VIRTUAL REALITY TRAINING: REDUCING SOCIAL DISTANCE ABROAD
AND FACILITATING SPANISH SECOND LANGUAGE ACQUISITION

by

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ABSTRACT

The current study attempts to investigate the potential benefit of using a custom-designed virtual reality experience to reduce the social distance between the students and the speakers of the target language. This virtual reality experience provides opportunities for students to acclimate to the Spanish culture and at the same time practice and consolidate certain aspects of the communicative competence of Spanish in a simulated version of the natural setting. The final goal of this experiment is to reduce the impact of transcultural contact once abroad and facilitate interaction between the learners and the speakers of Spanish.

The participants of this study were undergraduate students of Spanish who took part in a summer study abroad program in Spain. The participants were divided into a control group undergoing traditional pre-study abroad training and an experimental group undergoing a virtual reality experience. The present study used mixed methods research to collect numerical and non-numerical data. The data were collected through interviews, journal entries, questionnaires, and recordings of in-game behaviors. The results of the study showed improvement in the level of adjustment to the foreign language culture for the participants who completed the virtual reality experience. The positive feedback received and the analysis of the language attitudes of the participants while abroad confirmed the effectiveness of the virtual reality training in comparison with traditional training.
### LIST OF ABBREVIATIONS

<table>
<thead>
<tr>
<th>Acronym</th>
<th>Description</th>
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<tbody>
<tr>
<td>ACTFL</td>
<td>American Council on the Teaching of Foreign Languages</td>
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<td>CALL</td>
<td>Computer Assisted Language Learning</td>
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<td>CS</td>
<td>Cultural shock</td>
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<td>FL</td>
<td>Foreign Language</td>
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<td>MALL</td>
<td>Mobile-Assisted Language Learning</td>
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<td>SLA</td>
<td>Second Language Acquisition</td>
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<td>TC</td>
<td>Transcultural contact</td>
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<td>VR</td>
<td>Virtual reality</td>
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ACKNOWLEDGMENTS

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CHAPTER 1: INTRODUCTION

Language acquisition is a complicated and lengthy process and its success depends on more than knowledge of grammar and vocabulary. To succeed “learners must acquire not only the lexis and syntax of this language but also concomitant abilities required to utilize these elements in culturally appropriate ways during communication” (Culhane, 2004, p. 50). A child learning a language at home or in a natural setting usually receives a constant influx of information in the language spoken around him. On the contrary, school-aged children or adults learning a language in a formal context are exposed to a restricted amount of information in the foreign language (FL), and in most cases their interactions in the FL are limited to the ones they have with their teachers and their classmates. The limited amount of interactions in the FL combined with the limited exposure to the FL might restrict the development of pragmatic and cultural aspects in a formal classroom. In formal settings, the communicative teaching approach and its push toward authentic communication inside the classroom have partially addressed this problem (Kasper & Schmidt, 1996). This approach addresses this problem by using authentic material, focusing on interaction between the students, and by promoting the use of the target language in the classroom.

To improve their competence in the previously mentioned aspects and their overall language proficiency, some language learners have traditionally decided to spend an educational period abroad (Holtbrügge & Engelhard, 2016). However, despite the increase in the number of U.S. students who decide to study abroad each year, the length of time spent abroad has decreased dramatically (Open Doors 1997, 2007, 2015). The reduction of time spent abroad is
directly impacting the amount of time the students can immerse themselves in the culture of the host country. Unfortunately, this reduction of time spent abroad has not pushed universities and study abroad programs to create predeparture training to mitigate the potential negative impact of transcultural contact (TC) between the students and the host country. This study defines TC as the effects of proactive cross-cultural contact between learners and native speakers of Spanish. The immersion in a new environment might have a negative impact on the students by creating isolation from the host culture so that interaction is reduced to a minimum. Therefore, the impact of the TC might create a social barrier that limits the social and psychological integration with the way of life and with the culture of the host country. Integration, according to Schumann (1978, 1986), is necessary to improve the language level of a learner in a natural setting.

Although the validity of Schumann’s model in a natural setting has been supported by evidence from different studies (Doughty & Long, 2003; Schumann, 1978; Stauble, 1977), this model has never been used for language learners in a classroom setting. However, the spread of new technology such as computers and smartphones is changing the way we perceive certain experiences to an extent that Schumann’s model might work in a classroom. These technologies can be used to simulate the natural settings and to obtain a deep level of immersion that permits the students to perceive the simulated world as if it were real. Virtual reality (VR) experiences are pushing the level of immersion to a new limit.

VR headsets, which until recently were relegated to sci-fi novels, movies, and a few hypertechnological labs around the world, became commercially available in 2016. These headsets, which can be connected to a computer or a smartphone, allow users to experience a simulated world from a first-person perspective using glasses and a series of motion sensors, creating a virtual experience that tricks the brain into believing the simulation is real.
Research Questions

The current study uses a custom-designed VR experience that reproduces the first part of a trip from the United States to Madrid, Spain. During this simulation, the students can walk and simulate authentic interaction with people from Spain. The goal of this VR experience is to let students immerse themselves in a natural environment without leaving the classroom. Inside this experience, the students can practice and reinforce their performance regarding certain communicative aspects of the Spanish language, such as the use of tú and usted (informal and formal second-person singular, respectively) and various pragmatic abilities used in interpersonal communication (e.g., apologizing, requesting information, greetings) that they have previously learned in the Spanish classroom. Moreover, the VR simulation allows students to get used to being in a country that is not their own and to being surrounded by speakers of a different language. This experience was designed to jumpstart the adjustment to the FL culture during the Pre-Study-Abroad Training phase with the objective of facilitating interactions once abroad.

The following key research questions guided the present study:

Research Question 1. How does the level of presence experienced during a custom-designed VR experience translate into success in the training?

Research Question 2. How does a VR experience compare to traditional training received by the students before studying abroad?

Research Question 3. How does a custom-designed VR experience impact the language abilities of intermediate and advanced students of Spanish once they are abroad?

Specifically, this study is concerned with how allowing the students to immerse themselves in a simulated experience, whereby they walk and interact with people in a country where the FL is spoken, could potentially have a positive impact on their FL acquisition.
Definition of Terms

**Virtual reality.** Virtual reality “is an artificial environment that is created with software and presented to the user in such a way that the user suspends belief and accepts it as a real environment” (Virtual Reality, n.d.). Virtual reality places the user inside these environments so that the user can feel immersed and interact with the artificial objects inside it. The user experiences these artificial environments with as many senses as possible (e.g., sight, hearing). The current study defines virtual reality as an immersion experience inside a simulated environment experienced through a headset that stimulates the participants’ senses of hearing and sight. Users experience the artificial environment in first person and have agency, therefore they decide how and when to interact with the objects and characters they encounter. The simulated environments used in this study consist of a 3D reproduction of an airplane, a small part of the international terminal of the Adolfo Suárez airport in Madrid, and a street in Madrid.

To clarify, augmented reality and mixed reality are two other types of virtual experiences that are often confused with VR. Mixed reality, which can also be experienced using a VR headset, consists of a 360° video that fully immerses users in the experience, but it does not allow them to interact with what they are seeing. Users of a mixed-reality experience are mere spectators of the 360° video. In contrast, augmented reality could be defined as a VR “on steroids” because it adds a simulated layer of objects and/or interaction with the real world. Both mixed reality and augmented reality can be experienced with a VR headset or on any other digital screen, such as a computer or a phone.

**Culture(s).** The definition of culture has evolved over time to reflect the changing society. Reisinger and Turner (2012) defined culture as, “a complex multidimensional phenomenon” (p. 4) for which different definitions have been proposed over the years. Williams
(1976) defines culture as “one of the two or three most complicated words in the English Language” (p. 87). In the past, the consensus of anthropologists and sociologists was “that human culture is acquired or created by man as a member of society and that it is communicated largely by language” (Bidney, 1944, p. 30).

A good starting point is the definition proposed by Tylor (1924), according to whom culture is a “complex whole which includes knowledge, beliefs, art, morals, law, customs, and any other capabilities and habits acquired by man as a member of society” (p. 1), although the definition requires necessary revision due to the changes observed throughout the years. Tylor used the word culture to describe a civilization and the uniformity between its members. It is evident that this notion of culture does not stand the test of time. In Kramsch’s (2014) words, “The link between one national language and one national culture has been significantly weakened as people belong to different cultures and change cultures many times over the course of their lifetimes. National cultures themselves have become hybrid and fragmented” (p. 303). Although it is possible to observe a shift from a country-based culture toward a global culture, a different distinction is necessary to theorize culture and its role in language acquisition.

It is easy to wrongly generalize cultures and divide them into two distinct types of culture: one that goes beyond the national borders and can spread everywhere (e.g., the spread of certain phenomena online such as Gangnam Style from South Korea, a song that received more than 3 billion views on YouTube ), and another one that is more local and limited to specific groups of people or areas. These two types of culture overlap and mix with one another. The distinction between uppercase culture and lowercase culture proposed in the past is very stereotypical and does not account for the constant evolution of cultures, the multiple identities
of the speakers, and the effects of technology that have changed and continue to change the way people interact and see the world.

The current multinational world comprises a multitude of cultures. According to Kumaravadivelu, “cultures are not an island unto themselves … they are all interconnected” (2004, p. 18). In his book, Kumaravadivelu described the impossibility of generalizing and attributing a single culture to a country. Dubreil agreed that “the national paradigm is obsolete” (2009, p. 3). Dubreil saw this phenomenon as a “dynamic equilibrium between two (or more) cultures” (2009, p. 3), for which he preferred the word “transcultural” to highlight the constant movement between cultures. Kramsch (2011) and other scholars (Corbett, 2003; Guilherme, 2002) described the connection between cultures and their fluidity in the current world with the term *intercultural*.

Another important definition of *culture* to keep in mind when discussing this topic is from Nieto (1999). She described culture as a complex and intricate phenomenon that comprises three essential aspects: the product, which stands for the cultural artifact, the process how the product is created and transformed; and the agent, in other words, the person or group of people responsible for creating and transforming the product. Nieto recognized the central role of people as individuals and as a collective to create, transform, and share culture throughout social interactions. In a like manner, patterns of social interactions also hold a central role in the cultural framework of the National Standards for Foreign Language Teaching referred to as the 3 *Ps* (Cutshall, 2012). The 3 *Ps* framework presents three components of culture: products, perspectives, and practices. The first component, products, includes the tangible and intangible cultural artifacts. The second component, perspectives, portrays the culture view of the world.
The last component, practices, constitutes the pattern of social interactions and behaviors accepted by a culture.

In language education, culture should no longer be associated with just teaching facts about a specific country, but rather it should be viewed as a dynamic concept that changes and evolves diachronically and differs based on the speakers and the situations in which a language is spoken. The cultures of a language should be considered as a set of language skills, social constructs, and mindsets needed to be able to understand and communicate in the target language. At the same time, teachers should help students understand the dynamism of this concept and the multiple identities of the speakers and learners of a language. They should guide learners of a language to develop the necessary competences to understand regional varieties of the lexicon, pragmatic uses of the languages, and multilingual communication, and to develop critical thinking to notice, compare, explore, and acquire the multitude of cultures of the language they are studying.

Chapter Overview

In this overview, I describe the remaining chapters. Chapter 2 starts with an introduction to the study abroad phenomenon in the United States. This section is followed by a review of the concept of transcultural contact (TC) and the importance of the acculturation model when studying abroad. Next, a brief history of second language acquisition (SLA) and an overview of some of learners’ individual differences that might affect language acquisition are discussed. The last section of Chapter 2 provides an overview of the current research involving digital gaming and VR.

Chapter 3 outlines data collection and analysis procedures used in the present research. Chapter 4 explores the data gathered during this study. Chapter 4 has three main sections, each
dedicated to answering one research question. Chapter 5 provides a discussion of the results illustrated in Chapter 4, and some pedagogical implications. The last chapter includes recommendations for future research and VR training development, the limitations, and conclusion of this study.
CHAPTER 2: LITERATURE REVIEW

The current chapter presents an overview of the literature that influenced and informed the design of this dissertation. It begins with a section providing an overview of the study abroad phenomenon and research with a specific focus on U.S. students. The next section discusses the effects of the contact between learners and native speakers of a FL while abroad. The following section continues with a brief historical background on the learning of foreign languages, a description of sociocultural theory, and the role of learners’ individual differences in SLA. The next section provides a definition of communicative competence in interpersonal communication. The chapter concludes with a description of the role of VR and digital gaming in education.

Study Abroad

Every year more than 300,000 students from the United States decide to study abroad for various educational reasons (Open Doors, 2017). Additionally, more than 10% of U.S. students studied abroad during their undergraduate program in the academic year 2015/2016 (Open Doors, 2017). One of the main reasons behind this choice is to improve their language skills (Holtbrügge & Engelhard, 2016). However, coming back home with improved language proficiency does not happen in the same way for all students. Numerous factors such as length of time spent abroad, personal motivation, and social and cultural distance between the students and the speakers of the host country might affect language development during a period abroad. All these factors can be related to the amount of social interaction with speakers of the FL that the
students get while abroad. Another important factor to consider as possibly limiting language development is the impact of transcultural contact (TC) on interaction.

Dwyer (2004) observed that long-term study abroad “has more significant and enduring impact on students” (p. 161) than shorter periods. However, the length of time spent abroad by U.S. students has been consistently decreasing (Figure 1). According to the data from the Institute of International Education (Open Doors, 2017), up until before the academic year of 2004/2005 most U.S. students studied abroad for a mid- or long-term period, whereas the students preferring a short-term option comprised less than 30%. In contrast, during the academic year 2013/2014, over 60% of students preferred a short-term program, sojourning abroad for less than 8 weeks (Open Doors, 2015).

![Figure 1. Duration of study abroad stays of U.S. students over time (Open Doors, 2017).](image)

The reduction of time spent abroad by U.S. students reduces the amount of time they can adapt to the culture of the host country and fully immerse themselves in the new context. This reduction might have a negative impact on the time spent interacting with speakers of the FL and
hinder the language acquisition process while abroad, especially regarding cultural aspects and communicative competence.

Numerous studies have shown the importance of social interaction with the speakers of the FL for the development of pragmatic competence comparable to that of a native speaker (Cohen & Shively, 2007; Felix-Brasdefer, 2004; Murillo Medrano, 2004). In her overview of pragmatic acquisition in second language Spanish, Shively (2013) affirmed that “developing pragmatic competence in Spanish is often a difficult task for L2 learners, but pragmatic abilities can be acquired through exposure to Spanish in uninstructed settings as well as through pedagogical intervention in instructed settings” (p. 345). Shively also pointed out the importance of Vygotskian sociocultural theory and studies using emerging new technologies to further understand pragmatic acquisition in Spanish. New technologies pointed out by numerous recent articles are playing an increasingly central role in study abroad. For example, Marijuan and Sainz (2017) observed how new technology, such as eye-tracking, online surveys, and e-journals, has been used by study abroad research to investigate students’ motivation, identity, and intercultural competence.

New technology is not always seen as a positive tool. Dewey (2017) reported on the negative effects that technology might have for immersion during a sojourn abroad. Dewey clarified that the use of social networks might reduce immersion in the FL by increasing the number of interactions students can have with speakers of their native language back home.

To put it briefly, instructions received inside a formal classroom are not sufficient, as pointed out by Murillo Medrano (2004), to develop a pragmatic competence like that of a native speaker of the FL. At the same time, study abroad periods are becoming shorter and shorter. Thus, there is a need to prepare the student as much as possible before the study abroad period to
maximize the impact of sojourns in the development of the FL. Training should include reinforcing language abilities involved in interpersonal communication and cultural aspects of the FL. Any extra training could be beneficial during the sojourns abroad to facilitate interaction.

Recent growing academic interest around study abroad and language acquisition has resulted in the publication of a special issue of *System* in 2017 and the creation of a new journal in 2016 called *Research in Second Language Acquisition and International Education*. Still, there is a lack of research investigating the preparation and training received by students before they study abroad. In fact, neither the special issue of *System* dedicated to study abroad nor any of the five published issues of *Research in Second Language Acquisition and International Education* include an article dedicated to predeparture training.

On the other hand, recent research observing study abroad from a psychological standpoint shows the advantages of taking part in predeparture training (S. B. Goldstein, 2017) to develop intercultural adaptability (D. L. Goldstein & Smith, 1999). Bennett (2008) added that developing intercultural competence requires specific training that guides the students during contact with the culture of the host country. Intercultural competence can be described as “a complex, non-linear process built from an accumulation of cultural knowledge, practices and social encounters experienced within a variety of cultural contexts” (NCSSFL-ACTFL, 2017).

Despite the potential positive impact that predeparture training might have for a successful study abroad experience, most students do not receive enough training before their departure (Berdan, Goodman, & Taylor, 2013). Preparation in most cases does not take place or, as noted by S. B. Goldstein (2017), is relegated to “brief workshops, podcasts, online documents, or student handbooks” (p. 406). In contrast to the lack of predeparture preparation and to confirm the importance of study abroad preparation, S. B. Goldstein (2017) proposed the creation of a
predeparture course that “may be useful in equipping students with the intercultural competencies essential for a successful study abroad experience” (p. 418). Hence, the current study aims to fill this gap by providing an innovative predeparture training that helps the students develop their communicative competence (see Chapter 2, Communicative Competence in Interpersonal Communication) inside an immersive intercultural environment.

**Transcultural Contact and the Acculturation Model**

**Redefining culture shock.** Culture shock (CS) was described for the first time by Oberg as “an occupational disease of people who have been suddenly transplanted abroad” (1954, p. 1). The CS results from the inability to recognize familiar signs and symbols of social interaction (Oberg, 1954). These signs and symbols are necessary for the success of the communicative process and are specific to the language and the culture of a specific area: “These cues which may be words, gestures, facial expressions, customs, or norms are acquired by all of us in the course of growing up and are as much a part of our culture as the language we speak or the beliefs we accept” (1954 p. 1). Culture shock can happen when a person must face unexpected situations in a new environment (Banjong, Wuraola, & Biaku, 2016). Therefore, an apparently simple interaction such as meeting a new person in a different culture can cause CS, which results in a feeling of frustration and anxiety (Oberg, 1954). In the past, the negative impact of contact between immigrants and the culture of the hosting country has been diagnosed as CS and as cause of health problems in immigrants.

However, when talking about students traveling abroad, it would be inaccurate to talk about CS. Twenty-first century students are living in a transnational world, and it is unlikely that they would experience what one could label a shock when traveling abroad. The next few
paragraphs provide a brief description of previous research regarding CS, intercultural contact, and how the current study moves away from the term CS in favor of *transcultural contact*.

Based on the previous research done by Oberg (1954), Taft (1977) identified six aspects typical of CS that can help one understand how this phenomenon may negatively affect a person while living abroad (as cited in Mumford, 1998, p.149).

1. Strain due to the effort required to make necessary psychological adaptations;
2. A sense of loss and feelings of deprivation regarding friends, status, profession, and possessions;
3. Rejection by and/or rejection of members of the new culture;
4. Confusion in role, role expectations, values, feelings, and self-identity;
5. Surprise, anxiety, even disgust, and indignation after becoming aware of cultural differences;
6. Feelings of impotence due to not being able to cope with the new environment.

Despite what Taft (1977) claimed, CS manifests in different ways, with both positive and negative implications. Attempting to separate the different phases, Oberg (1960) proposed four stages of CS, which still receive broad academic consensus (Kohls, 1984; Mitchell & Myles, 2010; Winkelman, 1994), even if the labels might be slightly different from Oberg’s (1960) original ones. Winkelman (1994) proposed the following stages:

1. the honeymoon or tourist phase;
2. the crises or CS phase;
3. the adjustment, reorientation, and gradual recovery phase; and
4. the adaptation, resolution, or acculturation phase.
These stages are cyclical and can occur multiple times while sojourning abroad, until a person “may become effectively bicultural, and then the adaptation phase is a permanent stage” (Winkelman, 1994, p. 122).

The first stage of CS occurs during the first days or weeks of the sojourn abroad. During this stage, the person experiences a short period of euphoria and excitement about the new culture and sees everything in a positive way. As time passes, the honeymoon stage fades away, and the crises phase begins. This phase matches the typical description of CS: Cultural differences start to appear and can be seen negatively, causing the FL to become an insurmountable barrier. This causes the appearance of some of the typical aspects of CS mentioned previously and identified by Taft (1977). The discomfort experienced during this stage increases the desire to return home. It is important to point out that “the crises phase may [also] emerge immediately upon arrival” (Winkelman, 1994, p. 122). To overcome the difficulties encountered in the second stage, the sojourner starts addressing problems and sociocultural differences with a more positive attitude. As pointed out by Winkelman, “adjustment is slow” (p. 122) and involves various phases of crises and readjustments. Different people will achieve different levels of adjustment, some will gradually adjust, whereas others may isolate themselves from the host culture. Some never adjust and therefore return home. The last stage, introduced by Oberg (1960), coincides with the adaptation to the new culture and with “a development of a bicultural identity” (Winkelman, 1994, p. 122).

The phases previously listed fail to describe two other stages that coincide with the predeparture and the return home period. These phases described by Mitchell and Myles (2010) consist of a series of ups and downs between moods before going abroad and a sort of repetition of the CS cycle once the sojourners return home. In this case, a first phase of excitement is
followed by missing the host culture period and usually ends with a re-adaptation to the native culture phase.

As shown in many studies, factors “such as individual personality characteristics, demographic factors, and organizational support” influence CS (Rajasekar & Renand, 2013, p. 145). From these factors, it is possible to deduce that CS is a phenomenon that can be experienced in different ways depending on the personality of the individual; however at the same time, it is strongly dependent on the culture of the native country and can be reduced with better support before and during the period abroad. Saylag (2014) suggested that “three factors have consistently emerged as leading contributors to adjustment: knowledge of host and home culture, ethnocentrism, and language proficiency” (p. 534).

Current research has shown how people moving to a different country are not experiencing CS anymore, instead they are “seen as proactively responding to and resolving problems stemming from change, rather than being passive victims of trauma stemming from a noxious event” (Zhou, Jindal-Shape, Topping, & Todman, 2008, p. 65). Learners going abroad go through a period of adjustment to the new context, and it is essential to prepare them for this transition. Admittedly, describing this phenomenon requires a shift in terminology. There is the need to move away from passive CS to a proactive cross-cultural contact that involves cultural learning, stress and coping adaptation, and a restructuring of the social identities of the students sojourning abroad. Due to new technology, this contact can start long before the students travel abroad. In view of the above discussion, it is more accurate to use the term *transcultural contact* (TC) rather than CS and this is in fact the line that this study follows. The name was inspired by the definition of culture proposed by Dubreil (2009). TC takes the hybrid nature of the current world into account, as pointed out by Welsch, “cultures todays are in general characterized by
hybridization” (1999, p. 196). In other words, culture cannot be considered as something unique of a single country (see Chapter 2, section on Culture) but as a hybrid mix in constant evolution, which is caused by the fact that cultures are all interconnected and that every culture takes pieces from other cultures.

In conclusion, predeparture training that lets the sojourners experience and practice the host culture and language is vital to facilitate the transcultural transition of the participants. This training should help the sojourners become familiar with the host culture’s ways of communicating (Ferraro, 2006), by focusing on the countless interaction and communication differences, such as the distance between the speakers during a conversation, politeness strategies, and the different degrees of formality of a given context.

Measuring transcultural contact. To study the contact between the students and the hosting country culture, it is essential to have a way to verify the extent to which someone is experiencing TC to be able to compare the different participants within one study, and with other studies. The current research looked at previous instruments created to measure CS with the objective of finding one that could be adapted to measure TC. The following provides an overview of the different approaches used in the past.

Rajasekar and Renand (2013) categorized the CS experienced by their study participants in 15 different ways: communication, dress, ethics, individualism/collectivism, food, language, structure, perception, power distance, religion, rules, time, orientation, traditions, and weather. The data for their study originated during a series of open-ended interview questions. Although interesting, this measurement is not optimal for comparing how much TC affects an individual.

Another way that could be used to classify the TC phenomenon is the one proposed by Graig (1979), in which the sojourners are divided into three different categories based on the way
they interact with the host culture: encapsulators, cosmopolitans, and absconders. The encapsulator lives in a sort of isolation from the host culture, where interaction with the host culture and language is reduced to a minimum, limiting contact to a group of people who share the home culture and language. The cosmopolitans instead adapt to new cultures without avoiding contact with their own. The absconders, the last group Graig (1979) mentioned, refuse any contact with their native culture and fully immerse themselves in the new lifestyle. Overall, Graig’s method was also discarded because, as with the other ones mentioned previously, it does not provide a simple and easy way to compare how much each individual in a specific group experiences this phenomenon.

In this study, a quantitative instrument based on an adaptation of the Mumford test for CS (1998) is used to measure TC. Mumford (1998), aiming to measure CS quantitatively, proposed and tested a method involving a simple questionnaire. The questionnaire divides 12 questions into two sets: (a) The first set includes seven “core” questions directly derived from the previously mentioned six typical aspects proposed by Taft (1977), and (b) a second set of five questions focuses on the interpersonal situations that might occur and the stress these could potentially generate. Every question allows three choices, which receive a score of 2, 1, and 0, respectively. The TC questionnaire allowed the participants to score between 0 and 24, with 0 being the lowest level of TC possible, and 24 the highest level of adaptation to a different culture. Many other studies (Saylag, 2014; Tartakovsky, 2007) have used the Mumford questionnaire (1998) and could potentially serve as a point of comparison of the results. The current study uses a slightly modified version of the Mumford questionnaire (Appendix A) to assign a value to the adaptation level of the participants and how they dealt with TC while abroad. The questionnaire was adapted in a way that allowed participants to complete it, whether
they had been abroad before or not, by referring to broader cultural adaptation (e.g. moving to a new city). This test was chosen because it provides a numerical value to attribute to each participant of the study, allowing for a direct comparison between individuals and groups.

**Transcultural contact and its impact on second language acquisition: The acculturation model.** Anyone sojourning abroad (e.g., immigrants, students, tourists) can experience TC, which can negatively impact their experience. Sometimes it creates psychological consequences that may lead to the temporary rejection of the host culture and, in the worst cases, an early return home. Furthermore, this phenomenon might have an impact on language acquisition, and a reduction of the negative effects of TC might facilitate the learning process. Numerous theories of SLA published in the last few decades mention this impact. Worth mentioning are the acculturation model proposed by Schumann (1978, 1986) and the intercultural interaction model proposed by Culhane (2004).

Schumann (1986) argued about SLA that “an aspect of the acculturation and the degree to which a learner acculturates to the FL community will control the degree to which he acquires the second language” (p. 384). Essentially, he claimed that when living abroad, the more people socially and psychologically integrate into the way of life and the culture of the host country, the more they will improve their language level. Schumann based his model on two groups of variables: one for social factors, and one for psychological factors. These variables determine the distance between the learner and the FL community, hence the reduction of this distance should correspond with an improvement in the FL level.

Schumann proposed eight variables to describe the social interaction between the FL learners and the FL community (Schumann, 1978, 1986). These social factors, according to Schumann (1986), “can either promote or inhibit contact between the two groups” (p. 380). The
following social factors list, an adaptation of the one presented by Schumann (1978, 1986),
focuses on the social factors related to students and does not consider immigrants or other types
of sojourners because they are not under study in the current research.

1. Social dominance patterns: If the learners perceive themselves as belonging to a group
that is politically, culturally, technically, or economically dominant to the FL community,
they will tend not to learn the FL. The same is true if the learners perceive themselves as
belonging to a subordinate group, because there is social distance between the learners
and the FL community.

2. Integration strategies: Students living abroad tend to follow three patterns of integration,
which are assimilation, preservation, and adaptation: (a) Assimilation occurs when they
adopt the values, culture, and lifestyle of the host country by losing their own. In this
case, the social distance between the two groups is reduced, and active contact time is
maximized, therefore promoting SLA; (b) Preservation of their own culture results in a
refusal of the values, culture, and lifestyle of the host country, which in turn creates social
distance between the two groups and reduces the social interaction; (c) Adaptation is the
last integration strategy proposed by Schumann (1986), and it can be considered a middle
ground between the previous two. While assuming an adaptation strategy, the students
will accept the values, culture, and lifestyle of the host group without rejecting their own.
This integration strategy allows various degrees of social contact; therefore, one should
expect various degrees of learning.

3. Enclosure: This social factor is based on the physical locations in the host country used
by the students. This enclosure could be schools, restaurants, churches, bars, and so on. If
the students frequent the same locations as the host group, then the enclosure could be considered low, and SLA should be facilitated.

4. Cohesiveness: The presence of cohesiveness between the students will reduce the need to seek interaction with people outside of the group; therefore, the learning process will be slowed down.

5. Size: A large group of students has more possibilities of intragroup interaction, and therefore the outside social contact is reduced, as well as language learning.

6. Culture similarity: If the student’s culture is like that of the host group’s, social interaction will be facilitated, as well as language learning.

7. Attitude: A positive attitude of the students toward the people of the host country is likely to facilitate learning. A positive attitude of the FL community should also be considered beneficial for the learning process.

8. The length of study abroad: The longer a student is planning to live in the host country, the more he or she will try to learn the FL.

Although these social variables do not exactly identify the level that can be achieved in the FL, as pointed out by Larsen-Freeman and Long (1991), these variables are a good starting point for analyzing and classifying the degree of socialization with the FL community experienced by the students while abroad. A reduction of the social distance between the students and the FL community should be considered a goal of any study abroad program because it will promote contact and social interaction, which will facilitate SLA. As Culhane (2004) stated, “Positive interaction experiences have been found to assist L2 learners with developing communicative and cultural competence” (p. 55).
A related issue is that the current study considers social distance as the cultural and social separation between the learners and the speakers of the FL as perceived by a learner of the FL. As proposed by Schumann (1978, 1986), social and psychological factors shape the degree of social distance between the learners and the speakers of the FL community. It is important to emphasize that social distance is personal to the learner, and it does not depend exclusively on the language of the learner and/or the FL. That is, two learners of Spanish coming from the same town and with similar backgrounds might perceive a different degree of social distance with the FL while studying abroad.

Aside from the previously presented social factors, Schumann (1986) identified four psychological variables that might affect SLA while abroad, with language and CS being the first two. Although technology has reduced the cultural and social distance between learners and speakers of a FL, it fails to reproduce situations where the FL surrounds and immerses learners. Learners of a FL have access to an incredible amount of information about the FL culture before traveling abroad, via documentaries, the internet, newspapers, and so on. However, for many, contact with the FL for the most part is restricted to classroom language.

Another psychological factor identified by Schumann (1986) is ego-permeability. This variable consists of the students’ ability to open themselves up to the FL culture. The last factor proposed by Schumann is motivation. He used the two motivation tendencies for SLA proposed by Gardner and Lambert (1972) to differentiate the learners. One type of learner can have integrative motivation, which means learners have the goal of learning the FL to become more like the native speakers. Another type of learner may have instrumental motivation, which means they are learning a FL based on the desire to improve themselves or their careers and are not interested in the members of the FL community. Although motivation could be considered an
important push toward language acquisition, the classification presented by Schumann does not provide any indication of achieving better results by being in one motivation group or the other. Schumann (1986) emphasized that “motivational orientation that is associated with proficiency in the second language seems to vary according to the setting” (p. 383). This study recognizes the learners’ motivations as part of the individual differences that might affect SLA. A more detailed review of learners’ individual differences is presented in the current chapter.

**Second Language Acquisition and Sociocultural Theory**

Although interesting, Schumann’s acculturation theory (1986) describes the role of social distance and contact with the FL community only for SLA in a natural setting. Therefore, although the social variables proposed by acculturation theory were used as a tool to describe the study abroad sojourns of the participants of this study, SLA theories in formal settings provide the theoretical background needed for the creation of a tool that aims to facilitate TC while abroad.

**Brief historical background on the learning of foreign languages.** Over the years, numerous theories have been proposed with the goal of describing the mechanism behind SLA and to guide teachers and learners during this process. A brief historical overview of the main theories of SLA is necessary to understand the direction taken by this discipline. In the most recent years, SLA research has been increasingly focused on observing and describing the role of pragmatic aspects and social interactions while learning a language.

Skinner (1957) provided one of the first theoretical frameworks to describe language acquisition, although it was originally intended to refer to verbal behavior in general, not solely to how a language is acquired. According to this behaviorist theory, acquisition takes place because of the interaction between certain stimuli and an organism. Following the same
behaviorist theory, the works of Bloomfield (1933) and Lado (1957) are of equal importance. They described learning a language as a system of habit.

This psychological theory was used by others to lay the foundation for the development of the audio-lingual teaching method, a method which focused on pronunciation and on drills involving oral repetitions of sentences from the FL. The main problem with this method is that the sentences involved in the drills are disconnected from each other and do not constitute part of the communicative discourse. The audio-lingual method, while emphasizing pronunciation, does not facilitate the development of the communicative pragmatic aspects of a language.

A crucial moment in the development of the way we understand language acquisition was the publication of an article criticizing Skinner’s assumptions (Chomsky, 1959). This article and the book, *Aspects of the Theory of Syntax* (Chomsky, 1965), can be considered the basis of modern linguistics. However, Chomsky’s theory of language acquisition explains how a first language is acquired, not a second language. Nevertheless, since its publication, this theory has influenced and shaped the field of SLA. In his theory, Chomsky assumes that the ability to learn a language is innate to the human being. Chomsky (1965) states that “knowledge of grammatical structure cannot arise by application” (p. 57), meaning that the knowledge of grammar is not learned because it is already present in the human brain, and it is activated when learning a first language; this knowledge is universal for all languages and innate to each human.

Taking advantage of the basic concepts of Chomsky's theory and adapting them to SLA, Corder and Selinker began to develop two very similar concepts: transitional competence (Corder, 1967), and interlanguage (Selinker, 1972). These two theories started a debate, still active today, that has inspired various SLA theories and pedagogical methods.
The ideological shift, started first by Chomsky’s theory and followed later by Selinker’s ideas, has resulted in a distinct change in the approach used to teach a second language. Starting in the late 1970s, the grammar translation and the audio-lingual methods lost their acceptance. The communicative language teaching approach slowly replaced these methods. This new approach, still in use today with some improvements and adjustments from its original form, put interaction as the foundation of SLA. With this new approach, learners are encouraged to use the FL as much as possible, without focusing on their mistakes. The goal of this approach is to prepare the learner to have meaningful interactions in the FL via inclusion of authentic materials in the classroom, and learning of useful language skills.

One of the most popular, and at the same time much criticized, SLA theory of the first period of communicative language teaching is the input hypothesis proposed by Krashen (1977). This theory comprises five hypotheses “that attempt to provide the foundation of a theory of SLA” (Krashen, 1985, p. 79). The following is a simplified version of the five hypotheses presented by Krashen (1985):

1. The acquisition-learning hypothesis: This is the famous distinction between

   acquisition, which happens subconsciously, and learning, which is “a conscious process that results in knowing about language” (S. D. Krashen, 1985, p. 79).

2. The natural order hypothesis: Languages are learned in a predictable order that is independent “of the order in which rules are taught in class” (p. 79).

3. The monitor hypothesis: Only subconsciously acquired language can be used in language production, whereas consciously learned language serves only as a monitor for language output.
4. The input hypothesis: Languages are acquired by receiving comprehensible input. Krashen (1985) hypothesized that SLA happens when a learner receives input that is just a little over his own level of competence (i+1). Moreover, speaking results from acquisition, and learners will only progress in their acquisition process when they receive comprehensible input slightly above their competence in the FL.

5. The affective filter hypothesis: A mental block can stop learners from learning, even when they have comprehensible input. Negative emotions, anxiety, and other affective individual differences can block SLA. Krashen argued that “the filter is lowest when the acquirer is so involved in the message that he temporarily forgets he is hearing or reading another language” (1985, p. 82).

Krashen’s theory, despite the criticism received (Gass & Selinker, 1994; McLaughlin, 1978; Munsell & Carr, 1981), can be considered “one of the most ambitious and influential theories in the field of SLA, and one that is probably the most familiar to language instructors” (Van Patten & Williams, 2007, p. 2e5).

In the 1990s, new theories began to emerge based on cognitive perspectives that laid the foundations for the second round of communicatively oriented approaches. These theories have revised some of the criticisms received by Krashen’s theory by eliminating the distinction between acquisition and learning. These new theories permanently separated from first language acquisition theories and based their theoretical frameworks solely on SLA. Among these, the following are worth mentioning: input processing by Van Patten (1996) and the interaction hypothesis (Long, 1996), with the latter being basically an evolution of the input hypothesis (Krashen, 1985) combined with the output hypothesis (Swain, 1985). Van Patten’s model and the
interaction hypothesis, in contrast with Krashen’s, assigns a central role in SLA not only to input, but also to output and interaction (Gass & Mackey, 2007).

**Vygotsky and sociocultural theory.** Most of the theories mentioned previously, albeit valid and fascinating, focus mainly on the learning of the grammatical and conversational aspects of a language in a formal setting, ignoring the mechanism behind acquisition of the language abilities needed to communicate in a natural setting. However, it is possible to identify theories that take the development of those abilities during SLA into account. For example, according to the interaction hypothesis, learning is a consequence of face-to-face interaction, through negotiation of meaning (Long, 1996). Long’s hypothesis, although it represents a step toward a more inclusive language acquisition, described only the acquisition of “vocabulary, morphology, and language-specific syntax” (Long, 1996, p. 414), ignoring other communicative parts of competence such as the pragmatic and cultural aspects of a FL.

A few decades before Long’s hypothesis, Hymes (1972) proposed the idea of communicative competence, in contrast to Chomsky’s (1965) distinction of competence and performance. Hymes’s concept of competence provided a wider definition than that of Chomsky. This new definition includes grammatical as well as pragmatic aspects of linguistic competence. Moreover, Hymes’s (1972) definition goes against the idea of an idealized speaker proposed by Chomsky (1965) and focuses on what is acceptable and appropriate in relation to the context in which the utterance is used. Pragmatics can be defined as an abstract system of unwritten rules that regulates social and cultural interaction in a language to rules that are malleable and change based on social and cultural factors, contexts, and social distance between speakers, just to name a few. While discussing grammar, one may appeal to a binary distinction between grammatical or ungrammatical, whereas pragmatics evaluates whether a sentence is appropriate for the
context in which it occurs. Pragmatics allows us to look at discourse and observe multiple interpretations of meaning based on the intentions of the speakers and how the meaning is received.

Sociocultural theory (Jaramillo, 1996b; Thorne & Lantolf, 2007) is probably the framework that most closely alludes to pragmatic acquisition. This theory is in part inspired by the ideas of Vygotsky, a Russian philosopher from the early 19th century. According to Vygotsky (1993), learning occurs through social and cultural interaction between individuals. These interactions are mediated by cultural artifacts and by artificial concepts. Thus, language is not something entirely abstract inside our brains but is also based in part on artificial aspects. These aspects depend on social and cultural artifacts that are unique and common to each group of speakers.

Thorne and Lantolf (2007) argued that “developmental processes take place through participation in cultural, linguistic, and historically formed settings such as family life and peer group interaction, and in institutional contexts like schooling, organized activities, and workplaces, to name only a few” (p. 201). At that point, they concluded that crucial cognitive abilities develop from human interaction (Thorne & Lantolf, 2007). In conclusion, it is conceivable that SLA is facilitated by learning the FL in a natural environment or in an environment able to simulate, as closely as possible, social interactions that are almost authentic. Other vital contributions to research on pragmatic development during language acquisition are the studies of Kasper and Rose (1999, 2002). Their research concludes that the interaction happening inside an SLA classroom is not sufficient to develop pragmatic competence, because it is “difficult for learners to develop the processing control in utterance comprehension and production required for effective participation in conversation” (Kasper & Rose, 2002, p. 26).
Sociocultural theory provides the most appropriate theoretical background on which to base the current study, which uses an innovative method to provide access to social interaction between the students and native speakers of the FL in a pseudo-authentic environment, without the need for leaving the classroom. A VR experience is an ideal instrument to simulate interactions in social and material environments in an SLA classroom, which can facilitate the acquisition of certain pragmatic and cultural aspects of the FL.

**Learners’ Individual Differences in Second Language Acquisition**

This chapter introduced social variables that might facilitate or slow down SLA. Social variables are not the only factor to affect learning; there are other individual differences that determine the success of a learner. Numerous studies have divided individual differences into three or four main categories (Dörnyei & Skehan, 2003; Ellis, 2004). These categories usually include cognitive, affective, and physiological factors that are specific to each person in addition to the previously mentioned social factors that, in turn, describe the cultural and social relationship of the learners with the FL community.

One of the first and most famous attempts at using individual differences as an indicator of SLA is the work of Carroll and Sapon (1959), who created an aptitude test, still commercially available, designed to predict success in learning a FL. These differences common to all individuals vary by a certain degree (Dörnyei, 2005) and can be used to explain and compare the achievements of a group of learners. Therefore, these factors may help “explain why some learners succeed more than others” (Ellis, 2004, p. 526). To be able to first identify these differences in the students involved in this study and compare them afterward with their achievements, it is essential to provide a simple and easy way to classify them. The following
subsections describe three types of personal differences that might affect SLA: physiological, cognitive, and affective differences.

**Physiological differences.** The first group of differences relates to specific physiological characteristics, especially age and gender. Numerous studies have hypothesized the existence of a critical period after which SLA becomes harder (Johnson & Newport, 1989; Lenneberg, Chomsky, & Marx, 1967). According to this hypothesis, learning a language after a certain age, usually around puberty, results in the impossibility of achieving a native speaker level of proficiency. Criticisms of the critical period hypothesis mostly relate to the inability “to be tested at the scientific level” (Zafar & Meenakshi, 2012, p. 640), and as mentioned by Zafar and Meenakshi, there have been a few cases in which an adult learner of a FL was able to achieve a native speaker level. Despite the criticisms, Dörney and Skehan (2003) reported that there are many studies that have “examined the effects of age on second language acquisition” (p. 600). In a study involving immigrants in the United States, DeKeyser (2000) showed that most immigrants in the study who arrived after the age of 17 failed to achieve a native speaker level of proficiency.

In contrast to the findings on age differences in learners, gender research in SLA in most cases was not able to show any statistically relevant difference. Neither the biological gender nor the socially constructed one is a determining factor of difference in SLA. Although there is a scientific consensus that females learn their L1 at an earlier stage than males do (Larsen-Freeman & Long, 2000), only a few studies have been able to find differences in FL success based on gender in favor of female learners (Zafar & Meenakshi, 2012). However, it is likely that gender might affect the learning process when studying abroad in countries with social restrictions toward some genders, which might cause a lack of interactional opportunities. In these contexts,
a student will not have the same number of social opportunities to interact with the FL community.

To conclude, this study will consider age as a possible influencing factor in SLA success and will leave gender aside, because Spain can be considered a society that allows students to interact with the FL community the same way regardless of their gender. On the contrary, studying abroad in a country that, for example, does not allow women to go out alone or applies other individual gender restrictions might affect the amount of time a student would be able to interact with the FL community.

**Cognitive differences.** The second group of personal differences that might affect SLA includes various cognitive variables such as intelligence, memory, language aptitude, learning style, and learning strategies. Ellis (2004) described intelligence, memory, and language aptitude as the three cognitive abilities involved in SLA. However, intelligence and memory in their traditional description have not been proven to be valid indicators of success in SLA (Sasaki, 1996), unless we look at them as specific language skills related to language aptitude, such as noticing the gap, deep semantic process, input processing strategies, and pattern identification (Dörnyei & Skehan, 2003; Sasaki, 1996). Some of these skills, if not all, could and should be considered as part of the learning strategies that can be acquired during SLA, not only as innate abilities of an individual. These language skills also represent a step forward from the language aptitudes that underpin the previously mentioned language aptitudes test of Carroll and Sapon (1959) to a new way of observing language aptitude.

Another cognitive difference that instructors and learners should take into consideration when teaching or learning a FL is represented by different learning styles. Oxford (2013) pointed out that “language learning styles and strategies are among the main factors that help determine
how—and how well—our students learn a second or foreign language” (p. 1). These styles are usually based on models from other disciplines, and they try to describe the individual’s preferred way of learning a language. The most mainstream method of classifying the learning style is the division based on the perceptual learning channels of the students (Reinert, 1970). This classification includes three styles: Visual, auditory, and kinesthetic/tactile.

1. Visual learners prefer to receive their information by reading them in a book or by seeing them in a PowerPoint, a chart, and so on.

2. Auditory learners prefer learning by listening.

3. Kinesthetic/tactile learners prefer to learn by physically experiencing the situation and will benefit from hands-on learning.

To conclude, even if students differ in their own preferred style, “different styles may be equally valid and advantageous” (Dörnyei & Skehan, 2003, p. 601); therefore, a variety of styles should be included in a learning context. The use of a variety of styles will be beneficial in a learning context in two ways. First, because it will allow learners to use their preferred style and, moreover, as remarked by Ellis (2004) it serves as a way “to help learners to see the advantages of learning styles other than the one they incline to and thereby to become more flexible in the way they learn” (p. 536).

The last group of cognitive differences that this study takes into consideration involves learning strategies. These differences identify the various strategies used by the learners during SLA. These strategies are “influenced directly by learners’ cognition and their explicit beliefs about how best to learn” (Ellis, 2004, p. 544). The most comprehensive and well-accepted study about learning strategies classifies them into three main categories (O’Malley & Chamot, 1990). Cognitive strategies are used to receive and manipulate information with the purpose of learning
a FL, whereas metacognitive strategies are skills used to plan, evaluate, and monitor the information necessary for SLA. The last category presented by O'Malley and Chamot (1990) is the so-called social/affective category, which includes the strategies used to interact with other speakers. In a traditional SLA classroom, the learning process is usually focused more on the developing of cognitive strategies and ignores the development of metacognitive and social/affective strategies. The current study proposes a way to integrate the development of these strategies into a pre-study-abroad classroom through VR.

In conclusion, all these cognitive differences affect SLA to a certain degree. Ellis (2004) observed that “there is now ample evidence that cognitive abilities, as measured in particular by language aptitude tests, can account for a substantial proportion of the variance in achievement scores in L2 learners” (p. 534). However, as Ellis stated, it is hard to identify which ability has a more significant role in a learner’s success.

**Affective differences.** Affective differences are the last set of individual differences considered in this study. The affective factor includes those that relate to the personality traits of an individual, explored from a psychological standpoint. Some of the main affective differences observed in SLA research include the difference between introverts and extroverts, the role of anxiety, risk-taking, and the two factors mentioned by Schumann (1986): motivation and self-confidence, which he calls ego-permeability. Although the impact of affective differences could be minimized inside a language classroom, they more than likely play a critical role in a natural context such as a study abroad period. In the latter case, affective differences might be responsible for reducing interaction with the FL community for some of the participants and facilitating it for others.
Communicative Competence in Interpersonal Communication

Hymes (1972) proposed the concept of communicative competence, which is the knowledge and the ability to use grammatical concepts in various contexts. Communicative competence has various interpretations, among which are Canale and Swain’s (1980) model, Bachman (1990)’s model and its reformulation in Bachman and Palmer (1996), along with the three modes of communication described by the American Council on the Teaching of Foreign Languages (ACTFL). Each of these are discussed in turn below.

Canale and Swain (1980) identified three competencies for their model: grammatical competence, sociolinguistic competence, and strategic competence. Grammatical competence is knowledge of all the grammatical aspects of a language (e.g., phonology, morphology, syntax) and includes the lexicon. Sociocultural competence includes sociocultural and discourse rules. Strategic competence includes verbal and nonverbal communication strategies that facilitate communication in the FL. Canale and Swain identified two types of strategic competence: one that is more related to grammatical competence and used by the FL speakers to overcome a grammatical gap (e.g., paraphrasing a grammatical form), and another related to sociolinguistic competence.

Bachman (1990) proposed a more extensive model of communicative competence, which Bachman and Palmer (1996) later improved on. The latter is based on Bachman’s (1990) model and it describes language ability as the combination of two components: language knowledge and strategic competence. Bachman and Palmer’s model presents certain similarities with Canale and Swain’s (1980), such as strategic competence, but goes into more detail when describing grammatical and sociolinguistic competencies, and groups them under the term language knowledge. Language knowledge is divided into two main components: organizational
knowledge and pragmatic knowledge, in turn divided into four main components (Table 1). The importance of this model comes from the emphasis Bachman and Palmer (1996) put on language use with the goal of accomplishing specific communicative goals based on the context of the communication.

This study recognizes the importance of all components of language knowledge for learning a FL. However, for this study VR training focused on only certain types of knowledge. Specifically, the participants had to show their sociolinguistic knowledge by using the appropriate personal pronoun of address based on the interlocutor and on the context. Additionally, participants demonstrated their language ability by using specific strategies (e.g., asking for directions) to solve a problem.

Table 1

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<th>Components of Language Knowledge</th>
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<th>Pragmatic knowledge</th>
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<td>Vocabulary</td>
<td>Textual knowledge</td>
<td>Sociolinguistic knowledge</td>
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<td>Syntax</td>
<td>Cohesion</td>
<td>Ideational functions</td>
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<td>Phonology</td>
<td>Rhetorical or conversational organization</td>
<td>Manipulative functions</td>
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</table>


In conclusion, the communicative competence that this study examined is all part of the interpersonal communication mode. The ability to communicate effectively in a FL is
determined by success in the three modes of communication: interpersonal, interpretive, and presentational (ACTFL, 2015). This study focuses on the interpersonal mode, where “learners interact and negotiate meaning in spoken, signed, or written conversations to share information, reactions, feelings, and opinions” (ACTFL, 2015). Moreover, ACTFL classifies the ability to speak a FL into two types: performance, which is the ability to use the FL in an instructional setting, and proficiency, which consists of the ability to use the FL in real-world situations (e.g., spontaneous interactions in a manner acceptable and appropriate to native speakers of the FL) (ACTFL, 2012). Given the double nature of the VR training used in this study, in which the students are using the FL in an instructional setting but with various elements of a real-world situation, this study uses the more generic term communicative competence to refer to the participants’ use of Spanish. The following two segments describe specific pragmatic abilities taken into consideration by the current study.

**The use of tú and usted.** In Spain, where the study abroad took place, speakers usually can decide to address someone by using two different second-person singular pronouns: tú and usted. The use of one over the other is influenced by multiple social factors and differs according to the region in which the conversation takes place. There are multiple ways to explain the different use of these pronouns. Brown and Gilman (1960), pioneers in the study of personal pronouns of address in Spanish, described usted as the pronoun of power that denotes social distance between interlocutors. On the other hand, they defined tú as the pronoun used to express solidarity between speakers and that denotes less social distance.

Other scholars have found the definitions proposed by Brown and Gilman (1960) limiting and not inclusive of all the ramifications of this phenomenon. Weyers (2001) noted that there are different politeness strategies and different social norms and traditions among Spanish-speaking
countries regarding personal pronoun use. The use of address forms in Spanish changes according to the norms of the region and the group of speakers observed. Uber (2014) found in her study that the use of *usted* can be characterized as being politer than the use of *tú* and *vos*. According to Fernández (2003), it is possible to observe four different systems regarding the use of personal pronouns in the Spanish-speaking world. The area of Madrid is considered part of the Peninsular norm regarding the use of the pronoun *tú* to express solidarity and intimacy and in familiar contexts, whereas speakers use the pronoun *usted* to express formality, power, and social distance (Fernández, 2003).

One should consider that changes in the use of the personal pronoun of address have been observed not only geographically and based on social factors, but also diachronically (Jaramillo, 1996a). The current study does not seek to determine the sociocultural reasons behind the use of one pronoun over the other, but rather to first observe how the context and the interactions experienced during the VR and then the participants’ sojourn in Spain can affect changes in their preference for pronouns of address. For this reason, it is essential to describe current pronoun use in the region where the participants sojourned. Rossomondo (2002) wrote one of the most recent studies investigating forms of address in the city of Madrid. The participants in her study were 77 residents of Madrid, 30 males and 47 females between the ages of 18 and 65 (Rossomondo, 2002). The results of her study show that gender did not play a role, whereas age was a distinguishing factor: Participants “over the age of 46 both give and receive Ud [*usted*] significantly more often than speakers aged 18 to 45” (p. 126). Additionally, she reported that the participants used *usted* significantly less in Madrid than in the rest of Spain. In addition to age, speakers of Madrid used *usted* more frequently with strangers and “when being addressed by someone of higher and lower status” (Rossomondo, 2002, p. 127).
It should also be noted that the southeastern university in which the current study took place does not have any rules imposing or favoring the use of one pronoun over the others. Moreover, the instructors of Spanish where the study took place come from different linguistic backgrounds. Some of them use and let the students use the pronoun tú, whereas others employ the hierarchical, asymmetrical system of address and require the use of usted. In conclusion, differences in use of the personal second-person singular pronouns was expected to be encountered in the participants.

**Greetings, apologies, expressions of gratitude, and requests for information.** Other pragmatic abilities examined by the current study coincide with the ability of the participants to have meaningful and appropriate interactions in specific situations. The participants of the current study showed the use of these pragmatic abilities during the in-game interactions. Thanks to the simulated VR environment, these interactions occurred as if they were happening in a natural setting abroad. This study observed the use in context by students (i.e. how students demonstrated pragmatic ability) of greetings (e.g., Hi, how are you?), apologies (e.g., Excuse me), expressions of gratitude (e.g., Thank you), and requests for information (e.g., Where is the university?).

**Presence Theory**

So far, this chapter has discussed the literature review of all the aspects that could be related to language, including study abroad, SLA, sociocultural theory, learner’s individual differences in SLA, and communicative competences in interpersonal communication. The following sections provide a literature review of the technology aspects of this dissertation, including presence theory and the role of virtual reality and digital gaming.
The technological leap forward that began in the last decades has completely changed the way we experience the world. Traditional media and then digital technologies have narrowed distances and time between countries, allowing the instantaneous spread of an incredible amount of information that has changed the way we do things. The spread of digital technologies can be observed in any field of work, in education, and in personal life, from simple social interactions that take place via email, messages, or video calls to the training of highly skilled doctors and pilots in VR environments.

These new technologies “replace or augment people’s immediate surroundings by digital content” (Haans & Ijsselsteijn, 2012, p. 211), creating a new way of perceiving things that have not been experienced before. A technology so immersive can push users to start feeling “as if they are physically present in the mediated or simulated environment” (p. 211). Almost 40 years ago, Minsky (1980) was the first to hypothesize and describe this kind of experience and coined the word *telepresence*. Later, Sheridan (1992) distinguished between two kinds of experiences: telepresence and virtual presence. *Telepresence* is used to describe the “sense of being physically present with a virtual object(s) at the remote teleoperator site” (p. 120). *Virtual presence*, in contrast, is described as the “sense of being physically present with visual, auditory or force displays generated by a computer” (p. 120). These two definitions highlighted a substantial distinction between the two. Telepresence is defined as a way of exploiting these technologies to manipulate objects that are not easily accessible; for example, in the case of a complex surgical operation or the control of a drone flying on the other side of the world. In contrast, virtual presence is an experience that immerses the participants in the VR environment to the point of confusing their senses and tricking their brains into making these experiences feel real.
Academics in many fields, as well as private industries and governments, have studied and analyzed this phenomenon (Lombard & Ditton, 1997). Therefore, many definitions of presence have been proposed, each of them with a slightly different name: virtual presence, telepresence, mediated presence, and so on. This study, following the call for a unified term proposed by Lee (2004), uses the word presence to describe this concept. Numerous attempts have been made in the past to conceptualize and categorize presence, such as the aforementioned distinction proposed by Sheridan (1992) or the one by Lombard and Ditton (1997), who proposed six conceptualizations of presence.

Lee (2004) proposed the most recent definition and classification of presence. Lee argued that presence is “a psychological state in which virtual (para-authentic or artificial) objects are experienced as actual objects in either sensory or nonsensory ways” (p. 37). This definition presents a first distinction between the objects that can be experienced during presence. Para-authentic objects are used to describe real objects or people encountered in the virtual experience and artificial objects created to simulate real objects or people. Moreover, the acceptance of nonsensory ways broadens the concept of presence to “the use of low-tech nonsensory media such as books” (Lee, 2004, p. 38).

Furthermore, Lee’s (2004) classification provides three substates of presence: physical, social, and self-presence. Physical presence occurs when objects are experienced through VR, for example, controlling an object from a computer or visiting a city on Google Street View. Social presence takes place when the experience involves social actors, whether real or artificial, for example, a video call with a friend or a chess game against a computer. Self-presence is the term that describes when a representation of one’s self becomes virtual, such as seeing one’s face during a video call or the identification with the character of a video game one is playing. Due to
the spread of new technologies, such as virtual simulators, artificial intelligences, and VR
headsets, these three substates can be experienced simultaneously.

The VR experience used in this study allowed the participant to experience all three
substates of presence proposed by Lee (2004). The combination of these three substates during a
VR experience allows the participant to experience the virtual world as if it were real;
consequently, this experience should be considered a hybrid experience. Therefore, a VR
experience could have aspects of second language classroom learning which, at the same time,
can simulate a natural language acquisition process. For this reason, a VR experience allows us
to observe certain elements discussed in relation to the acculturation model presented previously
in the current chapter. For example, speaking a FL in a VR experience allows the learners to feel
social distance between themselves and the FL community, which is not possible in a classroom
context. To conclude, the substate of social presence activated by being inside a VR experience
can show to what degree learners experience the social and psychological aspects described by
Schumann (1986), as discussed in the section on “Transcultural contact and its impact on second
language acquisition: The acculturation model” of the current chapter.

The Role of Virtual Reality and Digital Gaming in Education

As described in the review of the literature on study abroad section, social interaction is
fundamental to developing communicative competence in the FL. However, it is not always
possible to have this necessary contact between the learners and the FL community in a FL
classroom. Previously, the only solution to this problem was to study abroad, which is expensive
and time consuming. Since the spread of the communicative approach, educators have attempted
to compensate for the lack of interaction with the FL community by using authentic materials
and role-playing simulations. Another aid for the classroom came with the spread of technology
that can be used as a tool to facilitate and simulate authentic interaction. The two main fields that integrate language research with technology are Computer-Assisted Language Learning (CALL), and the more recent Mobile-Assisted Language Learning (MALL) that includes the use of hand-size portable devices such as music players, smartphones, and tablets to facilitate SLA.

Beyond these methods, study abroad remains a valuable opportunity used by learners to enhance their competence in the FL. However, as mentioned early in this chapter, if the current trend continues, only a small percentage of U.S. students will have the opportunity to study abroad for more than a few weeks. Because opportunities for students to be in as many contact situations as possible are proportionate to the time spent abroad, a reduced stay will result in fewer contact situations between the students and the FL community. To overcome this problem, it is essential to prepare students before they travel abroad with specific tools and instructions aimed at reducing the social distance between them and the FL community. Well-designed preparation can potentially have the effect of reducing the social distance between the learners and the speakers of the FL and facilitate interactions between them.

A formal effort to prepare students before their sojourn abroad has already begun with the universities organizing study abroad programs. However, this formal classroom training, although interesting and well prepared, usually focuses more on the physical and bureaucratic needs of the students while abroad and less on preparing students to have social and cultural interactions in the FL. These training sessions do not have the resources or the time to re-create in the classroom, even as a role play, possible scenarios that the students might encounter during their sojourns abroad. This gap in the students’ preparation indicates the need for creating new tools that simulate social interaction in the SLA classroom with the objective of facilitating the
development of communicative competence during these preparation training sessions and consequently while abroad.

**Studies on virtual reality.** These new kinds of virtual experiences can be used to interact with authentic social actors and places or to re-create an authentic simulation of places and interactions without leaving the room. VR headsets allow a person to experience all the substates of presence by re-creating an authentic environment and reproducing authentic interaction. As noted by Lombard and Ditton (1997), this new VR technology,

is designed to give the user a type of mediated experience that has never been possible before: One that seems truly “natural,” “immediate,” “direct,” and “real,” a mediated experience that seems very much like it is not mediated; a mediated experience that creates for the user a strong sense of presence. (para. 1)

One of the first applications of a VR environment as an immersive learning tool is Virtual Harlem, used in an English literature course (Leigh et al., 2001). This experience, created by Bryan Carter, is described as follow:

[it] is a collaborative virtual reality tour of Harlem in which participants can travel back 80 years to see historical figures, and hear speeches and music from that period. The Virtual Harlem project is an effort to create a learning environment that can enrich students’ understanding of the Harlem Renaissance. (Leigh et al., 2001, p. 489) This experience made it possible to activate physical presence by letting the students walk around the streets of Harlem, a neighborhood the students had studied in their literature course. This study used a technology called CAVEs, a room connected to a powerful computer that projected images on the walls that students saw in 3D with specific glasses, and a motion platform to simulate the movement. Carter and his colleagues created social presence using
avatars that produced effortless interaction. The results of this study were positive, and the authors concluded that “students were more engaged in classroom activities, e.g., more debates were spurred in the class after the VR experience” (Leigh et al., 2001, p. 496). One of the weaknesses of this study, as confirmed by the authors, is the impossibility of bringing this experience into the classroom. Due to the technological limitations of that time, students had to go to a special room, the CAVEs, to participate in this experience.

The Virtual Harlem experiment is important because it was the first study in the field of VR and has been the only VR experiment in the field of education. One of the fields that most took advantage of this technology was the medical one. There are numerous studies that use VR as a form of treatment, such as a study for anxiety disorders (Newman, Przeworski, Connssoli, & Taylor, 2014), one for chronic imbalance (Hsu et al., 2016), and another for the treatment of social phobia (Gebara, Barros-Neto, Gertsenchtein, & Lotufo-Neto, 2016). Nevertheless, there is a lack of research involving VR and the educational field. Another experiment with VR took place at Samford University in Birmingham, Alabama, where a VR headset was used to show an interactive experience simulating the universe (Weigel & Moraitis, 2017). Albeit interesting, their study uses VR more as a promotional tool to encourage students to sign up for astronomy classes rather than as a teaching tool.

The lack of studies involving VR in the field of education should not discourage, but further boost investigation. We must consider that the first VR headsets just entered the market in 2016 and that the few studies done before that were using expensive equipment not available to everyone. Moreover, the studies conducted so far show encouraging results. For example, a study carried out at Stanford University showed that “the greater level of presence that
participants experienced in the virtual world appears to be associated with their ability to remember certain types of information” (Bailey, Bailenson, Won, Flora, & Armel, 2012, p. 27).

**Digital gaming for second language acquisition.** In addition to the lack of specific research about VR applied to SLA, previous studies involving digital gaming/simulation, which can be considered as a simplified version of VR, have shown encouraging results and a rise in popularity (Cornillie, Thorne, & Piet, 2012). Role playing and games have been used in the classroom since the spread of the communicative language teaching approach. A brief search on the internet shows how many games have been created or adapted with the purpose of facilitating language acquisition and stimulating learners’ brains in an enjoyable way: Bingo is usually used to stimulate students' interactions, Hangman to practice the alphabet and learn new vocabulary, Simon Says to learn commands, and so on. The social act of playing is considered to have a fundamental role in children's development (Bruner, Jolly, & Sylva, 1976; Pellegrini, 2001). Play has also been associated with facilitating language acquisition (Charman et al., 2000; Cook, 2000) and developing sociocultural beliefs, behaviors, and customs (Goncu & Gaskins, 2012; Willis, Jones, Canaan, & Hurd, 1990).

The rise of computers first, and smartphones later, has allowed for a higher level of immersion and interaction than the traditional games and roleplaying simulation of SLA classrooms. Digital games can provide an experience with a high sense of immersion and details that facilitate presence. Sykes, Reinhardt, Liskin-Gasparro, and Lacorte (2012) emphasized that “the potential for digital games in second and foreign language teaching and learning is enormous” (p. xi). Digital games targeting SLA can provide learning contexts that provide real-time and individualized feedback (Sykes et al., 2012). Digital games also allow learners to
engage in FL interaction with other learners or characters in a more similar way to the authentic interaction with the FL community that they would experience in a natural setting.

In the last two decades, digital games have been the object of extensive research, whether they are specifically designed for SLA purposes or commercially designed for entertainment purposes, such as Second Life and World of Warcraft. Leaving aside the studies that have investigated how to adapt commercial digital games intended for entertainment in the SLA classroom, there are a few games that have been designed with the sole purpose of being used in SLA. Croquelandia and Mentira are considered the two most popular digital games with Spanish as a FL.

Croquelandia is described by its author as a “synthetic immersive environment designed for learning how to make requests and apologize in Spanish” (Sykes, n.d.). Croquelandia is a digital game developed at the University of Minnesota. This game was created to serve as a research prototype to be used as a teaching tool for Spanish pragmatics. “In Croquelandia, players set out on a series of missions (i.e., quests) in which they have to perform various types of requests and apologies” (Sykes, 2012). The learners in the game could interact with other learners as well with native speakers: “Interaction within this [game] carries the ultimate goal of enhancing learners’ ability to perform requests and apologies in Spanish” (Thorne, Black, & Sykes, 2009, p. 812). The game’s impact on SLA was determined by observing students’ in-game behavior, experience impressions, and achievement of certain learning outcomes (J. M. Sykes, 2012). The results of this experiment showed that the students did not improve in the use of all the pragmatic strategies present in the games (Sykes, 2012) but only in a few types of apologies and request strategies. However, “perception data, interview data, and summative class presentations presented evidence of improvement in the learners’ metapragmatic strategies,
including analysis skills and strategies for dealing with pragmatic elements of the Spanish language” (Thorne et al., 2009, p. 813).

Another video game is Mentira (www.mentira.org), designed by Holden and Sykes (2012) for use in a Spanish 202 class. Mentira is an augmented reality game in which the players explore through their phones the neighborhood of Los Griegos in Albuquerque, New Mexico, with the goal of solving a murder mystery. This game pushes the players to have meaningful interactions with the fictional characters of the game, with the other players, and with the local citizens of Los Griegos. The choice of this neighborhood is important because most people there speak Spanish. By playing this game, students can learn, practice, and use Spanish skills in authentic dialogues and contexts. This game also tries to help expose the students to pragmatic aspects of Spanish that are usually ignored in a formal classroom environment (Holden & Sykes, 2012). It does so by allowing the students to get out of class and interact with the local citizens of Los Griegos. Another objective is to try to lower the anxiety experienced by language learners when trying to use the FL. The game environment created for Los Griego was designed with the hope that language production would have a low perceived risk since the players could start the game again without receiving a penalty (Holden & Sykes, 2012).

Even if Mentira can be considered a successful experiment on how to integrate a video game in a second language classroom, it presents some limitations. One of the limitations of this game is that it is only available on iPhones and iPads; therefore, its implementation in a Spanish classroom might be problematic if some of the students are using mobile devices with a different operating system such as Android or Windows. Another limitation of Mentira is that it must be played in the Los Griegos neighborhood, and therefore is hard to implement in a Spanish classroom located away from New Mexico.
CHAPTER 3: METHODOLOGY

The VR experience employed to train the participants of this study had the objective of having students practice and reinforce certain cultural aspects, specific language skills and strategies, communicative competence and pragmatic abilities of Spanish. Moreover, the virtual experience used by the current study was designed to help students get comfortable with having social and cultural interactions with speakers belonging to the FL community. Although the VR experience allowed for a certain degree of freedom, the participants nevertheless needed to demonstrate their Spanish language abilities. By this I mean that students needed to display some level of communicative competence, various language skills and strategies (such as the ones mentioned in relation to Bachman and Palmer’s [1996] model of communicative competence), and certain pragmatic abilities to successfully complete the experimental training. During the VR experience, the participants had to show their ability to switch registers by using the personal pronouns of address tú and usted, and show their proficiency in greetings, apologizing, and requesting information in Spanish.

Specifically, this study is concerned with the potential positive impact of having students immersed in a simulated VR experience of walking around and interacting with people in a country where the FL is spoken. The following key research questions guided the present study:

Research Question 1. How does the level of presence experienced during a custom-designed VR experience translate into success in the training?

Research Question 2. How does a VR experience compare to traditional training received by the students before studying abroad?
Research Question 3. How does a custom-designed VR experience impact the language abilities of intermediate and advanced students of Spanish once they are abroad?

The following four sections introduce the participants of the study, list the instruments used for the data collection, explain the data analysis procedures, and describe the experimental training and the control training received by the participants before their sojourns abroad, respectively.

Participants

The participants of this study were 12 undergraduate students, 18 years of age or older, from a large southeastern university. All the students were learning Spanish and participating in a study abroad program in Spain that was organized by their university and took place during May and June 2017. The level of Spanish proficiency of the students varied on a case-by-case basis; however, all the participants had already successfully completed four semesters of Spanish or the equivalent prior to the Spring 2017 semester. Their minimum proficiency level could be compared to an intermediate low of the ACTFL Proficiency Guidelines.

While in Spain, the participants spent 4 weeks at the Real Centro Universitario El Escorial. This university is in San Lorenzo de El Escorial, about 30 miles north of Madrid, Spain. During their sojourns in Spain, the participants enrolled in at least two Spanish classes worth three credit hours each. The participants were in class from Monday to Friday for 5 hours a day. They stayed in individual bedrooms in a dorm-type residence inside the university. At the same time, they received assigned individual conversation partners with whom they were required to spend a certain amount of time every day. The conversational partners were native speakers of Spanish. Additionally, some of the participants spent some time alone traveling around Spain either before or after the study abroad period.
The participants were recruited during an orientation meeting before the departure to Spain. During this meeting, which took place in March 2017, 12 participants volunteered to be part of this study and signed a written consent form. The participants self-evaluated their level of Spanish by responding to the Language Background Survey (Appendix B). This survey allowed the principal investigator to find out about other languages spoken and previous travel abroad experience. Additionally, the participants were randomly divided into two groups: control and experimental. Specifically, the first three students who volunteered went into the experimental group, then the next three into the control group, three more to the experimental one, and the last three to the control group. There was no financial compensation or extra course credit provided to the participants for their time.

To protect the identities of the participants, and in compliance with the guidelines of the Institutional Review Board of the university where the study took place, instead of the participants’ names this study used a system of code names. The participants were identified by a code composed of the letter E if they were part of the experimental group and C if they were part of the control group and a number from 1 to 6. The following letter describes the gender the participants identified themselves as, with only two genders selected by the participants: female (F) and male (M). The last two digits represent the age of the student, for example, E2M24 identifies a participant belonging to the experimental group who identifies himself as a male and who is 24 years old.

As can be seen in Table 2, not all the participants were able to complete all the instruments of this investigation, and as such three were excluded from this study. Of the initial 12 participants, this study only considered nine of them, of which five belonged to the experimental group and four to the control group. Participant E6 and participant C4 were
excluded because they only completed the consent form. Participant C5 was also excluded because she completed only the instruments that took place before the study abroad period in Spain. All the other participants were included, but it is important to emphasize that some of them did not complete all the instruments. Thus, this study used the partial data collected from participants E3F18, E4F18, and C2M18 because they provided a sizeable amount of data that was ideal for an analysis from a qualitative perspective.

Table 3 synthesizes the background information provided by each participant, including age, gender, languages spoken, and so forth. Appendix C presents an in-depth description of each participant. Both Table 3 and the written descriptions in Appendix C are based on the Language Background Survey the participants completed at the beginning of this investigation. In this survey the participants provided details such as self-disclosed language attitudes toward Spanish, or time spent abroad, which facilitated the interpretation of the data collected. An in-depth analysis of the results shown in Tables 2 and 3 will be taken up in Chapter 4.
## Table 2

*Data Collection Level of Completion*

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<th>TC Survey</th>
<th>Training</th>
<th>Presence Survey</th>
<th>Digital Journal Entry 1</th>
<th>Digital Journal Entry 2</th>
<th>Digital Journal Entry 3</th>
<th>TC Survey 2</th>
<th>Post-Study-Abroad Interview</th>
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<tr>
<td>E1F18</td>
<td>English</td>
<td>13</td>
<td>Yes, but with some difficulty</td>
<td>Very. She wants to be able to speak with her Hispanic grandparents in Spanish</td>
<td>Minor in Spanish</td>
<td>1 week (U.K.)</td>
<td>Spanish</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E2M18</td>
<td>English</td>
<td>15</td>
<td>Yes, with language teachers and classmates</td>
<td>N.A.</td>
<td>Communicate more effectively in Spanish</td>
<td>None</td>
<td>Spanish Advanced Grammar and Composition</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E3F18</td>
<td>English</td>
<td>6</td>
<td>Yes, with native speakers</td>
<td>She enjoys learning it</td>
<td>Minor in Spanish</td>
<td>1 month (Spain)</td>
<td>Fourth semester Spanish</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participants</td>
<td>L1</td>
<td>When did you start learning Spanish? Age expressed in years</td>
<td>Understand and speak Spanish</td>
<td>Importance of Spanish</td>
<td>Goals</td>
<td>Time spent studying or living abroad (country)</td>
<td>Last Spanish class taken</td>
<td>Other languages spoken</td>
<td></td>
<td></td>
<td></td>
</tr>
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</tr>
<tr>
<td>E4F18</td>
<td>English and Spanish</td>
<td>Heritage speaker</td>
<td>Native speaker</td>
<td>To show the people of her country that she can speak it.</td>
<td>Improve her Spanish</td>
<td>4 years (Germany)</td>
<td>Spanish Latin American Literature II</td>
<td>French (studied in the past)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E5F18</td>
<td>English</td>
<td>12</td>
<td>Yes, but with some difficulty</td>
<td>To master it as best as she can</td>
<td>She believes that she should develop all her skills to their fullest potential</td>
<td>5 years (Germany)</td>
<td>Spanish Latin American Literature II</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C1F18</td>
<td>English</td>
<td>12</td>
<td>Yes, but with some difficulty</td>
<td>Very important</td>
<td>To communicate effectively with Spanish speakers</td>
<td>1 month (England, Germany, Italy)</td>
<td>Commercial Spanish</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Participants</td>
<td>L1</td>
<td>When did you start learning Spanish? Age expressed in years</td>
<td>Understand and speak Spanish</td>
<td>Importance of Spanish</td>
<td>Goals</td>
<td>Time spent studying or living abroad (country)</td>
<td>Las Spanish class taken</td>
<td>Other languages spoken</td>
<td></td>
<td></td>
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<td></td>
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<tr>
<td>C2M18 English</td>
<td>14</td>
<td>Yes, but with some difficulty</td>
<td>To be able to potentially practice medicine in a Spanish speaking country</td>
<td>Major in Spanish</td>
<td></td>
<td>2 weeks (Spain) 2 weeks (Mexico) 2 weeks (France)</td>
<td>History and Civilization of Spain</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C3F18 English</td>
<td>15</td>
<td>Yes, with language teachers and classmates</td>
<td>To be bilingual in our globalized market</td>
<td>Minor in Spanish</td>
<td></td>
<td>2 weeks (Barbados and Dominican Republic)</td>
<td>Advanced Grammar and Composition</td>
<td>None</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C6F18 English and Spanish Heritage speaker</td>
<td></td>
<td>Yes, with language teachers and classmates</td>
<td>Very important</td>
<td>To be as fluent as her family</td>
<td></td>
<td>2 weeks (Peru) 10 weeks (Costa Rica)</td>
<td>Advanced Grammar and Composition</td>
<td>French</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Experimental Schedule and Data Collection Methods

Different methods such as surveys, interviews, digital journals, and observations provided the data for this study. Data collection started during the first week of April 2017, and was completed by the end of September 2017; see Table 4 for a detailed schedule of the data collection. The current study, like most recent studies investigating study abroad, relies on student self-reports and is dependent on the accuracy of the participant reports (Malone, 2017). The following subsections will present the instruments used for the data collection.

Table 4

<table>
<thead>
<tr>
<th>Stage of study</th>
<th>Experimental Group</th>
<th>Control Group</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pretraining</td>
<td>Language Background Survey (Appendix B)</td>
<td>Language Background Survey (Appendix B)</td>
</tr>
<tr>
<td>(First week of April 2017)</td>
<td>Transcultural Contact Survey (Appendix A)</td>
<td>Transcultural Contact Survey (Appendix A)</td>
</tr>
<tr>
<td>Training</td>
<td>Participated individually in the VR experience which took place in one of the university computer labs (about 10 minutes)</td>
<td>Received a traditional training with the use of a PowerPoint presentation (in groups of 2 to 3 people) which took place in one of the university computer labs (about 10 minutes)</td>
</tr>
<tr>
<td>Post-Training</td>
<td>Post-Training Interviews (one-on-one) (Appendix D)</td>
<td>Post-Training Interviews (one-on-one) (Appendix D)</td>
</tr>
<tr>
<td>(Right after the training)</td>
<td>Presence Survey (Appendix E)</td>
<td></td>
</tr>
<tr>
<td>Study Abroad</td>
<td>Digital Journal Entries (3): One during their first week of stay, another at the beginning of their third week abroad; and a last one before their departure (either written or oral and in the language they preferred) (Appendix F)</td>
<td></td>
</tr>
<tr>
<td>(Summer 2017)</td>
<td>Transcultural Contact Survey (Appendix A)</td>
<td>Transcultural Contact Survey (Appendix A)</td>
</tr>
<tr>
<td>Post-Study Abroad</td>
<td>Post-Study Abroad Interviews one-on-one (Appendix D)</td>
<td>Post-Study Abroad Interviews one-on-one (Appendix D)</td>
</tr>
<tr>
<td>(September 2017)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
**Language background survey.** The Language Background Survey (Appendix B) was given to both groups at the beginning of the data collection process. This survey collected the age, gender, and data related to the participants’ language background. The data collected were used to compare and analyze the possible different results of this study with their language experiences and motivation. The participants self-assessed their language ability in Spanish and in any other language they spoke, whether they were bilingual, and whether they had ever traveled abroad and for how long. It also assessed the motivation of the participants to learn Spanish. It similarly obtained specific information about the Spanish classes the participants had been taking during the Spring semester of 2017 at the southeastern university they were attending.

**Transcultural contact survey.** The second survey that the participants filled out was an adapted version of the CS survey proposed by Mumford (1998), referred to here as the TC Survey (Appendix A). The participants completed this survey twice during this study: at the beginning of the pre-training phase and at the end, once the participants were back home after their period abroad in Spain. The questions on this survey were structured in a way that allowed participants who had never been abroad to answer them by considering not only the TC experienced while abroad but also the one they might have experienced when they moved to a different city from the one in which they grew up.

This survey comprises seven core questions that address personal emotions and situations related to TC and five questions that focus more on the interaction of the students with the speakers of the target group and the stress that these interactions could potentially generate. By collecting the data at the beginning and at the end of this study, it is possible to not only do a comparison across students but also to see if there was an improvement for each student during
this study. As suggested by Mumford (1998), the core items and the interpersonal stress items were given to the student in an alternating fashion. For clarity, the core items of the TC Survey (Appendix A) are 1, 3, 5, 7, 10, and 12; the remaining questions are the five interpersonal stress items. The discussion of the results appears in Chapter 4, Level of adjustment to the foreign language culture.

**Interviews.** With the purpose of collecting qualitative data about the participants’ experiences, this study conducted 2 one-on-one interview sessions. The first interview session (Appendix D) happened right after the participants received the training (either the VR experience or the supplemental traditional training). The second interview session (Appendix D) was held once the participants were back in the United States from Spain.

During the interview process, the participants described and stated their opinions about the training they had just received. Also, some questions focused on various pragmatic aspects of Spanish, such as the use of the pronouns tú and usted or linguistic accidents or misunderstandings that they encountered while in Spain, as these might have been caused by pragmatic differences between the participants and the speakers of the FL. Other questions investigated possible improvements related to specific pragmatic abilities (see Chapter 2, Communicative Competence in Interpersonal Communication) that the students practiced during the training and whether the training had any effects on their communication while they were abroad. For example, the third question of the first interview session (Appendix D) addressed the ability of the students to ask for information about the location of a place while in Spain. The two interview sessions also addressed the learning of certain cultural aspects of Spain and their language preferences while abroad. In Chapter 4 results are discussed in more detail.
**Presence survey.** To address the level of presence of the participants during the VR experience, the experimental group took a Presence Survey (Appendix E) right after they completed the VR training. This study uses a Presence Survey created by the igroup (www.igroup.org), a multidisciplinary consortium dedicated to addressing the way humans interact with the real and the virtual environment. According to Vasconcelos-Raposo, Bessa, and Barbosa (2016), “the IPQ questionnaire is considered one of the canonical presence questionnaires and it has been used in many research studies” (p. 192). The use of a standard and widely accepted instrument allowed the current study to not only compare the participants with each other but also to compare their presence levels with those of other people undergoing similar virtual experiences. In this case, the results of the current study were compared with the results provided by the igroup website, which shows the level of presence of two distinct groups of participants playing two popular video games. In both cases the participants were playing on a personal computer.

The first video game that was used for a comparison of the results presence is Tomb Raider, a popular franchise first published in 1998 by Eidos Interactive. The igroup website does not state which version of the video game was used for this study; it was probably one of the first five versions of the game. These versions were published from 1996 to 2000 and they all used the same graphic engine, Core Design. Given the fact that the same engine was used and the graphic was pretty much the same, the level of presence experienced by the players would not have changed much despite the version used in this survey. This video game is an action adventure in which the player assumes the role of Lara Croft by using a third-person perspective. As can be seen in Appendix G, the camera is behind the character, and the player can see the full body of the character.
The other video game used by the igroup to provide a comparison sample of the level of presence is Half-Life. Half-Life is a first-person shooter game published by Valve in 1998. According to its Wikipedia page, this game has been praised for its realistic gameplay ("Half-Life," n.d.). The goal of this game is to explore a sci-fi world and kill as many enemies that is possible while at the same time solving puzzles. Half-Life uses a first-person perspective; the player sees the virtual world through the eyes of the character. This type of perspective can be seen in Appendix G, and in this case the player can position himself or herself in the virtual world by looking at the gun he or she is holding.

The reliability of IPQ questionnaire is supported by the fact that it “has been constructed using a large pool of items and two survey waves with approximately 500 participants” (igroup). By using this survey, one could observe three aspects of the presence level of the participants. The first aspect observed was the spatial presence, which involves the feeling of being physically present in the VR experience. Also observed were the involvement experienced by the participants and the level of realism perceived during this experience. The numerical data generated by the Presence Survey were used to create a series of graphs, like the one shown in Figure 2 representing the level of presence of each participant. By overlapping the graphs obtained with this survey, it is possible to compare the different participants. In the graphical representation created by igroup to depict presence, G stands for general level of presence, SP for spatial presence, INV for the level of involvement, and REAL for realism. A detailed description of data coding is on the igroup website (www.igroup.org).
Figure 2. Sample visual representation of the level of presence obtained by Presence Survey.

As a reminder, Ready, Steady, Spain!, the VR experience developed for this study, uses a first-person perspective like the game Half-Life. This perspective should in theory allow for a higher level of presences, because it helps the players feel as if they were the characters. However, there is a difference between the perspective used in Half-Life and the one used in Ready, Steady, Spain! In the former, the player can see a gun on the screen as if they were holding it, which should in theory help the user feel physically there. In contrast, in the VR experience used for this study, the players do not see a visual clue, but instead see a transparent box with a big arrow (Figure 3). Although this artifice allowed the participants to move freely inside the VR experience without the need of a controller and by just looking at the arrow, it might have reduced the feeling of being physically present (See Chapter 4, Level of Presence; Success of the VR Training).
Digital journal entries. While sojourning in Spain, both the control and experimental groups completed three digital journal entries to describe their experiences abroad. The participants were to complete the first entry at the beginning of their stay abroad, the second one around the middle, and the last one right before leaving Spain to return to the United States. When it was time to start writing or recording the journal entry, the participants received an email (Appendix F) with a few questions to guide their entries. Participants completed this task by replying to the email in written form or by recording an audio message and attaching it to the email. Participants were not instructed to reply in any specific language and were free to use English and/or Spanish. The prompt questions were meant to push the students to talk about their language interaction with speakers of the FL and to understand if they felt comfortable using the FL. The participants had to describe possible pragmatic or social aspects that they learned while in Spain, or cultural differences that they might have encountered. In the last journal entry, the
participants were asked if their Spanish level had improved and to list the possible reasons why this did or did not happen. The data collected with these three journal entries allowed a comparative analysis between the experimental and control groups and individual differences across participants.

**In-game behaviors analysis.** I also collected a transcript of the participants’ dialogues inside the VR experience. The evaluation of the dialogues of two participants made it possible to compare the answers provided during the interviews and in the other surveys to see if there were any discrepancies or interesting behaviors. The analysis explicitly focused on observing the pragmatic competence of the students and the way they interacted with the characters inside the experience. The use of formal or informal pronouns of address was of particular interest, as elaborated in Chapter 4, Personal pronoun preferences.

**Data Analysis Procedures**

This study uses a mixed methodology to analyze the data collected. Mixed methodology research can be considered a pragmatic approach that dismisses the philosophical dichotomy between ontological and epistemological assumption (Mehdi Riazi, 2016). This approach let the research questions guide me through the data collection and data analysis (Teddlie & Tashakkori, 2009). The current study uses numerical (quantitative) and non-numerical (qualitative) data collection methods. The mixed data collection provides the most accurate comparison possible between the participants of the study.

I collected data by administering the surveys to the participants in person or by email. Subsequently, he analyzed the data using NVivo 11 for the qualitative portion and Microsoft Excel for the quantitative dataset. Microsoft Excel was used to run various statistical tests. Corel
Draw was used, in conjunction with Excel and NVivo 11, to create more in-depth tables and figures to visualize the data and facilitate the understanding of the results.

The quantitative data analysis began with a tabulation of all the data collected during the study. Descriptive statistics combined with data visualization were also used to summarize the results. Due to the small sample size of the participants, inferential statistics were not used in this study. The results of the Presence Survey were the first quantitative data analyzed and were used to attempt to answer Research Question 1. The data presented includes the comparison of mean scores of the Presence Survey obtained by this study with the results from two video games. A tabulation of data from the Presence Survey by each participant is also presented. Standard deviations and means were calculated using Microsoft Excel. The data visualization of the comparison was done using Corel Draw.

To answer Research Question 2, a triangulation of quantitative and qualitative data was used. The quantitative data obtained from the TC Survey were used for the quantitative portion of the analysis. The quantitative data were presented by including descriptive statistics and visual representations of the results. For the qualitative part of the analysis, feedback and comments provided by the participants during the Post-Training Interview (Appendix D) and the Post-Study-Abroad Interview (Appendix D) were used to further confirm the results showed by the quantitative analysis. To facilitate the analysis, two word clouds with the most-used words to describe the two types of training were created.

To answer Research Question 3, I analyzed and coded in NVivo the qualitative data obtained from the participants during the study. This part of the analysis includes data collected from the Post-Training Interviews (Appendix D), the Digital Journal Entries (Appendix F), Post-Study Abroad Interviews (Appendix D), and the transcripts from the in-game dialogues.
During the first two rounds of coding, I transcribed and subsequently coded in NVivo all the qualitative data collected by this study except the in-game dialogues. The first round of coding allowed the creation of a first general categorization of the data driven by the research questions and by other thematic patterns that emerged during the preliminary readings of the data. I coded
the data by cases that referred to each participant, and by nodes and subnodes for the actual coding. Table 5 provides a detailed list of the first round of coding. The coding system allowed each reference to be coded under multiple nodes.

Additionally, I created two word clouds to compare traditional and experimental training. The word clouds represented the 20 most-used words by the participants while talking about the training. I used all four subnodes (descriptions, improvements, negative, positive) in the creation of each word cloud. I did the word analysis in NVivo and used Corel Draw for the design of the word clouds. The font size increased according to the frequency of the word, for example if a word was used 6 times, the font was size 60.

The second round of coding was based on two emergent common themes of the participants. These themes are from Graig’s (1979) model of CS, which classified expatriates as encapsulators, cosmopolitans, and absconders (discussed in-depth in Chapter 2, Measuring transcultural contact of the current study). As shown in Table 6, I only found two of the themes in the participants of this study. The identification of these themes allowed for a deeper level of analysis and discussion. The same coding themes used during the second round of coding were used to code the in-game dialogues of the participants. The main goal of this third round of coding was to understand if the participants showed comparable behaviors between the VR training and their sojourns in Spain.
Table 6

<table>
<thead>
<tr>
<th>Second Round of Coding</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nodes</td>
</tr>
<tr>
<td>Encapsulators</td>
</tr>
<tr>
<td>Isolation, group of foreigners, avoidance of TC, social interaction with local people of Spain reduced to a minimum</td>
</tr>
<tr>
<td>Cosmopolitans</td>
</tr>
<tr>
<td>Creating groups with other students from the U.S. and at the same time with local people, seeking TC, looking for social interaction with local people of Spain</td>
</tr>
<tr>
<td>Absconders</td>
</tr>
<tr>
<td>Refusing any contact with their native culture</td>
</tr>
</tbody>
</table>

Description of Experimental Training and Control Training

The participants of both groups received a supplemental training session as part of this study, in addition to the official training they were already receiving at the southeastern university in preparation for their stay abroad. The official training received consisted of a few meetings during which the director of the study abroad program explained to the students all the legal/technical requirements they had to fulfill to travel abroad and to register in a class in Spain; additionally, participants discussed any other questions regarding their trip and their stay during these meetings. The control group received a more formal training session that started with a short PowerPoint presentation that introduced a few pragmatic abilities of Spanish in interpersonal communication such as the use of the second person formal and informal singular pronouns of address and other features typical of interpersonal communication (e.g., apologizing, requesting information, greetings). The presentation shared some cultural aspects typical of Spain with the participants. Afterward, the participants practiced the pragmatic aspects they had just reviewed in pairs by simulating a few hypothetical interactions such as asking for direction to a stranger or to a kid. The pragmatic abilities, language skills, and cultural aspects presented in
this training to the control group were identical to the ones encountered in the VR experience by the experimental group. The traditional training was held in small groups of two or three people and conducted by the principal investigator. The busy schedules of the participants required division into small groups.

The supplemental training reserved for the experimental group consisted of a custom-designed VR experience, handled individually by each participant, which facilitated immersion in an authentic context by simulating authentic interaction with speakers of Spanish, without leaving the United States. This interactive experience allowed the participants to complete the training with various degrees of freedom in the choice of the dialogues used, through in-game characters voiced in real-time by a group of actors. All actors were native speakers of Spanish from the same town in which the study abroad program took place. A detailed explanation of how the VR experience was envisioned at the beginning of this study can be found in the in-game design document (Appendix H). The actual VR experience used in the experiment differs slightly from the one proposed in the in-game design document. The in-game designed document has been left at the earliest stage to show the way this project was envisioned. The main differences between the final version used in this project and the in-game design document (Appendix H) regards Scene 3, the in-game interface, and the hardware used.

This experience has been developed by the principal investigator with the collaboration of a small group of graduate students who helped with the dubbing and other small tasks without receiving any financial compensation. The VR experience has been created by using the engine Unity3D (Version 5.6.0b9). The video shown during Scene 1 was created by using the video editing software Animatron (http://www.animatron.com). This experience, named Ready,
Steady, Spain!, comprises three main scenes that simulate the start of a study abroad trip to Spain. The VR experience lasted approximately five minutes.

During the first scene, the participants are sitting on a plane headed to Madrid. During this introductory scene, the participants are watching a video in which first the pilot, then a flight attendant, tells them that they are about to land in Madrid; a script of this video can be found in Appendix H. Through this video, the participants are expected to start getting used to the VR environment. This video also exposes the participants of the experimental group to an indirect interaction with the pilot and the flight assistant with technical terms that might be hard to understand for a learner of Spanish, especially when listening for the first time. Therefore, this video exposes them to this problematic situation, and possible source of stress, well in advance of when they will encounter it in the real world.

![Figure 4. Screenshot from Scene 1 of the VR experience.](image)

The video also presents visual clues that helped the participants understand certain terms that might be unknown to the students. As can be seen in Figure 4, while the pilot is talking about the weather in Madrid, the sun appears in the video. This scene also exposes the students to some cultural differences between Spain and the United States, as can be seen in Figure 5. In
this screenshot of the video, the flight attendant is informing the players that they have just landed in Madrid. A road sign with the name of the airport appears in this part of the video; this is meant to help the students get used to the different colors (e.g. blue for general directions) of the road signs in Spain.

![Road Sign](image)

*Figure 5. Screenshot from Scene 1 of the VR experience.*

Scene 2 of the game helps the participants become familiar with the control of the game and with the airport in Madrid. The objective of this scene is to reach the exit of the airport by following the directions they hear (in Spanish) and see on the screen. With the goal of immersing the participants in an authentic environment, there were reproductions of authentic shops and billboards in Spanish inside the virtual 3D airport created for this study.

Scene 3 is the final part of the VR experience. This scene is set in the center of Madrid, Spain. In this scene, the players interact with different characters. Each character requires the use of different pragmatic competence specific to Spanish. The participants interacted with a 10-year-old child from Spain, a taxi driver, and a Spanish professor working for the university. The participants also experienced context-specific cultural aspects of Spain, such as the currency, a taxi, and the impossibility of paying with a credit card anywhere. In this scene, the players
interact with virtual characters inside the VR experience who are voiced by two actors standing in the same room. This technique was used to keep the coding cost close to zero. Using a virtual character with voice recognition can be done, but it requires an incredible amount of work if it is to be done from scratch or with an expensive subscription to a software that provides this function.

The experimental training took place in a university computer lab. Participants in the experimental group arrived at the lab individually, and as soon as they were done filling out the preliminary surveys, they started the experiment. The principal investigator gave a short introduction describing the tools used. In the room, in addition to the participant and the principal investigator there were two male graduate students, both speakers of Spanish, who served as voices for the in-game characters. The principal investigator and the actors could see what was going on inside the VR from a computer that was casting the VR experience.

The hardware used to show the VR experience to the student consisted of a smartphone Google Pixel XL and a Google Cardboard. This was the preferred hardware over a more complex system such as Oculus Rift or HTC Vive for two reasons. First, portability allowed replication of the experiment in any room of the university without the need for setting up cameras and sensors. Second, because the headset does not have any strap holding it to the head, the participants could simply move it away from their head if they were feeling any discomfort during the experience.
CHAPTER 4: RESULTS

The current study has attempted to investigate the potential benefits of a custom-designed VR training program to prepare a group of students for studying abroad. The training design had the goal of reducing social distance abroad and facilitating Spanish second language acquisition. As stated in the previous chapter, a group of 12 students from a large southeastern university in the United States participated in this study. The experimental and control groups then completed quantitative and qualitative instruments. Table 4 in Chapter 3 provides a detailed schedule of the data collection.

The current chapter reviews the results obtained by this study and is organized into three main sections. The first section shows how the level of presence experienced during the experimental training was comparable to that achieved by playing two popular video games. This section uses the results of the Presence Survey to answer Research Question 1 of this study. The following section compares the VR training with the formal training students receive before going to Spain. The participants’ feedback provided during this study and the results of the TC Survey were used to answer Research Question 2. The last section of this chapter is devoted to answering Research Question 3, that is, investigating how VR training impacts the language abilities of a group of students of Spanish during a short-term study abroad experience, results from multiple instruments were used to answer the last research question.

Level of Presence and Success of the VR Training

The VR training was designed with the objective of simulating the initial part of a study abroad period in Spain, and as a result let the students feel immersed in a Spanish-speaking
context without leaving the classroom. The idea behind this design is that such immersion would allow the students to start getting used to living abroad; therefore, this VR experience would jumpstart the adjustment to the FL culture and at the same time allow the participants to practice various language skills and pragmatic abilities of Spanish in an authentic environment. To have a successful VR training experience, it is considered essential that the participants reach a high level of presence. The current section compares the level of presence experienced by the participants with two other famous video games, and then compares the level of presence experienced by each participant.

The results of the Presence Survey can be considered positive and show how even with a not-so-polished virtual experience, the participants were able to reach a comparable level of presence to Tomb Raider and Half-Life, thanks to the fact that they were experiencing the virtual world through a VR headset. Table 7 shows the means of the aspects of presence observed by the Presence Survey: General (G), spatial presence (SP), involvement (INV), and realism (REAL). From a general standpoint, the overall level of presence achieved by the participants was $M = 2.99$, a number that is very close to $M = 3.20$, the level achieved by the players of Half Life, and higher than $M = 2.46$, which was achieved by another group of players while playing Tomb Raider. Additionally, Figure 6 provides a visual representation of the presence results.

Of the components of presence evaluated, the spatial presence (SP), which encompasses the feeling of being physically present in a virtual world, is the aspect in which the participants of the VR training scored lower than the other games for that subpresence type, as can be seen in Figure 6. The level of spatial presence achieved by the participants of this study ($M = 3.04$) is almost identical to the one reached by the players of Tomb Raider ($M = 3.06$), an old video game with a low level of presence. The low level of spatial presence could be attributed to the fact that
the participants were shown a big red arrow that they used for moving around the virtual world, as shown in Figure 3 of Chapter 3. Another factor that could have contributed to this result is the low resolution of the texture used in this VR experience, combined with the low level of sophistication of the light effects.

Table 7

*Mean Scores on the Presence Survey by Videogame*

<table>
<thead>
<tr>
<th>Virtual Experience</th>
<th>Tomb Raider</th>
<th>Half-Life</th>
<th>Spain!</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>2.46</td>
<td>3.20</td>
<td>2.99</td>
</tr>
<tr>
<td>SP</td>
<td>3.06</td>
<td>3.99</td>
<td>3.04</td>
</tr>
<tr>
<td>INV</td>
<td>2.40</td>
<td>3.40</td>
<td>3.40</td>
</tr>
<tr>
<td>REAL</td>
<td>1.92</td>
<td>2.34</td>
<td>2.80</td>
</tr>
</tbody>
</table>

*Note.* Data for Tomb Raider and Half-Life from igroup.com N and SD were not available, compared to Ready, Steady, Spain!

On the other hand, the participants of this experiment achieved a higher score than Half-Life and Tomb Raider in the subscale of experienced realism (REAL). This category measured the subjective experience of realism, and asked questions aimed at understanding how real the virtual world seemed to the participants. In this subtype of presence the participants of the VR training scored higher (M = 2.80) than the other two games: Tomb Raider (M = 1.92) and Half-Life (M = 2.34). The last category observed regards the involvement (INV) experienced while in the virtual world. In this case, the questions were designed to find out if the participants could immerse themselves in the experience and what the level of awareness of the real world was. As shown in Table 7, the mean achieved in this variable by the VR experience is comparable to that of Half-Life (M = 3.40) and almost 1 point higher than that of Tomb Raider (M = 2.40).
Figure 6. Visual representation of the level of presence obtained by the Presence Survey.

Examining the results of individual participants shows that the level of presence achieved by each of them is highly variable. Table 8 shows the means of each participant for the three categories and their general level of presence. Participant E4F18 achieved the highest level of general presence ($M = 3.71$), whereas Participant E1F18 achieved the lowest level of general presence ($M = 2.29$). Regarding the general level of presence, the standard deviation is still below 1 point ($SD = 0.55$). In contrast, the experienced realism level is the aspect of presence in which the participants of the study showed the widest range of difference ($SD = 1.01$). In this
case, Participants E1F18 and E5F18 scored the lowest \( (M = 1.75) \), whereas Participant E4F18 achieved a level of experienced realism more than 2 points higher \( (M = 4.00) \). The different levels of presence achieved by the participants could be caused by various factors. For example, the low level of presence achieved by E1F18 could be attributed to her initial difficulty navigating the virtual environment. However, it is important to state that all participants said that this was their first experience with a VR headset, so this is one factor that is kept constant across participants.

Another important consideration is that all participants did the experimental training the same day in ascending order from participant E1F18 to E5F18. The lower level of presence achieved by the first two participants could have been caused by the two actors that voiced the in-game characters, as they were still learning how to interact with the students. Before the experiment, the primary investigator and the actors tested the VR experience only once and with a native speaker of Spanish as a participant. It is possible that as the experiment progressed, the team became better at providing the right instructions to the students, which allowed the last participants of the experimental training to achieve higher levels of presence.

Table 8

*Mean Scores on the Presence Survey, by Participant*

<table>
<thead>
<tr>
<th>Presence</th>
<th>E1F18</th>
<th>E2M18</th>
<th>E3F18</th>
<th>E4F18</th>
<th>E5F18</th>
<th>( M )</th>
<th>( SD )</th>
</tr>
</thead>
<tbody>
<tr>
<td>GENERAL</td>
<td>2.29</td>
<td>2.64</td>
<td>3.29</td>
<td>3.71</td>
<td>3.00</td>
<td>2.99</td>
<td>0.55</td>
</tr>
<tr>
<td>SP</td>
<td>2.40</td>
<td>3.00</td>
<td>2.80</td>
<td>2.80</td>
<td>4.20</td>
<td>3.04</td>
<td>0.68</td>
</tr>
<tr>
<td>INV</td>
<td>2.75</td>
<td>3.50</td>
<td>3.50</td>
<td>4.50</td>
<td>2.75</td>
<td>3.40</td>
<td>0.72</td>
</tr>
<tr>
<td>REAL</td>
<td>1.75</td>
<td>3.25</td>
<td>3.25</td>
<td>4.00</td>
<td>1.75</td>
<td>2.80</td>
<td>1.01</td>
</tr>
</tbody>
</table>
In conclusion, the VR training can be considered successful, because it allowed the participants to feel immersed in the virtual environment and to reach a similar level of presence as the players of Tomb Raider and Half-Life. Even the level of presence achieved by Participant E1F18, who scored the lowest \( M = 2.29 \) of the participants, is only slightly lower than the average level of presence experienced by the players of Tomb Raider \( M = 2.46 \), a commercially successful video game.

**Comparison of Traditional and Experimental Training**

The previous section showed how the experimental training used in this study was successful at immersing the participant in the virtual experience. This section compares the experimental training with the traditional training given to the control group. Research Question 2 is answered by looking at the data collected during the study from two different perspectives. The first subsection shows the numerical results of the TC Survey and provides insights about the ability of the participants to adjust to Spain’s culture. The second subsection compares and analyzes the participants’ feedback about the two types of training received before studying abroad.

**Level of adjustment to the foreign language culture.** To understand the level of participants’ adjustment to a new culture, students of both groups took two identical TC Surveys at different times during the study. Participants completed the first survey at the beginning of the pre-training phase concomitantly with the Language Background Survey. The participants completed a second survey during the Fall 2017 semester once the participants were back home from Spain. Comparing the first and second iteration of this instrument provides a partial answer to Research Question 2, which compares traditional training to experimental training. Given the small sample of participants \( N = 7 \) it was not possible to run any inferential statistical tests that
would have shown possible statistically significant differences over time; therefore, the next few paragraphs illustrate the results of the two TC Surveys from a descriptive standpoint. Recall that a few participants did not complete this instrument because they were not able to complete the second TC Survey. The TC Survey is composed by 12 questions and the highest possible value is 24 points.

According to the results of the two TC Surveys (Table 9), the mean of the sample overall increased by 0.57 between the two phases. It is important to note that the level of adjustment to a new culture did not increase for all the participants. The results of the TC Surveys showed an increase for only five; in contrast, Participant C1F18’s level of adjustment decreased by three points and stayed the same for Participant C6F18. The change in value between the two phases can be attributed to various factors, for example individual differences of the participants, the experiences they had during their sojourns abroad, and possibly the training received before their journeys.

Regardless of the general results, it is important to observe and compare the data obtained by the two TC Surveys, because an increase or decrease in the level of adjustment in one of the groups could be a partial indication of the effectiveness of one training over the other. By isolating the participants belonging to the control group, the results show a slight decrease of the mean from 11.00 (SD = 3.00) pretraining to 10.33 (SD = 2.08) post study abroad. In reality, the results of the two TC Surveys of the control group show a different picture (Table 9) if each participant is observed individually. Of the three participants who completed both surveys, only Participant C1F18 shows a decrease in her level of adjustment to the FL culture in line with the average of her group. On the contrary, the level for Participant C6F18 did not change, and increased by 1 point for Participant C3F18.
The experimental group is the last sample analyzed in this section. According to the results of these surveys, the mean for the experimental group increased between the two phases. This increase appears in the visual representation of Figure 8. As shown in Table 9, the mean for all participants went from 7.25 (SD = 0.96) to 8.75 (SD = 1.5). Although the isolated results for the control group did not show a homogenous picture, the results for the experimental group by participant confirm the general increase of the experimental group; each participant showed an increase of at least 1 point between the two phases of the study.

Table 9

*Scores on the TC Surveys by Participant*

<table>
<thead>
<tr>
<th>Participant</th>
<th>TC Survey (Pretraining)</th>
<th>TC Survey (Post Study Abroad)</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1F18</td>
<td>6</td>
<td>7</td>
</tr>
<tr>
<td>E2M18</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>E3F18</td>
<td>8</td>
<td>10</td>
</tr>
<tr>
<td>E5F18</td>
<td>7</td>
<td>8</td>
</tr>
<tr>
<td>C1F18</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td>C3F18</td>
<td>11</td>
<td>12</td>
</tr>
<tr>
<td>C6F18</td>
<td>8</td>
<td>8</td>
</tr>
<tr>
<td>Mean all participants</td>
<td>8.86 (SD = 2.73)</td>
<td>9.43 (SD = 1.81)</td>
</tr>
<tr>
<td>Mean Experimental Group</td>
<td>7.25 (SD = 0.96)</td>
<td>8.75 (SD = 1.5)</td>
</tr>
<tr>
<td>Mean Control Group</td>
<td>11.00 (SD = 3.00)</td>
<td>10.33 (SD = 2.08)</td>
</tr>
</tbody>
</table>

*Note.* Total possible scores range from 0 to 24.
Additionally, the starting mean of the control group was more than 3 points higher than that of the mean of the experimental group. It is possible that the discrepancy between experimental group and control group in the values of acculturation at the beginning of the experiment could have partially affected these results. It could be hypothesized that, because the participants belonging to the control group already had such a high level of acculturation, they
did not improve that much while abroad. This hypothesis can be discarded just by looking at the individual differences of each participant of this group. The acculturation level of the two participants with the highest initial score, C1F18 and C3F18, in the latter case increased by only 1 point and in the former case decreased by 3 points. In contrast, the score for participant C6F18, the only one belonging to this group with a score in line with the mean of the experimental group, stayed the same. For those reasons, the results of these two instruments should be considered valid and are used in tandem with the qualitative analysis of participants’ feedback to answer Research Question 2 of this study.

In conclusion, the results for this instrument show a difference in the change of level of adjustment to the FL culture between the two groups. The two different types of training the participants undertook before traveling to Spain could have influenced this change, at least in part. To further confirm these results, the next subsection analyzes the participants’ feedback and comments regarding the traditional and the experimental training.

Participants’ feedback on training. The goal of this section is to further discuss the results related to Research Question 2 of this investigation, namely how a VR experience compares to a traditional training session received before studying abroad. This section analyzes qualitative data collected with multiple instruments. The triangulation of the results obtained from the TC Survey (See section on “Level of adjustment to the foreign language culture”) with the results of the current section was done to improve the credibility and trustworthiness of the results. This section answers this question by taking the feedback and opinions provided by the participants of the two groups during the Post-Training Interview (Appendix D) and the Post-Study-Abroad Interview (Appendix D) into consideration.
The following two sections use the data obtained from the first round of coding to inform how the participants described the training received, the positive and negative feedback they provided to the investigator, and possible improvement in the training. These sections were based on 8 themes that emerged during the first round of coding. Table 10 shows the themes (subnodes) and the number of occurrences of each theme. The last section is dedicated to the analysis and comparison of two word clouds created by combining the most used words by the participants to describe the training.

Table 10

<table>
<thead>
<tr>
<th>Participant’s feedback on training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nodes</td>
</tr>
<tr>
<td>-------------------------------</td>
</tr>
<tr>
<td>Training</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td></td>
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<tr>
<td></td>
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</tr>
</tbody>
</table>

**Experimental training feedback.** When asked to describe the training experience, all participants from the experimental group used the first person singular pronoun, except for Participant E1F18, who preferred to use the plural form of that pronoun. All the participants described the VR experience accurately and mentioned all the scenes and the interactions they had in the virtual world. All descriptions were like the following one from Participant E5F18:

I was in an airplane and they played a video before it landed. Then I was in Madrid, I got into a taxi. I talked with the taxi driver, I got directions from a child and then I found my professor and I talked to him for a bit. (E5F18, Post-Training Interview, April 2018)
The participants enthusiastically accepted the experimental training, which received only two negative feedback responses. This paragraph investigates those two and provides possible solutions to implement in a future iteration or replication of the current study. During the Post-Training Interview, Participant E5F18 stated that she had a hard time hearing the first video. In this case, the sound of the video the participants watched while on a plane came from the speaker of the phone placed inside the VR headset. This issue could be easily fixed by using external speakers and by improving the quality of the recording. The second negative response was expressed by the same participant during the Post-Study-Abroad Interview. In this case, she pointed out that the training only facilitated her interaction when asking for directions but not in other contexts, saying, “It hasn’t facilitated all the interactions, just when I was asking for directions” (E5F18, Post-Study-Abroad Interview, September 2017). This negative feedback was expected because Ready, Steady, Spain! was created only to show the validity of this type of training and was never intended to be a comprehensive training tool. The addition of new scenes and interactions in different contexts should be able to address this complaint and improve the overall training experience.

The two one-on-one interviews in this investigation consisted of four questions directly inquiring about the effectiveness of the training received by the participants. During the Post-Training Interview, participants were asked to express their opinions about the training session and if they thought the training would be helpful once they were in Spain. On the other hand, the Post-Study-Abroad Interview asked the participants if the training received had facilitated the interactions they had with local people while in Spain, and in what way. This interview also asked for their input on how the training could be improved. The next few paragraphs focus on
describing and analyzing the positive feedback collected, and the final paragraph illustrates ways to improve the VR training.

All the participants enjoyed the experimental training and expressed a favorable opinion. When asked about the training in the Post-Training Interview, they used words like *interesting*, *cool*, and *fun*. For example, Participant E3F18 commented that “it was really cool [and that] it was really interesting” (Post-Training Interview, April 2018).

Additionally, when explicitly asked if they thought the training would be useful while in Spain, all participants said yes and provided additional opinions regarding the benefits of this type of VR training. Participant E1F18 thought that the experimental training was very helpful to get used to the environment. Participant E2M18 added that the VR experience made him realize that he would have to ask for help while abroad. On the other hand, this training helped Participant E5F18 realize that she should practice speaking more in Spanish.

A further confirmation of the usefulness of the VR training was provided by the participants during the Post-Study-Abroad Interview when asked, based on their experience, if the training had facilitated interaction in the FL. In general, all the participants of the experimental group confirmed that the training had been useful. For example, Participant E1F18 said, “It helped me approaching people” (Post-Study-Abroad Interview, September 2017). Likewise, Participant E3F18 confirmed the utility of the training as a facilitator of interaction. After responding positively to the interview question, she said that when she was in Spain she had to ask many people for directions and while doing so, she thought about the VR training. Participant E5F18 agreed with the other participants and reported that the training had facilitated interaction in that specific context. She also added that she got lost, but thanks to the training, she was successful in asking for directions.
Another notable result stemming from the participants’ opinions is that they noticed specific details that were added to the VR experience to enhance the level of immersion and to provide additional authentic cultural input. Two participants mentioned the *jamón* (ham) shop located in the airport during an interview and in a journal entry. Another participant noticed a sticker on a suitcase with the rallying cry of the large southeastern university. This last result confirms the importance of adding authentic material to the VR experience. In this case, the use of billboards and authentic Spanish shops inside the airport was noticed by the participants and provided an additional level of immersion in the FL culture. It also shows that the participants could read the posters and were paying attention to them.

The efficacy of the experimental training is finally confirmed by two digital journal entries in which the participants reported on their first days in Spain and described contexts and interactions like the ones experienced in the VR training. In her first journal entry, Participant E3F18 provides a description of her arrival in Spain that looks exactly like the VR training: “This is my second day. The plane ride did not seem as long as it actually was. It was very easy to navigate the airport and find our group once I arrived” (E3F18, Digital Journal Entry 1, May 2017). Another participant recalls her successful interaction with a taxi driver, a context that she practiced during the experimental training: “I spoke to the taxi driver the whole ride to the school. I wasn't worried about my Spanish proficiency. I speak Spanish very well and I wasn't nervous about it” (E4F18, Digital Journal Entry 1, May 2017). Both of those journal entries show how Participant E3F18 and Participant E4F18 related to the training while experiencing similar interactions and contexts in Spain.

To conclude, the experimental training facilitated immersion and authentic communication in the FL. The fact that the VR experience only provided the participants with
limited exposure to the FL and only a restricted number of contexts and interactions makes these results even more meaningful. During the Post-Study-Abroad Interview the participants were asked for their input on how the training could be improved. The unanimous opinion of the participants was that the training needs to be longer and have more interactions. For example, Participant E2M18 suggested adding a scene in which he would be allowed to order some food in a café and another scene in which he would enter a shop and pick up something quick. An increase in duration and adding more interactions would allow for the implementation of other suggestions in which participants requested the inclusion of more dialogues that require the use of vosotros and slang words. Another interesting suggestion came from Participant E3F18, who wrote, “I wasn’t prepared for how much PDA [public display of affection] there is in Europe. I was surprised by it. That’s the worst culture shock I had, probably” (Post-Study-Abroad Interview, September 2017). Public displays of affection are something I had not considered when creating the VR experience, but that certainly deserves more consideration in the future.

**Traditional training feedback.** As discussed previously, the control group received more traditional training in place of the VR experience. Their reception of this training was less enthusiastic than that of the experimental group. During the Post-Training Interviews, although stating that this training might help them while abroad, none of the participants used words such as **very interesting**, **cool**, or **a lot**. When asked about the benefit the training had or could have had, their answers were not very positive and used a lot of structures that conveyed doubt. For example, Participant C6F18 said, “Maybe a little bit. It just got me thinking more about being able to ask directions and knowing where I am, but as far as my Spanish speaking it was the same” (Post-Training Interview, April 2017), whereas Participant C2M18 just said “It kinda helped” (Post-Training Interview, April 2017) without adding anything else.
Moreover, when providing input about what they had learned during the training, some of their responses focused on the places shown during the training, whereas others focused more on the fact that they had to practice or brush up on their Spanish. Additionally, none of them mentioned the training or something related to it in their journal entries. Once back in the United States, Participant C3F18 had completely forgotten the training she received a few months earlier. The lack of connection between the traditional training and their experience in Spain is a clear indication of a low level of effectiveness of the training. In this case, contrary to the results of the experimental group, the participants of the traditional training did not find any situations (e.g., asking for directions, the airport of Madrid, and so forth) that resembled the training even though these topics were presented in the traditional training.

When asked how the training could be improved, the control participants did not have much to offer. Participant C3F18 suggested that receiving a two-page list with the most commonly used phrases in Spain could be useful. Additionally, Participant C6F18 asked for training that would focus more on language use. Interestingly, while answering this question, Participant C1F18 said that she was caught off guard by the greeting ¿Qué tal estás? (How are you?), an expression that had been used multiple times during the experimental and traditional training. It is clear from this comment how the traditional training did not help the students to start feeling like they were in Spain and therefore limited their ability to notice pragmatic and cultural aspects of the FL presented during the training. To conclude, it is evident that, based on the participants’ feedback and opinions, the traditional training was not as effective and memorable than the experimental training. The following section provides another level of comparison between the two types of training by looking at the most-used words to describe the training by participants.
**Word clouds comparison.** To further compare the traditional to the experimental training, I created two word clouds to visualize the data from a frequency standpoint. A word cloud with the 20 most-used words describing the experimental training can be seen in Figure 9. The font size of each word is directly proportional to frequency of use. A word cloud with the 20 most-used words describing the traditional training can be seen in Figure 10. As in Figure 9, the font size of each word is directly proportional to the frequency of use; however, Figure 10 appears smaller than Figure 9 because the frequencies are lower. See Appendix I for a detailed list of the words appearing in the two word clouds and the frequencies of each word.

![Figure 9. Most-used words by the participants regarding the experimental training.](image)

By looking at the two word clouds it is possible to observe how the two types of training were perceived in different ways from the participants. The most-used word to describe the traditional training is *think*, which was used 9 times (13 times with its gerund). The use of *think* is a good example of the way the traditional training was received by the participants. This training made the participants think about Spain and Spanish, but in a more passive way, in the sense that there is no evidence of any resulting consequent action planned in relation to the
“thinking about” it. The training was useful in that it allowed the participants to start reflecting on what they were going to need while in Spain.

On the contrary, the most-used words to describe the experimental training show a different picture. The two most-used words to describe the experimental training are direction and ask (with its gerund), which were each used 9 times. These words and the word interaction (4 times) show how the participants were actively involved in the experience. They asked questions and interacted with the in-game characters. In this case, the roles of the participants seem more active and engaged.

What the participants remembered from each type of training emerged as another interesting difference. All the participants of the experimental training remembered and mentioned the city of Madrid and some of the locations explored during the VR experience as shown by the use of airport and taxi (both used 6 times), and Madrid and school (all used 5 times). In contrast, none of these words showed up in the most-used words by the participants of...
the traditional training. Due to presence and the way the VR allowed the participants to feel immersed and actually experience Madrid, the experimental training had an advantage in retention by being more memorable while comparing it to the traditional training that only allowed the participants to look at pictures of Madrid from a presentation.

**Interpersonal Communication**

The current section answers Research Question 3 of this study, specifically the ways the experimental training impacted the ability of the participants to demonstrate certain pragmatic abilities and language skills while abroad. The first section is dedicated to a thematic analysis of the in-game behaviors of the experimental group. This section is crucial because it provides more insight into how the participants interacted in the simulated FL context. The second section categorizes the way the participants from both groups behaved while sojourning in Spain by using the same themes identified during the in-game behavior analysis.

Further results of this study are presented in the last section. These results include data that were gathered from this study with the objective of providing additional evidence to further answer Research Question 3. However, the results were not enough to make a generalization. These results were included to improve the transparency of this dissertation. These results include personal pronoun preferences and language use while abroad. The instruments considered in this section are Digital Journal Entries collected while the participants of this study were sojourning in Spain, the Post-Training Interviews conducted during Spring 2017, the Post-Study-Abroad Interviews conducted during Fall 2017 when the participants were back home, and transcripts of the participants’ in-game behaviors.

**In-game behavior analysis.** The experimental training forced the participants to have interactions with the in-game characters in Spanish to proceed to the next step (or task) and
finally to complete the VR experience. The use of actors to voice the in-game characters allowed a lot of freedom regarding the dialogues chosen. Moreover, the actors could adjust their Spanish based on the proficiency level of the participants. During the second round of coding (Chapter 3, Data Analysis Procedures), I divided the participants of the experimental group into two themes based on how they behaved and interacted during the VR experience. The themes used in this analysis are from Graig’s (1979). One group, named cosmopolitans, includes participants ($N = 3$) that were very comfortable during the interactions and asked many questions of the in-game characters. Alternatively, other participants ($N = 2$) seemed a little hesitant to start a conversation with the in-game characters; they were included in the second group called encapsulators. In the latter case, the actors had to start the conversation, and only then did the participants start talking. To conclude, aside from minor slowdowns, all the participants could interact in Spanish, find the way from the airport to the metro station, and complete the VR experience.

The thematic classification of the in-game behaviors resulted in the placement of the participants of the VR experience into two groups. Table 11 shows the thematic classification of the participants and the number of occurrences (references) of behaviors associated with the theme by participant. The two groups displayed opposite behaviors during the experimental training. For example, Participant E2M18 seemed confident, able to hold multiple conversations, and continuously sought interaction with the in-game characters. On the other hand, Participant E1F18 was not able to interact as much with the in-game characters and when possible avoided interaction. An emblematic case is when Participant E1F18 walked away from the taxi driver without having a conversation with him.
The in-game dialogues showed many differences regarding the ability to complete the VR training without any problems. For example, the cosmopolitans could clearly understand the in-game characters and hold conversations with them. The encapsulators required the actors to constantly repeat or rephrase their questions to help them understand the meaning of their utterances. More proof of the difficulty in understanding the FL inside the VR training and of avoidance of social interaction comes from Participant E1F18. In this case, she skipped the interaction with the taxi driver entirely and walked toward the second in-game character because she was not able to follow the directions provided inside the VR experience.

During the experimental training, the participants needed to use various pragmatic resources to interact with the in-game characters, including greetings (e.g., Hi, how are you?), apologies (e.g., Excuse me) and expressions of gratitude (e.g., Thank you), and requests for information (e.g., Where is the university?). The way the participants used the just-mentioned pragmatic resources and the total number of occurrences were taken into consideration to determine and confirm the thematic division of the participants into two groups. By only looking at the number of total occurrences (Table 12), it is evident that the total of occurrences of the strategies observed is higher for the cosmopolitans (5-8) and lower for the encapsulators (3-4).
Moreover, further analysis of in-game interaction focused on the way the participants used communicative strategies as appropriate and necessary to the context and confirmed the distinct behaviors of the two groups. For example, Participant E1F18 and Participant E5F18, both belonging to the encapsulators’ group, tried to avoid interaction in the FL and reduced interaction with the in-game characters to a minimum. For example, Participant E1F18 only said “Hi” back to the in-game characters, never started a conversation, and her sentences were generally limited to one or two words. Participant E5F18 behaved in the same fashion as Participant E1F18 except for her reply to the professor’s question asking how she was doing. In this case, she sought social interaction, a behavior typical of the cosmopolitans, by saying: “¿Bien, y tú?” (Well, and you?) (Participant E5F18, VR Training, April 2017). A possible sign that she was getting ready to become more used to the interaction in Spanish is not confirmed by her last interaction of the VR training, because she leaves without saying goodbye to the professor.

On the other hand, the cosmopolitans showed their desire to interact with the in-game characters by starting a conversation, by asking questions back, and by showing interest in what the in-game characters were saying. An example of this is in Participant E2M18’s answer to the professor’s question asking him if he was tired. To which, he replied: “Sí, muy. ¿Cómo está usted?” (Yes, very. How are you doing, sir?) (Participant E2M18, VR Training, April 2017). Clearly, he is interested in keeping the conversation going. Another clear indication of belonging to this group can be seen by interjections used by Participant E4F18 that, while the in-game characters were talking, used the murmur “mm” (VR Training, April 2017) to show agreement and that she was listening to them.
Table 12

*Communicative Strategies During the VR Training by Participant, Experimental*

<table>
<thead>
<tr>
<th>Participants</th>
<th>Theme</th>
<th>Greetings</th>
<th>Apologies and Expressions of Gratitude</th>
<th>Requests</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1F18</td>
<td>Encapsulator</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>4</td>
</tr>
<tr>
<td>E2M18</td>
<td>Cosmopolitan</td>
<td>4</td>
<td>3</td>
<td>1</td>
<td>8</td>
</tr>
<tr>
<td>E3F18</td>
<td>Cosmopolitan</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>5</td>
</tr>
<tr>
<td>E4F18</td>
<td>Cosmopolitan</td>
<td>3</td>
<td>2</td>
<td>2</td>
<td>7</td>
</tr>
<tr>
<td>E5F18</td>
<td>Encapsulator</td>
<td>1</td>
<td>2</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

It is important to stress that the difference in behaviors between encapsulators and cosmopolitans should not be attributed to their Spanish proficiency, because they were all able to hold a conversation with the principal investigator in Spanish. Moreover, all the participants had taken equivalent Spanish courses during their university career. In conclusion, the resulting division into two groups (i.e. encapsulators vs. cosmopolitans) highlights the importance of this type of training before a study abroad sojourn, because some students might require additional time to adjust to the FL culture and confidently use the FL while abroad. The next section provides the analysis of the behaviors of the participants while abroad, and it uses the same thematic classification used by the current section.

**Participant behaviors while abroad.** As seen in the previous section, the participants of the experimental group behaved in two different ways during the VR training. Two of them (Participant E1F18 and Participant E5F18) tried to avoid social interaction and were categorized
as encapsulators. The other three participants (Participant E2M18, Participant E3F18, and Participant E4F18) constantly sought interaction with the in-game characters. The same thematic categories, introduced in Chapter 3, Data Analysis Procedures, appear in this section to see how the participants of both groups behaved while in Spain and to understand whether the two different types of training might have had a positive influence on their behaviors. Part of this section is dedicated to analyzing the evolution of the two participants of the VR training from encapsulators to cosmopolitans.

Most participants (78%) showed behaviors that belonged to both groups, as shown in Table 13. However, it was possible to assign each participant to a theme, based on the number of references in which they showed tendency typical of the encapsulators group or the cosmopolitan group (see Chapter 2, Measuring transcultural contact). According to this classification, three participants of the control group are encapsulators and only one is a cosmopolitan. On the other hand, all participants from the experimental group could be classified as cosmopolitans. The latter is an interesting switch from the results of the in-game behavior analysis according to which only three out of five belonged to the cosmopolitans. It is also important to point out that for two participants (C2M18 and E3F18) the number of references encountered was so low ($N = 3$) that it is hard to draw a clear thematic picture of the two. This is because (as shown in Table 2, Chapter 3) the two participants did not write all their Digital Journal Entries and Participant C2M18 was also not able to take part in the Post-Study-Abroad Interview.

The three participants belonging to the encapsulator group showed behaviors which tend to preserve their own culture such as isolation, creation of a group of foreigners, avoidance of TC, and social interaction with local people of Spain reduced to a minimum. On the contrary, the cosmopolitans adopted an integration strategy of adaptation to the Spanish culture. The main
distinctive features of the latter group are the willingness of the participants to create mixed
groups of people that include Spanish and American speakers, seeking TC, and constantly
looking for social interaction with Spanish locals.

**Cosmopolitan participants.** While in Spain the participants belonging to the
cosmopolitan group tended to create and hang out in groups composed of other U.S. students and
local people from Spain. Some of the participants created two distinct groups, one composed of
U.S. students and another one of Spanish speakers, as confirmed by Participant E1F18: “When
we were in the monastery I was mostly surrounded by everyone in the program, but whenever
we left (to Madrid or any excursion) we were able to speak more with the locals from Spain”
(Post-Study-Abroad Interview, September 2017). Others instead, created mixed groups as
written by Participant E5F18: “También estoy en un grupo más largo con dos otros hablantes
nativos que se llaman Ignacio y Javier y con cinco otros estudiantes de la universidad,” (I am
also part of a larger group with two native speakers named Ignacio and Javier and with five other
students from my university) (Digital Journal Entry 1, May 2017).

Another characteristic of the cosmopolitans that emerged from the Digital Journal Entries
and the Post-Study-Abroad Interview is their desire to explore and adapt to the new culture
without avoiding contact with their own. The participants belonging to this groups constantly
sought TC with excitement. For example, Participant C3F18 told the principal investigator that
“people were very welcoming and it was exciting experiencing a new culture” (Post-Study-
Abroad Interview, September 2017). For this group of students TC is considered a way of
learning as confirmed by participant E4F18: “Experiencing subways, restaurants, meeting new
people, and more is what I believe where people learn the most” (Digital Journal Entry 3, June
2017).
Table 13

**Thematic References by Participant**

<table>
<thead>
<tr>
<th>Participant</th>
<th>Theme</th>
<th>References</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1F18</td>
<td>Encapsulators*</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Cosmopolitans</td>
<td>3</td>
</tr>
<tr>
<td>C2M18</td>
<td>Encapsulators</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Cosmopolitans*</td>
<td>2</td>
</tr>
<tr>
<td>C3F18</td>
<td>Encapsulators*</td>
<td>10</td>
</tr>
<tr>
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<td>Cosmopolitans</td>
<td>5</td>
</tr>
<tr>
<td>C6F18</td>
<td>Encapsulators*</td>
<td>5</td>
</tr>
<tr>
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<tr>
<td>E1F18</td>
<td>Encapsulators</td>
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</tr>
<tr>
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</tr>
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<tr>
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<td>Cosmopolitans*</td>
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</tr>
<tr>
<td>E3F18</td>
<td>Encapsulators</td>
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</tr>
<tr>
<td></td>
<td>Cosmopolitans*</td>
<td>2</td>
</tr>
<tr>
<td>E4F18</td>
<td>Encapsulators</td>
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</tr>
<tr>
<td></td>
<td>Cosmopolitans*</td>
<td>3</td>
</tr>
<tr>
<td>E5F18</td>
<td>Encapsulators</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Cosmopolitans*</td>
<td>4</td>
</tr>
</tbody>
</table>

*Note.* *The theme with more references by participant. Data from Digital Journal Entries and Post-Study-Abroad Interviews.*
The cosmopolitan participants not only sought TC, but also social interaction in the FL. For instance, Participant E2F18 said that they “made a big effort to only speak Spanish” (Post-Study-Abroad Interview, September 2018). Moreover, their efforts were not limited to seeking interaction in the FL, but also to leaving the comfort zone created by their group and seeking interaction with local people. This is confirmed by Participant E5F18, who said, “[I] went out pretty often so I would have to speak with someone from the local town (Post-Study-Abroad Interview, September 2017). Those interactions outside of the study abroad group are also confirmed by Participant C2F18, who wrote: “I talk with people from Spain (outside of our conversation partners) on a daily basis, and I have been communicating very effectively thus far” (Digital Journal Entry 1, May 2017).

**Encapsulator participants.** The encapsulators showed opposite behaviors to those of the cosmopolitans. They adopted a strategy of isolation from the host culture that pushed them to create groups composed of only U.S. students. An example of this behavior can be seen in the comment made by Participant C3F18, who said: “We didn’t really interact with Spanish speakers, most of the time we went out we were in our group and so we were never really on our own in this town or anywhere” (Post-Study-Abroad Interview, September 2017).

Isolation strategy can also be seen in their avoidance of TC and social interaction. For example, Participant C1F18 wrote in one of her Digital Journal Entries that she often stayed back in her room reading and studying instead of going out. The avoidance of social interactions in the FL is confirmed by Participant C3F18, who wrote: “My interactions with people that aren’t proficiently fluent in English has been very limited” (Digital Journal Entry 1, May 2017). Participant C6F18 wrote about similar behavior: “I was very nervous to try to speak to Spanish
people in their language and therefore did not practice as much as I should have” (Digital Journal Entry 1, May 2017).

It is evident how the isolation strategy adopted by the encapsulators reduced the amount of social interaction and TC of the participants of this groups. Additionally, it was possible to observe, at least for some of them, a switch from encapsulators to cosmopolitans around the end of their sojourns. A representative example of this switch is in the third Digital Journal Entry of Participant C1F18, who preferred to spend her time in Spain studying Spanish in her room instead of going out. She realized her “mistake” right before going back to the United States. At that point, it was too late to change her integration strategy. In fact, Participant C1F18 wrote: “I noticed soon thereafter that a lot of valuable speaking practice was happening at the bar” (Digital Journal Entry 3, June 2017), and, “Looking back, of course I wish I had resorted to English far less” (Digital Journal Entry 3, June 2017).

A similar switch, although at an earlier date, can be observed in the two participants from the experimental group (Participant E1F18 and Participant E5F18) who showed encapsulator behavior during the VR training, but while in Spain they adopted the adaptation strategy typical of the cosmopolitan group. This quick adjustment to the FL culture for the participants of the experimental group could be attributed to the impact that the VR training had on them. This impact is even more apparent when one considers that it was possible to observe a similar adjustment to Spanish culture from a few of the control participants, but later, when they were getting ready to return to the United States.

Further results. During this study, it has been possible to observe how students demonstrated pragmatic knowledge, i.e. Bachman and Palmer (1996)’s functional and sociolinguistic knowledge in certain situations such as in their choice of 2nd person singular
personal pronoun and their use of Spanish and English while abroad. The next few paragraphs are devoted to the discussion of the language use of the participants while sojourning abroad and to pointing out any differences between the two groups.

**Language use while abroad.** The language use of the participants while abroad is based on data coming from self-reports collected during the Post-Study-Abroad Interview. An interview that took place once the participants were back in the United States contained two questions that explicitly inquired about the participants’ language use while abroad. Question 3 asked each participant what language he or she was speaking the most while in Spain and part of Question 5 asked what language they were using to communicate on their phones.

![Figure 11. Self-reported percentage of language use while in Spain, by group.](image)

As shown in Figure 11, the participants belonging to the experimental group stated that the language they used the most while in Spain was Spanish. Opposite results were observed in the control group. However, it is important to notice that one participant from the control group and another one from the experimental group stated that they spoke English and Spanish in equal amounts (Participant E5F18 and Participant C6F18). The stated percentage of language use for
each participant can be seen in Table 14. On average the participants of the experimental group spoke English 38% ($SD = 10\%$) of the time and spoke Spanish 63% of the time. In contrast, on average the participants of the control group spoke English 60% ($SD = 10\%$) of the time and spoke Spanish 40% of the time.

Furthermore, the participants’ responses to Question 5 show that at least regarding use of social networks, there is not a clear distinction between the two groups. Both groups behaved in a similar manner. Some of the participants only used their social networking apps to communicate in English with their family and friends back home and with the other students studying abroad with them. On the other hand, other participants separated their digital language use based on the apps used and the language spoken by the person they were interacting with. For example, Participant E5F18 said: “I used Facebook to communicate with Spanish speakers in Spanish and I used Instagram and Twitter to communicate with my friends back home in English” (Post-Study-Abroad Interview, September 2017). Other participants had similar responses. This separation between social networks and language preferences denotes how the students possibly still see the target culture as something foreign to them, and they are not comfortable enough to hold a conversation in Spanish with their American peers studying with them in Spain.

The results of this section show that both groups had multiple interactions in Spanish during their sojourns abroad. However, according to what I already noted, the experimental group used the FL more often than the control group and, even further, constantly sought authentic interactions to improve their Spanish. To conclude, it is important to point out that even though the results presented in this section show a distinction in behavior between the two
groups, the number of participants is too low to draw any conclusions, and other factors than the VR training might have contributed to this result.

Table 14

<table>
<thead>
<tr>
<th>Participant</th>
<th>English</th>
<th>Spanish</th>
</tr>
</thead>
<tbody>
<tr>
<td>E1F18</td>
<td>30%</td>
<td>70%</td>
</tr>
<tr>
<td>E2M18</td>
<td>30%</td>
<td>70%</td>
</tr>
<tr>
<td>E3F18</td>
<td>40%</td>
<td>60%</td>
</tr>
<tr>
<td>E5F18</td>
<td>50%</td>
<td>50%</td>
</tr>
<tr>
<td>C1F18</td>
<td>70%</td>
<td>30%</td>
</tr>
<tr>
<td>C3F18</td>
<td>60%</td>
<td>40%</td>
</tr>
<tr>
<td>C6F18</td>
<td>50%</td>
<td>50%</td>
</tr>
</tbody>
</table>

**Personal pronoun preferences.** During the post-training interview before their trip, participants were asked if they preferred using the pronoun *tú* or the pronoun *usted*. Of the seven participants who completed both interviews, three said that they preferred using the pronoun *tú*, three preferred the pronoun *usted*, and one did not have any preference. Their responses changed after the study abroad period in Spain. During the final interview, five participants stated that while in Spain they felt more comfortable using the pronoun *tú* and only one preferred the pronoun *usted*, as can be seen in Table 15. The pronoun use switch occurred with both groups. In this case, it is evident that the most significant factor in this change has been the interaction in Spanish.
Oddly, participant C6F18 had an unexpected shift from preference for the pronoun tú to preference for the pronoun usted, although she recognized that in Spain “it was just more common to use tú” (Post-Study-Abroad Interview, September 2017). This participant’s behavior was unusual in the sense that her shift after the trip differs entirely from the other participants. Moreover, as stated by Participant E2M18, tú was the pronoun of choice of native Spaniards in the context in which she was living, as pointed out by the participant herself,

Most times we used tú. It was weird at first. But even our professors they asked us to use tú and I wasn’t used to it. Here, you just normally use usted. But over there it seemed less formal than here in the U.S. (E2M18, Post-Study-Abroad Interview, September 2017)

<table>
<thead>
<tr>
<th>Participant</th>
<th>Before Spain</th>
<th>After Spain</th>
</tr>
</thead>
<tbody>
<tr>
<td>C1F18</td>
<td>Usted</td>
<td>Both</td>
</tr>
<tr>
<td>C3F18</td>
<td>Usted</td>
<td>Tú</td>
</tr>
<tr>
<td>C6F18</td>
<td>Tú</td>
<td>Usted</td>
</tr>
<tr>
<td>E1F18</td>
<td>Both</td>
<td>Both</td>
</tr>
<tr>
<td>E2M18</td>
<td>Usted</td>
<td>Tú</td>
</tr>
<tr>
<td>E3F18</td>
<td>Tú</td>
<td>Tú</td>
</tr>
<tr>
<td>E5F18</td>
<td>Tú</td>
<td>Tú</td>
</tr>
</tbody>
</table>

Furthermore, most of the participants were surprised by the commonly used second person plural pronoun of address vosotros: “Everyone was using vosotros for everything and I was like I don’t understand vosotros” (E3F18, Post-Study-Abroad Interview, September 2017). For example, Participant C1F18 said that she was caught off guard by the use of vosotros. The
unfamiliarity of the participants with vosotros was also confirmed by Participant E5F18 in her second journal entry in which she wrote that she was having trouble getting used to the use of vosotros and the verb haber as an auxiliary in the present perfect construction, but she recognized that those aspects of the language are more common in Spain: “No acostumbro el uso de vosotros o haber pero en conversación aquí estas cosas son más comunes” (I was not familiar with the use of vosotros or haber, however, here those things are very common during a conversation) (E5F18, Digital Journal Entry 2, June 2017). The student is referring to her being more accustomed to use the pretérito simple (simple past) in place of the preterito perfecto (present perfect) whose frequency, cross-dialectally is much higher in Spain. To conclude, the use of the vosotros pronoun should be taken into consideration when further developing the experimental training if it is related to a program in Spain because this is the only country in which vosotros is used as a form of address for 2nd person plural.

Summary

Chapter 4 introduced the results and the data analysis of this study. The first section showed that the VR training allowed the participants to experience a high level of presence and, therefore, feel immersed in the virtual environment. The second section compared the VR experience to traditional training given to the students before studying abroad. The results of the TC Survey showed how the two groups adjusted differently to the FL culture while in Spain. The experimental group mean for the level of adjustment improved after their sojourns abroad; on the contrary, it decreased for the control group. The qualitative analysis of the results further confirmed this last result.

The last section of Chapter 4 analyzed the two main themes that emerged from the qualitative data analysis, which were based on the behaviors of the participants during the VR
experience and while abroad. Two types of participants emerged from this analysis based on how they behaved and interacted during the VR experience. The participants that tried to avoid interaction in the FL and tended to isolate themselves from the FL culture and speakers were described as encapsulators. In contrast, the participants that sought interaction and tried to create groups with native speakers of Spanish were described as cosmopolitans. A shift in behavior from encapsulator to cosmopolitan was observed for some of the participants in the experimental group between the VR experience and during their sojourns abroad. Further results of this study were also reported at the end of the last section and included language use while abroad and personal pronoun preferences.
CHAPTER 5: DISCUSSION

This chapter reflects on the results of this study in relation to the literature review that guided the design of this study. The first section relates the results of this study to the acculturation model proposed by Schumann (1978, 1986), and sociocultural theory. The second section addresses the importance of training before studying abroad. The last section provides possible pedagogical implications of using VR in a FL classroom.

Acculturation model, sociocultural theory, and VR

The results of this study are in line with the acculturation model proposed by Schumann (1978, 1986), according to which the level of adjustment to the FL culture defines success in FL use, as was demonstrated by the results of the TC Survey and the participants’ thematic analysis. Moreover, this study shows that a VR environment, thanks to its similarities to the actual setting abroad, could be used as a valid alternative to a natural context in which human interaction takes place. It is this interaction which, according to sociocultural theory, is responsible for the development of the FL (Thorne & Lantolf, 2007). The current study draws from Schumann’s idea (1986) that certain social factors can promote or inhibit contact between two groups and directly affect language acquisition. However, the purpose of this study was not to study language acquisition abroad, but to observe how social interaction can be facilitated via VR training. The choice to not test an improvement in the language level of the participants that occurred during the study abroad period was motivated by the fact that so many other variables could have affected this change.
A good way to start a discussion about TC and social interaction is to characterize the study abroad experience that the participants had based on the social variables identified by Schumann (1986) described in Chapter 2. These variables can help identify the level of social distance between the two groups (U.S. students and people from Spain). A reduction in social distance between the two groups is supposed to promote contact and social interaction that might facilitate acquisition of the FL. The group of U.S. students observed in this study showed some social aspects that according to Schumann (1978, 1986) are typically expected to reduce social distance and some that are expected to have the opposite effect. For example, social interaction should have been facilitated by the cultural similarity between the two groups and by the positive attitudes of the participants of this study toward the people of Spain. On the other hand, the large size of the group (more than 50 U.S. students from the same university), their cohesiveness (they were all university students with similar interests), and the short amount of time spent abroad (around one month) should have negatively affected social interaction with local people while abroad.

Aside from the similarity common to all the participants of this study, it was possible to identify a social variable, integration strategy, that was not adopted in the same manner by all participants. As pointed out in the thematic analysis (Chapter 4), the participants adopted two different types of integration strategies: preservation (the participants who adopted this strategy were categorized as encapsulators) and adaptation (the participants who adopted this strategy were categorized as cosmopolitans). As shown by the data analyzed in Chapter 4, the integration strategies adopted by the participants were variable, and it was possible to observe multiple instances during which a participant switched from one strategy to another.
The participants showed different levels of comfort with social and cultural interaction. The data from the two TC Surveys (Chapter 4) showed that, during the study, most participants improved their levels of adjustment to Spanish culture. In a similar manner, during the thematic analysis (Chapter 4), I observed improvement in the level of adjustment to Spanish culture in the different integration strategies adopted by two participants (E1F18 and E5F18) during the VR training and while abroad. During the experimental training, these two participants showed behaviors typical of the preservation strategy, which is a type of integration strategy that reduced their interaction in the TL to a minimum. However, the controlled environment in which the VR training took place allowed both participants to experience, at least to a certain degree, TC. The benefits of this early exposure to TC manifested during their sojourn abroad. In this case, the thematic analysis showed a substantial shift regarding the integration strategy adopted by Participant E1F18 and Participant E5F18, both of whom adopted an adaptation strategy that reduced the social distance and facilitated social and cultural interaction.

Adjustment to Spanish did not happen exclusively in the experimental group but to a certain extent also in the control group. As expected, every participant adjusted to Spanish culture at his/her own pace. The results of this study offer suggestive evidence that the participants who partook in the VR training adjusted more rapidly than the control group and adopted an integration strategy more readily while abroad. In contrast, the control group participants adopted a more conservative integration strategy while abroad. Although this was the general tendency, one could observe a change of integration strategy toward the end of the study abroad period for some of the participants in the control group. A slower change toward an integration strategy would have facilitated social and cultural interaction in Spanish, if it had
occurred earlier instead of when the participants were about to leave Spain and return to the United States.

The different pace of adjustment to Spanish culture between the experimental and the control group would suggest that the VR training might have played an important role in the integration strategy adopted by the participants. This claim is supported by the results of the TC Survey. A possible explanation of the effectiveness of the experimental training compared to traditional training is the level of presence experienced by the participants during the VR simulation of their trip abroad. In this case, the participants of the experimental group could experience TC in a simulated environment and feel immersed in a FL context while still in the United States. It is possible that this early exposure to TC started the adjustment to Spanish culture before they left the United States, which did not happen for the control group who had to wait until they arrived in Spain to finally experience TC.

Besides the observed improvement of the adjustment levels of the participants to Spanish culture, it was not possible to confirm that this adjustment facilitated language acquisition and that it resulted in an improvement of their level of Spanish. At the same time, one could speculate that an increase in social and cultural interaction might result in an improvement in the participants’ Spanish level, if we are to base this speculation on the sociocultural theory according to which language acquisition occurs from social interaction in formal and informal settings. To conclude, this study showed how VR training can simulate interaction in a virtual environment using aspects of the language typically seen among the members of the FL community. Thanks to presence, the participants can experience the virtual environment as if it were real and can perceive the social interaction as if it were authentic.
The importance of training before studying abroad

This study also had the goal of finding a way to accelerate the adaptation period to the culture of the host country to allow the students to feel fully immersed in the new context. Acceleration of this adaptation period is necessary now more than ever, because the time spent abroad by U.S. students is declining (see Chapter 2). Numerous studies have shown the potential benefits of training students before a sojourn abroad (Bennett, 2008; S. B. Goldstein, 2017; D. L. Goldstein & Smith, 1999). However, only a few universities offer in-depth predeparture training, and in most cases, they only offer quick workshops that prepare the students to comply with the technical requirements (e.g., signing up for a class, buying a plane ticket) of their study abroad period (S. B. Goldstein, 2017).

This study recognizes the importance of predeparture training and proposes a solution in the development of specific VR training that simulates TC and interaction in the FL. The current study appears to support the argument for the importance of training and for a change in the training that takes place before sending a group of students abroad. Predeparture training that introduces students to the culture in which they will be sojourning should be considered the norm and offered in every single study abroad program. Additionally, the results of this study show that specific training (e.g., VR training; other alternatives might also work) that exposes the students to simulated TC and social and cultural interaction might also be included in a study abroad program, especially before a short-term one.

The results of this study indicate how important it is to keep developing predeparture experimental training to reduce negative reactions to TC while abroad and facilitate social and cultural interaction. The results of this study support the argument that VR training can be an effective alternative for predeparture training. Nonetheless, the VR training employed in this
study has room for improvement (Chapter 4). In a future iteration, VR training should include more interaction and contexts than the one designed for this study. Additionally, to facilitate its adoption it is necessary to automate the training by eliminating the actors and by substituting them with virtual characters that can interact in the FL without any external intervention.

**Possible pedagogical implications**

**The advantages of VR in SLA.** In addition to its importance for predeparture training, this study found several positive aspects of using VR for education and language acquisition. Prior to this study, VR had yet to be researched in relation to language acquisition, so this study provides a unique perspective on how VR can influence current language acquisition research. The next few paragraphs highlight the ways VR helps students take control of their learning by allowing them to experience in first person and by accommodating for their individual differences.

As mentioned in Chapter 2 of this study, learners’ individual differences can be a factor in determining the success of an individual’s language learning (Ellis, 2004). Numerous studies show the importance of cognitive differences in SLA (Dörnyei & Skehan, 2003; Oxford, 2003; Sasaki, 1996). The concept of diverse individual learning styles is one of the most popular cognitive differences discussed in language acquisition. This concept divides learners into three styles (visual, auditory, and kinesthetic) and calls for the use of a variety of teaching styles in the classroom to enhance the learning process. Before analyzing the benefits of VR related to these learning styles it is important to mention that a study has questioned evidence supporting the validity of this concept (Pashler, McDaniel, Rohrer, & Bjork, 2008). Aside from the academic debate and the need for additional research on this topic, VR has the potential to provide an ideal educational tool that includes all three learning styles.
This study showed how a VR experience can allow students to receive information in different formats simultaneously. For example, in VR a student can take part in a conversation in the FL by listening to the audio, and at the same time he or she can receive visual clues and be immersed in the context of the conversation taking place. Additionally, the learner can move inside the environment and change the environment if he or she wishes. The VR experience designed for this study illustrates how this can be accomplished. In Scene 1 of the VR experience the participants watched a video in Spanish; the video allowed them to not only get audio exposure to Spanish but also to receive visual clues that could have helped the visual learners. Moreover, by being surrounded by the virtual environment, the participants watched the video as if they were inside a real plane, and this catered to the kinesthetic learners.

It is important to point out that the VR experience created for this study did not take full advantage of the potential of this tool. A VR experience can theoretically be designed with multiple functionalities in mind that could cater to different learning styles, but at the same time it could be used to provide an inclusive educational tool accessible to all. For example, inside a VR experience, students with impaired or reduced movement could move freely, whereas visually impaired students could benefit from mechanical corrections of the lenses and by receiving the input in audio format.

Furthermore, the potential of VR is also shown by the possibility of integration of all learning strategies into one learning experience. Inside a traditional language classroom, the development of metacognitive and social/affective strategies is passed over in favor of the development of cognitive strategies. A VR experience can easily combine the three strategies and create an educational tool that does not need to focus mainly on one of them. The hybrid nature of this tool allows educators to create educational experiences that are set in an authentic
context, with simulated real-world interactions and tasks (metacognitive and social/affective strategies) but that can at the same time focus on certain aspects of the language (cognitive strategies), due to the possibility of controlling the environment.

Although educators can have full control of the environment, VR offers the possibility of creating educational experiences that are also characterized by flexibility, and that let learners make choices. In other words, it is possible to create VR experiences that are focused on certain aspects of the language but that, thanks to the flexibility of this tool, allow the students to pick their own path to completion. In VR, learners feel as if they are in control of their learning experience and advance at their own pace. For example, participants completed the VR experience used in this study by using different structures and sentences in Spanish. This flexibility allowed students with different proficiency levels to access the same experience.

**VR as an assessment tool.** The multiple degrees of freedom of a VR experience combined with the possibility of fully controlling the environment make this tool an ideal way to assess student FL performance and proficiency. The potential uses of VR as an assessment tool are numerous. For example, a VR experience could be used instead of a classroom test, as a substitute for a formal proficiency test (e.g., TOEFL, DELE), or as a way for students to practice and self-assess their FL.

Using VR as an assessment tool, either in a formal setting or as a self-assessment tool, has many advantages. First, the hybrid nature of this tool allows learner assessment in a simulated authentic environment, which is much more natural than using paper or a computer standardized test. The sole fact of using a simulated environment will bring us close to being able to assess the proficiency level of a speaker with more accuracy than with a traditional test. Moreover, use of a VR tool might help reduce the negative effects of affective individual
differences, such as test-taking anxiety. A side effect of this new type of environment that needs further consideration is that it is possible that some students might show certain affective differences that are typical of authentic communication and are responsible for reducing interaction in the FL (e.g., lack of self-confidence, being an introvert, etc.).

Another educational application of VR as a tool is that could help students to learn, practice, and consequently self-assess their FL. While the experimental training created for this study was not designed specifically to address or incorporate Can-Do statements proposed by NCSSFL-ACTFL, it shows many similarities. The set of Can-Do statements is a self-assessment tool that allows the students to list what they know and what they can produce in the FL (NCSSFL-ACTFL, 2017). After setting their language goals with Can-Do statements, students could hypothetically use a VR environment to test and practice their Can-Do statements. VR is particularly indicated for these types of activities because it allows the students to demonstrate what they can do in an environment that is pseudo-authentic, and, at the same time, with a low level of stress. Moreover, the adaptability of VR allows students to use the FL in the same virtual environment even if they have different levels of proficiency. With this technology it is possible to create a series of VR experiences that allow learners to use the FL in many contexts (e.g., daily life, formal settings) and use these virtual experiences to learn the FL. The flexibility of this tool lets students react to a conversation as many times as they want, go at their own pace, re-take the experience, use different pragmatic abilities and language skills, and record it and watch it once it is over.

Another benefit of using VR experiences to simulate communication in the FL is that the same experience could be tailored for different levels of proficiency, as shown by the fact that all participants were able to complete the experimental training regardless of their level of Spanish.
proficiency. It will also allow the use of the FL in a more natural way, not limiting the learners to specific grammar topics and predictable conversation routines. Moreover, once the learners feel confident with their level of interaction inside a VR experience, they could potentially share their interaction with other learners or with their teacher, who could use it to provide feedback or for performance-based grading.
CHAPTER 6: CONCLUSIONS AND LIMITATIONS OF THE STUDY

This study attempts to compensate for the short length of time spent abroad by U.S. students by creating VR training that allows students to immerse themselves in a simulated authentic Spanish environment. The VR experience allows students to jump-start the adjustment to the Spanish context before leaving the United States by exposing them to simulated transcultural contact to maximize the benefits of their study abroad sojourns. In general, participants do not receive any training aimed at facilitating acculturation while abroad. Usually, training focuses more on the practical aspects of their study abroad (e.g., documents needed, laws of the foreign country, what classes to attend).

This study shows the importance of including a different type of predeparture training and the benefit of using a simulated VR experience to immerse the student in the FL context. This study fills a gap in study abroad research, the most recent findings of which are collected in the 2017 issue of *System*, and hopes to push research to investigate further the importance of predeparture training.

This study compared two groups of students from a large southeastern university who were about to participate in a summer study abroad program in Spain. Both groups underwent training that had the objective of facilitating adjustment to the FL context. The control group attended traditional training, whereas the experimental group took part in a VR experience specifically designed for this study. The participants’ minimum proficiency level of Spanish has been compared to an Intermediate Low of the ACTFL Proficiency Guidelines.
The high level of presence shown by the participants during the experimental training suggests that the VR training used in this study allowed the participants to feel immersed in the virtual environment. Overall participants reached similar levels as those (levels) of two famous video games (Chapter 4). This result confirms the validity of this type of experimental training employed to simulate the TC in the FL.

Overall, the two main themes that emerged from the data analysis were used to divide the participants into two groups based on their behaviors during the VR experience and while abroad. The first group was the encapsulators, defined by their tendency to isolate themselves from Spanish culture, their avoidance of TC and social interaction with people of Spain, and their preference of creating groups of foreigners. The cosmopolitans, the second group identified by the analysis, were the participants who sought TC, looked for social interaction with people of Spain, and created hybrid groups composed of other students from the United States and local people. The in-game behavior analysis showed how the participants of the experimental group behaved in two differing ways during the VR training and divided them into two groups (two of them belonged to the encapsulators and three to the cosmopolitans). A further analysis of their behaviors while abroad highlighted a shift in the two encapsulators that showed a prevalence of behaviors belonging to the cosmopolitans group. In contrast, most of the control group participants showed behaviors typical of the encapsulators, with the sole exception of one participant (C2M18).

**Study Limitations**

Although this study showed substantial evidence in support of the research questions, several limitations are as follows. First, the sample of participants in this study was small. Only data from less than 10 students were used in the analysis. There is a need to replicate this
experiment with a similar study that includes a larger sample. Second, the current study divided
the participants into two groups, a control group that received more traditional training and an
experimental group that received the training by completing the VR experience. However, a
comparison of the two groups with an additional group that did not receive any training could
help discover the impact of the training versus the sole transcultural contact in the FL context.

Third, only a few interactions of Spanish were simulated in the VR experience. Additional contexts, interactions, and pragmatic aspects of Spanish should be included in a
future version of the training. The participants expressed a need for including the second person
plural personal pronoun vosotros, as it is not typically used in Latin America and therefore
participants may have less prior experience with this address form. Additional contexts should
also be included, such as ordering food in a restaurant or buying something in a shop. Moreover,
there is the possibility to include in the VR experience the differences in public displays of
affection between Spain and the United States. Last, there was a lack of feedback from the
instructor during the VR experience. A future study should try to integrate feedback inside the
VR experience or provide additional feedback right after the conclusion of the training.

Suggestions for Future Research

First, it is important to emphasize the importance of replicating this study with a larger
number of participants, which might potentially support the validity of the results. The addition
of more scenarios, pragmatic abilities, and interactions is also desirable. Much research also
remains on the role of VR in language education. Apart from the already-mentioned possibilities
of using VR as a learning and assessment tool, this study has shown many areas that deserve
more research. Predeparture training needs to be further investigated with the goal of facilitating
its adoption in as many study abroad program as possible, especially in the ones involving short-term sojourns.

One possible study that could be derived from this dissertation would include an improved version of the VR training and a larger number of participants. This study would focus only on comparing language use while abroad by using daily self-reported digital questionnaires. Furthermore, more research should be done to investigate the impact of VR training on various study abroad experiences. One possible study could investigate the difference in the effects of VR training between different Spanish-speaking host countries. This study would compare two groups of participants studying abroad in two different Spanish speaking countries. A follow-up study using VR could incorporate a linguistic/sociopragmatic measure to assess language acquisition.

Another area that needs further attention and investigation is the concept of presence to assess the types of virtual interactions and whether they could replace or at least be a valid alternative to authentic interaction. A possible study could be set up to test if presence can enhance instructed SLA. This study would compare the acquisition of specific interactions in the FL between two groups of learners: a control group learning in a traditional classroom and an experimental group learning with the use of VR. Additional efforts should be devoted to studying the role of transcultural contact and the impact it has on FL learners. To conclude, it is also important to apply the same concepts proposed by this study to other foreign languages.

**Conclusion**

This dissertation and the VR training were designed to explore a possible way to train students before studying abroad. The main goals behind this research were to reduce social distance between the students and Spanish speakers, and to facilitate Spanish language
acquisition while abroad. Returning to the research questions posed at the beginning of this dissertation, it is now possible to state that the VR training not only allowed the participants to feel *Presence* in the virtual environment, but it also facilitated immersion and authentic communication in the FL while abroad.
REFERENCES


APPENDICES
APPENDIX A

TRANSCULTURAL CONTACT SURVEY ADAPTED FROM MUMFORD (1998)
1. Do you feel strain from the effort to adapt to a new culture (e.g., moving to a different city from the one you grew up, living in another country for a certain amount of time, etc.)
   - Most of the time
   - Occasionally
   - Not at all

2. Do you feel anxious or awkward when meeting local people?
   - Most of the time
   - Occasionally
   - Not at all

3. Have you been missing your family and friends back home?
   - Most of the time
   - Occasionally
   - Not at all

4. When talking to people, can you make sense of their gestures or facial expressions?
   - Not at all
   - Occasionally
   - Most of the time

5. Do you feel generally accepted by the local people in the new culture?
   - No
   - Not sure
   - Yes

6. Do you feel uncomfortable if people stare at you when you go out?
   - Very uncomfortable
   - Slightly uncomfortable
   - Not at all

7. Do you ever wish to escape from your new environment altogether?
   - Most of the time
   - Occasionally
   - Not at all
8. When you go out shopping, do you feel as though people may be trying to cheat you?
   o  Most of the time
   o  Occasionally
   o  Not at all

9. Do you ever feel confused about your role or identity in the new culture?
   o  Most of the time
   o  Occasionally
   o  Not at all

10. Have you found things in your new environment shocking or disgusting?
    o  Many things
    o  A few things
    o  None

11. Are you ending it an effort to be polite to your hosts?
    o  Most of the time
    o  Occasionally
    o  Not at all

12. Do you ever feel helpless or powerless when trying to cope with the new culture?
    o  Most of the time
    o  Occasionally
    o  Not at all
APPENDIX B
LANGUAGE BACKGROUND SURVEY
(This information will be kept confidential)

First and last name: ____________________

e-mail: _______________________________________

this e-mail will be used to contact you while in Spain

1. What languages do you speak other than English? Between parentheses write down at what age you started learning that language.

   o _________________________________

   o _________________________________

   o _________________________________

   o _________________________________

   o _________________________________

   o _________________________________

   o _________________________________

2. How old are you?
   o 18-24
   o 25-30
   o 31-40

3. What gender do you identify as?
   o _________________________________
4. What language did you first learn…
   o to read and write?
     _______________________________
   o to speak?
     _______________________________

5. Would you like to improve your Spanish language skills?
   o Yes
   o No
   Why? _______________________________

6. How important is Spanish for you?
   _______________________________

7. Have you traveled to a foreign country? If yes, list your experiences by indicating the country, the time spent there, and the purpose of the trip. If you never traveled abroad just write NO.
   • _______________________________
   • _______________________________
   • _______________________________
   • _______________________________
   • _______________________________

8. Rate your current overall language ability in Spanish
   o understand but cannot speak
   o understand and can speak with great difficulty
   o understand and speak but with some difficulty
   o understand and speak comfortably with my Spanish teachers and classmates
   o understand and speak comfortably, with a native speaker
   o understand and speak fluently like a native speaker
9. Rate your current overall language ability in ____________ (write the name of the language you speak other than English and Spanish, repeat for all the languages you speak)
   o understand but cannot speak
   o understand and can speak with great difficulty
   o understand and speak but with some difficulty
   o understand and speak comfortably with my language teachers and classmates
   o understand and speak comfortably, with a native speaker
   o understand and speak fluently like a native speaker

10. Rate your current overall language ability in ____________ (write the name of the language you speak other than English and Spanish, repeat for all the languages you speak)
    o understand but cannot speak
    o understand and can speak with great difficulty
    o understand and speak but with some difficulty
    o understand and speak comfortably with my language teachers and classmates
    o understand and speak comfortably, with a native speaker
    o understand and speak fluently like a native speaker

11. What Spanish classes did you take this semester (Spring 2017)?
    □ SP 353 (Spanish Conversation)
    □ SP 356 (Adv Grammar and Compos)
    □ SP 360 (Commercial Spanish)
    □ SP 362 (Spanish for Healthcare)
    □ SP 367 (Technical Writing)
    □ SP 371 (Masterpc Sp-Amer Lit II)
☐ SP 376 (Spanish Outreach)

☐ SP 389 (Spanish Outreach)

☐ SP 390 (Special Topics)

☐ SP 484 (Phonetics and Pronunciation)

☐ SP 485 (Open Topics in Linguistics)

☐ SP 489 (Open Topics Sp-Amer Lit)

☐ SP 490 (Open Topics)

☐ SP 491 (Cervantes)
APPENDIX C

PARTICIPANTS’ DESCRIPTIONS
Participant E1F18

Participant E1F18 is a young adult, aged 18 to 24 who self-identifies as female. She attends the university that organizes the study abroad program in Spain. One of her goals is to receive a minor in Spanish. She is a native speaker of English and she started learning Spanish when she was 13 years old. She would like to improve her Spanish and become fluent. Spanish is also important to her because she comes from a Hispanic background and she would love to speak the native language of her grandparents, who she states were never able to teach their own children. Based on the self-reported proficiency level of Spanish, she is comfortable with understanding others but speaks with some difficulty. During the semester leading up to her study abroad period she took a Spanish Advanced Grammar and Composition class. She does not speak any languages other than English and Spanish. Prior to her 1-month sojourn in Spain observed by this study, she had already studied abroad in the past. She spent one week in England during high school and one month in Spain, during summer of 2016, with a study abroad program of the Engineering Department of the university she is currently attending. She completed all the instruments of this study.

Participant E2M18

Participant E1M18 is a young adult, aged 18 to 24 who self-identifies as male. He attends the university that organizes the study abroad program in Spain. He is a native speaker of English and he started learning Spanish when he was 15 years old. He would like to improve his Spanish to communicate more effectively. Based on the self-reported proficiency level of Spanish he understands and speaks Spanish comfortably with his Spanish teachers and classmates. During the semester leading to his study abroad period he took a Spanish Advanced Grammar and Composition class. He does not speak any languages other than English and
Participant E3F18

Participant E3F18 is a young adult, aged 18 to 24 who self-identifies as female. She attends the university that organizes the study abroad program in Spain and one of her goals is to receive a minor in Spanish. She is a native speaker of English and she started learning Spanish when she was 6 years old. She would like to improve her Spanish because she believes that it is a valuable language to know. She also states that she simply enjoys learning the language. Based on the self-reported proficiency level of Spanish she understands and speaks comfortably with a native speaker. During the semester leading to her study abroad period she took an intermediate class of Spanish, equal to a fourth semester course. She does not speak any languages other than English and Spanish. Before her 1-month-sojourn in Spain observed by this study, she had spent three weeks in Costa Rica with the goal to study Spanish. She completed all the instruments of this study except for the third journal entry.

Participant E4F18

Participant E4F18 is a young adult, aged 18 to 24 who self-identifies as female. She attends the university that organizes the study abroad program in Spain. She is a heritage speaker of Spanish that grew up in the United States. She learned to speak Spanish and English simultaneously. Since she only received formal instruction in English when she was young. She states that she first learned how to read and write in English. She would like to improve her Spanish because it is her native language and she would love to show the people of her country
that she can speak the language she was born into. Based on the self-reported proficiency level of
Spanish she understands and speaks Spanish fluently, like a native speaker. Additionally, she
studied French in the past and her proficiency level is novice low. This was her first study abroad
experience and she sojourned in Spain for one month. She lived in Germany with her family for
four years. She did not complete all the instruments of this study. During this study, she skipped
the Post Study Abroad Interview and the second TC Survey. The pre-training TC Survey will not
be taken in consideration by this study given that comparison across instruments will be
impossible to carry out.

**Participant E5F18**

Participant E1F18 is a young adult, aged 18 to 24 who self-identifies as female. She
attends the university that organizes the study abroad program in Spain. She is a native speaker
of English and she started learning Spanish when she was 12 years old. She would like to
improve her Spanish because she believes that she should develop all her skills to their fullest
potential. She also states that Spanish is important for her because she spent a lot of time
studying it and she would like to master it as best as she can. Based on the self-reported
proficiency level of Spanish she understands and speaks it with some difficulty. She does not
speak any languages other than English and Spanish. During the semester leading to her study
abroad period she took the second semester of a Latin American literature course. This was her
first study abroad experience and she sojourned in Spain for one month. She comes from a
military family, therefore she lived in Germany for five years and in Japan for three years. She
completed all the instruments of this study except for the third journal entry.
Participant C1F18

Participant C1F18 is a young adult, aged 18 to 24 who self-identifies as female. She attends the university that organizes the study abroad program in Spain and one of her goals is to become fluent in Spanish. She is a native speaker of English and she started learning Spanish when she was 12 years old. She would like to improve her Spanish and be able to communicate with Spanish speakers effectively. Based on the self-reported proficiency level of Spanish she can understand it but she has some difficulty in speaking the language. She does not speak any languages other than English and Spanish. During the semester leading to her study abroad period she took a commercial Spanish and a technical writing course in Spanish. This was her first study abroad experience and she sojourned in Spain for 1 month with the university program and she had traveled around Spain right before her stay for two weeks with her mom. She had traveled abroad in the past in multiple occasions, always for vacations. She completed all the instruments of this study.

Participant C2M18

Participant C2M18 is a young adult, aged 18 to 24 who self-identifies as male. He attends the university that organizes the study abroad program in Spain and one of his goals is to major in Spanish. He is a native speaker of English and he started learning Spanish when she was 14 years old. He would like to improve his Spanish and be able to potentially practice medicine in a Spanish speaking country. Based on the self-reported proficiency level of Spanish he can understand and speak the language but with some difficulty. He does not speak any languages other than English and Spanish. During the semester leading to his study abroad period he took a Spanish civilization course. This was his first study abroad experience and he sojourned in Spain for seven weeks. He had traveled abroad in the past in multiple occasions, always for vacations.
Among all the places he has visited, he spent more than a month between Spain and Mexico. He did not complete all the instruments of this study. During this study he skipped the Post Study Abroad Interview, the second TC Survey, and the third journal entry. For lack of comparison the pre-training TC Survey will not be taken in consideration by this study.

**Participant C3F18**

Participant C1F18 is a young adult, aged 18 to 24 who self-identifies as female. She attends the university that organizes the study abroad program in Spain and one of her goals is to minor in Spanish. She is a native speaker of English and she started learning Spanish when she was 15 years old. She would like to improve her Spanish and be bilingual. She wants to become bilingual because she believes it is important to be bilingual in our globalized market. Based on the self-reported proficiency level of Spanish she can understand and speak comfortably with her Spanish teachers and classmates. She does not speak any languages other than English and Spanish. During the semester leading to her study abroad period she did not take any class, since has already took all the coursework necessary to minor in Spanish. This was her first study abroad experience; she sojourned in Spain for one month with the university and she traveled around Spain right before her stay for 2 weeks. She had traveled abroad in the past only in two occasions, always for vacations. However, the total time she spent abroad before this study took place was around two weeks. She completed all the instruments of this study.

**Participant C6F18**

Participant C1F18 is a young adult, aged 18 to 24 who self-identifies as female. She attends the university that organizes the study abroad program in Spain. and one of her goal is to become fluent in Spanish. She is a heritage speaker of Spanish that grew up in the United States. She learned to speak Spanish and English simultaneously. She would like to improve her
Spanish and be able as fluently as her family. Based on the self-reported proficiency level of Spanish she can understand and speak comfortably with her Spanish teachers and classmates. She also studied French in the past and she self-reported that she can understand and speak it with great difficulty. During the semester leading to her study abroad period she took a Spanish civilization and an Advanced Grammar and Composition course. Prior to her 1-month-sojourn in Spain observed by this study, she had already studied abroad in the past. She spent 2 weeks each summer for five years in Costa Rica and two weeks in Peru studying Spanish. She states that she also traveled for vacation to Mexico several times and once to Honduras and Belize. She completed all the instruments of this study.

**Excluded participants**

Participants E6 and C4 were excluded from this study because they only filled out the consent form and never completed any instruments. Participant C5 was excluded from this study, because she only completed the instruments before her study abroad period. None of the data collected from this participant were included in this study because of the impossibility of diachronic comparison of the data.
APPENDIX D

INTERVIEW QUESTIONS
Post-training interview questions

1. What do you think about the training?
2. Describe your training experience? What did you learn?
3. Do you think that you will be able to ask for information about the location of a place while in Spain?
4. Do you feel more comfortable using the pronoun tú or usted? Will you be able to use them correctly while in Spain?
5. Did the training make you change your mind about going to Spain this summer?
6. Do you think that this training would be helpful once you will be in Spain?
7. Do you have any questions for me?

Post-study-abroad-period Interview Questions

1. Welcome back home. What do you think about Spain? Did you enjoy the time you spent there?
2. Were you able to have social interactions with Spanish Speakers?
3. What language did you speak the most while in Spain?
4. Can you tell me about a linguistic accident or misunderstanding that happened while you were in Spain? Did you learn any pragmatic or cultural aspects from this accident?
5. Did you use any social networks (Instagram, Snapchat, Facebook, etc.) while in Spain? Did you use them to communicate with Spanish speakers? What language did you use?
6. Were you able to ask for information about the location of a place while in Spain?
7. Did you feel more comfortable using the pronoun tú or usted while in Spain? Were you able to use these two pronouns correctly?
8. Do you think, based on your personal experience that the training you did with me before going to Spain has facilitated the interaction you had with local people abroad? How do you think the training helped you?
9. What could I do to improve the training experience?
10. Do you have any questions for me?
APPENDIX E

PRESENCE SURVEY CREATED BY IGROUP.ORG
1. Were there other real persons within the virtual environment besides yourself?
   o No
   o Yes, but I did not interact with them
   o Yes, and I did interact with them

2. Were there artificial characters (e.g., computer game opponents) within the virtual environment?
   o No
   o Yes, but I did not interact with them
   o Yes, and I did interact with them

Now you'll see some statements about experiences. Please indicate, whether or not each statement applies to your experience. If a question is not relevant to the virtual environment you used, just skip it. You can use the whole range of answers. There are no right or wrong answers, only your opinion counts.

You will notice that some questions are very similar to each other. This is necessary for statistical reasons. And please remember: Answer all these questions only referring to this one experience.

3. How aware were you of the real world surrounding while navigating in the virtual world? (i.e. sounds, room temperature, other people, etc.)?

   extremely aware 0 0 0 0 0 0 0 not aware at all
   -3 -2 -1 0 +1 +2 +3

   moderately

   aware

4. How real did the virtual world seem to you?

   completely real 0 0 0 0 0 0 0 not real at all
   -3 -2 -1 0 +1 +2 +3
5. I had a sense of acting in the virtual space, rather than operating something from outside.

<table>
<thead>
<tr>
<th>fully disagree</th>
<th>fully agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
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<tr>
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<tr>
<td>-1</td>
<td>+1</td>
</tr>
<tr>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

6. How much did your experience in the virtual environment seem consistent with your real-world experience?

<table>
<thead>
<tr>
<th>not consistent</th>
<th>very consistent</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>+3</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>-1</td>
<td>+1</td>
</tr>
<tr>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

moderately consistent

7. How real did the virtual world seem to you?

<table>
<thead>
<tr>
<th>about as real as an imagined world</th>
<th>indistinguishable from the real world</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>-2</td>
</tr>
</tbody>
</table>

8. I did not feel present in the virtual space.

<table>
<thead>
<tr>
<th>did not feel</th>
<th>felt present</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>-2</td>
</tr>
</tbody>
</table>

9. I was not aware of my real environment.

<table>
<thead>
<tr>
<th>fully disagree</th>
<th>fully agree</th>
</tr>
</thead>
<tbody>
<tr>
<td>-3</td>
<td>+3</td>
</tr>
<tr>
<td>-2</td>
<td>+2</td>
</tr>
<tr>
<td>-1</td>
<td>+1</td>
</tr>
<tr>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

10. In the computer-generated world, I had a sense of "being there"
<table>
<thead>
<tr>
<th></th>
<th>not at all</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>very much</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
<td>0</td>
<td>+1</td>
<td>+2</td>
<td>+3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

11. Somehow, I felt that the virtual world surrounded me.

<table>
<thead>
<tr>
<th></th>
<th>fully disagree</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>fully agree</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
<td>0</td>
<td>+1</td>
<td>+2</td>
<td>+3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

12. I felt present in the virtual space.

<table>
<thead>
<tr>
<th></th>
<th>fully disagree</th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th>fully agree</th>
</tr>
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<tr>
<td></td>
<td>-3</td>
<td>-2</td>
<td>-1</td>
<td>0</td>
<td>+1</td>
<td>+2</td>
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13. I still paid attention to the real environment.

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14. The virtual world seemed more realistic than the real world.

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15. I felt like I was just perceiving pictures.

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16. I was completely captivated by the virtual world.
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APPENDIX F

DIGITAL JOURNAL ENTRIES
Journal Entry number 1

Following the email, the students will receive during their first week abroad. This will be the prompt for their first journal entry.

Buenos días (good morning),

I hope that your trip to Spain is going well and that you are already enjoying your time there. As soon as you have time, I will appreciate if you will upload on UA BOX your first journal entry. As a reminder feel free to use the language you prefer. This entry can be just an audio recording of your voice, a written text or both.

You can talk about your experience in general, the city where you are staying, the food, etc. Also, I will appreciate if you can answer these questions:

- Did you already talk with someone from Spain? Tell me a little bit about it. Where you able to understand them? Were you worried about your Spanish proficiency level?

That’s it for today,

Hasta pronto (see you soon),

Giovanni Zimotti

Journal Entry number 2

Following the email, the students will receive at the beginning of their third week abroad. This will be the prompt for their second journal entry.

Buenos días (good morning),

You have been in Spain for more than two weeks by now. Do you miss being in the U.S.?
As soon as you have time, I will appreciate if you will upload on UA BOX your second journal entry. As a reminder feel free to use the language you prefer. This entry can be just an audio recording of your voice, a written text or both.

You can talk about your experience in general, the city where you are staying, the food, etc.

Also, I will appreciate if you can answer these questions:

- Did you learn any pragmatic or social aspects beyond the Spanish classroom?
- Did you learn any cultural differences between Spain and the U.S. or between Spanish and English?

That’s it for today,

Hasta pronto (see you soon),

Giovanni Zimotti

---

**Journal Entry number 3**

Following the email, the students will receive at the end of their final week abroad. This will be the prompt for their third journal entry.

Buenos dias (good morning),

You have been in Spain forever, right? It is almost time to go back home. Are you excited to come back?

As soon as you have time, I will appreciate if you will upload on UA BOX your second journal entry. As a reminder feel free to use the language you prefer. This entry can be just an audio recording of your voice, a written text or both.

You can talk about your experience in general, the city where you are staying, the food, etc.

Also, I will appreciate if you can answer these questions:
• Did you learn any pragmatic or social aspects beyond the classroom of Spanish?
• Did you learn any cultural differences between Spain and the U.S. or between Spanish and English?
• Do you think that your Spanish is better than when you left the U.S.? Why do you think your Spanish is improved? Why do you think your Spanish did not improve?

That’s it for today,

Nos vemos en Tuscaloosa (see you in Tuscaloosa),

Giovanni Zimotti
APPENDIX G

SCREENSHOTS OF VIDEO GAMES USED BY THE PRESENCE SURVEY

(IGROUP.ORG)
A screenshot from Tomb Raider 3.

(http://www.tombraiderchronicles.com/tr3/screenshots_04.html)

Ready, Steady, Spain! (Proof of Concept)

Game Design Document

Prepared by:

Giovanni Zimotti

PhD Student - Romance Languages (Spanish Linguistics)

gzimotti@crimson.ua.edu

Department of Modern Languages and Classics

The University of Alabama

234 BB Comer - Box 870246

Tuscaloosa, AL 35487
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5. License
**Game Design**

**Summary**

The players (the learners) will be immersed in an authentic reconstruction of Madrid, Spain. In this game, the players will be able to practice their language skills in a natural environment.

**Gameplay**

Players should be able to move freely inside Madrid. However, the players will have to follow specific tasks in a certain order to complete the game. They will receive instruction about their tasks through interaction with other character (AI). To complete these tasks, player will be required to follow the instruction received and move inside the game to reach certain points and also with interaction with other characters. At least, for the moment it will be a 1 player game. A local multiplayer version should be considered for the future.

**Target Platform**

This game will be created for a Virtual Reality environment. Ideally, it will support Oculus Rift, HTC Vive, and Google Daydream. However, the first version of the game should support at least Oculus Rift.

**Visual Style**

This game, in order to be compatible with multiple devices, will use a low-poly style. The actual style of the game will be decided by the Design Director of the game.

**Audio Style**

This game will use as background noises authentic recording from Madrid, Spain.
The dialogues between the player and the characters will be only in the target language (Spanish). Actors from Madrid will be used to recreate the dialogues.

Starting Out

Game start – Main Menu – Character Selection/Creation

The game will start with a very simple loading screen showing the name of the game. Past the loading screen, the player will have the option to select its preferred gender. This selection should be done with a screen with the gender pronouns of Spanish (el/ella). I will prefer not to use any male/female symbol to respect gender diversity. Gender selection is important since Spanish is not a gender-neutral language. Right after this quick selection, the player will start playing the game.

Game Start and Intro

- **SCENE 1 - THE AIRPLANE** (passive introduction - Tutorial Part A). The player will be sitting on a plane watching a very short video explaining what is going on. This will be a good start for the game, to get used and immerse themselves in this new environment. It will also create a connection to the next scene. The video will also tell the player what to do once landed.

- **SCENE 2 - THE AIRPORT** (active introduction - Tutorial Part B). The player in this scene will familiarize with the movement of his character, will have a very brief conversation with one character (AI), and he/she will complete his/her first task. The first task will consist in going from point A to point B and get inside a cab.
• **SCENE 3 - MADRID** (the actual game). This preliminary version of the game will be limited to a very small part of Madrid. The player will be free to move and interact with the characters (actors that will be present in the room) in the street and complete the assigned tasks in order to successfully finish the game. In the future, other levels could be added to this scene.

**In-Game HUD & Menus**

The in-game HUD should be simple (see figure 1).

- Left bottom part of the screen a button to see the objectives of the game and to pause the game. This button will open a new on-screen menu (figure 2)
- Right-bottom part of the screen a button that will let you answer your phone. (This functionality will be developed in the future).

![Figure 1. In-Game HUD.](image-url)
Multiplayer

This function will be added in the future.

Mechanics and controls

This game will use a simple mechanics.

The player should be able to move in all the directions (no need to run).

The player should also be able to use 1 button to start a conversation with a character of the game. The same button could be used in the future to interact with objects (no need for it right now).

*The player will also be able to open the left menu during the game and to open the right menu (the phone). Ideally these two menus should be opened by looking at them and by the click of a button. The phone menu is a gimmick I would like to add to the game, but it is not necessary.*
Scenes in detail

SCENE 1 - THE AIRPLANE (passive introduction - Tutorial Part A)

The player will be sitting on a plane watching a very short video explaining what is going on. This will be a good start for the players to get used to and immerse themselves in this new environment. It will also create a connection to the next scene. The video will also tell the player what to do once landed.

No movement needed for the player. The player is sitting watching the video on the screen.

Transcript of the video:

[the video will start with the pilot informing the passengers that they are about to land in Madrid]

PILOT: Señores pasajeros, os habla el capitán Alejandro Velázquez. Buenos días, estamos comenzando el descenso en el aeropuerto Adolfo Suárez de Madrid. Viaje procedente de Birmingham, Alabama. La temperatura exterior es de 30 grados centígrados.

Durante el aterrizaje no se levanten y no se quiten el cinturón hasta que el avión no se detenga por completo.

[Airplane noises]

FLIGHT ATTENDANT: Señores pasajeros, bienvenidos al aeropuerto Adolfo Suárez de Madrid. Por favor, permanezcan sentados, y con el cinturón de seguridad abrochado hasta que el avión haya parado completamente los motores y la señal luminosa de cinturones se apague. Los teléfonos móviles deberán permanecer totalmente desconectados hasta la apertura de las puertas.
Por favor, comprueben que llevan consigo todo su equipaje de mano y objetos personales. Les recordamos que no está permitido fumar hasta su llegada a las zonas autorizadas de la terminal. Si desean cualquier información, por favor diríjanse al personal de tierra en el aeropuerto; muy gustosamente les atenderán. Muchas gracias y buenos días.

SCENE 2 - THE AIRPORT (active introduction - Tutorial Part B)

This scene is pretty basic and should be very easy to create. We should not spend a lot of time creating it. Estimated playing time 1 minute. However, the players could spend more time looking around.

The players in this scene will familiarize with the movement.

The scene begins with the player having a very brief conversation with one character (AI). They will not have to talk back to the character. They will only have to understand what the character is saying. The character will basically tell them that they need to get out of the airport and get into a cab.

Walking from the starting point to the exit will be the only task to be completed in this scene.

SCENE 3 - MADRID (the actual game)

This preliminary version of the game will be limited to a very small part of Madrid. The player will be free to move and interact with the characters (actors that will be present in the room) in the street and complete the assigned tasks to successfully finish the game. In the future, other levels could be added to this scene.
This scene is set in Calle de Velásquez, a street of Madrid as shown in Figure 2. However, to reduce the amount of work to be done we will not be using the whole street but only a small part. The game will include lot 1, 2, 3, 18, 19, and 20.

*Figure 3. Map of Scene 3, only lots 1, 2, 3, 18, 19, and 20 will be used in the first version of the game.*

**Gameplay:**

- **Task 1:** the game starts with the player getting out of the cab (we don’t need to create this animation. We can just put a car next to the player. The taxi has to look as shown in figure 4.). In this task, the player will have to interact with the taxi driver. The price will be in Euros. The player will try to pay with credit card, but the taxi driver will refuse and tell them that he only accepts cash, in small bill. The purpose of this interaction is to start the acculturation process of the learner.

  **Elements of this task:** 1 car, 1 character (voiced by an actor).

  **Extra** (to add later if we have time): the player will have to convert his/her money from dollars in order to pay in Euros.
Figure 4. Taxi of Madrid.

- **Task 2**: another person will approach the player. This person works for the University that organized the trip. The person will introduce himself, and then the player will have to do the same. After this first interaction, the person will tell the player that they are late and he/she will have to apologize for it. During this task, the player should use the formal pronoun *usted* and should also demonstrate the ability to apologize. Then the character will tell the player that he has to leave and that they can go to the place where they are staying, and that if they don’t know where the place is, they must ask someone.

  **Elements of this task**: 1 character (voiced by an actor).

- **Task 3**: the player is lost, and it has to ask for direction to someone else. Close to the player, there will be a little kid. The player will interact with the kid and ask direction. The player should use the informal pronoun *tú*.

  **Elements of this task**: 1 kid (voiced by an actor).

  **Extra**: the kid could draw a map with direction on a piece of paper.

- **Task 4**: the player will reach the place indicated by the kid, but they cannot get it. The player does not have the key. In this task, the player will have to fix a problem. To fix this problem the player will have to communicate with someone else and explain what is going on. After a few seconds, the character from task 1 will appear, and the player will have to explain the problem, and the character will hand he/she the key.

**License**

This game will be open source and it will use the license GNU GPLv3.
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APPENDIX L

IRB LETTER
February 24, 2017

Giovanni Zimotti
Dept of Modern Languages & Classics
College of Arts and Sciences
Box 870246

Re: IRB # 17-OR-081, "Virtual reality: reducing social distance and facilitating second language acquisition abroad"

Dear Mr. Zimotti:

The University of Alabama Institutional Review Board has granted approval for your proposed research.

Your application has been given expedited approval according to 45 CFR part 46. Approval has been given under expedited review category 7 as outlined below:

(7) Research on individual or group characteristics or behavior (including, but not limited to, research on perception, cognition, motivation, identity, language, communication, cultural beliefs or practices, and social behavior) or research employing surveys, interview, oral history, focus group, program evaluation, human factors evaluation, or quality assurance methodologies.

Your application will expire on February 22, 2018. If your research will continue beyond this date, please complete the relevant portions of the IRB Renewal Application. If you wish to modify the application, please complete the Modification of an Approved Protocol Form. Changes in this study cannot be initiated without IRB approval, except when necessary to eliminate apparent immediate hazards to participants. When the study closes, please complete the Request for Study Closure Form.

Please use reproductions of the IRB approved stamped consent forms to obtain consent from your participants.

Should you need to submit any further correspondence regarding this proposal, please include the above application number.

Good luck with your research.

Sincerely,

Stuart Usdan, Ph.D.
Chair, Non-Medical IRB
The University of Alabama