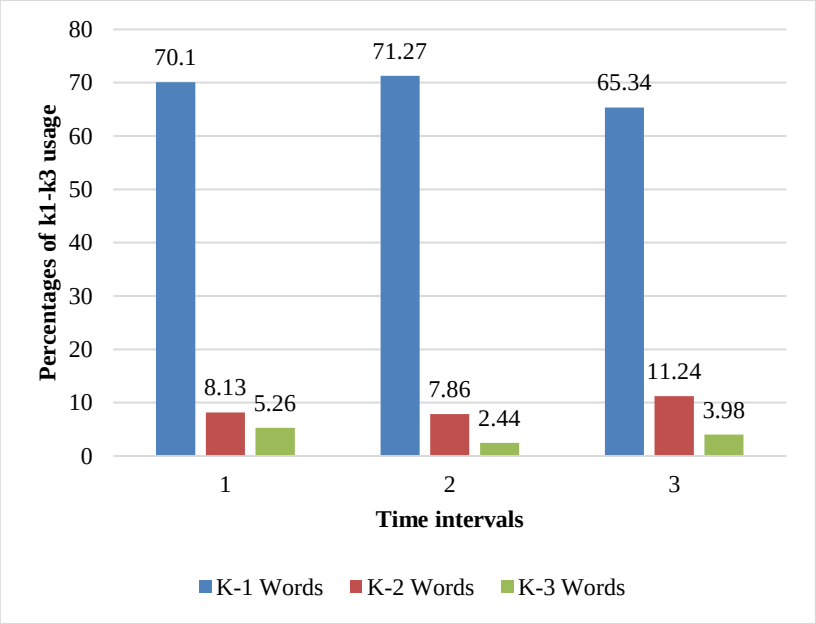


Figure 17. Changes in the percentages of K1-K3 in F's discourse over time.

The results show an opposite trend of changes in the samples collected from the participants in T2. Overall, the percentages of the first one thousand most common words in the participants' discourse increased from the first to the third time intervals (see Figure 18 below).

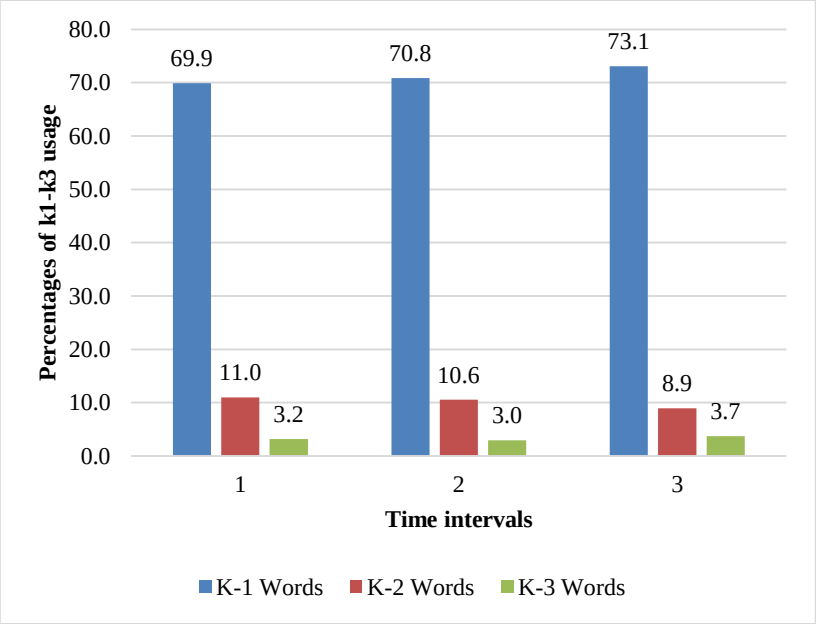


Figure 18. Average changes in the percentages of K1-K3 over time in T2.

These changes are well represented in the samples collected from B and M (see Figures 19 and 20 below), who were quite similar in proficiency but slightly less proficient than E.

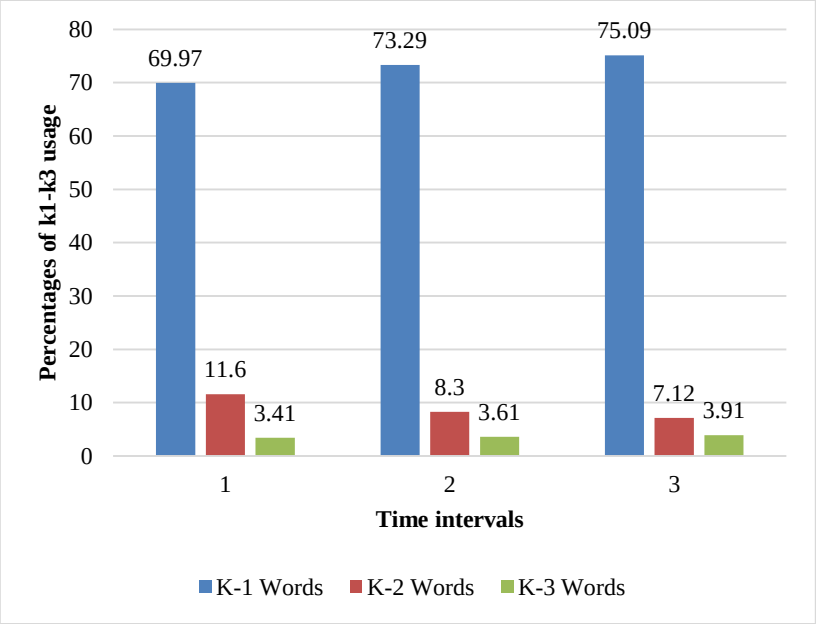


Figure 19. Changes in the percentages of K1-K3 in B's discourse over time.

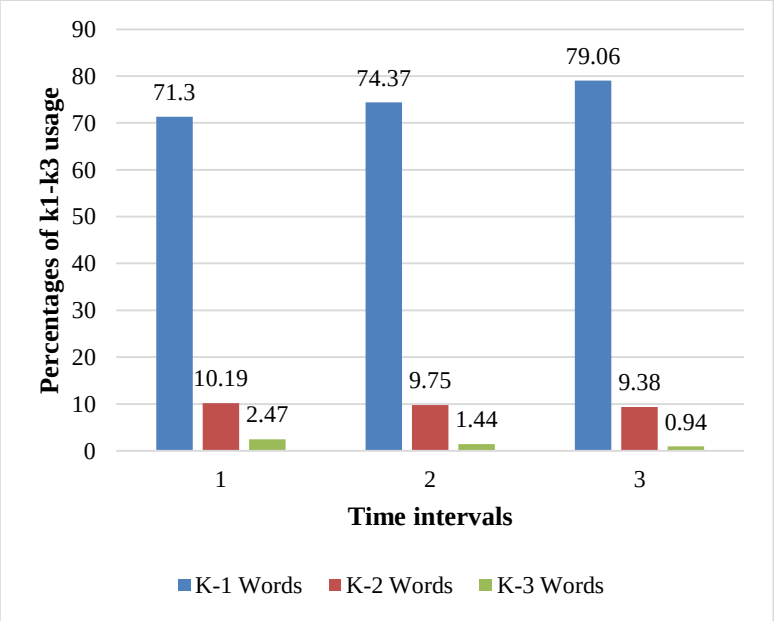


Figure 20. Changes in the percentages of K1-K3 in M's discourse over time.

The changes in the percentages of k1-k3 show an inconsistent trend in the samples collected from E, who was a slightly more proficient speaker than B and M. As Figure 21 below displays, in the second sample of data, the percentages of K1 decreased (-3.61%); and accordingly, the percentages of K2 increased (2.5%). However, the changes show a little shift in the third sample. The percentage of K1 show a small increase (0.33%), and the percentage of K2 displays a slight decrease (-3.35%).

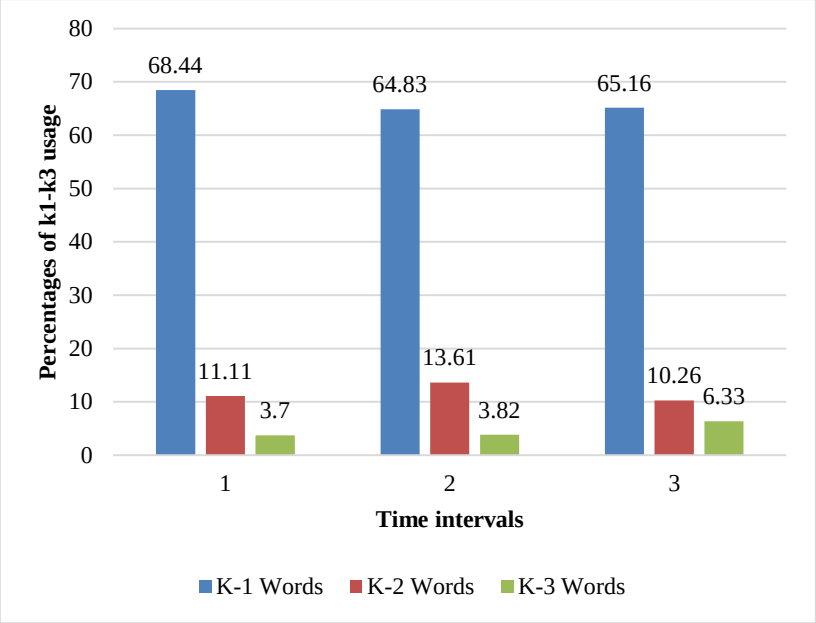
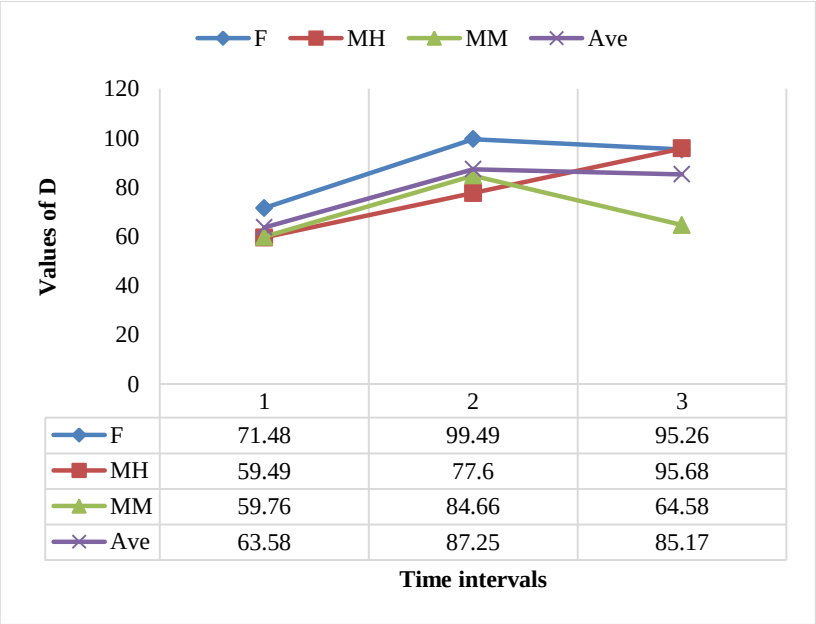


Figure 21. Changes in the percentages of K1-K3 in E's discourse over time.

Q 3: Does the Lexical Variation of the NNESs' Discourse Increase During Five Months Playing WoW?

The calculation of D measure (using VOCD command in CLAN program) revealed opposite trends of change in the discourse samples collected from T1 and T2.

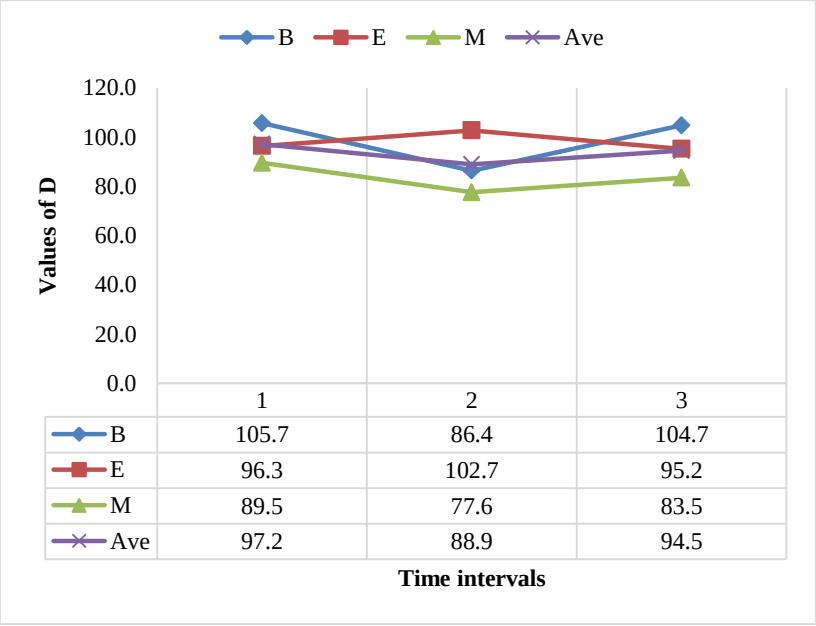
As Figure 22 below exhibits, the values of D increased in the second samples for all the three NNESs in T1 (28.01, 18.11, and 24.9 units for F, MH, and MM respectively). In the third time interval, however, the D values decreased for F (-4.23 units) and MM (-20.08 units). On the contrary, the value of D continued—with a similar slope—to rise (18.08 units) in MH's discourse sample in the third interval. Although the values of D measure declined in the third samples of discourse generated by F and MM, the D values are still higher than their initial values in the first interval. Overall, the results suggest that the participants' spoken discourse in T1 grew lexically more diverse as a function of time.



	1	2	3
F	71.48	99.49	95.26
MH	59.49	77.6	95.68
MM	59.76	84.66	64.58
Ave	63.58	87.25	85.17

Figure 22. Changes in D values over time in T1.

In T2, the values of D measure decreased in the second and increased in the third time intervals for the discourse samples generated by B and M. The D value decreased 19.3 units for B and 11.91 units for M in the second time interval. Then, the D value increased 18.39 and 5.89 units for B and M respectively in the third point of time (see Figure 23 below). This trend is opposite for the samples drawn from E, who was a little more proficient than B and M. E produced lexically more (6.37 units) diverse discourse in the second and lexically less (-7.49 units) diverse discourse in the third time interval. The average values of D show that the discourse samples produced by the NNESs in T2 became lexically less diverse in the second time interval but grew a little more lexically diverse in the third time interval. Considering the trend of change in the average values of D, it appears that the discourse samples in T2 did not make any improvement.



	1	2	3
B	105.7	86.4	104.7
E	96.3	102.7	95.2
M	89.5	77.6	83.5
Ave	97.2	88.9	94.5

Figure 23. Changes in D values over time in T2.

Q 4: Does the Syntactic Complexity of the NNESs' Discourse Increase During Five Months Playing WoW?

To address this question, Lu's (2010) L2SCA, which incorporated fourteen different measures, was implemented. As noted earlier, L2SCA was conducted using TAASSC, which is developed by Kyle (2016).

Syntactic Complexity Measures in T1

As the results suggest, among the measures of the "length of production unit" (i.e., MLC, MLS, and MLT), only the average values of MLC showed an increase (see Figure 24 below); although the individual values of MLC in MH's spoken discourse decreased both in the first (-0.06 units) and in the second (-0.2 units) time intervals.

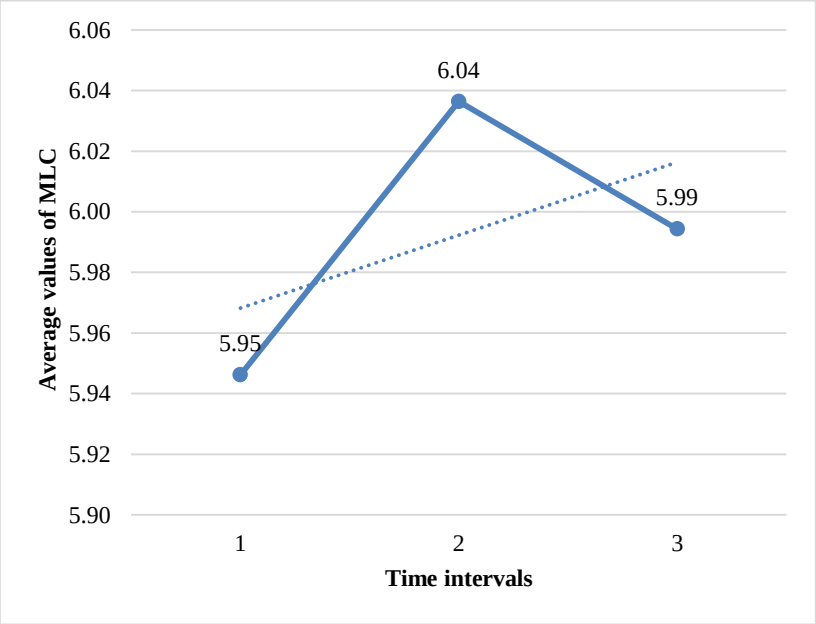


Figure 24. Average changes in MLC over time in T1.

The average values for the sentence complexity ratio (or the number of clauses per sentence), however, indicate a consistent decrease (see Figure 25 below). That means the number of clauses in sentences decreased as the participants spent more time playing the game.

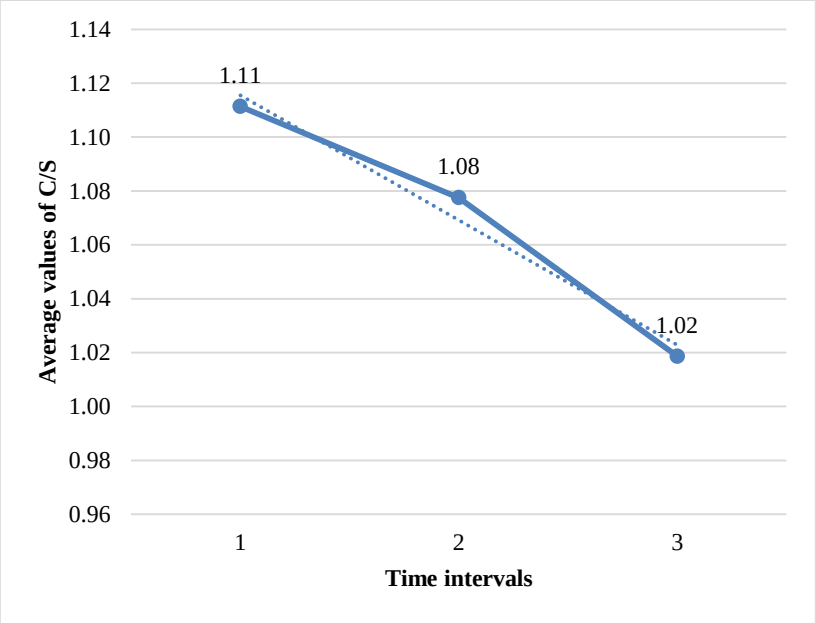


Figure 25. Average changes in C/S over time in T1.

In the third type of measures for syntactic complexity that concerns with subordination (i.e., C/T, CT/T, DC/C, and DC/T), the average values indicate a consistent decrease for all the measures. Although the microanalyses show a few cases of small improvements in the individual values of these indices (in the second or the third time intervals), the overall trend of change for them is negative. For example, the value of C/T in F's second sample increased 0.1 unit but decreased 0.13 unit in the third

sample. The value of CT/T and DC/T for the same participant increased 0.01 unit in the second but remained the same in the third sample; and, the value of DC/C for the same participant increased 0.01 unit in the second but decreased the same amount in the third sample. Overall, the participants' spoken discourse did not grow syntactically more complex concerning subordination indices of syntactic complexity.

Regarding the "coordination" indices of syntactic complexity (i.e., CP/C, CP/T, and T/S), the results revealed a consistent downward trend in the average values of CP/C and CP/T. There was an exception, though. The values of these two measures showed a minimal increase (0.02 units in CP/C and 0.01 units in CP/T) in MM's third sample compared to his second sample. The average values of T/S show a downward trend of change halfway (in the second sample) and a small increase in the third sample (see Figure 26 below). More precisely, the value of this measure increased (0.02 units) only in the second sample drawn from F, who was a little more proficient than MH and MM.

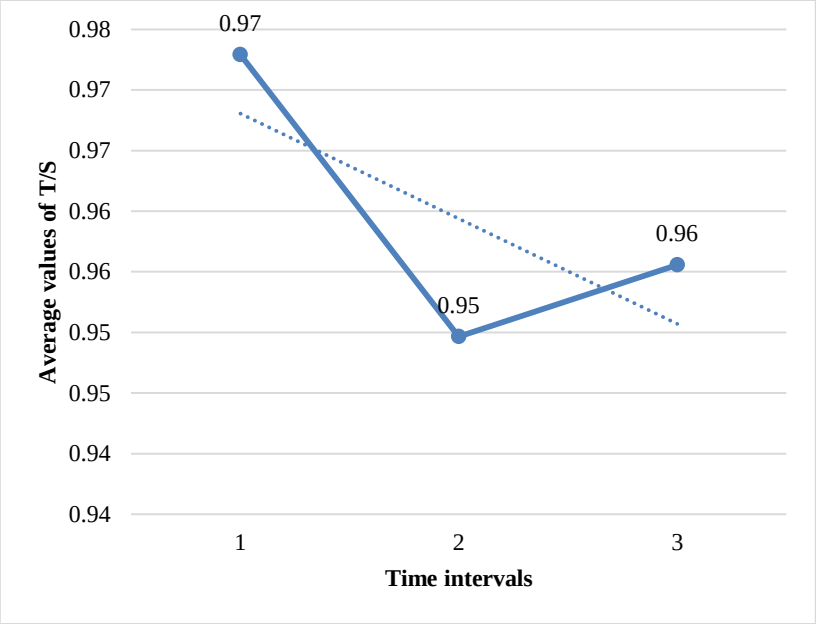


Figure 26. Average changes in T/S over time in T1.

Lastly, the average values of the third type of measures under the "Particular structures" category (i.e., CN/C, CN/T, and VP/T) increased in the second time interval (0.11, 0.13, and 0.05 units in CN/C, CN/T, and VP/T respectively). However, the average values of these indices decreased in the third time interval (-0.07 units in CN/C, and -0.11 units in CN/T and VP/T) (see Figures 27, 28, and 29 below).

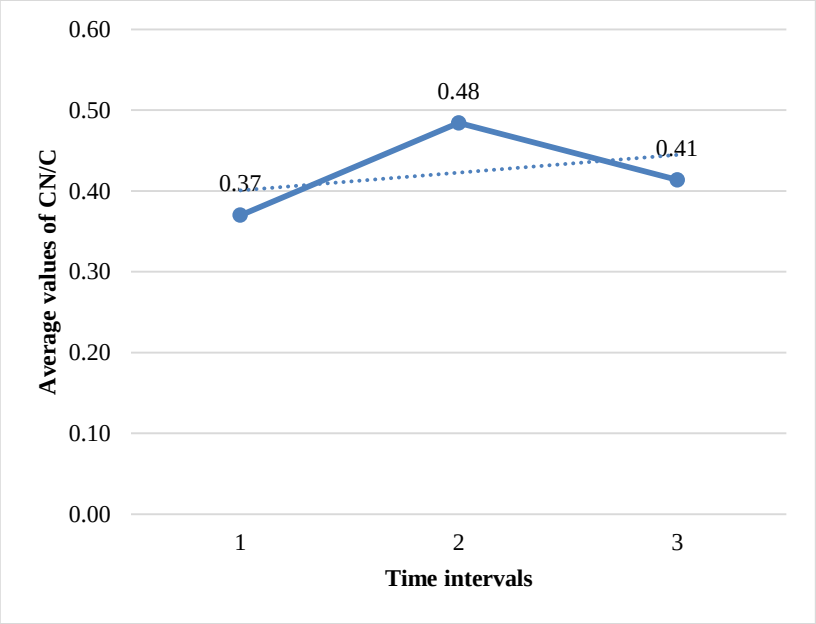


Figure 27. Average changes in CN/C over time in T1.

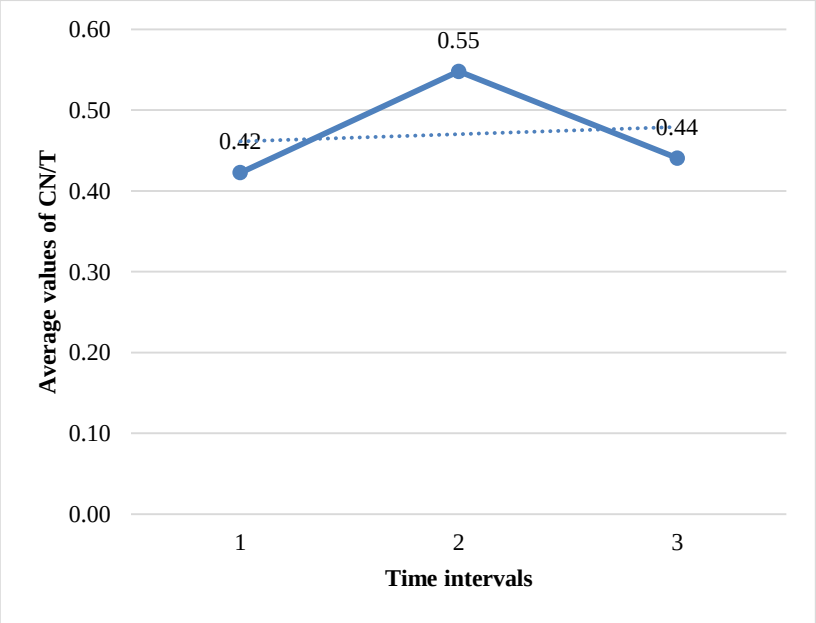


Figure 28. Average changes in CN/T over time in T1.

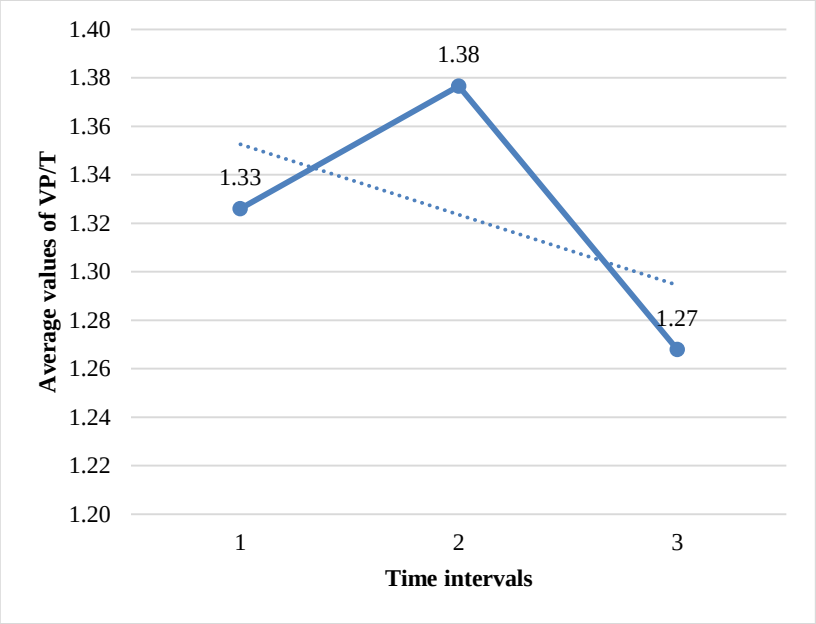


Figure 29. Average changes in VP/T over time in T1.

Changes in the individual values of CN/C and CN/T also show a pattern (i.e., an increase in the second and a decrease in the third samples) that is similar to the pattern observed for the average values of these indices. The individual values of VP/T, however, decreased consistently in the samples collected from MH.

Syntactic Complexity Measures in T2

In T2, the measures of "length of production unit" (i.e., MLC, MLS, and MLT) showed a negative (or downward) trend, indicating that the participants' spoken discourse did not grow syntactically more complex with regard to the length of clauses, sentences, and T-units. Although the average values exhibit a slight increase in the third compared to the second samples, the values of these indices did not even reach their initial values in the first samples (see Figures 30, 31, and 32 below).

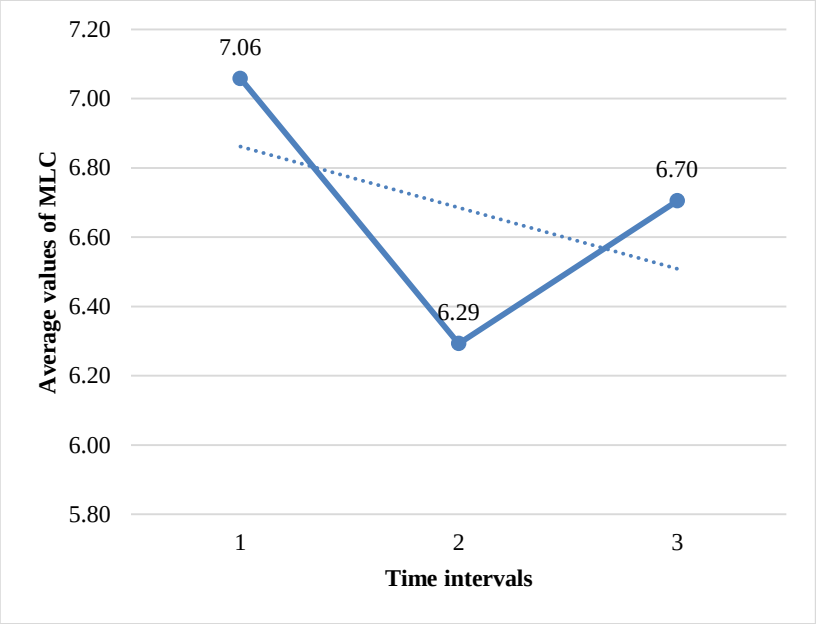


Figure 30. Average changes in MLC over time in T2.

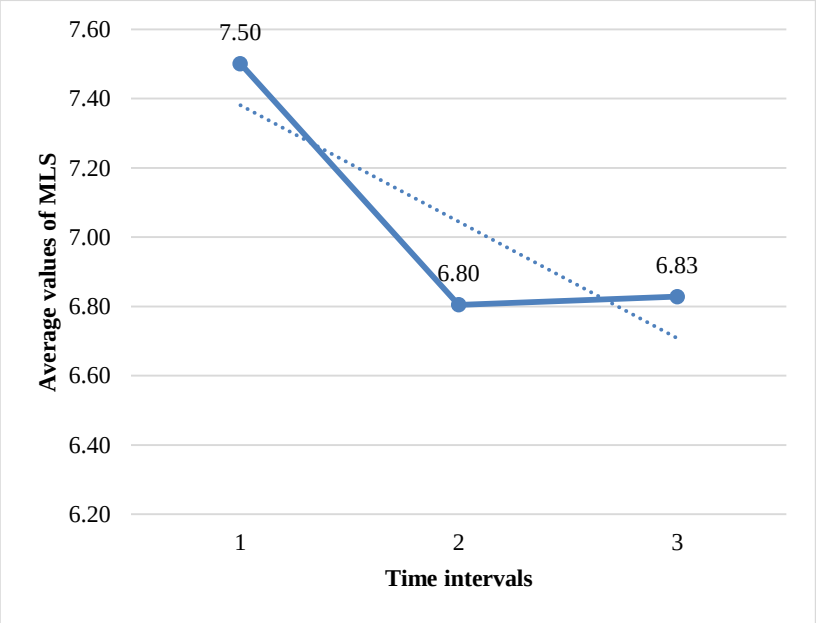


Figure 31. Average changes in MLS over time in T2.

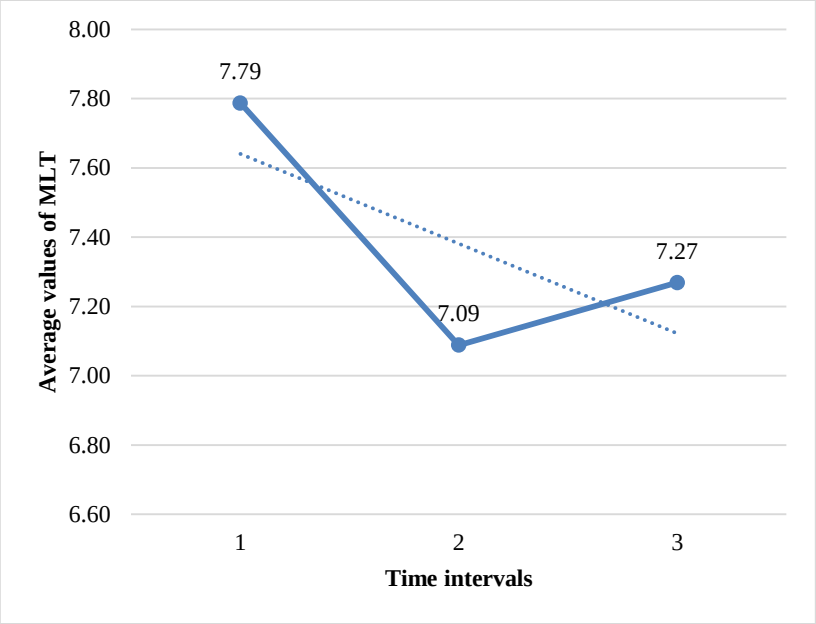


Figure 32. Average changes in MLT over time in T2.

The pattern of changes in sentence complexity ratio (or the number of clauses per sentence) for the samples in T2 is a little different from what was observed in the samples collected from T1. Although there is a declining trend in the sentence complexity for both teams, the average values of this index did not decrease consistently in T2. As Figure 33 below exhibits, the values increased about 0.02 units in the second samples and then dropped for 0.06 units in the third samples. Overall, due to the negligible increase in the average values in the second samples, maybe it can be concluded that no noticeable improvement occurred in the sentence complexity (i.e., number of clauses in the sentences) of the samples.

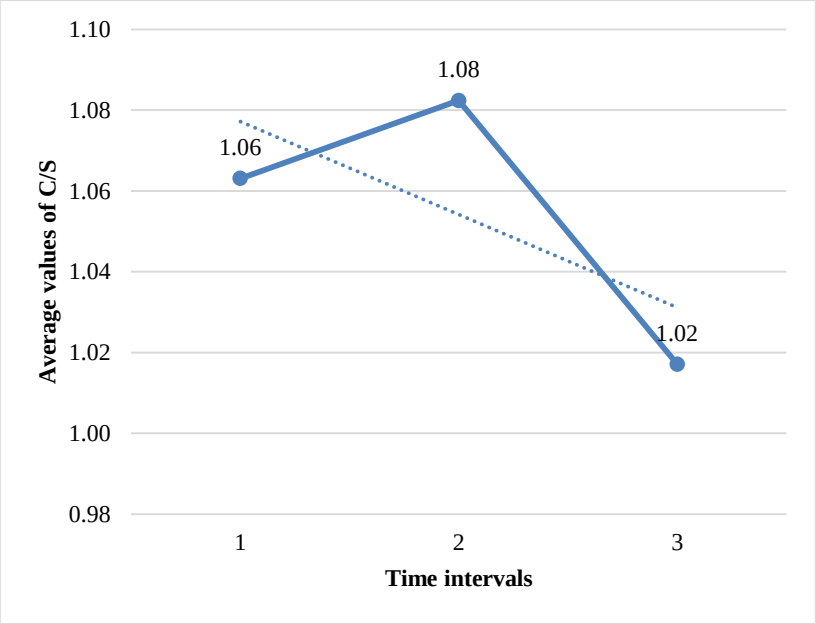


Figure 33. Average changes in C/S over time in T2.

The average values for "subordination" indices (i.e., C/T, CT/T, DC/C, and DC/T) show negative (or downward) trends for the discourse samples in T2. Similar to the patterns observed for the average values of these measures in T1, the negative trends were consistent for CT/T, DC/C, and DC/T. Simply, the average values for these measures declined from the first to the third samples. That means the participants' spoken discourse became simpler as they spent more time playing the game. The average values for C/T, however, show a little different pattern. Despite an overall negative trend in the average values of C/T (see Figure 34 below), the ratio of clauses per T-unit increased marginally (0.03 units) in the second samples.

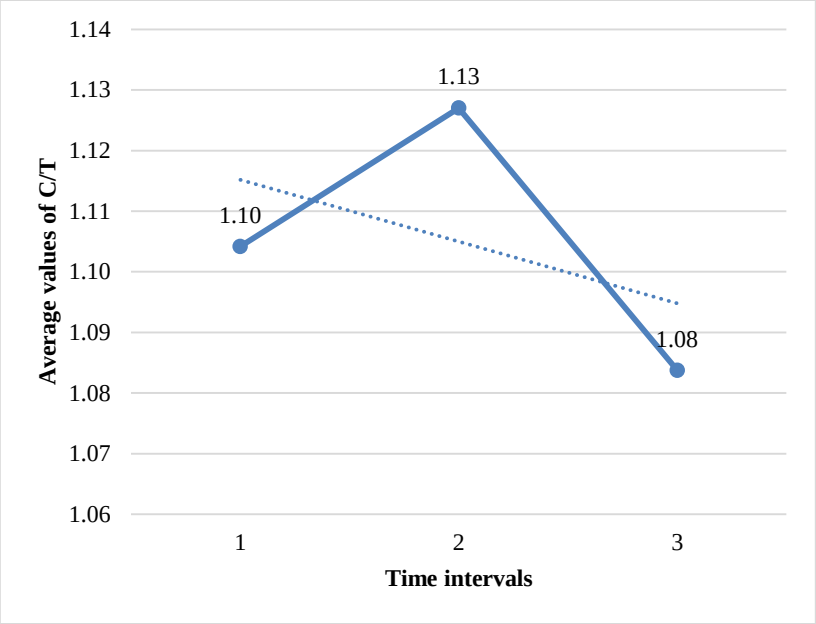


Figure 34. Average changes in C/T over time in T2.

A close look at the individual values of these measures revealed that only E's samples followed a different pattern. That was a slight increase (0.06 units in CT/T, and 0.05 units in DC/C and DC/T indices) in the second sample and remaining the same in the third sample.

Similar to their counterparts in T1, the average values of "coordination" indices of syntactic complexity (i.e., CP/C, CP/T, and T/S) show declining trends in the discourse samples generated by T2. These downward trends represent the fact that the participants' spoken discourse did not make any improvement as a function of time playing the MMORPG. A closer look at the individual values of these indices revealed a marginal (0.03 units) growth in the values of only CT/T in the spoken discourse samples produced by M in the second time interval.

Finally, according to the measures of syntactic complexity under the "Particular structure" category, the participants' spoken discourse did not show any improvement. Unlike the average values of these indices in T1, which show an increase in the second samples, the average values of these indices declined halfway for CN/C and CN/T, and remained the same for VP/T in T2 (see Figures 35, 36, and 37 below).

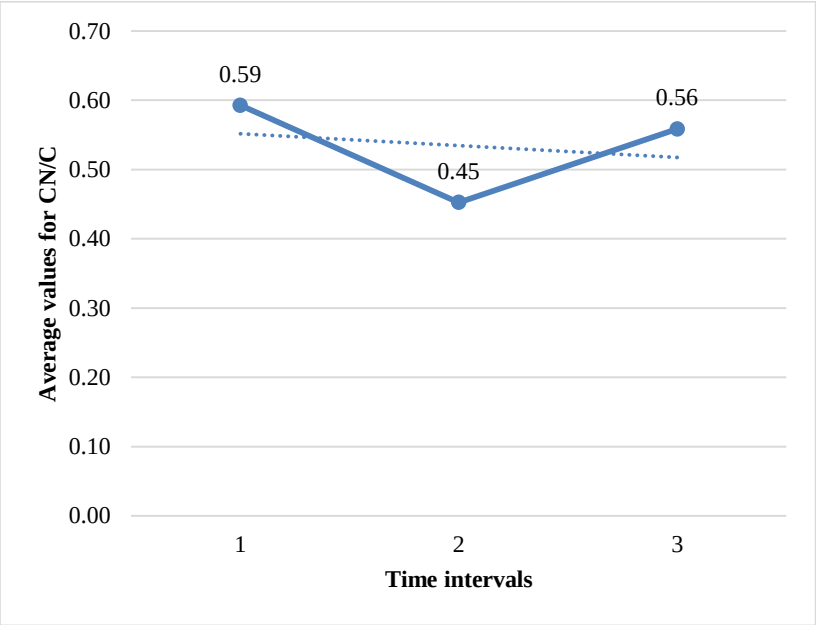


Figure 35. Average changes in CN/C over time in T2.

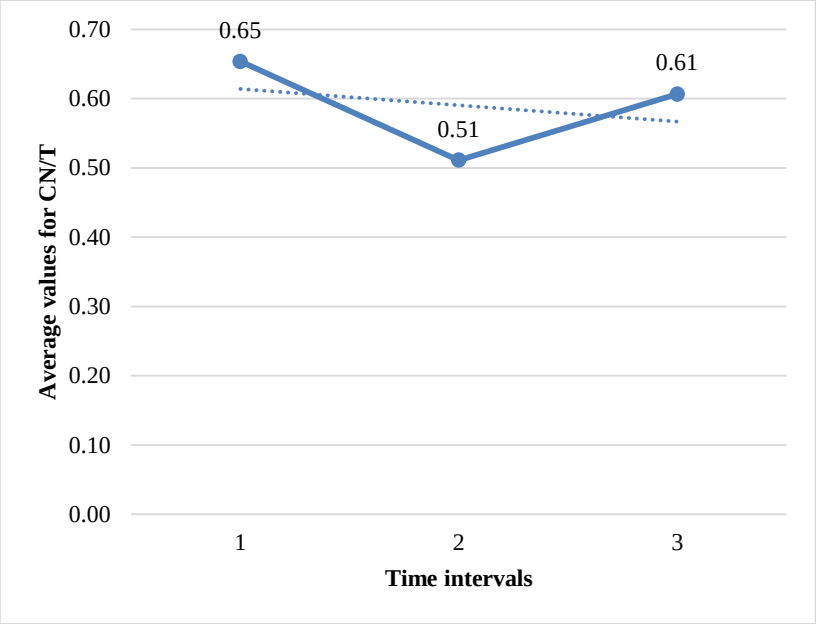


Figure 36. Average changes in CN/T over time in T2.

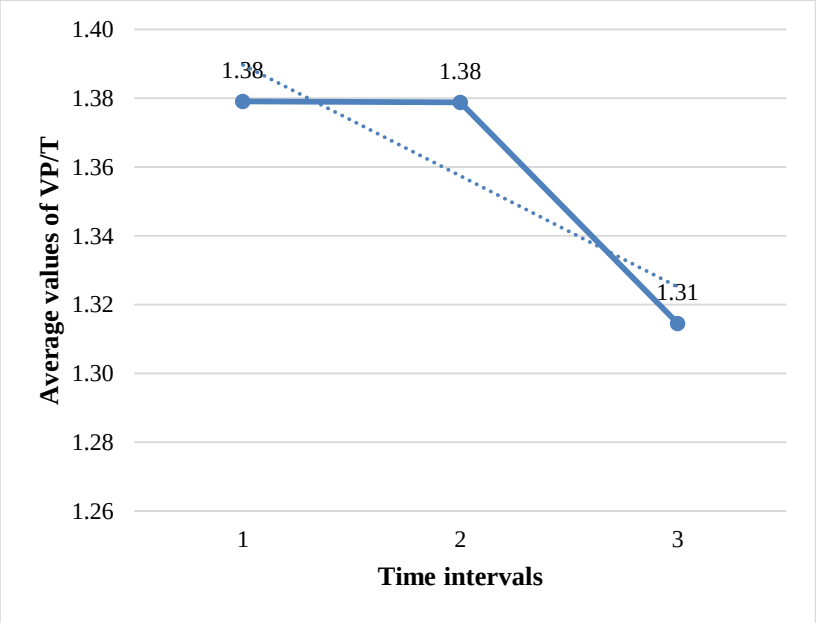


Figure 37. Average changes in VP/T over time in T2.

Microanalyses of individual values show tiny improvement in CN/C (0.03 and 0.01 units) and CN/T (0.03 and 0.01 units) in the third samples of discourse generated by E and M respectively, and a consistent increase (0.08 and 0.03 units in the second and the third samples) in the values of VP/T in the data collected from E.

Discussion

The purpose of the current research was to examine the level of linguistic (i.e., lexical and syntactic) complexity of the spoken discourse generated by NNESs (in lower and higher proficiency levels) during MMORPG play in the TL to understand if it displayed any improvement over time. By drawing on the underlying assumptions of interactionist perspective to L2 learning, it was hypothesized that meaningful, task-based verbal interactions in the TL (with peers and an NES) during the gameplay would improve some structural aspects of the NNESs' spoken discourse in the current study. As Lai and Li (2011) explained, interaction approach to SLA "[…] stresses that engaging learners in communicative activities provides them with quality language input and negative feedback, pushes them towards modified output, and channels their attentional resources selectively on structural properties during the interaction" (p. 500). To capture any changes in the linguistic complexity of the NNESs' discourse, their spoken samples were examined in detail through the implementation of fine-grained indices of lexical and syntactic complexity. This usage-based approach to the evaluation of L2 development is supposed to provide a clearer understanding (compared with formal assessment measures) of subtle changes in the development of learners' lexical and syntactic knowledge over time. This approach is justified by some scholars' (e.g.,

Palmer, 2010; Rankin et al., 2009) assertion that "The use of formal assessment measures fail to capture the extent that in-game social interactions between linguistically diverse players promote SLA" (Rankin et al., 2009, p. 162).

The first set of analyses assessed the developmental trend in the measures of lexical density, lexical variation (or diversity), and lexical sophistication. The results showed an improvement in the average values of lexical density and lexical variation for the spoken discourse samples collected from the NNESs in T1; whereas, the average values of the same measures did not indicate any improvement for the samples of discourse in T2. In particular, the average values of lexical density for the samples of data obtained from T2 decreased over time, and the average values of lexical diversity remained unchanged to a great extent. It appears that the NNESs in T1 produced more informative (or denser) and lexically more variant discourse as the function of time while their counterparts in T2 tended to produce discourse that was less informative and lexically as diverse as before. The results seem to suggest that playing *WoW* in the TL over an extended period encouraged lower more than higher proficiency team to use more content words and a wider range of vocabularies in their discourse. It is worth mentioning that observing similar developmental pattern for lexical density and lexical diversity in each team might be due to the correlational effect that probably exists between these two indices (Johansson, 2008). That means a text with high lexical density (i.e., contains higher proportions of content words) could naturally have a higher level of lexical variation (i.e., includes a wider range of vocabularies).

To provide a more detailed account of changes in the lexical sophistication of the NNESs' spoken discourse, some fine-grained analyses were carried out. These analyses included the measurement of four indices: BNC Written Trigram Frequency Normed Log, SUBTLEXus Range CW Log, BNC Written Range AW, and BNC Spoken Bigram Proportion. Kyle and Crossley's (2015) found that the first two indices were highly correlated with holistic speaking proficiency scores, and the next two were highly associated with holistic lexical proficiency scores. In addition to the indices mentioned above, word frequency bands (using BNC-COCA 1-25k) were also included in the analyses to provide a more reliable account of changes in the level of lexical sophistication. The results showed a promising outlook for T1. Three out of four indices showed improvement. The discourse samples contained (a) consistently higher percentages of multiword units (based on BNC Written Trigram frequency), (b) slightly more content words that occur in limited range of contexts (based on SUBTLEXus Range index for content words), and (c) considerably more words that are used in fewer contexts (based on BNC Written Range index for all words). Only, the values for BNC Spoken Bigram proportion remained somewhat unchanged throughout the three time intervals. According to Kyle and Crossley (2015), these results may represent the fact that *WoW* play improved the participants' holistic speaking and lexical proficiency over time. The examination of word frequency bands (using BNC-COCA 1-25k) also indicated some improvements in the lexical sophistication of the discourse produced by the participants in T1. On average, they used less K1 and more K2 words as they spent more time playing the game.

The results of syntactic complexity measures were also promising for T1 although not as promising as those obtained for the lexical sophistication measures. The average values of mean length of clause (MLC) (among other indices of "length of production unit"), complex nominals per clause (CN/C), complex nominals per T-unit (CN/T), and verb phrases per T-unit (VP/T) showed an increasing but inconsistent trend across the three time intervals. The average values for the first three indices decreased slightly in the third samples but the values were still higher than their initial points in the first samples. The average values of the last index, however, fell to a level lower than what was recorded for the first samples. On the other hand, the average values of sentence complexity ratio (or the number of clauses per sentence) as well as the average values of "subordination" and "coordination" indices showed a consistently decreasing trend. It can be concluded, though cautiously, that the lexical and syntactic complexity of the participants' spoken discourse in T1 improved although this improvement is more noticeable in the changes observed in the values of lexical complexity indices. This result is confirmed and well documented in the literature (e.g., Alp & Patat, 2015; Rankin et al., 2016; Rankin et al., 2009; Sylvén & Sundqvist, 2012). A probable explanation is the participants' primary focus on meaning due to "the demands for simultaneous communication flow" (Reinders & Wattana, 2011, p. 16) in the game context. Seeking to achieve more goals and to promote their characters (or avatars), the players are actively involved in the co-construction of "meaning" that is conveyed mainly by using content words and drawing on the game's contextual features (e.g., avatar-embodied actions performed by PCs and NPCs). Since syntactic (or structural)

elements of the language are not of serious concern in the gameplay, they may not be noticed and are probably overshadowed by semantic and semiotic features of the game context, which can contribute more significantly to the players' success in the game.

The results for the samples collected from T1 seem to contradict the findings of Reinders and Wattana (2011), who studied the effects of playing a MMORPG on the quantity and quality of L2 interaction. They conducted the study with very similar participants in terms of age range, education, English as a foreign language proficiency level, and experience with MMORPG. They found that although the participants produced a large quantity of the TL, L2 interactions during the MMORPG play did not seem to improve the accuracy and complexity of the learners' discourse. The researchers modified and extended the game by creating three new quest events relevant to the content and objectives of the three lessons the participants studied in an English course. The participants were also instructed to collaborate with other game players and use the TL in their communication (during the gameplay) for the purpose of L2 learning. Compared with the current research, Reinders and Wattana's research was expected to improve the participants' discourse complexity, considering that in the present study neither was the game modified for L2 learning nor the participants were oriented to play the game for learning the English language. An explanation for such a difference (between the results of the current research and those obtained in Reinders and Wattana's) can be the duration of the gameplay. In Reinders and Wattana's research, the learners played the game for three 90-minute game sessions while in the present study

the participants were involved in the gameplay for nearly 30 hours during a five-month period.

The results of lexical complexity measures were not as promising for the higher proficiency participants in T2. Unlike the samples in T1, the spoken discourse samples in T2 did not show any sign of improvement regarding the levels of lexical density and lexical diversity. More surprisingly, the values of lexical density indices for individual samples declined or remained somewhat stable as the function of time. Regarding the values of lexical diversity index for individual samples, only one of the participants produced discourse that was slightly more lexically diverse in the second compared to the first sample. Overall, the TL output of the NNESs in T2 did not grow more informative or lexically diverse. Among the four indices of lexical sophistication and the word frequency band scores, the average values of only *BNC Trigram Written Frequency Logarithm* and *BNC Spoken Bigram Proportion* indicated negligible improvement in the lexical sophistication of the discourse samples drawn from T2. Although the changes are minimal, the results suggest that the higher proficiency group of NNESs produced spoken discourse that grew lexically more sophisticated containing slightly more high-frequency trigrams (or multiword units) and bigrams (that exist in the spoken portion of the BNC).

The average values of fourteen syntactic complexity indices for the samples of data in T2 also suggest that lower proficiency group of NNESs (in T1) benefited a little more from playing *WoW*. In T2, the average values of only two indices showed improvement, though very small, in the second compared to the first samples. They

include sentence complexity ratio (i.e., number of clauses per sentence) and complex T-unit ratio (i.e., number of complex T-units divided by T-units). The results of syntactic complexity measures may indicate some improvements in the participants' TL, but as Ortega (2003) emphasized, "syntactic complexity metrics would be misapplied if they were to be used as absolute developmental indices or as direct indices of language ability" (p. 494). As Ortega (2003) highlighted, the nature of L2 development is too complex and multifaceted to be "sufficiently investigated by means of these global measures alone" (p. 494). She argued that: "Progress in a learner's language ability for use may include syntactic complexification, but it also entails the development of discourse and sociolinguistic repertoires that the language user can adapt appropriately to particular communication demands" (Ortega, 2003, p. 494). Therefore, lack of improvement in the value of an index should not be misinterpreted as the absence of L2 development in its general sense.

Due to the descriptive nature of the results in this research, it is hard to interpret them objectively and generalize the findings of the current research. Nonetheless, overall, the results suggest that the lower proficiency team (T1) benefited more from playing the game in the TL, improving the lexical and syntactic complexity of their spoken discourse. This result seems to contradict some scholars' (e.g., Rankin et al., 2006) claim that ESL students need to possess at least intermediate level of L2 proficiency to be able to improve their conversational skills through playing MMORPGs. For example, Rankin et al.'s (2006) observation showed that lower-level ESL students were cognitively overloaded by multiple competencies required to

navigate the game, to comprehend the information displayed on screen and to look up unfamiliar vocabularies. The researchers concluded that the MMORPG (*Ever Quest II*) failed to provide adequate language learning support for lower-level ESL students. These results should, of course, be interpreted in light of the design of their research study, which is different largely from that of the current research. For example, it appears that the lower and the higher proficiency participants were grouped to play the game together. This configuration of different proficiency levels might have negatively affected the lower proficiency students' performance in the TL. The absence of native TL speakers in the gameplay could be another explanation for what they found. The presence of one or more native speakers of the TL in the gameplay could have changed the emotional and linguistic dynamic of the interactions within the game setting. The presence of a native speaker in the chain of interactions implies that the TL should be used primarily for communicating meaning. The social settings in which the TL is used for authentic purposes of real-time communications and not for the sake of language learning could help reduce learners' language anxiety and, in turn, enhance the level of self-confidence in active and creative use of the TL.

It is also worth noting that when the values of the indices were averaged and plotted for each team, the graphs revealed a promising picture for both lower and higher proficiency participants. Both teams improved some aspects of their spoken discourse regarding lexical and syntactic complexity. To present a detailed account of changes, the macro-level group averages were complemented by micro-level analyses of data for individual participants; as it is emphasized in a dynamic (or complex) systems

developmental approach to SLA (Larsen-Freeman, 2006; Larsen-Freeman & Cameron, 2008a, 2008b) that individual behavioral changes over time should also be taken into account. The graphs based on average values displayed some curves that were occasionally different from the graphs obtained from each participant's data. These inter-individual variations can be attributed to various game- and gamer-related factors (or variables) that are worth investigation. For example, different types and levels of engagement in the game context, in-game task complexity, L2 learning motivation, communication anxiety, knowledge about the target culture, gaming style (e.g., competitive or social), social skills, social and emotional bond with other players, willingness to communicate in the TL, and many more variables could influence the participants' linguistic behavior during the gameplay. Therefore, L2 users' (or learners') individual differences must be taken into account when their learning behavior is investigated. Selinker asserted that "A theory of second language learning that does not provide a central place for individual differences among learners *cannot* be considered acceptable" (Selinker 1972, p. 213).

Conclusion

Interest in digital games and particularly MMOGs is still growing. People spend millions of hours around the globe playing these games on different servers where they have to use languages other than their L1. Many of these gamers claim to have developed some L2 skills as the result of playing these types of games and socializing with other players in the TL. These perceptions, however, have neither been clarified scientifically nor verified empirically by research evidence. Through adopting a narrow

lens, this study examined the linguistic (lexical and syntactic) complexity of the participants' spoken discourse in the context of *WoW* as one of the most popular MMORPGs. Linguistic complexity, accuracy, and fluency are the three important constructs of language development (see Ellis, 2008; Ellis & Barkhuizen, 2005; Housen & Kuiken, 2009; Larsen-Freeman, 2009; Norris & Ortega, 2009). This research sought to find out if NNESs improve the linguistic complexity of their spoken discourse as they play *WoW* in the TL (with peers and a native English speaker). Without implementing any game manipulations (or extensions) and gamer orientations toward L2 learning, this study was designed to simulate real life, ordinary gameplay experience, the way millions of gamers around the globe log in and play the game in languages other than their L1. "Game-enhanced" perspective to L2 research raises the question of "How does game-mediated L2 learning occur 'in the wild'?" (Reinhardt & Sykes, 2012, p. 33). In line with this broad question, more specific research questions were addressed in the current research. The NNESs' naturally occurring, non-elicited, in-game conversational (oral) exchanges were analyzed carefully using fine-grained indices of lexical and syntactic complexity.

Overall, the results were promising for both teams, but the progress appeared more noticeable for T1, which represents lower proficiency group of participants. The results confirmed the notion of "Naturalistic CALL," which refers to "students' pursuit of some leisure interest through a second or foreign language in digital environments in informal learning contexts, rather than for the explicit purpose of learning the language" (Chik, 2013, pp. 835–836). It can be concluded, though cautiously due to lack of

comprehensive empirical evidence, that playing off-the-shelf MMOGs can provide opportunities for L2 users to develop the linguistic complexity of their interlanguage. The results of this research highlighted the effectiveness of informal L2 learning environments such as those provided by MMORPGs. It is important to note, though, that improvement of linguistic complexity in L2 users' discourse should not be misinterpreted as an absolute indicator of L2 development. According to Complexity and Dynamic Systems Theory (Larsen-Freeman, 2006; Larsen-Freeman & Cameron, 2008a, 2008b), L2 learning should not be conceived as merely mastering linguistic rules of the TL but as "the constant adaptation of their linguistic resources in the service of meaning-making in response to the affordances that emerge in the communicative situation, which is, in turn, affected by learners' adaptability" (Larsen-Freeman & Cameron, 2008a, p. 135).

CHAPTER V

CONCLUSION

Overview of the Studies

This dissertation sought to supplement our understanding of L2 development in the context of non-educational, off-the-shelf, massively multiplayer online (role playing) games. To this end, three different but inter-related studies were carried out. The first study was a scoping review, which provided an overview of the current literature concerning what has been investigated in this area and how. The second and the third studies were designed to expand and refine our understanding of the contributions that playing a MMORPG in the TL can make for L2 development. The data for these two studies consisted of naturally occurring, non-elicited, in-game conversational (oral) exchanges among the participants during a five-month period of gameplay. The participants comprised six NNESs (based in Iran) and one NES (based in the USA). The NNESs were assigned to two different groups (or teams) based on their L2 proficiency (low and high intermediate). The low intermediate NNESs, who were all experienced *WoW* players, were assigned to Team 1; and the high intermediate NNESs, who had extensive experience playing other MMORPGs than *WoW* were assigned to Team 2. The NES, who was an expert in MMORPG play, participated as the fourth member of each team. A brief overview of each study is provided below.

Study 1

Purpose

As a scoping review, the first study aimed at providing an overview of the current empirical research to find out what aspects of L2 development have (or have not) been investigated in the context of MMOGs and how. This study included 32 empirical research studies (25 peer-reviewed journal articles, three conference proceedings, two dissertations, one master's thesis, and one book chapter). The studies were coded according to their (a) purpose, (b) research paradigms (e.g., quantitative, qualitative, or mixed method), (c) theoretical (or conceptual) frameworks, (d) data collection procedures, (e) data analysis techniques, and (f) findings. In particular, this review addressed the following research questions:

1. What theoretical perspective(s) were adopted to examine L2 development in the context of MMOGs?
2. What aspects of L2 development have thus far been investigated in the context of MMOGs?
3. What approaches (or research paradigms) and methodologies (including sampling procedure, data collection, and data analysis) have been implemented?
4. What are the significant findings in this area of research?

Findings

Synthesizing the 32 studies' research foci, paradigms, theoretical (or conceptual) frameworks, data collection procedures, data analysis techniques, and findings in the scoping review led to the following prominent highlights. First, among several research

foci, L2-related motivational and affective outcomes, vocabulary acquisition, communicative competence/strategies, and the quantity of L2 production were the most frequently investigated topics in this area of L2 research. Second, most (62.5%) of the studies were qualitative, and particularly virtual ethnographic case studies. Very few of the studies were quantitative (mainly quasi-experimental) and mixed-method studies. Third, about a third of the studies did not elaborate on or mention any theoretical framework (or related assumptions) that determined the formation of their hypotheses, choice of research paradigms, and methodological procedures. Among the theories mentioned, Vygotsky's (1978) sociocultural theory stood out as the most cited theory. Fourth, interviews (structured and semi-structured), observations, chat logs, and questionnaires were the most widely utilized data collection tools; and discourse analysis, descriptive statistics, paired/independent samples *t*-test, and constant comparative analysis were the most frequently applied techniques for data analysis. Fifth, the studies' findings painted a promising picture of the potentials and opportunities that getting involved in MMOG play can offer for developing different aspects of L2. Results of the reviewed paper suggested that:

(a) MMOGs' environmental (designed and social) features and characteristics motivated and encouraged L2 learners to become actively involved in conversational exchanges in the TL,

(b) L2 learners were regularly exposed to the linguistically (i.e., lexically and syntactically) complex discourse within (e.g., MMOG-presented texts) and beyond (e.g., MMOG-related websites) the game context,

(c) playing MMOGs provided L2 learners with opportunities to get involved in negotiations of meaning, to practice discourse management strategies, to produce more TL in game-mediated verbal interactions, to practice both traditional and modern literacies, to socialize in the TL, to practice conversational skills, and finally to improve intercultural knowledge and understanding, and

(d) MMOG play developed L2 learners' communicative competence and vocabulary knowledge in the TL.

Study 2

Purpose

Inspired by interactionist perspective of L2 development, the second study was conducted to identify and characterize the instances of negotiation of meaning taking place among the participants during in-game conversational exchanges. To this end, this study examined negotiations of meaning in the participants' spoken discourse considering (a) three types of dyadic configurations (i.e., NES-NNES, NNES-NS, and NNES-NNES), based on the origin of the trigger, and (b) two kinds of turns (i.e., on-task, and off-task), depending on the topic of the conversations.

This study intended to identify, describe, and quantify the main components of negotiations of meaning (i.e., trigger, indicator, response, reaction to the response). The significance of this study resides in Long's (1996) updated version of the interaction hypothesis, positing that:

> […] negotiation for meaning, and especially negotiation work that triggers interactional adjustments by the NS or more competent interlocutor, facilitates

acquisition because it connects input, internal learner capacities, particularly selective attention, and output in productive ways. (pp. 451–452).

More specifically, this study investigated (a) the extent to which *WoW*-mediated, task-based, oral communications in the English language fostered negotiations of meaning between the participants, (b) the nature of the linguistic modifications (or adjustments) the participants applied in their language output, and (c) the effectiveness of meaning negotiations in the comprehensibility of ongoing discourse during the gameplay.

Findings

A brief overview of the results is provided below.

a. The participants' conversational turns were mostly dedicated to on-task (or game-related) topics.
b. Communication breakdowns occurred in a small proportion of on-and off-task turns.
c. There was no association between types of turns and the frequency of communication breakdowns in T1; however, in T2, more turns than expected were interrupted to resolve communication breakdowns in off-task conversations.
d. Almost all the interrupted turns were negotiated in both teams. There was no association between where the communication breakdown occurred (i.e., during on- or off-task turns) and whether or not they were negotiated in T1.
e. There was an association between the participants' level of L2 proficiency and types of conversational turns they were involved in. The higher proficiency

group with little or no *WoW* experience (in T2) seemed to get more involved in on-task conversations.

f. There was an association between the participants' level of L2 proficiency and the frequency of communication breakdown. The lower proficiency group (in T1) faced communication breakdowns more frequently. Additionally, there was an association between the participants' level of L2 proficiency and the frequency of negotiated turns. The higher proficiency group negotiated more interrupted turns than their counterparts in lower proficiency group.

g. Majority of the negotiation episodes were simple in both teams, and there was no association between the participants' level of L2 proficiency and the negotiations' level of complexity.

h. There was a significant association between the participants' level of L2 proficiency and type of dyads in which the communication breakdowns occurred. In T1, less, and in T2, more negotiations than expected were triggered by the NNSs' utterances (in $NNS_{trigger} \rightarrow NS_{signal}$ dyadic conversations).

i. Rate of speech, vocabulary, and content were the three most frequently occurred triggers in $NS_{trigger} \rightarrow NNS_{signal}$ dyads; and their distribution was similar for both teams.

j. Pronunciation (including mispronunciation and unclear pronunciation) and content stood out in both teams as the most recurrent triggers in the NNS's utterances (in $NNS_{trigger} \rightarrow NS_{signal}$ conversational dyads). The distribution of these triggers was similar in both groups.

k. In the $NNS_{trigger} \rightarrow NNS_{signal}$ negotiated interactions, pronunciation, content, and vocabulary were—in order—the first three most frequent triggers.

l. Concerning types and frequency of indicators, the results showed that explicit, global, clarification request (CR) and explicit, local, CR were the first and the second most frequently utilized types of indicators in almost all three forms of dyadic interactions in both teams. More analyses suggested that there was a significant association between the use of these two types of indicators and level of L2 proficiency in $NS_{trigger} \rightarrow NNS_{signal}$ negotiations. Explicit, local, CR indicators were applied by the NNSs in T2 significantly more frequently than expected (compared with NNSs in T1). In other words, explicit, global, CR type of indicator was used more by the NNSs with the lower level of L2 proficiency. The distribution of these two types of indicators was however similar in the $NNS_{trigger} \rightarrow NS_{signal}$ dyadic conversations for both teams.

m. The results also displayed a high rate of responses (to signals of incomprehension) in both teams. The total frequency for each response strategy (as they appeared alone or in combination with other strategies in a single response move) indicated that expansion, rephrasing, and repetition with pace modification were the most frequently utilized response strategies by the NS (in $NS_{trigger} \rightarrow NNS_{signal} \rightarrow NS_{response}$). The NNSs' level of L2 proficiency did not have any significant effect on the NS's choice of response strategy for improving the comprehensibility of his discourse.

n. The total frequency of responses by the NNSs (in $NNS_{trigger} \rightarrow NS_{signal} \rightarrow NNS_{response}$ dyads) indicated that expansion, repetition without modification, repetition with modified pronunciation, and rephrasing were the most frequently applied strategies, accounting for 81% and 98% of the total frequency in T1 and T2 respectively. The NNSs' level of L2 proficiency seemed to have no significant effect on their choice of response strategies for bridging the communication gap.

o. The total frequency for each response strategy by the NNSs in $NNS_{trigger} \rightarrow NNS_{signal} \rightarrow NNS_{response}$ dyads showed that expansion was the most frequently applied strategy for both teams. This pattern is similar to the one observed in $NNS_{trigger} \rightarrow NS_{signal} \rightarrow NNS_{response}$ negotiated interactions.

p. With regard to the RR strategies, the results revealed that responding back and minimal response strategies were the first and the second most frequently occurred verbal reactions in all three types of dyadic conversations. Additionally, the distribution of these two types of RR strategies appeared to be similar in lower and higher L2 proficiency groups of NNESs.

Study 3

Purpose

As a longitudinal, quasi-experimental research (with a time-series design), the third study was undertaken to examine the developmental trends of linguistic (lexical and syntactic) complexity in the NNESs' spoken discourse. Lexical complexity was operationalized as constituting three sub-components: lexical density, lexical

sophistication, and lexical variation/diversity. This study was inspired and rationalized by the usage-based theories of language learning (Behrens, 2009; Ellis, 2002; Tomasello, 2003), positing simply that frequent constructions of language are acquired earlier (or more easily) than less frequent constructions. By drawing on this supposition, the NNESs were expected to use less common (or more complex) lexical and syntactic elements (in their spoken discourse) as they were spending more time in the game interacting in the TL. Through a detailed examination of the data by the implementation of several measures, this study intended to find out whether or not the lexical density, lexical sophistication, lexical variation, and the syntactic complexity of the NNESs' spoken discourse improved in the course of a five-month period of MMORPG play in the TL.

Findings

The results showed an improvement in the average values of lexical density and lexical variation in the spoken discourse samples collected from the NNESs in T1. The average values for the same measures, however, did not indicate any improvement in the discourse samples produced by T2. The results of three out of four lexical sophistication indices showed an improvement in the samples drawn from T1. Their language use displayed some improvements as the discourse samples contained (a) consistently higher percentages of multiword units, (b) slightly more content words that occur in a limited range of contexts, and (c) considerably more words that are used in fewer contexts. The results of word frequency bands also indicated some improvements in the lexical sophistication of the discourse samples produced by the NNESs in T1. The results,

however, were less promising for the discourse drawn from the NNESs in T2. Only two of the lexical sophistication indices showed negligible improvements. In these cases, the discourse samples grew lexically more sophisticated, incorporating slightly more high-frequency trigrams (or multi-word units) and bigrams (that exist in the spoken portion of the BNC).

The results of syntactic complexity measures were also promising for the discourse generated by T1. Their discourse grew syntactically more complex considering the average values of mean length of clause (MLC), complex nominals per clause (CNC), complex nominals per T-unit (CNT), and verb phrases per T-unit (VPT). In the discourse produced by T2, the average values of only two indices showed a slight increase from the first to the second time interval. These indices included: sentence complexity ratio (i.e., number of clauses per sentence), and complex T-unit ratio (i.e., number of complex T-units divided by T-units).

Contributions

This dissertation has three main contributions to the field of applied linguistics and in particular to the research area of technology-mediated second language learning/acquisition. The first is informing the field of applied linguistics of the inadequacy of research in the area of MMOGs regarding theoretical frameworks and methodology. The results of the scoping review highlighted the necessity of adopting varied theoretical perspectives and an interdisciplinary approach for explaining the dynamic processes (e.g., emotional, social, cultural, and linguistic) undergirding L2 development in informal, non-educational contexts such as those provided by off-the-

shelf MMOGs. The results of the review also emphasized that the field of applied linguistics needs to reconceptualize the widely-held notion of L2 learning as merely the mastery of a set of grammar rules before embarking on any L2 research within informal, dynamic settings. The review also highlighted the fact that the field of applied linguistics has to be more innovative in the implementation of research methodologies so that it can capture the dynamically developmental nature of SLA in natural communication settings.

The second contribution of this dissertation is bringing into the L2 scholars' and practitioners' attention the affordances of MMOGs as potential informal venues for L2 development. The results may prove to be of particular interest to those L2 researchers who are eager to discover more about the potentials of MMOGs, as "unorthodox language-learning tools" (Rankin et al., 2006), for L2 development. Additionally, the results of this dissertation can contribute to L2 practitioners' (e.g., teachers, curriculum developers, and policy makers) and L2 learners' understanding of how real-life, informal communication settings such as those provided by off-the-shelf MMORPGs can help with L2 development.

The third contribution of this dissertation concerns with the alternative research approaches it introduced for the examination of L2 development in the context of "vernacular" MMOGs. By adopting the psycholinguistic account of interactionist perspective and drawing on the usage-based theories of L2 development, this dissertation examined the phenomenon of L2 acquisition in the context of a MMOG through the implementation of two different, though not new, approaches. One was the

identification and description of the prerequisite conditions hypothesized as facilitative in the process of L2 development. The other approach, which was drawn from usage-based perspective to L2 development, was a detailed analysis of the discourse to discover any changes in the complexity of its linguistic components.

Limitations and Further Research

Similar to most studies, the research in this dissertation has some limitations. One of the limitations concerns the narrow scope of the scoping review. It included the empirical research articles that investigated L2 development in the context of only off-the-shelf MMOGs. Of the same importance are the studies that examined the affordances of educational or "serious" games for L2 learning and pedagogy. Future reviews can address this limitation by including a wider range of studies that investigated the potentials of educational MMOGs for developing L2 skills.

The second limitation concerns with the theoretical perspective adopted in the second study, which described and characterized the participants' in-game verbal (oral) interactions. This study was informed by psycholinguistic interactionist perspective (Peterson, 2010a), positing that "the cognitive restructuring involved in language development is enhanced through real-time interaction in the target language" (Peterson, 2010a, p. 431). According to this perspective, two types of interaction may facilitate SLA. The first type of interaction—known as negotiation of meaning—takes place when a communication problem occurs. The second type of interaction—known as negotiation of form—involves interactions that focus learner's attention on form-related problems in their linguistic output. The second study in this dissertation adopted a narrow perspective

and focused only on negotiations of meaning. Therefore, the methodology was determined, and findings were interpreted based on the psycholinguistic account of interactionist perspective to SLA. Future studies in this area can address this limitation by investigating the interactions that involve negotiations of form (and corrective feedback). In a broader sense, future studies in this area can adopt a wider interactionist perspective that encompasses both psycholinguistic and sociocultural views on SLA.

The third limitation concerns with the context (or setting) of the study. The researcher attempted to simulate an authentic context in which MMORPG players get involved in the gameplay in real life situations. The researcher was successful to a great extent by being absent in the game setting and asking the participants to play the game for the fun of it. Despite the implementation of these strategies, the data could presumably be different, though meagerly, if the data were collected in an authentic gameplay setting. Future studies can address this limitation by observing L2 users (as MMORPG players) and their interactions (with each other and with more competent speakers of the TL) in real-life, authentic situations.

The fourth limitation is related to the configuration of teams in terms of the number of participants (both NS and NNS), level of L2 proficiency, and level of game expertise. In this dissertation, the participants comprised three low intermediate NNESs with extensive *WoW* experience (in T1) and three high intermediate NNESs with little or no *WoW* expertise but extensive MMORPG experience (in T2) as well as an NS, as an expert *WoW* player who participated in both teams. Future research can be more innovative in its research design by, for example, including larger groups of participants

with various L2 and gaming proficiencies. Studying the dynamics of negotiation (of meaning and form) in such heterogeneous groups of game players could provide a more genuine picture of communication patterns in real-life situations. Overall, this area of research is still young and warrants more innovative and rigorous research.

Finally, as the focus of the current research (in the third study) was limited to the examination of linguistic (lexical and syntactic) complexity of the NNESs' L2 discourse, future research can adopt a wider scope and examine accuracy, fluency, and complexity as the three principal components of L2 performance (e.g., Ellis, 2008, 2009; Ellis & Barkhuizen, 2005). Similar to complexity, accuracy and fluency are multidimensional and multifaceted constructs, which needs to be examined by a variety of measures and indices. The examination of these three interrelated, multidimensional constructs of L2 performance in the context of MMORPGs can provide a comprehensive insight into the affordances of MMORPG-mediated communications in the TL for improving L2 skills.

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APPENDIX A

THE REVIEW MATRIX FOR EMPIRICAL RESEARCH OF L2 LEARNING IN MMOG CONTEXTS

Author(s)/Year	**Focus**	**Participants**	**Major findings**
Alp and Patat (2015)	Teaching Italian through playing *WoW*	14 Turkish undergraduates (aged 18-23)	*WoW* play accelerated L2 vocabulary acquisition and enhanced self-confidence in using the TL.
Bytheway (2014)	Vocabulary learning strategies	6 ESL students from different first language (L1) backgrounds	Participants used a variety of vocabulary learning strategies affected by the MMORPG culture.
Chik (2014)	Practicing autonomy	10 Chinese-speaking undergraduates	Gamers are involved in L2 gaming as a long-term leisure and learning activity; they managed their gaming activities autonomously by drawing on personal experiences and the communal pedagogical resources.
Dixon (2014)	Learning and communication strategies in the gameplay, attitudes toward L2 learning	3 Chinese ESL students (early 20s)	The most commonly used learning strategy was ‘pooling information’ that outnumbered ‘giving commands,’ ‘making statements,’ ‘giving suggestions,’ and ‘modelling’; MMORPGs provide opportunities for negotiations of meaning; ‘requesting’ and ‘checking’ were the two most commonly used

Author(s)/Year	Focus	Participants	Major findings
			communication strategies; learners perceived in-game interactions as beneficial to L2 learning.
Kongmee et al. (2011)	Supportive role of MMORPGs in L2 teaching	8 Thai undergraduates	MMORPGs have positive effects on the participants' attitude towards, motivation for and confidence in using ESL.
Lee and Gerber (2013)	L2 development in forms and functions throughout *WoW*	a 21-year-old Korean male	The participant learned game-relevant language forms, utilized various language functions, improved self-confidence and showed less anxiety in TL interactions.
Li (2011)	L2 literacy practices in *WoW*	4 Chinese ESL learners	'Doing quests' and 'socializing' were the main gaming activities for the novice and the experienced players respectively; 'reading' and 'decision making' were the most frequently observed literacy activities within and around *WoW* gameplay; literacy activities within *WoW* gameplay were inducted into four literacy practices including 'information seeking,' 'strategizing,' 'problem solving,' and 'socializing.'
Newgarden et al. (2015)	Coordination among *WoW* players, contribution of this coordination to values realizing in the L2	3 college-age ESL learners	"[P]rospective coordination was a strong predictor of values realizing while common ground alignment and coaction were not ....; multimodal languaging in gameplay increased the odds of players' dual values

Author(s)/Year	Focus	Participants	Major findings
			realizing, suggesting that avatar embodiment afforded an enriching experience for these L2 learners" (Newgarden et al., 2015, p. 39).
Palmer (2010)	L2 socialization and pragmatic development in *WoW*	2 (a 37-year-old male and a 28-year-old female) NESs learning Spanish	The learners improved abilities to socialize in Spanish virtual communities and the naturalness of their Spanish language.
Peterson (2010b)	L2 learners' interactions in and attitudes toward MMORPG play	7 Japanese EFL students (aged 24-27)	The intermediate and advanced learners utilized adaptive and transfer discourse management strategies effectively, and engaged actively in collaborative social interaction in the TL; real time computer-based interactions provided benefits such as access to an engaging social context, enjoyment, exposure to new vocabulary, reduced anxiety, and valuable opportunities to practice L2.
Peterson (2012a)	L2 learners' linguistic and social interactions in and attitudes toward an MMORPG	4 EFL students in Japan (aged 23-25)	The learners managed in-game communications (through appropriate use of positive politeness strategies), expressed positive attitude toward gameplay as a means to develop reading and vocabulary skills, and experienced low anxiety in using the TL.

Author(s)/Year	Focus	Participants	Major findings
Peterson (2012b)	L2 learners' interaction management strategies during and their attitudes toward MMORPG play	5 Japanese and 1 French EFL learners (aged 19-37)	The learners utilized a combination of transfer and adaptive discourse management strategies to manage their in-game interactions, were motivated by the learner-centred nature of the in-game interactions, and claimed that these interactions provided opportunities for fluency and discourse management practices in the TL.
Rama et al. (2012)	L2 learners' response to *WoW*'s affordances	2 college-age Spanish learners	*WoW*'s affordances for socialization and L2 learning include "a low-anxiety setting, multiple routes for and modes of communication, expert-novice interaction, immersion in the TL, and access to native speakers" (Rama et al., 2012, p. 328).
Rankin et al. (2006)	Impacts of gameplay on L2 proficiency, improvements required to transform MMORPGs to L2 learning tools	4 ESL students	A 40% improvement in the intermediate and advanced learners' L2 vocabulary; a 100% increase in the amount of their chat messages
Rankin et al. (2009)	L2 vocabulary acquisition, in-game social interactions and communication patterns	8 NESs and 18 Chinese ESL students	82% of the students who played the game improved their L2 vocabulary; those who participated in traditional classroom instruction performed significantly better ($p < 0.05$) in sentence usage post-

Author(s)/Year	Focus	Participants	Major findings
			test scores; those who collaborated with NES players performed significantly better ($p < 0.05$) in vocabulary post-test scores than those who attended classroom instruction and those who played the game on their own; social in-game interactions helped ESL students improve their communicative performance.
Reinders and Wattana (2011)	L2 interaction patterns and attitudes toward interacting in the TL	10 male and 6 female Thai undergraduates (aged 21-26)	Comparing game sessions 1 and 3 revealed: (a) an increase in the quantity of L2 interactions via text-based [($t = 3.837$, $p < .05$) ($d = 0.49$)] and voice-based chat [($t = 8.1$, $p < .05$) ($d = 0.75$)] channels, (b) an improvement in the learners' positive feelings about communicating in English during gameplay [($t = 6.301$, $p < .05$) ($d = 1.15$)], and (c) a change in the students' WTC ($t = 5.921$, $p < .05$).
Reinders and Wattana (2014)	L2 learners' WTC	30 Thai EFL learners	More WTC [($t(29) = 21.54$, $p < 0.001$) ($d = 2.79$)], less anxiety to communicate [($t(29) = 21.20$, $p < 0.001$) ($d = 3.33$)], and higher communicative self-confidence [($t(29) = 25.89$, $p < 0.001$) ($d = 3.54$)] in English during gameplay than during class time
Reinders and Wattana (2015a)	L2 learners' interactions in English	30 Thai EFL learners	An increase in the quantity of in-game interactions in both text chat [($t(29) = 11.27$, $p < 0.001$) ($d = 0.87$)]

Author(s)/Year	Focus	Participants	Major findings
			and voice chat [($t(29) = 18.51$, $p < 0.001$) ($d = 1.96$)]; producing more L2 during gameplay than face-to-face communicative activities (CAs) [($t(29) = 5.49$, $p < 0.001$) ($d = 0.97$)]; producing a greater number and variety of discourse functions in game-mediated compared to face-to-face class activities
Reinders and Wattana (2015b)	L2 learners' WTC	30 Thai EFL learners	Lower communication anxiety, increased perceived communicative competence, and increased motivation to communicate in English were the main reasons for the students to feel more willing to use English during gameplay; the game context encouraged supportive interaction and encouraged risk-taking using L2.
Ryu (2011)	Traditional and new literacy learning practices in beyond-game affinity space	20 NNESs from different L1 backgrounds	Beyond-game culture (i.e., civfanatics) provided opportunities to practice traditional and new (e.g., multimodal, gaming, multilingual and multicultural) literacies.
Ryu (2013)	L2 learning activities through gameplay and beyond-game culture	6 male gamers (average age 27.8) from different L1 backgrounds	The participants learned a limited number of words and phrases being repeated constantly in the game; they learned sophisticated TL forms through collaborative interactions with NESs or more fluent peers in civfanatics; adopting temporal roles of readers

Author(s)/Year	Focus	Participants	Major findings
			and writers helped them develop English language skills through copying, reading and writing extensively.
Steinkuehler (2007)	The social and intellectual activities MMOG players are routinely involved in	16 key informants	Within and beyond the game, the gamers engaged in multiple forms of literacy practices that meet a good deal of the National Council of Teachers of English language and literacy standards.
Sundqvist and Sylvén (2014)	The learners' language-related activities outside school and their engagement in playing digital games	76 Swedish ESL learners (aged 10-11)	Young learners are extensively involved in extramural English (EE) activities out of school; digital gaming is popular, and more time is spent on gaming in English than in Swedish; compared to non- and moderate gamers, frequent gamers mostly rated themselves as 'good' or 'very good' in self-assessed English ability.
Sylvén and Sundqvist (2012)	The relationship between L2 proficiency and different types of digital games and amount of time playing them	86 Swedish ESL learners (aged 11-12)	A positive correlation between ESL proficiency and the amount of time spent on gameplay; a larger ratio of frequent gamers claimed to have learned English mainly outside of school compared with non- and moderate gamers ($p < .01$); frequent gamers performed significantly better than non- and moderate gamers in vocabulary recognition ($p = .012$), productive vocabulary knowledge ($p = .006$), reading ($p = .021$)

Author(s)/Year	Focus	Participants	Major findings
			and listening (p = .022) comprehension.
Thorne (2008)	L2 use and learning opportunities in *WoW*	2 gamers (an American and a Russian)	In-game conversations showed instances of beneficial TL activities (e.g., providing expert knowledge, language-specific explicit corrections, making requests for help, and collaboratively assembled successful repair sequences); the participants established an affiliative social bond.
Thorne et al. (2012)	The linguistic complexity of *WoW*-presented texts and *WoW*-related websites	32 Dutch and 32 American gamers	The texts used in *WoW* quests and three most visited *WoW*-related websites are linguistically complex.
Turgut and Irgin (2009)	L2 vocabulary learning and pronunciation skills	10 primary and secondary school students (aged 10-14) from Turkey	The participants developed some vocabulary learning strategies and grew more motivated to learn unknown words; "Online games' repetition allows a language learner to 'bootstrap;' to use known language's vocabulary or grammar to decode unknown elements through constant exposure" (Turgut & Irgin, 2009, p. 763).
Wu et al. (2014)	ESL learners' perceptions about and motivations for	19 ESL students (18 and older)	The top three motivation subcomponents for both male and female participants were socializing,

Author(s)/Year	Focus	Participants	Major findings
	playing an MMORPG to improve English proficiency		relationship, and teamwork; males are driven by the motivation components of customization, discovery and role-playing; the top three motivational components for females were teamwork (M = 3.56), discovery (M = 3.51), and role-playing (M = 3.51).
Zheng et al. (2009a)	The affordances of Quest Atlantis (QA) chat for language and culture learning	4 females (2 Chinese, 2 Americans)	QA provided opportunities to improve L2 by using it in an authentic, meaningful and goal-driven collaboration to perform educational tasks.
Zheng et al. (2009b)	The impacts of gameplay on L2 learners' attitude and self-efficacy toward English language learning, achievement test scores, and responses to writing prompts	61 (42 male, 19 female) 7th grade students from China	QA group showed higher self-efficacy toward English language learning [F(3, 53) = 3.11, p = .034] and expressed high confidence in daily use of English; the non-QA group performed better in the post English Achievement test [t(58) = 2.087, p = .041]; the t test was non-significant [t(56) = -.808, p = .422)] on the score for readability of English essays.
Zheng et al. (2012)	The distribution of CAs and coordination of learners in *WoW*, and fluctuation of values realizing in a communicative project	3 college-age ESL learners from different L1 backgrounds	Coordinating, gameplay knowledge distributing and reporting on actions were the most predominant CAs; game-players integrated both language and action to achieve personal and collective goals.
Zheng, Bischoff and Gilliland	Vocabulary learning	A Japanese undergraduate and	The researchers realized that "coaction in languaging

Author(s)/Year	Focus	Participants	Major findings
(2015)		a NES	with an expert and the game narrative affordances" (Zheng, et al., 2015, p. 782) facilitated vocabulary learning, and that "the virtual world can link resources of in-game linguistic resources, actions within the game, and text chat with other learners or teachers to help situate words in a wider social context" (Zheng, et al., 2015, p. 784).

APPENDIX B

ENGLISH PLACEMENT TEST

English Unlimited Placement test

Written test

A1 to C1

- Choose the best answer for each question.
- Stop when the questions become too difficult.
- Spend no more than 40 minutes on the test.

1 Where _____ from?
I'm from Russia.
A you are B you C are you

2 We have _____ house in Moscow.
A any B a C an

3 I have two _____, a boy and a girl.
A sons B daughters C children

4 I work in a _____. I'm a doctor.
A hospital B hotel C supermarket

5 This is my brother. _____ name's Paul.
A Her B His C He's

6 _____ five people in my family.
A They are B There is C There are

7 I get up _____ 7 o'clock in the morning.
A for B at C in

8 I like apples, but I _____ bananas.
A don't like B like C do like

9 Excuse me, _____ speak French?
A do you B you do C you

10 How much are _____ shoes?
A this B these C that

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11 Where are my glasses?
They're _____ the table.
A at B on C in

12 My sister _____ tennis very well.
A plays B play C playing

13 I usually go to work _____ train.
A on B with C by

14 I don't see my parents very often _____ they live in South Africa.
A so B but C because

15 Rosie stayed _____ home yesterday afternoon.
A in B at C to

16 Last night I _____ to the cinema.
A went B did go C was

17 The _____ is quite expensive but the food there is excellent.
A film B restaurant C book

18 Do you want to listen to music or _____ TV?
A see B look C watch

19 _____ were you at the weekend?
I was in Scotland.
A When B Where C What

20 _____ you have a good time at the party?
Yes, it was fun.
A Did B Were C Had

21 Are you _____ English teacher?
A Maria B Marias' C Maria's

22 Bob will meet _____ at the airport.
A us B we C our

23 I'm going to a concert tonight. _____ you like to come?
A Do B Are C Would

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24 _____ use your dictionary?

Sure. Here you are.

A Could I B Could you C Do I

25 I like this apartment but the _____ is too expensive for me.

A money B rent C cost

26 Excuse me, how do I _____ to the bus station?

A come B get C arrive

27 Do you sell stamps?

Yes, we do. How _____ do you want?

A any B many C much

28 Sorry I'm so late.

That's _____ .

A OK B great C right

29 I'd like _____ milk in my coffee, please.

A some B any C a

30 _____ a bus stop near my flat.

A It's B Here's C There's

31 Is this a good time to talk?

Sorry, no. I _____ dinner.

A cook B am cooking C cooking

32 I think cycling is more dangerous _____ driving.

A as B like C than

33 We _____ going to the theatre next Saturday.

A will B do C are

34 _____ meet for coffee some time soon.

A Let's B Do you C Shall they

35 Kamal has got a holiday home near _____ sea.

A a B the C some

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36 If you've got a headache, you _____ go home.

A should B did C had

37 _____ ever been to New York?

A Have you B Are you C Did you

38 I only get about five hours' sleep a night.

That's not _____ .

A enough B lot C too much

39 Did Amina finish the report?

No. She _____ it tomorrow.

A finishes B is going to finish C finished

40 Paula _____ loves working with children.

A very B really C much

41 Is Ottawa the capital of Canada?

I think _____ .

A is B yes C so D right

42 We never _____ a television when I was a child.

A have had B hadn't C had D didn't have

43 We paid the restaurant bill _____ credit card.

A to B with C on D by

44 The last time I _____ Joanna was in Paris.

A have seen B saw C see D was seeing

45 If you _____ money from a friend, you should always pay it back promptly.

A borrow B earn C spend D lend

46 Can I make myself a cup of coffee?

Of course. You _____ to ask.

A haven't B mustn't C needn't D don't have

47 I _____ a lot of sport in my free time.

A do B practise C make D exercise

48 _____ anywhere interesting recently?

A Do you go B Have you been C Are you going D Will you go

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49 It's Walter's birthday on Friday. He _____ be 30, I think.

A should B can C will D shall

50 Learning the piano isn't as difficult _____ learning the violin.

A like B so C than D as

51 If the weather _____ bad tomorrow, we can go to a museum.

A will be B was C is D would be

52 About a billion cans of Coca-Cola _____ drunk around the world every day.

A is B are C was D were

53 My mum's not very well.

Oh, _____ .

A it doesn't matter B I do apologise C sorry to hear that D not bad, thanks.

54 Hans isn't here. He _____ to see his grandmother. He'll be back tomorrow.

A has gone B had been C has been D had gone

55 Would you mind changing my appointment? _____ time on Friday is fine.

A Next B All the C Every D Any

56 When I was a child, I _____ climb the wall and jump into our neighbours' garden.

A would B did C have D used

57 Have you finished _____ the wall yet?

A paint B to paint C painting D painted

58 Can you help me? I've tried _____ hotel in the city and can't find a room.

A many B any C every D all

59 Lena used to find work boring _____ she became a nurse.

A unless B until C if D since

60 If I _____ closer to my office, I could walk to work.

A lived B would live C had lived D live

61 I _____ outside the cinema when suddenly a police car arrived.

A stood B was standing C have stood D am standing

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62 Shall we go to *The Riceboat* for dinner?
It _____ be fully booked. They're sometimes busy on a Monday.
A will B may C can D must

63 We've _____ come back from a trip to India. It was amazing.
A already B yet C just D only

64 I've got to be at work in five minutes.
Don't worry, I _____ you a lift if you want.
A give B am giving C 'll give D 'm going to give

65 My doctor advised me _____ more exercise.
A take B taking C having taken D to take

66 I couldn't _____ up with the noise in the city, so we moved to the countryside.
A put B live C set D take

67 There's no name on this dictionary.
It _____ be mine then. Mine's got my name on the front.
A might not B mustn't C won't D can't

68 Julia _____ married since she was 20.
A is B was C has been D is being

69 Don't worry if I _____ late tonight. I'm going to the gym after work.
A am B will be C would be D was

70 I've got a terrible headache, and it won't go away.
Have you tried _____ some aspirin?
A to take B take C took D taking

71 Boxing is a sport _____ requires a lot of speed and fitness.
A it B that C what D where

72 Jon _____ working on this project for a couple of months so he hasn't made much progress yet.
A is only B has only been C was only D had only been

73 I was wondering _____ I could ask you some questions.
Sure, go ahead.
A what B if C that D how

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74 What clothes should I pack for a trip to Boston?
Well, it depends _____ the time of year that you go.
A on B with C up D to

75 I've finished this salad and I'm still hungry. I _____ ordered something more filling.
A must have B would have C should have D may have

76 Do you ever ask your neighbours to do favours _____ you?
A for B to C with D about

77 Some married couples seem to get more _____ over time.
A alike B same C like D equal

78 I don't know how much this card costs. The price label's _____ off.
A gone B taken C done D come

79 Ben got the job because he _____ a very good impression at his interview.
A made B did C put D took

80 Salsa music always _____ me of my trip to Cuba.
A remembers B realises C recognises D reminds

81 I _____ to be picking Tom up at the station but I've lost my keys.
A am supposed B am requested C am intended D am obliged

82 How about going to *Colours* nightclub?
There's no _____ I'm going there. It's awful!
A hope B way C time D opportunity

83 By the age of 18, I _____ not to go to university.
A had decided B decided C have decided D was deciding

84 I'm afraid your car _____ repaired before next week.
A hasn't been B wasn't C wouldn't be D can't be

85 The amount of organically grown food on sale has _____ enormously in recent years.
A raised B lifted C increased D built

86 Can you believe it? A woman has been _____ for hacking into the computer of her online virtual husband.
A accused B suspended C arrested D suspected

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87 You may borrow my laptop _____ you promise to look after it.

A unless B in case C as long as D although

88 It's a huge painting. It _____ taken ages to complete.

A must have B can't have C should have D won't have

89 Pierre tends to put _____ dealing with problems, rather than dealing with them immediately.

A down B off C over D away

90 If the taxi hadn't stopped for us, we _____ standing in the rain.

A were still B would still be C are still D will still be

91 My mother's Italian, so _____ the language has been quite easy for me.

A to learn B learn C having learned D learning

92 _____ I had the talent, I still wouldn't want to be a movie star.

A In case B Even if C Provided that D However much

93 The factory workers threatened _____ on strike if they didn't get a pay rise.

A going B to go C that they go D to have gone

94 I was about to go to sleep when it _____ to me where the missing keys might be.

A remembered B happened C appeared D occurred

95 There's going to be a new department at work. They've asked me to _____ it up.

A take B set C put D bring

96 If the film is a _____ success, the director will get most of the credit.

A big B high C large D good

97 By the end of today's seminar I will _____ to each of you individually.

A speak B have spoken C be speaking D have been speaking

98 This is a photo of my little sister _____ ice cream on the beach.

A eat B eating C was eating D having eaten

99 Our students take their responsibilities very _____ .

A considerably B thoroughly C seriously D strongly

100 Pia was _____ delighted with the birthday present.

A very B completely C fairly D absolutely

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101 People were amazed that the burglary took place in _____ daylight.

A wide B broad C large D open

102 She invested a lot of time _____ researching the most appropriate university course.

A to B for C with D in

103 The police claimed that they acted in self- _____ .

A interest B confidence C defence D discipline

104 I _____ remember putting my briefcase down on that shelf.

A deeply B entirely C clearly D strongly

105 He turned _____ to be considerably older than I had imagined.

A over B up C out D round

106 The windows in this house are in urgent _____ of replacement.

A need B help C want D demand

107 Speed cameras _____ shown to reduce accidents.

A have B were being C have been D are being

108 Life is a _____ deal easier for immigrants who can speak the local language.

A far B huge C big D great

109 The experiment _____ testing people's responses before and after drinking coffee.

A contained B incorporated C involved D consisted

110 We may be a bit late. We're _____ in a traffic jam.

A buried B stuck C blocked D surrounded

111 Having _____ his driving test several times, Paul finally passed at the fourth attempt.

A taken B made C had D attended

112 Gospel music has been a major influence _____ other musical styles, especially soul.

A with B to C about D on

113 Maintaining an accurate balance sheet is essential, _____ business you're in.

A however B wherever C whatever D whenever

114 It's _____ likely that this novel will win a literary prize.

A totally B deeply C strongly D highly

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115 It's no _____ for me to get Brad's phone number – I'll be seeing him tonight.

A point B wonder C secret D problem

116 I'd lived in Australia, so I was used to _____ on the left side of the road.

A driving B drive C having driven D drove

117 I don't think the colours in Julia's outfit _____ together.

A fit B suit C match D go

118 Very rarely _____ here in July.

A it rains B does it rain C is it raining D it is raining

119 I prefer to buy CDs _____ download music from my computer.

A in contrast to B as opposed to C rather than D in comparison to

120 The number of turtles on the island _____ by 70% over the last decade.

A has declined B has been declining C has been declined D is declining

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English Unlimited Placement test

Oral test question banks

Introductory questions
What's your name? How do you spell your surname?
Where are you from?
Did you learn English at school? For how many years?

1 Starter

A1

	Question	*Goals (with coursebook unit)*
1	What do you do? Do you work or are you a student?	Say where you work (2)
2	Tell me about your family.	Talk about families (2)
3	What do you do in your free time? (Do you play football or any sports?)	Say how you spend your time (4)
4	What do you do every day? What time do you get up / start work?	Talk about your daily routine (6)
5	Tell me about the town where you live.	Talk about a place you know (7)

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2 Elementary

A2

	Question	*Goals (with coursebook unit)*
6	Tell me about something you can do well. (Can you swim? Can you cook?)	Say what you can do (1)
7	How often do you usually see your friends? (What do you do together?)	Say what you do in your free time (3)
8	Where do you live? Tell me about your home.	Talk about homes (5)
9	What are you going to do at the weekend?	Talk about hopes and plans (14)
10	Have you been to an English-speaking country? Tell me about your visit. (OR Tell me about an interesting place you have been to.)	Talk about trips and past events (4) Talk about experiences (13)

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3 Pre-intermediate		B1
	Question	*Goals (with coursebook unit)*
11	Tell me about something that you did with your friends/family recently. Why did you enjoy it?	Describe past events (4)
12	Tell me about the weather in your country. Which is your favourite season and why do you like it?	Talk about weather (6) Give opinions (3)
13	Imagine that I am a visitor to your country. What advice would you give me?	Give advice (5) Make recommendations (7)
14	Can you tell me about an object that is special for you? Why is it special?	Talk about possessions (8)
15	Where do you live – in a house or an apartment? What's it like?	Talk about homes and housing (11)

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4 Intermediate		B1 to B2
	Question	*Goals (with coursebook unit)*
16	What sort of television programmes do you like?	Talk about TV and radio (1) Express preferences (1)
17	How do you keep in touch with your friends and family (by phone/email)? How do you think communication might change in the future?	Talk about methods of communication (2) Speculate about the future (2)
18	Tell me about the last film you saw at the cinema (or the last book you read). Would you recommend it?	Describe a book [or film] (1) Make recommendations (1)
19	Think about an interesting person you have met. What is he/she like?	Describe personality (7)
20	Have you ever been on a journey where something went wrong?	Talk about unexpected travel situations (8) Talk about something that went wrong (5)

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5 Upper Intermediate		B2
	Question	*Goals (with coursebook unit)*
21	Tell me about something you are good at.	Talk about things you're good at (1)
22	Can you tell me about a famous landmark/person in your country? What do you know about it/them?	Talk about landmarks where you live (4) Talk about well-known people where you live (4)
23	What do you use the internet for? Do you think it will ever replace books and newspapers? Why / why not?	Talk about media and the internet (6) Justify your point of view (6)
24	If an English person wanted to learn your language, how should they do this and why?	Make and justify recommendations (12)
25	Where do you see yourself in five years' time?	Talk about the future (14) Describe personal hopes and expectations (14)

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6 Advanced

C1

	Question	*Goals (with coursebook unit)*
26	How has the way you learn English changed over the years?	Describe experiences of language learning (3)
27	Do you think life for children today is easier or harder than it was for your parents / for you?	Make comparisons and talk about changes (4)
28	Describe an advert you have seen. How effective do you think it is?	Talk about advertising and marketing (8)
29	What image do other people have of your country, its food and its people? Do you think it is accurate?	Speculate about image (9)
30	Are you concerned about climate change? What evidence of it is there in your country?	Talk about climate change (11)

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Written Placement Test Key

English Unlimited Placement test

Written test key

	Starter		Elementary		Pre-int.		Intermediate		Upper Int.		Advanced
1	C	21	C	41	C	61	B	81	A	101	B
2	B	22	A	42	C	62	B	82	B	102	D
3	C	23	C	43	D	63	C	83	A	103	C
4	A	24	A	44	B	64	C	84	D	104	C
5	B	25	B	45	A	65	D	85	C	105	C
6	C	26	B	46	D	66	A	86	C	106	A
7	B	27	B	47	A	67	D	87	C	107	C
8	A	28	A	48	B	68	C	88	A	108	D
9	A	29	A	49	C	69	A	89	B	109	C
10	B	30	C	50	D	70	D	90	B	110	B
11	B	31	B	51	C	71	B	91	D	111	A
12	A	32	C	52	B	72	B	92	B	112	D
13	C	33	C	53	C	73	B	93	B	113	C
14	C	34	A	54	A	74	A	94	D	114	D
15	B	35	B	55	D	75	C	95	B	115	D
16	A	36	A	56	A	76	A	96	A	116	A
17	B	37	A	57	C	77	A	97	B	117	D
18	C	38	A	58	C	78	D	98	B	118	B
19	B	39	B	59	B	79	A	99	C	119	C
20	A	40	B	60	A	80	D	100	D	120	A

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APPENDIX C

THE SYNTACTIC COMPLEXITY MEASURES INCORPORATED IN SYNTACTIC COMPLEXITY ANAYZER

Measure	**Code**	**Definition**
Type 1: Length of production unit		
Mean length of clause	MLC	# of words / # of clauses
Mean length of sentence	MLS	# of words / # of sentences
Mean length of T-unit	MLT	# of words / # of T-units
Type 2: Sentence complexity		
Sentence complexity ratio	C/S	# of clauses / # of sentences
Type 3: Subordination		
T-unit complexity ratio	C/T	# of clauses / # of T-units
Complex T-unit ratio	CT/T	# of complex T-units / # of T-units
Dependent clause ratio	DC/C	# of dependent clauses / # of clauses
Dependent clauses per T-unit	DC/T	# of dependent clauses / # of T-units
Type 4: Coordination		
Coordinate phrases per clause	CP/C	# of coordinate phrases / # of clauses
Coordinate phrases per T-unit	CP/T	# of coordinate phrases / # of T-units
Sentence coordination ratio	T/S	# of T-units / # of sentences
Type 5: Particular structures		
Complex nominals per clause	CN/C	# of complex nominals / # of clauses
Complex nominals per T-unit	CN/T	# of complex nominals / # of T-units
Verb phrases per T-unit	VP/T	# of verb phrases / # of T-units

Note: From "Automatic analysis of syntactic complexity in second language writing," by X. Lu, 2010, *International Journal of Corpus Linguistics*, *15*, p. 479. Copyright 2010 by *International Journal of Corpus Linguistics*. Reprinted with kind permission of John Benjamins Publishing Company, Amsterdam/Philadelphia.

APPENDIX D

CONSENT FORM

TEXAS A&M UNIVERSITY HUMAN SUBJECTS PROTECTION PROGRAM

CONSENT FORM

Project Title: **Development of English as a Second Language in the Context of Massively Multiplayer Online Role-Playing Games**

You are invited to take part in a research study being conducted by **Dr. Zohreh Eslami** and **Nasser Jabbari**, researchers from Texas A&M University. The information in this form is provided to help you decide whether or not to take part. If you decide to take part in the study, you will be asked to sign this consent form. If you decide you do not want to participate, there will be no penalty to you, and you will not lose any benefits you normally would have.

Why Is This Study Being Done?
The purpose of the current research project is to study the quality and the quantity of the participants' verbal interactions (text chat logs) in the context of a massively multiplayer online role-playing game—that is World of Warcraft (*WoW*).

Why Am I Being Asked To Be In This Study?
You are being asked to be in this study because you are (a) a native English speaker who is an experienced *WoW* player, or (b) a non-native English speaker, who has little or no experience playing *WoW* and live in a non-English speaking country and finally (c) your age range is between 18 and 30 years.

How Many People Will Be Asked To Be In This Study?
Ten to sixteen people will be asked to participate in the current research project.

What Are the Alternatives to being in this study?
The alternative to being in the study is not to participate. You have the right to turn down the invitation to participate. You can choose not to participate in the study.

What Will I Be Asked To Do In This Study?
As a non-native English speaker (NNES), you will be asked to:

- **(a)** Take part in an English language placement test (oral and written) before the study begins
- **(b)** play *WoW* collaboratively for three months (at least 3 hours a week) with other gamers in your group,

(c) use in-game text chat to communicate in English with other gamers in your group,
(d) keep weekly journals in which you will write briefly about your gameplay experience,
(e) take part in an interview at the end of the study.

As a native English speaker, you will be asked to:
(a) play *WoW* collaboratively for three months (at least 3 hours a week) with NNESs in your group,
(b) help NNESs in the gameplay, and
(c) use in-game text chat to communicate in English with NNESs in your group.

Note:
To meet three hours of gameplay in a week, you have two options: (a) play the game for three hours in a single session, or (b) play the game in two or more gaming sessions that add up to at least three hours. In each gaming session, you and other participants in your group will enter the game at the same time and play the game. When the game finishes, you will write a paragraph or two about your experience playing World of Warcraft in English language.

You may be removed from the study by the investigator if you do not manage your schedule properly to participate in the gameplay when other participants are present in the game context.

Will Photos, Video or Audio Recordings Be Made Of Me during the Study?
The audio recording is only for the interviews. The researchers will make an audio recording during the interview so that they can transcribe and analyze it for the purpose of the study. If you do not give permission for the audio recording to be obtained, the interviewer will take notes during the interview. Indicate your decision below by initialing in the space provided.

_____ I give my permission for audio recordings to be made of me during my participation in this research study.

_____ I do not give my permission for audio recordings to be made of me during my participation in this research study.

Are There Any Risks To Me?
The things that you will be doing are no more/greater than risks than you would come across in everyday life. There are no physical, criminal, social, financial, economic and psychological risks. The only risk would be breach of privacy and confidentiality.

Although the researchers have tried to avoid risks, you may feel that some questions/procedures that are asked of you will be stressful or upsetting. You do not have to answer anything you do not want to.

Are There Any Benefits To Me?
By participating in this study as a non-native English speaker, the direct benefits to you are: (a) having fun playing World of Warcraft for three months for free, (b) having the opportunity to interact with a native English speaker and practice your English language skills, and (c) finding out how playing a massively multiplayer online role-playing game can influence your English language knowledge and skills. As a native speaker, the direct benefits to you are: (a) having fun playing *WoW* for three months for free, (b) getting familiar with NNSs' cultures during in-game conversations, and (c) improving your multicultural communication skills.

Will There Be Any Costs To Me?
Aside from your time, there are no costs for taking part in the study.

Will I Be Paid To Be In This Study?
You will be compensated for your time by receiving a $50 Amazon voucher card. This will occur upon the completion of the study (at the end of the 3rd month). No partial compensation will occur if you quit at any point during the course of the study.

Will Information From This Study Be Kept Private?
The records of this study will be kept private. No identifiers linking you to this study will be included in any sort of report that will be published. Research records will be stored securely and only Dr. Zohreh Eslami and Nasser Jabbari will have access to the records.

Information about you will be stored in a locked file cabinet; computer files will be protected with a password.

Information about you and related to this study will be kept confidential to the extent permitted or required by law. People who have access to your information include the Principal Investigator and the protocol director. Representatives of regulatory agencies such as the Office of Human Research Protections (OHRP) and entities such as the Texas A&M University Human Subjects Protection Program may access your records to make sure the study is being run correctly and that information is collected properly.

Who may I Contact for More Information?
You may contact the Principal Investigator, Dr. Zohreh Eslami, an associate professor in Teaching, Learning and Culture department, to tell her about a concern or complaint about this research at +1(979) 845-8384 or zeslami@tamu.edu. You may also contact the protocol director, Nasser Jabbari at +44(7470) 265-256 or nasserjabbari@tamu.edu.

For questions about your rights as a research participant; or if you have questions, complaints, or concerns about the research, you may call the Texas A&M University Human Subjects Protection Program office at (979) 458-4067 or irb@tamu.edu.

What if I Change My Mind About Participating?
This research is voluntary and you have the choice whether or not to be in this research study. You may decide to not begin or to stop participating at any time. If you choose not to be in this study or stop being in the study, there will be no effect on your student status, medical care, employment, evaluation, relationship with Texas A&M University, etc.

STATEMENT OF CONSENT
I agree to be in this study and know that I am not giving up any legal rights by signing this form. The procedures, risks, and benefits have been explained to me, and my questions have been answered. I know that new information about this research study will be provided to me as it becomes available and that the researcher will tell me if I must be removed from the study. I can ask more questions if I want. A copy of this entire consent form will be given to me.

_____ _____
Participant's Signature Date

_____ _____
Printed Name Date

INVESTIGATOR'S AFFIDAVIT:
Either I have or my agent has carefully explained to the participant the nature of the above project. I hereby certify that to the best of my knowledge the person who signed this consent form was informed of the nature, demands, benefits, and risks involved in his/her participation.

_____ _____
Signature of Presenter Date

_____ _____
Printed Name Date

APPENDIX E

RECRUITMENT EMAILS

Subject: Experienced World of Warcraft Players are Needed for a Research Project

Hello,

My name is Nasser Jabbari. I am a graduate student in the College of Education and Human Development (CEHD), Texas A&M University. I am investigating the quality and the quantity of verbal interactions between native and non-native English speakers in the context of World of Warcraft (*WoW*).

I am looking for a number of native English speakers who:

a. are experienced *WoW* players,

b. are between 18 to 30 years old, and

c. can participate in the gameplay for a period of three months (for at least 3 hours a week) for free with non-native English speakers.

You will receive $50 (in the form of Amazon voucher card) upon completion of your participation.

If interested, please reply to my email (nasser.jabbari@gmail.com) for more information.

Thank you for your interest!

Nasser Jabbari, PhD Candidate
Department of Teaching, Learning and Culture (TLAC)
College of Education and Human Development | Texas A&M University

Subject: Non-native English speakers are needed for a research project

Hello,

My name is Nasser Jabbari. I am a graduate student in the College of Education and Human Development (CEHD), Texas A&M University. I am investigating the quality and the quantity of verbal interactions between native and non-native English speakers in the context of World of Warcraft (*WoW*).

I am looking for a number of non-native English speakers who:

a. are at intermediate low and intermediate high level of English language proficiency,
b. have little or no experience playing *WoW*,
c. are between 18 and 30 years old, and
d. can play the game with native English speakers for free for a period of three months (for at least 3 hours a week).

You will receive $50 (in the form of Amazon voucher card or cash) upon completion of your participation.

If interested, please reply to my email (nasser.jabbari@gmail.com) for more information.

Thank you for your interest!

Nasser Jabbari, PhD Candidate
Department of Teaching, Learning and Culture (TLAC)
College of Education and Human Development | Texas A&M University