LEXICAL AND PRAGMATIC MANIFESTATIONS OF UNCERTAINTY: AN EXAMINATION OF NUMERIC APPROXIMATORS IN L2 SPANISH

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ABSTRACT OF THE DISSERTATION

Lexical and pragmatic manifestations of uncertainty: An examination of numeric approximators in L2 Spanish

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Vague language (VL) plays an essential role in effective communication since it carries relevant contextual implications. As noted by Sabet and Zhang (2015), VL helps speakers tailor their message so that they can convey the intended meaning of an utterance when, for example, precise information cannot be retrieved. According to Channell (1994), VL is commonly manifested through the use of numeric approximators (e.g., around, about, approximately). Numeric approximators (NumApps) are lexical items that target a semantically loose use of expressions and are frequently employed to discuss inexact quantities or numeric values (e.g., Fuentes Rodríguez, 2008; Mihatsch, 2009, 2010; Said-Mohand, 2006). Even though research on the uses of NumApps among native speakers of English and Spanish (as well as in other languages) does exist, this category of VL remains understudied in the second language (L2) context.

The dissertation extends empirical research on Spanish NumApps from an Interlanguage Pragmatics (ILP) perspective by drawing a connection between empirical evidence on the development of L2 pragmatic knowledge and theories of Second Language Acquisition (SLA). Specifically, it investigates the effect of the pragmatic condition of *magnitude* (i.e., number of significant figures) of quantities and examines how changes in the magnitude of a quantity affect the production and interpretation of numeric approximations among intermediate and advanced Spanish L2 learners in comparison to native Spanish speakers. The study included the following data collection protocols: an oral interview in Spanish, a prompted production task, a forced-choice task, and an oral interview in English.

The findings revealed that the intermediate and advanced L2 learners are able to express numeric uncertainty using a wide range of lexical and pragmatic devices. Furthermore, the use of NumApps was found to correlate with the level of Spanish proficiency. However, the study also revealed that the intermediate and advanced L2 learners are still in the process of developing pragmatic sensitivity towards the constraint of *quantity magnitude* with respect to the production and interpretation of numeric approximation. That is, when the two L2 learner groups discussed and interpreted uncertain quantities with large magnitudes, their lexical choices and interpretation patterns did not resemble those of the native speakers.

This study is the first to empirically examine the effect of the pragmatic condition of *quantity magnitude* from a developmental perspective among L2 learners. Furthermore, the study triangulates the data generated from the aforementioned protocols

and provides a comprehensive and detailed account of the process of acquisition of NumApps in L2 Spanish.

Keywords: vague language, numeric approximators, interlanguage pragmatics, L2 Spanish, second language acquisition

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Chapter 1

Introduction

In this chapter, I present the problem statement, the scope of the study, and the study's contribution to the field of Second Language Acquisition (SLA). This chapter also provides an outline of the organization of the chapters.

1.1 Problem statement and scope of the study

The problem that this study investigates is the role that Spanish L2 proficiency plays in relation to the production and interpretation of numeric approximations involving small quantities (e.g., *como 50* 'like 50') and large quantities (*aproximadamente 1,000* 'approximately 1,000'). Lexical items such as *como* and *aproximadamente* are known as numeric approximators (NumApps), and they represent a form of vague language (VL) that is typically employed by speakers when conveying imprecise quantities.

VL is a central feature of daily language use and a crucial element for successful communication, as it has been noted in previous research (e.g., Channell, 1994; Cutting, 2007; Jimenez & Flores-Ferrán, 2018; Jucker, Smith, & Lüdge, 2003; Metsä-Ketelä, 2006; Sabet & Zhang, 2015). VL is an inherent characteristic of languages, which, according to Channell (1994), can be purposefully manifested through the use of vague additives, such as NumApps (e.g., around, about, approximately). Mihatsch (2007) defined approximators as lexical items that target a semantically loose use of an expression. In other words, and following Channell (1994), NumApps can be considered lexical material that leads to an inexact but close interpretation of the proposition it modifies. Moreover, various scholars (e.g., Prince, Frader, & Bosk, 1982; Fuentes Rodríguez, 2008; Said-Mohand, 2006) have asserted that NumApps allow speakers to

convey imprecision when communicating inexact quantities since these forms affect the propositional content of an utterance, its veracity, and certainty.

NumApps present a relevant case for the study of SLA. Channell (1994) has observed that the use and interpretation of these forms lie at a complex intersection between semantics (i.e., linguistic meaning) and pragmatics (i.e., meaning according to the situational context). Therefore, in order to successfully use and interpret NumApps, speakers need to have knowledge of the semantic values of these lexical items and also be aware of the different meanings that they can convey according to the context. This intersection of semantics and pragmatics involves several layers of complexity and thus poses a challenge to second language learners (henceforth L2 learners).

NumApps among L2 learners remain understudied. Previous research on VL has mainly focused on examining the L2 uses of hedges (e.g., sort of, kind of, quite), general extenders (e.g., and things like that, and stuff), and non-numerical vague quantifiers (e.g., a lot of, many) (e.g., Cheng & Warren, 1999; De Cock, Leech, & McEnery, 1998; Drave, 2002; Holmlander, 2011; Metsä-Ketelä, 2006; Nikula, 1997; Sabet & Zhang, 2015; Yu, 2009). With regard to the empirical research on NumApps, most studies have focused on English monolinguals (e.g., Channell, 1980, 1983, 1994; Gibbs & Bryant, 2007; Jucker, et al., 2003), and, to my knowledge, only Holmlander (2011) has examined the use of NumApps among L2 speakers of Spanish. Thus, there is limited research regarding numeric approximation in the L2 context.

Even with the limited empirical studies on NumApps, theoretical discussions have suggested that NumApps are sensitive to contextual factors (e.g., Channell, 1980, 1994;

Lakoff, 1973; Lasersohn, 1999; Sadock, 1977; Wachtel, 1980). Three pragmatic considerations have been identified as relevant to the use and interpretation of NumApps:

- the purpose of the approximation (e.g., the degree of precision desired or needed),
- the nature of the item (e.g., whether it is discrete or non-discrete), and
- the magnitude of the approximated quantity (e.g., the number of significant figures).

The last pragmatic constraint, the magnitude of the approximated quantity, is the focal point of this study. Channell (1980, 1994) posited that changes in the number of significant figures in a quantity may influence how individuals interpret numeric approximations. According to Channell (1994), the greater the number of significant figures, the more flexible the interpretation of an approximation is. For instance, approximations of numbers with four significant figures (e.g., 2,000 and 6,000) activate intervals of possible interpretations that are wider than those for numbers with only two significant figures (e.g., 20 and 60). Channell's theoretical account of the pragmatic features of NumApps was supported by empirical data obtained from English monolinguals, and to my knowledge, the effect of changes in the magnitude of a quantity has not been studied among L2 Spanish learners.

Given the aforementioned gaps in the L2 pragmatics' literature, this dissertation examines the stages in the development of pragmatic competence (i.e., the ability to use language in a contextually-appropriate manner) related to NumApps among Spanish L2 learners. That is, the study investigates how intermediate and advanced L2 learners use and interpret NumApps, and examines, as well, the extent to which the learners resemble

native speakers. Specifically, the study addresses the effect of the pragmatic constraint of quantity magnitude (i.e., number of significant figures) and investigates whether NumApps are used and interpreted differently when there is uncertainty regarding small quantities (e.g., with two significant figures) in comparison to large quantities (e.g., with four significant figures).

This study takes an Interlanguage Pragmatics (ILP) approach to examine the acquisition of numeric approximation among Spanish L2 learners. Furthermore, the study investigates the stages of lexical and pragmatic development in the L2 (Anderson, 1984, 1990; Bardovi-Harlig, 2009; Jiang, 2000; Koike; 1996), as well as transfer at the pragmalinguistic level (Kasper, 1992). *Pragmalinguistics*, as noted by Leech (1983, p. 10) refers to "the particular resources which a given language provides for conveying particular illocutions". Thus, *pragmalinguistic transfer*, according to Kasper (1992), refers to the transfer of linguistic action from the first language (i.e., L1), including a large range of linguistic forms that can intensify or soften communicative acts. Transfer is a central process of L2 acquisition; therefore, knowing how the learners perform in their dominant language provides valuable information to enrich our understanding of how an L2 develops.

From a pedagogical perspective, the study aims to identify the categories of meaning Spanish L2 speakers need to acquire so they can express numeric uncertainty, as well as the linguistic devices needed to convey these meanings. The study sheds light on the process of acquisition of numeric approximation, a linguistic manifestation that previous research has identified as highly relevant for communication. For instance, based on a corpus of journalistic and academic language, Kennedy (1987) observed that

about one word in every seven involves quantification, and that "many different branches of linguistic study, both theoretical and applied, have recognized that one of the important things we do with language is to measure or estimate quantity" (p. 265). However, several authors have noted the lack of exposure L2 learners have to VL because it is absent in language classrooms and textbooks (Channell, 1994; Cutting, 2007; De Cock et al., 1998). In other words, language learners' knowledge of quantification in the target language needs to go beyond having numerals in their linguistic repertoire. For that reason, there is a need for research that provides empirically-based evidence to identify the most frequent lexical and pragmatic devices for conveying numeric uncertainty.

To recapitulate, the significance of the study lies here: First, it is the first empirical study to take an ILP approach to the study of NumApps. This dissertation study combines pragmatics with theories of SLA (i.e., integration of meaning, overgeneralization, and cross-linguistic influence) to investigate the stages in which L2 learners develop the ability to produce and interpret to numeric approximation. Second, this study provides a comprehensive depiction of the L2 learners' lexical and pragmatic development using a cross-sectional design (i.e., collecting data from L2 learners with different proficiency levels at a single period in time) and obtaining data on the learners' oral production and interpretation of numeric approximations . Third, the study examines NumApps only in money-related contexts. Since numeric approximations involving uncertain prices and cost of items or activities are commonly found in everyday conversations, money-related approximations represent a communicative context that is both realistic and meaningful. Fourth, the study takes a mixed-methods approach to the

data analysis, substantiating the quantitative findings with a qualitative analysis. Together, these approaches allow for data triangulation to cross-validate the results and increase the robustness of the findings.

1.2 Organization of the chapters

The dissertation is organized as follows: Chapter 2 provides the review of the literature regarding NumApps. The purpose of this chapter is to discuss empirical and theoretical accounts of NumApps. Also, Chapter 2 presents a proposal for framing the study of NumApps using ILP. Furthermore, this chapter reviews the findings of an initial study I conducted in 2016 and discusses the research questions, hypotheses, and predictions for the current study. Next, Chapter 3 deals with the methodology and study design. The goal of this chapter is to explain the data collection procedures, including the participants, the protocols, and the data analysis. The following chapters, 4 and 5, discuss the findings. Chapter 4 attends to the results of the quantitative analysis and addresses how the L2 learners approximate the native Spanish speakers with regard to their production and interpretation of NumApps in Spanish. Chapter 5 addresses the results from the qualitative analysis, which exemplifies how the L2 learners and the native Spanish speakers conveyed numeric approximations. Chapter 5 also attends to the use of NumApps in the L2 Spanish learners' native language (i.e., English), and addresses instances of L1 lexical and pragmatic transfer. Following this chapter, Chapter 6 provides a discussion of the findings. Finally, Chapter 7 elaborates on the conclusion, addresses the study's limitations, and identifies opportunities for future research with regard to the study of the development of numeric approximation in L2 Spanish.

Chapter 2

Review of the Literature

2.1 Communicative and Empirical Perspectives on Numeric Approximators

2.1.1 Definition and communicative purposes of numeric approximators.

Approximators are lexical items that modify expressions by making their assertions weaker. For instance, when approximators modify numerals, that is, when they function as NumApps, as in *almost 50, around 80,* or *approximately 100*, they yield a proximity effect, signaling that the expression is not exact, but close to the truth. As noted by Cheng and Warren (2003), NumApps signal to the hearer that the quantity that is being expressed should be interpreted as referring to a range rather than to a specific quantity, and that the range of possible interpretations is always in the vicinity of the exemplar number (i.e., the numeric value that is used as the reference). According to Lasersohn (1999), we say things close enough to the truth for practical reasons. Such reasons, as suggested by Channell (1994), Lasersohn (1999), and Cheng and Warren (2003), are determined by the pragmatic situation (i.e., context) of the utterance. In other words, speakers may employ NumApps when they lack precision, and when being imprecise is appropriate to a given context.

NumApps are known to introduce vagueness (e.g., Channell, 1994; Lasersohn, 1999)[1]. Following Pierce's (1902) work on vagueness, vague propositions are defined in this study as "intrinsically uncertain… not uncertain in consequence of any ignorance of the interpreter, but because the speaker's habits of language were indeterminate" (p. 748). Pierce's definition suggests that vagueness occurs when a speaker experiences

[1] Vagueness has been previously referred to as fuzziness (Lakoff, 1973), imprecision (Crystal & Davy, 1975), and looseness (Sperber & Wilson, 1985).

uncertainty about the message that is being conveyed, and not because the listener is unable to understand the meaning of the message. In fact, Cheng and Warren (2003) posited that "the successful use of vague language requires the participants in the discourse to have a shared understanding of the relative status of a particular set of vague lexical items" (pp. 394-395). Despite the lack of precision, VL is communicatively useful when the interlocutors share both semantic knowledge and knowledge of the pragmatic implications linked to vague lexical items.

According to Channell (1994), NumApps introduce vagueness by adding fuzziness to the meaning of constituents that would otherwise be precise. A similar observation was made by Lakoff (1973), who noted that lexical items such as *approximately* made the semantic boundaries of propositions fuzzy. Channell (1994) described NumApps as pertaining to the VL category of vague additives. Examples of vague additives are NumApps (e.g., around, about, approximately), hedges (kind of, sort of, like) and general extenders (e.g., and everything, or something, and stuff like that).

Jucker et al. (2003, p.1737) noted that although vagueness is often seen as "a deplorable deviation from precision and clarity", it actually serves several communicative purposes because it allows speakers to convey the intended meaning of an utterance. Similarly, Channell (1994) and Ullmann (1962) suggested that VL is composed of categories with meanings that are flexible enough to cope with the speakers' infinite variety of experiences. In a similar vein, Nikula (1997) suggested that approximators usually work at the word or phrase within the proposition and, that the speaker adapts the level of vagueness so that his or her intention is more accurately conveyed. Crystal and Davy (1975) noted that VL is an essential resource that allows speakers to communicate

effectively, and suggested that vagueness in discourse may contribute to facilitating communication when:

- there is a need to compensate for memory loss when a speaker forgets the correct word,
- there is a lack of suitable equivalents in the target language,
- the topic of the conversation does not require precision, or
- the use of a vague word or expression would contribute to maintaining a certain atmosphere of informality.

Channell (1994) expanded on Crystal and Davy's (1975) perspective on vagueness and identified a series of communicative purposes and reasons for which speakers use VL. Among the general communicative purposes discussed by Channell (1994), five functions can be used to describe why NumApps are employed. According to the author, VL is employed for the following reasons:

- to provide the right amount of information,
- when a speaker experiences uncertainty or when he or she lacks specific information,
- when a speaker deliberately withholds information if there is no desire to fully commit to the information that is given,
- to save face or avoid being perceived as too direct or too straightforward and,
- as a way of managing the degree of formality in a conversation, especially when a speaker desires to create or maintain an informal atmosphere.

In sum, we find that the field has identified a variety of forms in which VL can manifest in discourse (e.g., hedges, general extenders, and NumApps). Specifically,

NumApps, which belong to the VL category of vague additives, are lexical items that lessen the degree of certainty of constituents that would otherwise be precise. Also, I noted that NumApps serve different communicative purposes, such as allowing speakers to provide the right amount of information in contexts in which there is uncertainty or lack of specific information regarding quantities.

Having defined VL in relation to NumApps, as well as the communicative functions they serve, in the following section, I review empirical research on the uses of NumApps in L2 speech. The section focuses on discussing the empirical studies that have examined differences in the use of NumApps between L2 learners and native speakers.

2.1.2 Empirical research on the production of numeric approximators among L2 learners.

Studies related to the production of VL have reported that the level of L2 proficiency conditions the range and frequency in which vague lexical items are produced (e.g., Sabet & Zhang, 2015; Yu, 2005). However, there are currently few empirical studies that discuss L2 uses of NumApps since most of the existing literature has focused on vague categories such as general extenders (e.g., and stuff, *y así* 'and that'), hedges (e.g., sort of, *digamos* 'let's say') and non-numerical vague quantifiers (e.g., many, *bastante* 'a lot') (e.g., Cheng & Warren, 1999; De Cock, et al., 1998; Drave, 2002; Holmlander, 2011; Metsä-Ketelä, 2006; Nikula, 1997; Sabet & Zhang, 2015; Yu, 2009). In this section, I review previous research that has investigated the production of NumApps among L2 Spanish and L2 English learners; although most of the studies have focused on L2 English.

To my knowledge, Holmlander (2011) is the only study that has examined oral interactions in native and non-native Spanish speakers and has taken into consideration the use of NumApps. Holmlander (2011) used the corpus AKSAM (*Aktivitetstyper och samtalsstruktur hos L1- och L2-talare av spanska* 'Discursive and sociocultural competency in native and non-native Spanish speakers') to examine the use of several VL categories, including NumApps. The study was conducted among advanced Swedish learners of Spanish and native Spanish speakers from Spain. The study used both *intercultural* interactions (i.e., dyads of native and non-native Spanish speakers paired together) and *intracultural* interactions (i.e., dyads of two native Spanish speakers together, as well as dyads of two non-native Spanish speakers together) during oral discussions and negotiations. In her analysis, Holmlander determined that the approximator *como* 'like' was the most frequent approximator used among both native and non-native speakers, in both inter and intracultural interactions, as well as in the two types of discourse investigated (i.e., discussions and negotiations). Holmlander noted that the frequent use of *como* 'like' among the L2 learners could have been motivated by both exposure to this lexical item, as well as by the transfer of the Swedish approximator *liksom*, which also translates to 'like'. Other approximators, such as *más o menos* 'more or less' and *casi* 'almost' were also produced by both native and non-native Spanish speakers. Conversely, the native speakers used *digamos* 'let's say' in significantly more frequency than the L2 speakers. This study was conducted with only one group of L2 learners who were classified as advanced. Therefore, it could be suggested that the performance of L2 learners of Spanish with lower proficiency levels remains understudied.

I should note that the use of *como* as a NumApp has been evidenced among monolingual speakers of several Spanish varieties, such as Peninsular, Colombian, and Argentinean, and among other dialects of Spanish in Latin America (e.g., Camacho, 2011; Grasso, 2012; Mihatsch, 2009, 2010). Therefore, Holmlander's finding regarding the use of the approximator *como* by native Spanish speakers is in line with the previous literature.

Two studies on Spanish-English bilinguals in the U.S. also confirmed the frequent use of *como* as a NumApp. For instance, Said-Mohand (2006) conducted informal oral interviews in Florida among Spanish-English bilinguals and found that the speakers exhibited a frequent use of *como* to approximate quantities. Similar findings were evidenced by Kern (2012), who interviewed Spanish-English bilinguals in Arizona and found that *como* was frequently used to approximate uncertain quantities. Both Said-Mohand (2006) and Kern (2012) focused on Spanish heritage speakers (i.e., speakers whose home language is Spanish) and did not include Spanish L2 learners.

As previously mentioned, most of the existing empirical studies on non-native uses of NumApps have been conducted on L2 learners of English. For example, Metsä-Ketelä (2006) used the English as a Lingua Franca in Academic Settings (ELFA) corpus to conduct a study about the multiple functions of the approximator *more or less.* The study examined several kinds of spoken academic discourse, such as lectures, seminars, conference presentations, and defenses by L2 speakers of English. The author suggested that *more or less* was among the most frequent markers of vagueness in academic L2 English and that this vague term carried out various communicative functions, such as minimizing (i.e., indicating that a concept is either small in scale or that it is not

adequate), hedging (i.e., softening the propositional content of a lexical expression), and approximating quantities (i.e., conveying lack of precision regarding a numeric expression). However, Metsä-Ketelä (2006) concluded that in the vast majority of occurrences, the term *more or less* was employed as a hedge or a minimizer, and not as a NumApp. Metsä-Ketelä's (2006) finding is not surprising if we take into consideration that previous studies, such as Channell (1980, 1994) and Ruzaite (2004) (who have investigated the use of vague terms among native English speakers), have revealed that, in English, speakers tend to express imprecise quantities with the NumApps *about* and *around* more frequently than with *more or less*.

Drave (2002) examined the use of vague terms in intercultural oral conversations between Cantonese learners of English and native English speakers. The data from this study were obtained through the Hong Kong Corpus of Conversational English (HKCCE). Drave (2002) reported that there were no significant differences in how native English speakers and non-native speakers approximated quantities. Among the two groups, *about* was the most frequent NumApp, and the second most frequent category of numeric approximation involved the use of numeric ranges, such as *m or n* structures (i.e., two numbers connected by the conjunction *or*, such as *40 or 50*). Drave (2002) attributed the results to the existing similarities between English and Cantonese with respect to how numeric approximation is expressed. However, in this study, the level of English proficiency of the non-native speakers was not specified. Therefore, from this study, we are not able to gather how advanced the participants' proficiency was, and whether a comparison with speakers of a different proficiency level would have yielded different results.

Similar to Drave (2002), Cheng and Warren (2003), conducted a study on intercultural communication also using the Hong Kong Corpus of Spoken English (HKCSE). The data consisted of oral conversations between native speakers of English and Hong Kong Chinese (i.e., Cantonese). The study examined several forms of VL, including the use of approximators between native and non-native speakers of English. The study was set to define the categories of indirectness, inexplicitness, and vagueness, as well as to discuss the pragmatic meanings of several lexical items under the aforementioned categories. With regard to the category of vagueness, and specifically to the use of approximators, Cheng and Warren (2003) identified the lexical item *about* as an indicator of imprecision regarding a quantity. Although this study focused on providing qualitative data on the realizations of the aforementioned categories (i.e., indirectness, inexplicitness, and vagueness) among native and non-native English speakers, it did not provide a descriptive perspective on how the two speaker groups differed from each other when approximating quantities, nor did it indicate the level of proficiency of the non-native speakers.

In another study, Yu (2005) examined the pragmatic development of hedging in L2 English. The study included several tokens containing NumApps in the analysis. Yu (2005) examined the production of hedges among beginner, intermediate, and advanced Chinese learners of English using a written questionnaire, as well as doing an oral interview and a debate. This study employed a developmental approach to L2 hedging; however, it did not include a comparison group of English native speakers. With regard to the numeric approximations produced, both the advanced and the intermediate L2 English speakers favored the use of numeric ranges, such as *n or m* structures. In contrast,

the beginners expressed quantity approximations by using vague quantifiers such as *a little, a few,* and *much.* The overall results of the oral production data revealed that the beginner English L2 learners produced fewer lexical items that signal numeric approximation (i.e., *n or m* structures) followed by the intermediate L2, and then by the advanced L2. Also, Yu (2005) observed that *n or m* structures were more prevalent in the interviews than in the debates. Thus, Yu (2005) concluded that increased proficiency correlated to a higher frequency and a wider variety of *n or m* structures in the intermediate and advanced participants' speech, and that the type of task (i.e., interviews vs. debates) influenced the behavior of the participants.

In summary, to date, there are only a few empirical studies that investigate NumApps in L2 speech. Most of the existing research on the L2 uses of these lexical items (e.g., in oral and written forms) focuses on L2 learners of English. To my knowledge, the acquisition of NumApps in L2 Spanish remains understudied. Thus, there is a need for research that discusses the frequency and range of NumApps employed by L2 learners of different Spanish proficiency levels in order to determine the extent to which they resemble native Spanish speakers. In addition, there is a need for us to investigate the developmental patterns involved in the process of acquisition of these lexical items. The present dissertation study addresses this gap.

The following section presents the theoretical proposals regarding the use and interpretation of NumApps. First, it discusses the semantic meaning of these lexical items. Then, it focuses on addressing what previous research has revealed about the pragmatic or contextual constraints affecting NumApps. The last section provides a

review of the theoretical frameworks that have been previously employed in the study of these lexical items.

2.2 Theoretical Perspectives on Numeric Approximators

2.2.1 Semantic and pragmatic accounts of numeric approximators.

There are several lacunae with regard to research on Spanish NumApps. First, apart from the initial study I conducted in 2016, to my knowledge, there are no studies that have empirically examined the interpretation of these lexical items (both quantitatively and qualitatively) among Spanish L2 learners. In fact, most of the research that has been conducted with the purpose of understanding the semantic meaning of NumApps in Spanish has addressed this matter only from a theoretical perspective (e.g., García-Medall, 1993; González Rodríguez, 2008). Second, the existing literature on the interpretation of NumApps has focused on monolinguals and studies have not addressed comparisons with L2 learners.

Having mentioned the gaps in the literature, in this section I will first provide a brief linguistic background on the semantic meaning of NumApps in Spanish and, then I will proceed to discuss the pragmatic meaning and constraints affecting these lexical items, as it has been noted in previous research on English (e.g., Channel, 1980, 1994; Lakoff, 1973; Saddock, 1977; Wachtel, 1980).

In a descriptive analysis of Spanish approximators, García-Medall (1993) and González Rodríguez (2008) reported that approximators belong to a semantic group composed of elements from different lexical categories. According to García-Medall (1993) and González Rodríguez (2008), NumApps signal scalar values that are close to

the element they modify (i.e., exemplar number) and can be divided into three categories: *defectivos* 'defective', *neutros* 'neutral', and *excesivos* 'excessive':

- Defective approximators (e.g., *casi* 'almost') signal values that are lower than the exemplar number. In other words, they activate negative inferences by establishing an upper bound.
- Neutral approximators (e.g., *como* 'like') signal values that are either below or above the exemplar number. That is, they can activate both positive and negative inferences.
- Excessive approximators (e.g., *y pico* '-ish'), indicate values that are slightly higher than the exemplar number. Therefore, excessive approximators activate positive inferences and establish a lower bound.

The restrictions in the interpretation of the NumApp categories are illustrated in the following examples (1-3), which were provided by González Rodríguez (2008, pp. 370-371):

1. *La bolsa de manzanas pesa alrededor de tres kilos.*
   a. Creo que dos kilos y medio.
   b. Creo que tres kilos y medio.

   'The bag of apples weighs around three kilograms.'
   a. 'I think two and a half kilograms.'
   b. 'I think three and a half kilograms.'

2. *La bolsa de manzanas pesa casi tres kilos.*
   a. Creo que dos kilos y medio.
   b. # Creo que tres kilos y medio.

   'The bag of apples weighs almost three kilograms.'
   a. 'I think two and a half kilograms.'
   b. # 'I think three and a half kilograms.'

3. *La bolsa de manzanas pesa tres kilos largos.*
   a. #Creo que dos kilos y medio.
   b. Creo que tres kilos y medio.

   'The bag of apples weighs three or so kilograms.'
   a. 'I think two and a half kilograms.'
   b. # 'I think three and a half kilograms.'

The interpretation for example (1), which contains the neutral NumApp *alrededor de* 'around', can be that the bag of apples weighs either *two and a half kilos* or *three and a half kilos*. For example (1), both options are acceptable. Example (2), on the other hand, could only be interpreted as *three and a half kilos*. This instance contains the defective NumApp *casi* 'almost', and we should note that defective approximators activate only negative inferences. Example (3) can only be interpreted as *three and a half kilos* because excessive NumApps, such as *largos* 'or so', only signal values that are higher than the exemplar number.

In sum, García-Medall (1993) and González Rodríguez (2008) proposed a semantic account of approximators based on the inferences they activate. Such inferences are guided by values that are assigned on a scale or continuum in relation to the exemplar number. In the case of NumApps, the scale is divided into three categories: defective, neutral, and excessive.

Channell (1994) suggested that drawing a line to determine at what point of the continuum an approximation becomes inappropriate can be a challenging task, especially when the pragmatic constraints concerning approximators are not taken into consideration. In other words, the study of NumApps should not only focus on the semantic meaning of these lexical items, but it should also examine the contextually determined properties that affect NumApps. In order to address this limitation, Channell

(1980) revisited the theoretical considerations of approximators that had been previously proposed by Lakoff (1973), Saddock (1977), and Wachtel (1980). Using empirical evidence, Channell (1980, 1994) challenged previous assumptions with regard to the pragmatic meaning of approximators and the contextual constraints that affect these lexical items. She concluded that there were three fundamental pragmatic restrictions that conditioned the way in which native English speakers interpret NumApps. According to Channell (1980, 1994), when analyzing numeric approximation, the following pragmatic considerations need to be taken into account:

- the purpose of the approximation (i.e., the degree of precision desired or needed)
- the nature of the item (i.e., whether it is discrete or non-discrete) and,
- the magnitude of the approximated quantity (i.e., number of significant figures).

According to Channell (1980, 1994), the first pragmatic consideration is related to the context in which the approximation is issued. The purpose of the approximation is crucial for determining its appropriateness, and two basic contextual constraints were identified. The first one is the extent of the speaker's knowledge of what is being approximated. For example, an approximation may be more or less appropriate depending on how much precision a context requires. The second constraint is determined by how much information the speaker can remember; that is, the degree of certainty with regard to a quantity.

The second pragmatic consideration is the nature of the item being described (i.e., discreteness). According to Channell (1980, 1994), approximations of discrete items

(e.g., people and houses) designate intervals with only whole numbers, whereas approximations of non-discrete items (e.g., units of measurement and money) may designate intervals with smaller units, such as *cents* in the case of money. Another observation made by Channell (1994) is that "the nature of the item being described affects the length of the interval for which the approximation seems appropriate" (p. 44). For instance, the interpretation of the interval designated by an approximation such as *about 10 pages* would be greater than that of an interval resulting from an approximation such as *about 10 liters*.

The third pragmatic consideration is related to the number of significant figures (i.e., magnitude) in the number/quantity that is being approximated (i.e., exemplar number). Channell (1994) posited that "as a general rule, the length of the interval increases as a function of the size of the exemplar number" (p. 44). That is, approximations with large exemplar numbers (e.g., with four significant figures, such as 1,400) designate intervals of interpretation that are larger than those for smaller numbers (e.g., with two significant figures, such as 40). In other words, larger numbers activate interpretations that are vaguer and that have a wider range of possibilities in comparison to smaller numbers. Thus, changes in the magnitude of an exemplar number affect the precision in the interpretation.

The aforementioned literature regarding the pragmatic constraints that affect NumApps focuses exclusively on interpretation. Moreover, for the specific case of the effect of the quantity magnitude in the interpretation of NumApps, besides Channell (1980, 1994), and to my knowledge, there are no other studies that have empirically examined such effect, neither among native speakers nor L2 learners of English, Spanish,

or other languages. Furthermore, as far as I have been able to find, there are no studies that investigate the effect the number of significant figures has on the production of NumApps. Thus, there are currently no references to whether approximations are expressed differently depending on the magnitude of a number. This gap in the literature presents an opportunity to advance our knowledge with respect to NumApps in two ways: By examining the acquisition among L2 learners, and by studying the effects of pragmatic constraints both in production and in interpretation.

In sum, in this section, NumApps were defined as lexical items that designate intervals of numbers. I also noted that the direction in which the intervals are designated (i.e., above, below, or around the exemplar number) is determined by the category of NumApp that is issued (i.e., defective, excessive, or neutral). Moreover, I explained that the interpretation of NumApps is guided by contextually determined properties, such as the purpose of the approximation, the nature of the item being described, and the number of significant figures of the exemplar number. Given the aforementioned information, it is worth noting that understanding the meaning of NumApps requires awareness of the semantic values of these lexical items, as well as awareness of the pragmatic constraints affecting them. This intersection between lexical semantics and pragmatics involves several layers of complexity that, in the context of L2 acquisition, can represent a challenge.

In the following section, I present the theoretical frameworks that have been previously employed to discuss the pragmatic meaning of NumApps. I discuss, as well, the similarities and differences in how the theoretical frameworks have addressed the study of NumApps.

2.2.2 Theoretical frameworks in the study of numeric approximators.

Jucker et al. (2003) and Sabet & Zhang (2015) posited that VL has been mainly examined from a pragmatic perspective, with particular emphasis on describing how vague expressions, in certain contexts, can be effective tools for conveying the intended meaning of an utterance (e.g., to soften the propositional content of an utterance). Previous research has approached the use of VL, and specifically NumApps, using Grice's (1975) Cooperative Principle (CP) and Sperber and Wilson's (1986) Relevance Theory (RT). Although CP and RT are not the frameworks I employ to analyze the data in the present study, they have been extensively used to investigate NumApps. Therefore, these two approaches merit mentioning.

2.2.2.1 Cooperative Principle (CP).

Grice's (1975) notion of conversational implicature has guided previous discussions on the communicative purposes of VL (e.g., Channell, 1994; Huang, 2007; Sabet & Zhang, 2015). Grice (1961) defined conversational implicatures as pragmatic inferences, which are not tied to the particular words and phrases in an utterance but arise from contextual factors and are modulated by the social interaction. According to Grice (1975), "our talk exchanges do not normally consist of a succession of disconnected remarks" (p. 45); each participant in the conversation recognizes (to some extent) the purpose or set of purposes of the cooperative efforts. On the assumption that it is possible to formulate a general principle that describes what participants expect to find in a conversation, Grice (1975) developed the concept of the Cooperative Principle (CP). The CP was defined as follows: "Make your conversational contribution such as is required, at the stage at which it occurs, by the accepted purpose or direction of the talk exchange

in which you are engaged" (p. 45). Furthermore, Grice (1975) proposed the existence of four maxims to which speakers have to adhere in order to achieve successful communication: Quantity, Quality, Relation, and Manner. Grice (1975) described the maxims as follows:

- Maxim of Quantity: Make your contribution as informative as is required and do not make your contribution more informative than is required.
- Maxim of Quality: Do not say what you believe to be false and do not say that for which you lack adequate evidence.
- Maxim of Relation: Be relevant.
- Maxim of Manner: Avoid obscurity of expression, avoid ambiguity, be brief, and be orderly.

Different scholars have suggested that the CP can be used to analyze the pragmatic meaning conveyed by VL (e.g., Channell, 1994; Huang, 2007; Sabet & Zhang, 2015; Zhang, 2005). For instance, it has been noted that the use of VL is an indicator of the speakers' awareness of the existence of the maxims and the need to adhere to the CP. For example, Channell (1980, 1994) and Zhang (2005) noted that the maxims of Quantity and Quality have been used to explain the communicative purposes of NumApps because, in contexts in which there is lack of information or direct evidence, using NumApps to speak about uncertain quantities is a way of remaining both informative and truthful. According to Zhang (2005), the use of VL adheres to the maxim of quantity because it is often used for succinctness. Similarly, Channell (1994) maintained that, when she is asked about what time she will be home, and she is not sure, the most informative and truthful reply would be *about six o'clock*. Thus, by not offering a precise

response, and using a NumApp (i.e., *around*) instead, she is able to raise the inferences needed for her interlocutor to decode her intended message.

As I mentioned previously, a Gricean approach to the study of NumApps analyzes these lexical items as communicative tools that assist speakers in tailoring their contribution such that they are both informative and truthful. In the case of numeric approximation, Grice's CP could allow for the examination of L2 learners' awareness of conversational implicatures. For instance, CP could be employed to investigate whether L2 speakers adhere to the conversational maxims by being as informative as possible (i.e., using NumApps) when communicating messages involving numeric uncertainty. Furthermore, the CP makes it possible to investigate L2 pragmatic knowledge by examining how implicatures are generated and understood by L2 learners at different stages of their learning development, and to what extent the L2 learners resemble the pragmatic behavior of native speakers.

2.2.2.2 Relevance Theory (RT).

Previous research has also approached the study of NumApps and other categories of VL using Sperber and Wilson's (1986) RT. Wilson and Sperber (2002) maintained that utterances in a conversation raise expectations of relevance that are precise enough and predictable enough to guide the hearer towards the speaker's intended meaning. Furthermore, Wilson and Sperber (2002) posited that the goal of RT is to "explain how the hearer infers the speaker's meaning on the basis of the evidence provided" (p. 250).

As opposed to Grice's (1975) theory of CP, which focuses on communication (i.e., conversation implicatures), RT centers on cognitive principles and the derivation of explicatures (i.e., explicit meaning). For instance, from an RT perspective, cooperative communication is a trade-off between the speakers trying to maximize cognitive effects and minimize the listeners' cognitive efforts, in order to convey the desired meaning. As noted by Sabet and Zhang (2015), the point of departure of RT is human cognition and not a socially acquired cooperative principle.

According to Sperber and Wilson (1995), RT treats pragmatics as a single notion of relevance that is manifested through two principles: A Cognitive Principle and a Communicative Principle. Sperber and Wilson (1995) posited that while the Cognitive Principle establishes that human cognition is geared to the maximization of relevance, the Communicative Principle states that utterances create expectations of optimal relevance. Gibbs and Bryant (2008) noted that the Communicative Principle is grounded on the notion that every act of communication produces a presumption that the speaker conveys messages that are relevant enough to warrant the addressee's attention, but that are still compatible with the communicator's own goals and preferences. For instance, when a speaker needs to speak about a quantity that is uncertain, the use of a NumApp may guide the hearer towards an interpretation that is closer to what the speaker has in mind.

One possibility for assisting the hearer in the interpretation of an utterance is by providing procedural information. According to Wilson (2016), procedural information is created by linguistic devices that guide the hearer towards the appropriate contextual assumptions by constraining the inferential comprehension process. This is precisely what NumApps do. In fact, Jucker et al. (2003) suggested that NumApps tend to

contribute more procedural meaning than conceptual meaning. As stated by Blakemore (1987), conceptual theory focuses on how linguistic structures map onto concepts, while procedural theory deals with how elements of linguistic structures map onto the mental processes (i.e., inferences) needed to retrieve meaning. In other words, conceptual meaning involves information on the representation of entities, whereas procedural meaning is defined as guiding the processing of conceptual information. For example, Jucker et al. (2003) proposed that a speaker's evaluation of the relevance of an utterance may sometimes also be partly determined by the accessibility. Thus, when a speaker cannot recall an exact quantity due to memory failure or due to the lack of specific information, he or she may rely on procedural meaning, which can be generated through the use of NumApps. Words such as *around*, *about,* or *approximately* signal uncertainty and guide the interpretation of the message so that the listener understands that the content of the utterance should not be interpreted as exact.

In this dissertation study, I did not employ any online methodology to measure the effect NumApps have with regard to processing effort or to measure whether these lexical items decrease the cognitive load in a conversation. Rather, I am interested in emphasizing the relationship between NumApps and the creation of procedural meaning. The conceptual-procedural distinction for meaning, which is an essential topic of RL, is also central to the study of NumApps. From a relevance theoretical perspective, and following Jucket et al. (2003), it is possible to suggest that NumApps encode information that is procedural, as these lexical items signal the inferential processes the addressee is expected to use to decode the speaker's meaning. According to Blakemore (1987, p. 18), utterances containing procedural information establish constraints on "the inferential

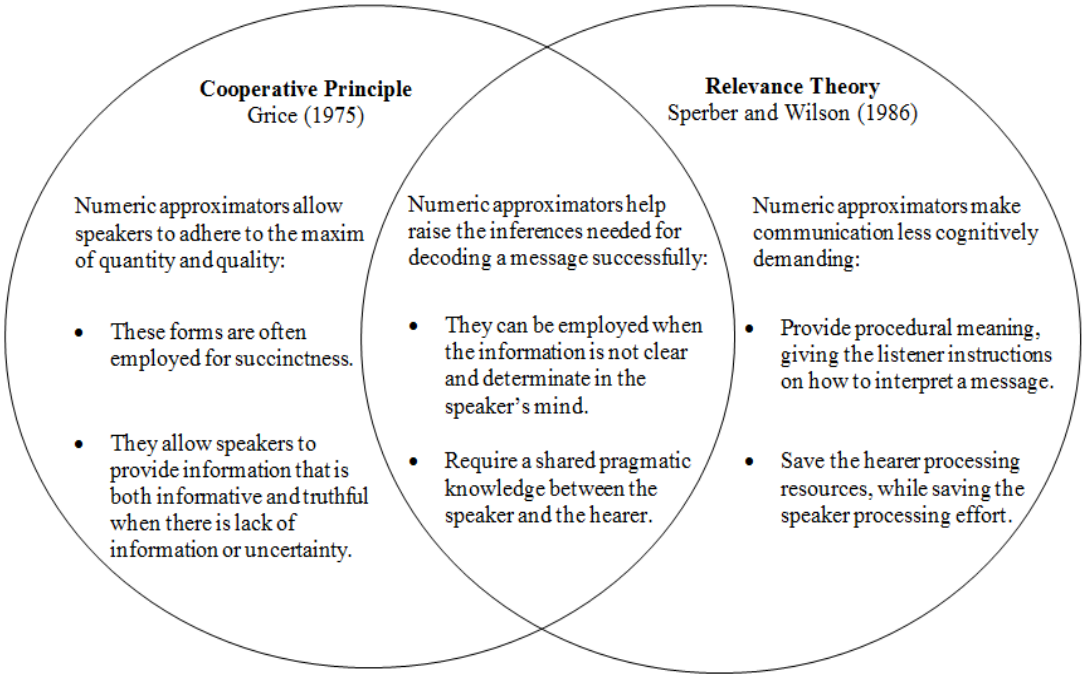
computations the hearer performs in order to establish the impact of that proposition or, in other words, its relevance". For instance, when a speaker uses a defective approximator such as *almost* or *practically*, these approximators establish an upper bound which guides the listeners, so they only activate negative inferences (i.e., quantities that are below the exemplar number). In contrast, if the speaker uses neutral approximators, such as *around* or *about*, the speaker is imposing fewer restrictions on the inferences that the listener can make since neutral approximators do not set specific limits.

With regard to NumApps and the how they can be employed to ease the cognitive load, Sabet and Zhang (2015) posited that VL allows interlocutors to achieve the greatest cognitive effect using the least processing effort. For instance, from an RT perspective, NumApps are specifically useful in contexts in which the information that needs to be conveyed is not clear and determinate in the speaker's mind (e.g., when there is uncertainty or lack of information). Therefore, when communication takes place in a context where precision is not mandatory, being able to express approximations instead of precise quantities lessens the cognitive load and eases the processing of information. As stated by Jucker et al. (2003), NumApps serve as focusing devices that convey the speakers' attitude about a quantity and convey as well as assumptions about the speaker's and/or hearer's beliefs. For example, in the study of the acquisition of NumApps, RT could be employed to examine whether L2 learners use and understand procedural information, and at what stage of their development they acquire this knowledge.

In this section, I discussed the theoretical framework of CP and RT, which have informed this current study of NumApps (e.g., Channell, 1994; Gibbs & Bryant, 2007; Huang, 2007; Jucker et al., 2003; Sabet & Zhang, 2015). The two frameworks suggest

that the use of NumApps eases communication. In addition, both CP and RT describe NumApps as lexical items that allow speakers to tailor the meaning they want to convey while guiding listeners to make the most appropriate pragmatic inferences. However, the two frameworks take different approaches when describing the derivation of meaning and the pragmatic processes involved in the use and interpretation of NumApps. The following figure provides a comparison of CP's and RT's approaches to NumApps in communication.

Figure 1. Pragmatic approaches to numeric approximators according to Cooperative Principle and Relevance Theory.



From Figure 1, we gather that both, CP and RT, treat NumApps as lexical items that assist the hearer in decoding an intended message. From this figure, we also gather that in both frameworks, NumApps can be employed in a context in which there is lack of certainty regarding the information that is being conveyed with the purpose of tailoring a message in such way that it resembles what is in the speaker's mind. Additionally, both

CP and RT take into account that in order to achieve successful communication, the interlocutors must share pragmatic knowledge regarding how NumApps modify the meaning of an utterance. Figure 1 shows that CP analyzes utterances involving NumApps based on the communicative principles that contribute to raising implicatures. More specifically, under the CP perspective, NumApps are lexical resources that allow speakers to adhere to the maxims of quantity and quality so that they are as informative and as truthful as possible. In contrast, from an RT perspective, cooperative communication is a trade-off between the speakers maximizing effective communication by minimizing cognitive resources. RT focuses on the cognitive *and* pragmatic principles that contribute to raising implicatures, such as the use of NumApps to generate procedural information that provides listeners with instructions on how to decode a message.

Although both CP and RT can be used to describe the speakers' pragmatic behavior with regard to NumApps, these two frameworks alone cannot provide an explanation that accounts for the developmental aspects in the acquisition of pragmatics. In order to address this issue from an L2 developmental perspective, it is necessary to take an approach that combines pragmatic theory with theories of SLA. Thus, Interlanguage Pragmatics (ILP) research provides such a possibility.

In the next section, I define ILP and the scope of its research, and I provide a rationale regarding why ILP is critical for the study of NumApps and the acquisition of L2 pragmatic knowledge from a developmental perspective.

2.3 Interlanguage Pragmatics: A Proposal for a Developmental Approach to L2 Pragmatics

As it was previously noted, both Grice's (1975) CP and Sperber and Wilson's (1986) RT are two theoretical frameworks that have been consistently employed in the study of VL. These frameworks can help us understand the cognitive and communicative purposes of VL. However, they cannot be used to examine the process of acquisition of VL categories (e.g., hedges, general extenders, and NumApps). This gap can be addressed by combining pragmatic theory and theories of SLA. Therefore, the study of the acquisition of NumApps can be enriched if it is addressed from an ILP perspective.

Selinker (1972) introduced the term *interlanguage* to describe the language that results from adult L2 learners' attempt to express meaning in the target language. Selinker (1972) posited that an interlanguage combines features of both the learners' native language and the target language and that interlanguages are shaped by processes that are central to L2 learning, such as language cross-linguistic influence (e.g., L1 transfer), transfer of training, strategies of L2 learning, strategies of L2 communication (e.g., circumlocution and simplification), and overgeneralization. Although the study of the L2 learners' interlanguage has mainly focused on examining L1 transfer and fossilization, several studies have investigated how learners become competent with respect the use of grammar, lexicon, and prosody when these features intersect with pragmatics (e.g., Bardovi-Harlig, 1999, 2009, 2013; Blum- Kulka & Levenston, 1987; Cohen & Olshtain, 1993; Eisenstein & Bodman, 1986; Koike, 1996; Takahashi & Beebe, 1987; Trosborg, 1987).

Pragmatics, in Levinson's (1983) words, is the study of the association between linguistic form and context. It is the science of language seen in relation to how it is used by speakers while taking into account the knowledge about the physical and social world (Leech, 1983; Mey, 1993; Stilwell Peccei, 1999). In other words, and as posited by Stilwell Peccei (1999), pragmatics examines the aspects of meaning that cannot be predicted by linguistic knowledge alone. Other definitions of pragmatics have elaborated more on both the cognitive and the social components. For example, Levinson (1983, p. 53) suggested that pragmatics studies the "detailed inferences about the nature of the assumptions participants are making, and the purposes for which utterances are being used". Levinson (1983) also added that, in order to take part in ordinary language usage, participants must be able to make the appropriate calculations so that both production and interpretation are successful.

The present study falls under the scope of ILP research since it examines the development of L2 lexical and pragmatic knowledge by investigating processes that are central to SLA, such as L1 transfer, integration of meaning, and overgeneralization. In this dissertation, the term *interlanguage* is used to refer to the language produced by the Spanish L2 learners, and it is understood that such language can change throughout the learners' process of linguistic development. In addition, and following Adejémian (1976), the learners' interlanguage is conceived not as a system that always produces meaning that diverges from the norm (i.e., the target language), but as a system that is *permeable* in different degrees and domains. Such permeability, as noted by Tarone (2006), is the result of the complex changes involved in having to learn new parameters for the L2 while other parameters had already been set for the L1. The complex changes mentioned

by Tarone pose a challenge to L2 learners, opening the door to central processes of L2 acquisition (e.g., L1 transfer and overgeneralization) and generating, as well, substantial variability in the linguistic development.

The area of research that focuses on the development of L2 learner's interlanguage with respect to pragmatic competence is known as Interlanguage Pragmatics (ILP). This area of research is currently also referred to as *Second Language Pragmatics* (e.g., Bardovi-Harlig, 2013; Taguchi & Roever, 2017); however, I will use the term ILP to be consistent with previous literature.

Kasper (1996) described ILP as an area of inquiry in SLA research that studies the use and acquisition of L2 pragmatic knowledge by non-native speakers. As noted by Félix-Brasdefer (2017, p. 416), ILP is an interdisciplinary area that "lies at the intersection of pragmatics and the study of SLA". ILP examines the pragmatic knowledge of speakers who are acquiring an L2 (or third or subsequent languages) after their L1 has already developed, and according to Bardovi-Harlig (2013), Félix-Brasdefer (2013), and Taguchi & Roever (2017) ILP investigates how L2 learners develop the ability to produce and comprehend linguistic and communicative action over time in a variety of settings. In other words, ILP focuses on the study of the acquisitional patterns and the developing system of L2 pragmatics.

To summarize, pragmatic meaning arises from the combination of a given linguistic form and how its meaning is tied to a context. Thus, in order to successfully convey and interpret pragmatic meaning, speakers must have a shared understanding of the meaning of lexical items and other linguistic structures, as well as of the social conventions linked them.

This section provided an introduction to ILP, as well as a general description of what is understood by the term *pragmatics*. Moreover, I described ILP as an interdisciplinary area of research that draws from pragmatics and from the study of SLA to investigate the development of L2 pragmatics.

The following section explores the connection between ILP and the field of SLA. It first defines the field of SLA and discusses the scope of its research. Then, it describes what motivated ILP researchers to turn their attention to theories of SLA. Later, it outlines some of the areas of inquiry of SLA and discusses how they have been incorporated in the study of ILP.

2.3.1 Interlanguage pragmatics and second language acquisition.

Cai and Wang (2013) noted that ILP has recently become a branch of SLA research. In fact, according to Kasper (1992), the incorporation of ILP in SLA research can be traced back no further than the late 1970s. Researchers started to notice that the lack of L2 pragmatic awareness might cause communication barriers in the same way as any other kind of linguistic mistake would do. Actually, research showed that errors involving the L2 pragmatics could be perceived or judged as more unacceptable than errors involving linguistic mistakes (e.g., grammatical errors) by native speaker interlocutors (e.g., Blum-Kulka, 1997; Cai & Wang, 2013). Thus, studying the use and comprehension of pragmatics from an SLA perspective allows us to not only describe what L2 learners do but also unveil the different developmental stages in the acquisition of L2 pragmatics.

The field of SLA examines how L2 learners acquire the linguistic system of the target language (e.g., syntax, vocabulary, semantics, morphology, phonology). Also, SLA

investigates the role of individual differences (e.g., age, gender, motivation, aptitude) in the process of L2 acquisition, as well as in the levels of L2 attainment (e.g., Ellis, 1994; Gass & Selinker, 1994; Larsen-Freeman & Long, 1991; Lightbown & Spada, 1999). In addition, according to Kasper (1992), SLA research is predominantly concerned with the process of L2 acquisition, rather than with only describing the L2 learners' use and interpretation of the target language. Therefore, the interlanguage of L2 speakers falls under the scope of SLA. According to Brown (1987) and Crystal (1997), interlanguage refers to a series of temporary stages in the process of L2 acquisition through which learners pass on their way to attaining fluency on the target language.

Crystal (1997) posited that a process that is commonly found in the interlanguage of a learner is L1 transfer. *Transfer is* a phenomenon belonging to the broader field of cross-linguistic influence, and it is defined by Odlin (1989, p. 27) as "the influence resulting from similarities and differences between the target language and any other language that has been previously (and perhaps imperfectly) acquired". Transfer may occur at a variety of levels (e.g., lexical, phonological, syntactical, among others), and specifically, ILP is concerned with pragmatic transfer. Kasper (1992) defines pragmatic transfer as the "learners' pragmatic knowledge of languages and cultures other than L2 on their comprehension, production, and learning of L2 pragmatic information" (p. 5).

Kasper (1992, 1996) proposed that transfer can either facilitate L2 acquisition or not, and distinguished between two types of pragmatic transfer. The first one is positive of facilitative transfer, which occurs when learners' production or comprehension of a pragmatic feature in the L2 shares structural, functional, or contextual characteristics of a feature in their L1. The second kind of transfer is negative transfer, and it occurs when a

pragmatic feature in the L2 does not share the structural, functional, or contextual characteristics of a feature in their L1. Furthermore, Kasper (1992) and Leech (1983) suggested that pragmatic transfer may occur at two different levels: pragmalinguistic and sociopragmatic. According to Félix-Brasdefer (2017), when transfer occurs at a pragmalinguistic level, it involves the transfer of linguistic action, and these features may or may not coincide with what native speakers of the target language use. On the other hand, sociopragmatic transfer is related to the transfer of sociocultural norms or perceptions, especially in relation to how the notions of social distance or social power are established in the L1 and the L2. Usually, research involving the study of pragmalinguistic and sociopragmatic transfer focuses on topics related to the management of degrees of indirectness in discourse (e.g., Félix-Brasdefer, 2015; Kasper, 1992; Robinson, 1992; Shively, 2011).

As mentioned earlier, in addition to investigating cross-linguistic influence (e.g., L1 transfer) as a phenomenon that is characteristic of SLA, researchers of ILP research have also examined linguistic development and its relationship with L2 pragmatic competence (e.g., Bardovi-Harlig, 1999, 2009, 2013, Blum- Kulka & Levenston, 1987; Cohen & Olshtain, 1993; Eisenstein & Bodman, 1986; Koike, 1996; Takahashi & Beebe, 1987; Trosborg, 1987). In fact, the relationship between pragmalinguistic knowledge (e.g., the knowledge of lexicon and grammar appropriate to the context) and pragmatic competence has been empirically studied regarding L2 learners' knowledge of the illocutionary force in speech acts (e.g., mitigation and intensification) across different levels of L2 proficiency (i.e., low, intermediate, and high proficiency), several languages (e.g., English, Spanish, and Hebrew), and various linguistic modalities (i.e., speaking,

comprehension, and writing) (e.g., Blum-Kulka & Levenston, 1987; Eisenstein & Bodman, 1986; Koike, 1996; Trosborg, 1987).

The aforementioned studies address speech acts and L2 learners' knowledge of linguistic forms (e.g., grammar and lexicon) in order to successfully perform and interpret pragmatic action, such as mitigated speech. Interestingly, the relationship between linguistic and pragmatic knowledge is also relevant to the present study since both speech acts and numeric approximation involve epistemic modality. Epistemic modality, according to Coates (1987) and Lyons (1977), refers to the linguistic modality in which speakers qualify their commitment to the truth value of the proposition and express their degree of confidence regarding the content of an utterance. For instance, Félix-Brasdefer (2008) and Coates (1987) noted that epistemic modality is present in the realization of speech acts when speakers mitigate their speech since mitigation can convey the speaker's degree of confidence regarding truth value of a proposition. Furthermore, Félix-Brasdefer (2008, p .479) observed that "mitigation is typically associated with attenuation, hedging, weakening, softening, or downgrading of those effects which are undesirable on the part of the hearer". NumApps also involve epistemic modality because these lexical items alter the degree of commitment speakers have to the truth value of a proposition. Thus, previous literature on the L2 learners' knowledge of speech acts could inform the current study.

The relationship between linguistic knowledge (especially grammar and lexicon) and pragmatic competence has also been examined from a theoretical perspective. Several scholars have attributed the use of non-target-like expressions among L2 learners to issues related to simplification of language, overgeneralization of forms, and to the

gradual integration of meaning. For instance, Koike (1989) suggested that, even though the L1 pragmatic knowledge (i.e., rules and conventions) can be transferred to the L2, many learners often perceive that their knowledge of linguistic forms is not enough to perform in a pragmatically appropriate manner. For this reason, L2 learners tend to rely on the use of less appropriate but simpler forms. In addition, Koike (1989, p. 282) posited that low-proficiency L2 learners are often challenged by interactional contexts in which they need to perform pragmatic action since, many times, "learners' pragmatic rules for politeness do not coincide with their limited ability on a grammatical and lexical level to communicate". Therefore, the learners' pragmatic behavior may be constrained by their linguistic ability, which may lead to the use of less complex structures.

Andersen (1984, 1990) also proposed a principle of L2 acquisition that addressed how learners map forms to functions. According to Andersen (1984, 1990), in the early stages of SLA, learners are often guided by the *one-to-one principle*, in which *one form* is assigned to *one function.* During the *one-to-one principle* phase, the most conventional pragmatic expressions (i.e., strings that native speakers use predictably in certain contexts) are identified (e.g., always using *You're welcome* as a response to *Thank you*). In later stages, L2 learners transition into the *multifunctionality stage,* in which *multiple forms* are assigned to *one function* (e.g., using *You're welcome* and *No problem* as a response to *Thank you*).

It is important to note that the *one-to-one principle* operates not only on a semantic level. As noted by Andersen (1984), the principle also operates on a functional level of discourse pragmatics since it can account for *meaning-to-form* relationships. Furthermore, Bardovi-Harlig (2009, p. 782) observed that principles identified in other

areas of L2 linguistic development, such as the *one-to-one principle*, "may also hold in L2 pragmatics" as it "may encourage some learners to use expressions they know rather than to expand their range of expressions". For instance, Bardovi-Harlig (2009, p. 783) observed that during the *one-to-one phase*, L2 learners may go through a period of overgeneralization, which may be manifested as "the use of one conventional expression in place of another unrelated expression or as the use of expressions that share the same lexical and syntactic base but with minor differences in form, such as lack of intensification or complementation". Also as noted by Bardovi-Harlig (2009), in more advanced stages involving a higher level of proficiency, learners may show progressively increasing multifunctionality (i.e., the use of multiple forms for one function). Therefore, when the L2 learners are at the *multifunctionality stage*, they have acquired the relevant linguistic resources for a specific function, and are able to communicate in a pragmatically accurate way.

Another relevant perspective on L2 lexical development was proposed by Jiang (2000). This proposal addresses the different stages in which the L2 lexicon develops, and the extent to which lexical acquisition differs between the L1 and the L2. For instance, Jiang (2000) suggested that while in the L1 all the specifications (i.e., type of information) are integrated within each lexical entry and are activated automatically, in the L2, learners acquire the specifications of lexical items gradually. More specifically, the L2 learners' representation and development of lexicon occur in three stages: First, the lexical entry with formal specifications is established. Second, the lemma information of the L1 counterpart is copied into the L2 lexical entry and mediates L2 word use. Third, the specifications of the lexical are integrated. Therefore, it is not until the third stage

when L2 learners have acquired a robust knowledge of the meaning of a lexical item. It is important to mention that Jiang (2000) does not specifically address the integration of pragmatic specifications to lexical entries. However, it proposes a model that accounts for L2 lexical development, and NumApps, which are the focus of the present study, are lexical items. Therefore, I suggest that Jiang's (2000) model could be taken into account when examining the acquisition of NumApps from a pragmalinguistic perspective.

In sum, ILP is a branch of SLA that draws from pragmatic theory, such as speech act theory (i.e., the use of language to perform an action) and politeness theory (i.e., the avoidance of face-threatening acts) to study the development of L2 pragmatic competence. Also, ILP draws from theories of SLA, such as cross-linguistic influence and theories that address the development of pragmalinguistic knowledge. While ILP originally focused on providing descriptions of the characteristics of non-native speech, the incorporation of SLA theories in ILP research has now allowed researchers to develop a more robust understanding of the acquisitional processes behind the pragmatic behavior of L2 learners.

With the aforementioned explanation in mind, in this study, ILP presents an opportunity to examine NumApps using theoretical pragmatic approaches in conjunction with theories of L2 acquisition.

The next section focuses on an important change ILP research has experienced, which is the incorporation of developmental studies on L2 pragmatics acquisition.

2.3.2 Interlanguage pragmatics and the need for developmental studies.

Kasper (1992) has noted that, even though there is a substantial body of research on ILP, the great majority of studies focus on L2 use rather than development. Several

researchers, who contend that ILP research is ignoring developmental matters in the acquisition of L2 pragmatics, have repeatedly made this observation (e.g., Bardovi-Harlig, 1999; Cai & Wang, 2013; Davies & Tyler, 2005; Kasper, 1992; Kasper & Rose, 1999, 2002; Kasper & Schmidt, 1996).

Bardovi-Harlig (1999) suggested that acquisition has been overlooked in ILP. She maintained that, between 1979 to1996, most studies did not even identify L2 speakers of a language as *learners*, but instead, they were referred to as *non-native speakers*. Bardovi-Harlig (1999) remarked that, initially, there was no attempt to characterize variables such as proficiency levels or length of residency in the host environment. Her work made a salient observation: The fact that significant profile details of the subjects (e.g., proficiency, length of residency in the L2 environment) were not given the importance that they deserve in any L2 acquisition research, indicated that the studies did not address L2 learners' use or interpretation of pragmatic meaning taking a developmental approach.

Ninio and Snow (1996) have noted that addressing the development of L2 pragmatics means to examine the "acquisition of the knowledge necessary for the appropriate, effective, rule-governed employment of speech in interpersonal situations" (p. 4). Moreover, Kasper and Rose (1999) claimed that research in this area has not had a significant link to the field of SLA, but that it has been rather conducted mostly in the fields of empirical pragmatics, cross-cultural pragmatics, and interactional sociolinguistics. Thus, Kasper and Rose (1999) highlighted the need for research on L2 pragmatics that focuses on the process of acquisition, and not merely on describing the characteristics of interlanguage pragmatics. Even though to some extent traditional ILP

research has failed to show the language acquisition process, as noted by Kasper and Rose (1999), it still has remained useful for exploring the real situation of learners' pragmatic competence.

Even though there was a general tendency for studies in ILP to be descriptive, some studies successfully incorporated an acquisitional component to their research. For instance, Hassall (1997) and Olshtain and Blum-Kulka (1985) studied the role of proficiency effects on pragmatic competence. Hassall (1997) found that increased L2 proficiency resulted in a more native-like performance in requests. Similarly, Olshtain and Blum-Kulka (1985)'s study revealed that increased L2 proficiency resulted in a more appropriate use of sociocultural rules of speaking. In addition, L2 development in the comprehension of speech acts and conversational implicatures has been studied by Bouton (1992, 1994), Koike (1989, 1992) and Taguchi (2005, 2011b), who found that learners' ability to successfully interpret implicatures (e.g., indirect criticism, sequence implicature, routine expressions, and irony) resulted from an increased L2 proficiency and constant exposure to the target language.

Moreover, methodological changes in ILP have been implemented in order to account for the different stages in the acquisition of L2 pragmatics. For example, the use of cross-sectional and longitudinal methodologies has been incorporated into the study of L2 learners' pragmatic development[2]. For example, Félix-Brasdefer (2017) explained several important observations regarding the benefits of conducting cross-sectional studies to examine L2 pragmatic development. First, cross-sectional designs allow researchers to compare large amounts of data from two or more proficiency levels at once. Second, cross-sectional studies allow researchers to control for variables such as

[2] For a thorough review of longitudinal ILP studies, refer to Félix-Brasdefer (2017).

level of proficiency, social distance and social power, individual differences, register, as well as the setting in which the research takes place (e.g., classroom or non-institutional contexts). Third, this type of design gives the researcher the possibility of including a pedagogical treatment, as well as to include post-tests to measure the learners' pragmatic development.

Several studies have used a cross-sectional design to examine the relationship between pragmatic development and proficiency level (e.g., Bardovi-Harlig & Bastos, 2011; Bardovi-Harlig & Dörnyei,1998; Félix-Brasdefer, 2007; Kerekes, 1992; Koike, 1996; Maeshiba, Yoshinaga, Kasper, & Ross, 1996; Scarcella, 1979; Trosborg, 1995). For instance, among the pragmalinguistic behavior that has been established to become more native-like with increasing proficiency we find requests (e.g., Félix-Brasdefer, 2007; Scarcella, 1979), apologies (e.g., Maeshiba et al., 1996; Trosborg, 1995), the interpretation of qualifiers (e.g., Kerekes, 1992), the use and recognition of conventional expressions (Bardovi-Harlig & Bastos, 2011), responses to suggestions (e.g., Koike, 1996), and grammatical awareness (Bardovi-Harlig & Dörnyei,1998), among others.

In conclusion, the studies on ILP have focused for an extended period on *describing* the pragmatic and linguistic behavior of participants (as noted by Bardovi-Harlig, 1999). However, more recent work has identified a gap in the field and has shifted the attention towards the acquisition of L2 pragmatics. By doing so, the field of ILP now incorporates developmental accounts for L2 pragmatics knowledge. As suggested by Bardovi-Harlig (1999), measuring the development of interlanguage pragmatics, either cross-sectionally or longitudinally, seems to lead to more acquisitionally-oriented ILP findings.

Given the previously discussed information on ILP, I suggest that ILP allows for a developmental approach to the study of the use and interpretation of NumApps in L2 Spanish. In order to examine the different stages of the acquisition of NumApps it is necessary to take into consideration the following aspects, which fall under the scope of ILP research:

1) Investigate the use and interpretation of NumApps among L2 learners with different proficiency levels (e.g., using a cross-sectional design)

2) determine if the L2 learners have acquired the pragmalinguistic values of these items, and,

3) examine whether SLA theories (e.g., cross-linguistic influence, gradual integration of meaning, overgeneralization) can account for the learners' behavior.

In the next section, I present a brief description of a study I conducted with the purpose of investigating Spanish L2 learners' approximation of quantities in Spanish, as well as their understanding of the meaning of NumApps.

2.4 Initial Study

I conducted an initial study[3] in 2016 in order to examine the production and interpretation of NumApps among intermediate and advanced L2 Spanish learners, and among Spanish native speakers. This study addressed a gap in the literature regarding the developmental stages in the acquisition of NumApps by examining if the participants knew how to use NumApps and whether they knew the meaning of the lexical items. The data were obtained using multiple protocols and were triangulated and analyzed using a mixed methodology. The study investigated whether there were observable differences in

[3] The *initial study* is a separate research project that informs the dissertation study.

the frequency and range of NumApps produced, as well as in the interpretation of NumApps by intermediate L2 learners, advanced L2 learners, and Spanish native speakers.

A total of 60 participants took part in the study. The participant groups consisted of 20 intermediate and 20 advanced Spanish L2 learners (L1 English), as well as a comparison group of 20 native Spanish speakers.

The study began with the oral interview, in which I asked the participants questions that elicited unknown quantities that were related to their daily life. After that, the participants completed a prompted production task in which they were asked to complete sentences by supplying lexical items that expressed numeric uncertainty. Then, in a forced-choice task, the participants were asked to interpret the meaning of NumApps. The forced-choice task aimed to examine whether the participants were able to distinguish between defective, neutral, and excessive NumApps. The last protocol was a short metalinguistic awareness interview in which the participants shared what the NumApps meant to them. The interview provided further information regarding the interpretation of NumApps.

The study yielded several notable findings, which are summarized as follows:

- The data obtained from the interview and the prompted production suggested that the advanced L2 resembled the native speakers both in the use of NumApps (favoring neutral approximators, such as *como*) and in the accurate interpretation of these forms' meaning.
- The intermediate L2 favored *cerca de,* and interpreted this lexical item as neutral, while the advanced L2 and the native speakers produced only a few *cerca de*

tokens and interpreted them as defective. This finding was substantiated by the metalinguistic awareness interview.

- In instances in which the participants did not produce a NumApp, they relied on the following lexical and prosodic devices:
  - Parenthetical verbs (e.g., *Pienso que estudio 10 horas.* '(I) think (I) study 10 hours.'),
  - Adverbs of doubt (e.g., *En cada clase hay probablemente veinte estudiantes.* 'In each class there are probably twenty students.') and,
  - Extra-linguistic cues, such as up-stepping[4] (e.g., *30 minutos?*[5] *para llegar al campus*. '30 minutes? To get to campus.') (This strategy was only found among the intermediate L2).
- The use of clusters of NumApps (e.g., two or three NumApps in one single utterance) was found characteristic of only native speakers (e.g., *Como unos 7,000 estudiantes'* like some 7,000 students.'). This clustering strategy was evidenced when the native speakers discussed quantities that had three significant figures or more (e.g., 500, 7,000), while the L2 learners only produced one single device. However, no further conclusions could be drawn since this initial study only yielded a few tokens with large quantities.

In summary, by triangulating the findings obtained from the four protocols, the initial study uncovered similar tendencies in the production and interpretation of approximators between the advanced learners and the native speakers. In all the cases, the advanced learners performed closer to the target language than the intermediate learners

[4] Ward and Hirschberg (1985) and Yang and Esposito (2000) define *up-stepping* as a prosodic strategy that allows speakers to express uncertainty by raising their pitch.
[5] In Jefferson's (2004) transcription conventions, the symbol *?* represents rising intonation.

both in the production and interpretation of NumApps. The findings suggested that the intermediate learners were still developing semantic and pragmatic knowledge relevant to the topic of numeric uncertainty.

The dissertation study thus expands on the findings from the initial study and examines the effect that the magnitude of a quantity has in the production and interpretation of NumApps in a context that is restricted to uncertainty regarding money-related situations. By doing so, the study addresses the development of L2 pragmatics and the extent to which intermediate and advanced L2 learners resemble native Spanish speakers with regard to the approximation of quantities with different magnitudes.

2.5 The dissertation study

2.5.1 Research questions.

Having the aforementioned literature in mind, this dissertation addresses an intersection between lexical and pragmatic knowledge of NumApps that has not been investigated in L2 learners' language. The study aims to examine the process of acquisition of one pragmatic constraint that affects NumApps: the magnitude of the approximated quantity. The study aims to investigate the language of Spanish L2 learners cross-sectionally, with the purpose of unveiling the different stages in the acquisition of pragmalinguistic knowledge that is relevant to the topic of numeric approximation.

In light of the previous literature, the following research questions guided the dissertation study:

1. Does the magnitude of a quantity (i.e., number of significant figures) have an effect on the production of NumApps among intermediate L2, advanced L2, and native

speakers of Spanish (i.e., according to proficiency), and to what extent do L2 learners resemble native Spanish speakers in their production of NumApps?

1a. Are there differences in the frequency in which NumApps are produced in comparison to other lexical and prosodic devices[6]?

1b. Are there differences in the range (i.e., variety) and frequency of NumApps produced?

1c. Does the expression of numeric uncertainty vary in terms of the number of lexical or prosodic devices produced (e.g., a single device vs. multiple devices)?

1d. Can we provide an in-depth depiction of the most representative devices employed by the L2 learners to express numeric uncertainty in Spanish?

2. Do intermediate and advanced learners experience cross-linguistic influence from English to Spanish when they express numeric uncertainty?
3. Does the interpretation of NumApps vary according to the magnitude of the quantity among the three groups, and to what extent do the L2 Spanish learners resemble the native Spanish speakers?

In order to answer the three research questions, I used a mixed-methods approach (i.e., combining quantitative and qualitative data). RQs 1a, 1b, and 1c investigate the participants' oral production patterns of numeric approximations. Therefore, these questions are addressed quantitatively. Then, RQ 1d is addressed using a qualitative analysis since it requires that I exemplify the use of lexical and prosodic devices that emerged in the data when speakers conveyed numeric uncertainty. Next, RQ 2 focuses on whether English (the learners' L1) conditions the production of NumApps in Spanish.

[6] In this study, devices other than NumApps employed to express numeric uncertainty are categorized as lexical devices (e.g., parenthetical verbs and adverbs of doubt) and prosodic devices (e.g., up-stepping).

This RQ only concerns the L2 learners, and it is addressed qualitatively. The purpose of this qualitative analysis is to illustrate specific instances of linguistic behavior that may result as a consequence of L1 influence (e.g., lexical and pragmatic transfer). Lastly, RQ 3 is addressed quantitatively since the purpose of this question is to unveil the patterns of interpretation of NumApps according to the magnitude of the quantity and the participants' L2 Spanish proficiency level.

2.5.2 Hypotheses and predictions.

Previous research has suggested that higher-proficiency L2 learners exhibit a greater sensitivity both in the production and interpretation of pragmatic features of the target language than lower-proficiency learners. Based on the given literature on NumApps, the initial study I conducted, and the literature reviewed on L2 pragmatic development, my hypotheses and predictions for the dissertation study are the following:

Hypothesis and prediction for RQ 1(a-c):

The literature has identified that a high proficiency in the L2 correlates to a target-like ability to produce NumApps in pragmatically appropriate forms. Therefore, the hypothesis for RQ1 (a-c) suggests that the level of L2 proficiency affects the category of devices, the frequency and range of NumApps, and the number of devices employed in the expression of numeric uncertainty of small and large quantities.

With the purpose of confirming the first hypothesis, my predictions are the following:

- The advanced Spanish L2 learners are expected to exhibit sensitivity to the pragmatic constraint of quantity magnitude by producing a single NumApp (e.g., *como $40* 'like $40') when they approximate small quantities, and to

combine a NumApp with another lexical or prosodic device (e.g., *como $4,000 quizá* 'like $4,000 perhaps') when they approximate large quantities.

- The intermediate L2 learners are expected to rely on devices other than NumApps, and to maintain similar production patterns among small and large quantities (e.g., *pienso que $80* '(I) think $80') (e.g., *pienso que $8,000* '(I) think $8,000'). Therefore, this group is not expected to exhibit sensitivity to changes in the magnitude of the quantity.

Hypothesis and prediction for RQ 2:

L1 transfer has been identified by the literature as a common phenomenon in the acquisition of L2 pragmatics, especially among low-proficiency L2 learners. Therefore, the hypothesis for the RQ 2 suggests that cross-linguistic influence from English to Spanish is experienced when L2 learners express numeric uncertainty.

In order to confirm the second hypothesis, my predictions are the following:

- I expect to find evidence of L1 lexical and pragmatic transfer among the L2 learners. More specifically, the intermediate group is expected to exhibit more English-like pragmalinguistic behavior than their advanced counterparts.

Hypothesis and prediction for RQ 3:

Previous research on the interpretation of NumApps has shown that the small quantities yield more specific interpretations than large quantities, which tend to generate wider intervals of possible interpretations. In addition, the initial study I conducted, suggested that advanced L2 learners provide more target-like interpretations of NumApps. Thus, the hypothesis for the RQ 3 suggests that the level of Spanish proficiency determines how L2 learners interpret small and large uncertain quantities.

With this hypothesis in mind, the predictions for the findings are the following:

- The intermediate L2 learners will prefer NumApps that set specific limits (e.g., the defective *casi* 'almost' or the excessive *y pico* '-ish') regardless of the magnitude of the quantity due to the limited sensitivity to the pragmatic constraint.
- With regard to the advanced L2 learners, I expect this group to prefer the NumApps that set specific boundaries (e.g., *casi* or *y pico*) with small quantities and to provide a less restricted interpretation for large quantities and opt for the neutral NumApp *como.*

Having presented the research questions, the hypotheses, and the predictions for the study, the next chapter addresses the method. Chapter 3 provides a description of the participants, the data collection instruments employed in the study, and the data analysis.

Chapter 3

Methods

This chapter presents the design and method of the present study, and it is organized in the following manner: First, I describe the participant groups as well as the recruitment process. Then, I explain the study design and provide a detailed description of each data collection protocol, including how each protocol responded to the research questions. This section is then followed by the procedures that were followed when administering each protocol. Information on how I analyzed the data is provided in the last section of this chapter.

I used multiple protocols for data collection, which generated data that were triangulated. Denzin (1970) defined data triangulation as the use of two or more data sources with similar foci to obtain a more comprehensive understanding of a topic. Triangulation of data was done with the purpose of cross-validating the results. The following protocols were used in this study:

1. Oral interview in Spanish,
2. Prompted production task,
3. Forced-choice task and,
4. Oral interview in English (administered only to L2 learners).

The goal of the oral interview in Spanish and the prompted production task was to address research RQs 1a, 1b, 1c, and 1d which inquired whether there were differences in the production of NumApps among intermediate L2, advanced L2, and native speakers (henceforth Int L2, Adv L2, and NSs) and according to the quantity magnitude (i.e., small or large quantity). Therefore, the two protocols elicited the production of NumApps in

Spanish. The forced-choice task aimed to investigate the interpretation of NumApp categories in order to respond to RQ 3, which addressed the differences in the participants' preference patterns for NumApps according to their level of Spanish proficiency and the magnitude of the quantities. The oral interview in English addressed RQ 2, which investigated whether it was possible to detect transfer from the Int and Adv L2 learners' L1 (i.e., English) with respect to the approximation of quantities in Spanish. The goal of the English interview was to reveal the lexical and prosodic devices the participants employed in their L1, and whether they were transferred to the L2. This oral interview in English was administered only to the L2 learners.

3.1 Participants

This section describes the participants in the study, as well as the process in which they were recruited. The aim of the present study was to examine the stages of acquisition of the lexical-pragmatic meaning of NumApps in Spanish among two learner groups: Int L2 learners and Adv L2 learners. Spanish NSs were also recruited, and they served as the comparison group. The purpose of this investigation was to examine the different stages in the process of acquisition of NumApps; therefore, a cross-sectional design was used. The cross-sectional design allowed the study of a large number of participants in a short period of time in order to draw conclusions and make predictions about the linguistic development of L2 learners.

The study employed a purposive sampling technique in order to achieve comparability among the participants in each group. Purposive sampling is a subject selection technique that, according to Tashakkori and Teddlie (2003, p. 713), involves selecting participants "based on a specific purpose rather than randomly". Following

previous studies (e.g., Cuza, Pérez-Leroux, & Sánchez, 2013; Duffield & White, 1999; Bruhn de Garavito, 2002; Montrul & Slabakova, 2003) and, in order to determine the Spanish proficiency of the L2 learners, the test *Diploma de Español como Lengua Extranjera* (DELE), which contained 50 multiple-choice items, was administered to the Spanish L2 learners. The L2 learners were considered intermediates if they scored within the range of 29-39 points and advanced if they scored within the range of 40-49. While the DELE is not without limitations, similar versions of this test have been extensively implemented to assess proficiency among Spanish L2 learners. In addition to the DELE exam, the study used the Language Experience and Proficiency Questionnaire (LEAP-Q) (Marian, Blumenfeld, & Kaushanskaya, 2007) as a screening method to gather information about the participants' language experience and use, age of acquisition of Spanish, years of formal education in Spanish, knowledge of other languages, and self-assessment of Spanish proficiency. The LEAP-Q was also administered to ensure that participants with significant exposure to other languages or who were Spanish heritage speakers were not included in the study. As noted by Bachman and Palmer (1981) and Ross (1998), in addition to providing valuable information regarding the participants' linguistic practices, self-reported language measures, such as the LEAP-Q, also reliably correlate with participants' actual linguistic ability. Two versions of the LEAP-Q were available for the participants: The English version was given to the English-dominant participants and the Spanish version the native Spanish speakers.

Following Genesee, Paradis, and Crago (2004), in this study, L2 learners were defined as native speakers of English who started acquiring Spanish in a classroom setting after their native language had been established. For this study, I recruited college

students with ages ranging from 18 to 35 years old, who had not had significant exposure to a third language. The recruitment of the Int L2 and the Adv L2 occurred at a large, public research university in the Mid-Atlantic region of the U.S. by doing classroom visits, using a recruitment flyer, and through snowball sampling. Additionally, I recruited a comparison group of Spanish NSs, with ages between 18 and 35 years old. The NSs were born and raised in Mexico, learned Spanish naturalistically in the home setting as children, and, at the time when the study was conducted, spoke only Spanish at home, at school/work, and with friends and family. In addition, the NSs did not receive significant instruction or exposure to English during their childhood and adolescence. Even though some of the NSs had taken short one-day trips to California for shopping, all the interactions with store clerks were done completely in Spanish since Spanish is commonly spoken in the shopping district near the U.S.-Mexico border. The participants did not have any other travel experiences in the U.S. or other English-speaking countries. The Spanish NSs were recruited in a large city in the Northwestern region of Mexico, using a recruitment flyer and snowball sampling, and the study was conducted in a quiet room at a public university. The participants completed the protocols in approximately one hour, and the compensation upon completion was $5 per participant. Table 1 presents the participants' information obtained from the LEAP-Q and the DELE.

Table 1. Demographics of the participants.

Group	Country of origin and place of recruitment	Age	DELE	Years of formal instruction in Spanish	Time spent in a Spanish-speaking country (months)
Int L2 (*n*= 25)	USA	*M*= 20.96 *SD*= 3.33	*M*= 34.88 *SD*= 3.43	*M*= 8.59 *SD*= 3.80	*M*= 1.68 *SD*= 2.46
Adv L2 (*n*=25)	USA	*M*= 22.92 *SD*= 4.82	*M*= 45.24 *SD*= 2.62	*M*= 9.84 *SD*= 4.63	*M*= 7.76 *SD*= 9.13
NSs (*n*=25)	Mexico	*M*= 25.44 *SD*= 3.64	N/A	N/A	N/A

As we can see in Table 1, the participants in the L2 groups were residents of the U.S., and the participants in the comparison group were residents of Mexico. In Table 1, we can also observe that each group included 25 participants, adding to a total of 75 participants in the study. Age differences were not marked amongst the participants in all three groups. According to Chambers (2002), age is considered an important social factor that affects language change. Therefore, to ensure homogeneity in the participant sample, the age means of the groups were comparable. Also, the self-reported data from the two learner groups indicated that the Int L2 and the Adv L2 learners had a comparable amount of years studying Spanish. However, we see a marked difference with regard to the time the Int L2 spent in a Spanish-speaking country in comparison to the Adv L2. This result means that, in addition to the DELE scores, what differentiated the learner groups was their exposure to Spanish outside the classroom setting.

3.2 Data Collection Instruments: Design and Procedures

In this section, I will first present a description of the protocols that I used in the study. The information that follows includes a description of each protocol, the procedures, and an explanation of how each instrument responded to the RQs.

The protocols for data collection are listed below and are presented in the order in which they were administered to the participants:

1.Interview in Spanish,

2.Prompted production task,

3.Forced-choice task and,

4.Interview in English (only for the L2 learner groups).

First, the interview in Spanish examined the spontaneous production of NumApps among the two L2 learner groups and the comparison group of native Spanish speakers. Second, the prompted production task evaluated the production of NumApps in a controlled context, in which all the participants were explicitly asked to express uncertainty in their responses and such responses were guided by a prompt. Third, the forced-choice task examined the participants' interpretation of NumApps. Fourth, the English version of the oral interview generated data to examine corresponding pragmalinguistic behavior in the use of NumApps in the learners' L1 and L2.

I will now proceed to provide a detailed description of each of the study's data collection protocols. The description includes the rationale, the design and procedures, and sample items for each protocol.

3.2.1 Protocol one: Oral interview in Spanish.

The first protocol was an oral interview, which examined the spontaneous use of NumApps in Spanish. For the purpose of this study, I followed Prins and Bastiaanse (2004, p. 1077), who defined the term *spontaneous production* as "speech that is elicited by an interview with open questions, in which the interviewer maintains a normal, informal, conversational mood". As observed by Williams and Menard-Warwick (2014),

oral interviews can be employed to examine specific linguistic features of L2 speech. For that reason, in the present study, this protocol simulated a natural and informal conversation in which the participants shared information about their lives, and responded to questions that elicited a numeric approximation. While the interview represents a semi-structured elicitation protocol and does not yield completely naturalistic speech, as noted by Eisenbeiss (2009, 2010), this type of protocol encourages the production of the topic under examination while keeping the communicative situation as natural as possible.

This protocol responded to RQs 1a-d, which inquired about the effect of quantity magnitude (i.e., number of significant figures) in the production of NumApps among the three groups (i.e., Int L2, Adv L2, and NSs). The interview included open-ended questions, presented in the same order to all participants. The questions touched on different topics related to the participants' daily life, and some of the questions elicited numeric approximation by asking the participants to speak about quantities that they were likely to not know with exactitude (e.g., *¿Cuánto cuesta un boleto para el cine los fines de semana?* 'How much is a ticket to the movies on the weekends?'). In addition, this protocol examined the use of NumApps according to the pragmatic constraint of the magnitude of the quantity. In the interview, certain questions required the participants to approximate small quantities (e.g., with two significant figures, such as 20, 40, or 70), and other questions triggered the approximation of large quantities (e.g., with four or five significant figures, such as 8,000, 10,000, or 15,000). Channell (1980, 1994) found that changes in the magnitude of a quantity affect how speakers interpret a numeric

approximation. This protocol aimed to expand on Channell's findings and examine whether this pragmatic consideration also affects the production of NumApps.

The interview consisted of a total of 36 questions, 12 of which elicited information regarding quantities that were not expected to be known by the participants with complete certainty. The 12 questions that elicited numeric approximation were divided into two categories: six questions that elicited the approximation of small quantities and six others that elicited the approximation of large quantities. The interview questions were asked in the same order to all the participants, and their responses were recorded in audio. Prior to beginning the interview, the participants were told that I was going to ask them questions about their school/work, friends, hobbies, housing situation, and vacations. No further directions were given. Sample interview questions and fillers are listed in example 4 (a)-(d) below. (For a full list of interview questions that elicited numeric approximation, see Appendix A.)

4. (a) Small quantity: *¿Cuánto cuesta un boleto para el cine los fines de semana?*
'How much is a ticket to the movies on the weekends?'

(b) Large quantity: *¿Cuánto cuesta tu renta con todo y los servicios cada semestre?*
'How much is your rent with utilities each semester?

(c) Filler: *¿A dónde te gusta salir con tus amigos los fines de semana?*
'Where do you like to go out with your friends on the weekends?'

(d) Filler: *¿Cuáles han sido tus vacaciones favoritas?*
'What vacation trip has been your favorite?'

3.2.2 Protocol two: Prompted production task.

In order to further respond to RQs 1a-d, which inquired about the effect of quantity magnitude and Spanish proficiency level in the use of NumApps, I administered a prompted production task. Unlike the interview, which elicited spontaneous speech, the

prompted production task examined the use of NumApps in a more controlled linguistic context. Although prompted production tasks have limitations which are related to the lack of spontaneity of the speech, Rebuschat and Mackey (2012) and Thornton (1996) noted that elicited or prompted production protocols set up a context using verbal or nonverbal prompting which creates a felicitous condition for the production of the target structure. Therefore, this type of task tends to generate a vast amount of data and increase the statistical power.

In the prompted production task, the participants were explicitly asked to express uncertainty and doubt when responding to a series of questions. Nonetheless, the participants were not instructed on which words they should use so that they were free to make their choices. Before beginning, the participants received a general context in which they were asked to help a student who was new on campus and who had several questions about places for buying food, book prices, the bus schedule, places for studying and doing homework, etc. I administered this protocol using PowerPoint slides, each one containing an audio file with a question and its corresponding answer. The participants had to listen to the questions and respond to each one orally by inserting a lexical item that conveyed uncertainty or doubt. The responses were prompted by written sentences that were presented on each PowerPoint slide. Sample prompted production items and fillers are listed in example 5 (a)-(d) below. In addition, Figure 2 provides a visual representation of the PowerPoint slides. The questions next to the speaker icon on the sample slides in Figure 2 are only for reference. In the actual protocol, the questions were presented as audio, and the participants did not see them. They only listened to the

questions. (For a full list of the prompted production protocol items that elicited numeric approximation, see Appendix B.)

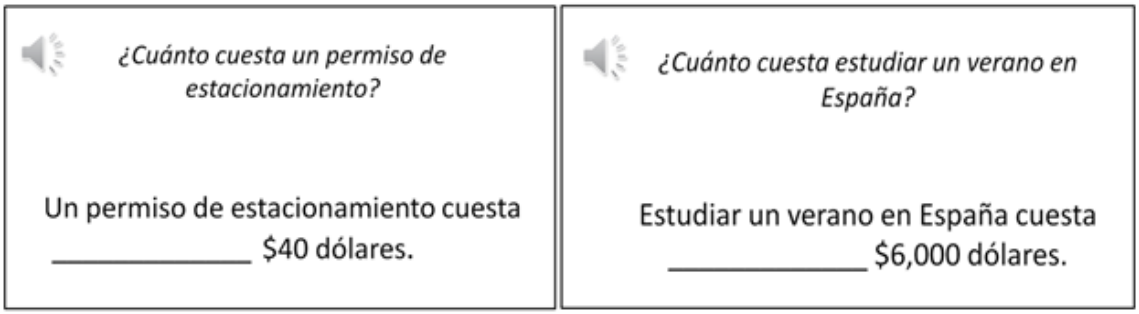
5. (a) Small quantity: *¿Cuánto cuesta un permiso de estacionamiento?*
Un permiso de estacionamiento cuesta _____ $40 dólares.
'How much does a parking permit cost?'
'A parking permit costs _____ $40 dollars.'

(b) Large quantity: *¿Cuánto cuesta estudiar un verano en España?*
Estudiar un verano en España cuesta _____ $6,000 dólares.
'How much does it cost to study in Spain in the summer?'
'Studying in Spain in the summer costs_____ $6,000 dollars.'

(c) Filler: *¿Cómo puedo llegar a otro campus?*
Para llegar a otro campus puedes tomar el autobús 11A_____.
'How can I get to another campus?'
'To get to another campus, you need to take the bus 11A_____.'

(d) Filler: *¿Dónde hay lugares para comer en la universidad?* '
_____ hay restaurantes en el centro estudiantil.
'Where can I find places to eat on campus?'
'_____ there are restaurants at the student center.'

Figure 2. Sample prompted production task items with small and large quantities.



3.2.3 Protocol three: Forced-choice task.

The third protocol in this study was a forced-choice task. The goal of this protocol was to investigate the interpretation of the three categories of NumApps (i.e.,

defective, neutral, and excessive) by examining the participants' preference for one category over another according to the magnitude of a quantity (e.g., small vs. large quantities). Thus, the forced-choice task addressed RQ 3, which investigated whether the participants in the study interpreted NumApp categories differently when small quantities were approximated in comparison to large quantities.

Ionin and Zyzik (2014) reported that forced-choice tasks are known to allow researchers to identify the interpretation of a variety of linguistic forms and structures. As noted by Schütze and Sporuse (2014), forced-choice tasks are the only task explicitly designed for the comparison of two (or more) conditions; and thus, tend to increase statistical power to detect differences between conditions. However, Schütze and Sporuse (2014) also observed that there is a limitation to this type of task. Force-choice tasks do not provide information about where a given condition stands on the overall scale of acceptability. According to Schütze and Sporuse (2014 p. 7), "for linguistic purposes, this is often important: a difference between two sentences both of which are at the high or low end of the acceptability spectrum may call for a different kind of explanation than a difference between two sentences in the middle of the spectrum".

In the forced-choice task, one NumApp represented each category: *casi* 'almost' represented the defective category, the approximator *como* 'like' represented the neutral category, and *y pico* '-ish', represented the excessive category. Recall that NumApp categories are separated according to the values they signal in relation to the exemplar number (i.e., the number used in the approximation):

- Defective NumApps only signal values that are slightly lower than the exemplar number (e.g., *cerca de* 'close to', *casi* 'almost').

- Neutral approximators signal values that can be either slightly lower or slightly higher than the exemplar number (e.g., *como* 'like', *alrededor de* 'around').
- Excessive NumApps convey values that are slightly higher than the exemplar number (e.g., *y pico* '-ish', *y tantos* 'or so').

Previously, in the Literature Review Chapter, I explained that the number of significant figures in an approximated quantity affects the flexibility of its interpretation. For instance, approximations of large quantities (e.g., quantities with four significant figures) have a wider interval of possible interpretations. Therefore, neutral approximators (e.g., *como* 'like') should be preferred when approximating large quantities since these lexical items activate inferences that are both below and above the exemplar number and do not establish a specific limit as defective and excessive NumApps do. However, approximations of small quantities (e.g., quantities with two significant figures) tend to be more precise. Hence, defective (e.g., *casi* 'almost') and excessive (e.g., *y pico* '-ish') NumApps are expected to be preferred when approximating small quantities. Defective and excessive approximators activate specific inferences (either higher or lower in relation to the exemplar number). For that reason, the interpretations of approximations containing these lexical items tend to be more specific than those using neutral approximators.

With the aforementioned documented behaviors in mind, in the forced-choice task, I asked the participants to choose between two possible approximations for one quantity (each option containing two NumApps, each from a different category). The aim of the task was to examine whether the participants had a preference for one approximator category over another according to the magnitude of the quantity.

The forced-choice task was also administered using PowerPoint slides. In order to contextualize this task using a real-life and meaningful situation, I told the participants that they had recently met a new friend who was doing a study abroad program at their university. The friend was new in town, and she had several questions regarding the cost of living in that city. Therefore, she asked questions regarding the prices of different items and activities (e.g., *¿Cuánto cuesta rentar un coche por un día?* How much does it cost to rent a car for a day?). As expected, the participants did not know the exact prices for every item or activity that the new friend asked about. However, they wanted to be friendly and assist her to gather this information.

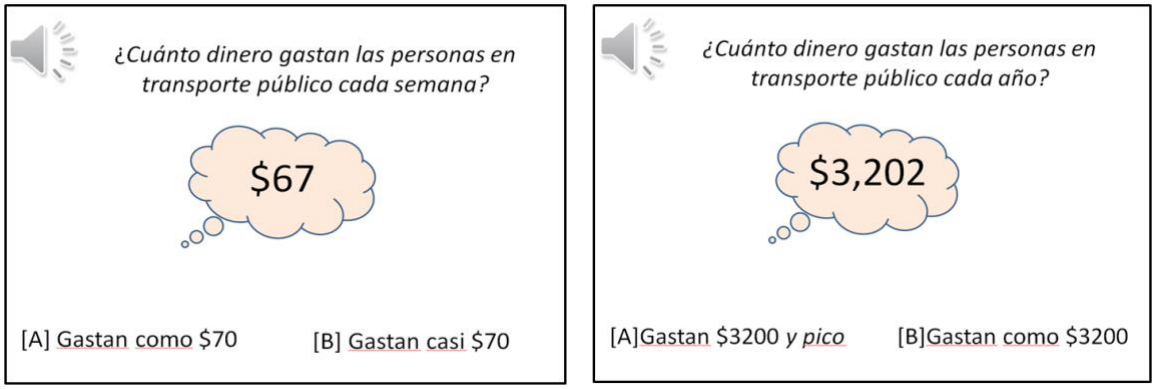
The participants' task was to decide the best way to approximate the quantities by choosing between two options (option A and option B). Each option contained a NumApp from a different category. For instance, certain items required the participants to choose between *casi* and *como,* and other items required them to choose between *como* and *y pico.* Each PowerPoint slide contained an audio file with the question that the new friend asked. In each slide, there was a thought bubble that contained a reference quantity. The thought bubble indicated that there was uncertainty regarding the quantity, and the quantity inside the bubble served as a reference so that the participants could make a decision regarding how they would make the approximation. The forced-choice task comprised 36 items related to numeric approximation and 72 filler items. Sample forced-choice task items and a filler item are listed in Table 2. In addition, a visual representation of the PowerPoint slides is presented in Figure 3. The questions next to the speaker icon on the sample slides are only for reference. In the actual protocol, the

questions were presented as audio, and the participants only listened to them. (More sample items are provided in Appendix C.)

Table 2. Sample forced-choice task items and filler.

Item	Question	Reference	Option A	Option B
Small	*¿Cuánto dinero gastan las personas en transporte público cada semana?* 'How much money do people spend on public transportation every week?'	$67	*Gastan casi $70.* '(They) spend almost $70.'	*Gastan como $70.* '(They) spend like $70.'
Large	*¿Cuánto dinero gastan las personas en transporte público cada año?* 'How much money do people spend on public transportation every year?'	$3,202	*Gastan como $3,200.* '(They) spend like $3,200.'	*Gastan $3,200 y pico.* '(They) spend $3,200-ish.'
Filler	*¿A cuántas personas conociste en la orientación?* 'How many people did you meet at the orientation?	José y Luis	*Al menos a dos, osea José y Luis.* 'At least two, namely José and Luis.'	*A más de una, osea José y Luis.* 'More than one, namely José y Luis.'

Figure 3. Sample forced-choice task items with small and large quantities.



3.2.4 Protocol four: Oral interview in English.

The fourth protocol in this study was an oral interview that was conducted in English. This protocol was similar to the interview in Spanish. The questions that were

asked in the Spanish interview were translated into English, and there were only minor changes made to the questions so that the participants did not already have an answer in mind[7]. For instance, if a question in the Spanish interview was *¿Cuánto cuesta tu renta con todo y los servicios cada semestre?* 'How much is your rent with utilities each semester?', the interview question in English was changed to 'How much are your rent and utilities every year?'.

Several scholars have suggested that investigating the linguistic behavior in the dominant language generates a more robust understanding of the linguistic behavior in the target language (e.g., Ellis, 1994; Gass & Selinker, 1994; Selinker, 1992). Therefore, the aim of this interview was to gather data to respond to RQ 2, which focused on the use of NumApps in the learners' dominant language (i.e., English). The use of the same protocol in English and in Spanish enabled the examination of corresponding production patterns in the L1 and L2.

The English interview consisted of a total of 36 questions, 12 of which elicited numeric approximation. The instructions the participants received before beginning the interview were identical to the instructions from the interview in Spanish. The answers to the questions were audio recorded. Before beginning the interview, I told the participants that I was going to ask them questions about their school/work, friends, hobbies, housing situation, and vacations, and no further directions were given. See 6 (a)-(d) for examples. (For a full list of experimental items in the English interview, see Appendix D).

6. (a) Small quantity: How much is a ticket to the movies on a weekday?

   (b) Large quantity: How much are your rent and utilities every year?

[7] While the English interview represented a translation of the Spanish interview, only the Spanish interview was reviewed by the IRB.

(c) Filler: Where do you like to go out with your friends on the weekends?

(d) Filler: What vacation trip has been your favorite?

3.3 Data Analysis

The study used a mixed-methods approach. With the purpose of generating a robust understanding of the L2 pragmatic development concerning NumApps, the triangulation of the data obtained using both the quantitative and qualitative approaches was important. As stated by Denzin (1970) and Creswell (2003), triangulation is a way of corroborating and validating results obtained from different methods.

In order to shed light on the tendencies regarding the use and the interpretation of NumApps, I conducted a quantitative analysis among the two learner groups (i.e., Int L2 and Adv L2) and the comparison group (i.e., NSs) across the first three protocols (i.e., interview in Spanish, prompted production task, and forced-choice task). Later, with an in-depth qualitative analysis, I unpacked specific uses of NumApps in the two Spanish oral production tasks that could not be elucidated by the quantitative analysis. That is, while the quantitative analysis attended to patterns of NumApp use by each participant group, the qualitative analysis exemplified NumApp uses that were characteristic of each proficiency group, and uncovered alternative linguistic behavior employed to express numeric uncertainty that did not involve the use of NumApps.

I analyzed the fourth protocol (i.e., interview in English) using a qualitative method. This protocol aimed to gather data from the L2 learner groups with the sole purpose of comparing the approximation of quantities in their L1 and L2. The use of NumApps in English was not the focus of this study. However, with the purpose of generating a more comprehensive understanding of how L2 learners develop their

knowledge of NumApps, and to be able to discuss instances of lexical and pragmatic transfer, it was necessary to examine the learners' behavior in their dominant language. In order to code and analyze the qualitative data, I extracted the relevant fragments from the audio recordings containing the participants' responses; then, I transcribed and analyzed the data following the steps for identification, examination, and interpretation of patterns and categories proposed by Saldaña (2009).

The next sections discuss the variables under examination in the quantitative analysis of the study and address the analysis of the data. First, I present the coding guide with the variables and their levels. Then, I define each variable and explain how the data were analyzed.

3.3.1 Coding guide and description of the variables.

In order to analyze the quantitative data obtained from the first three protocols (i.e., oral interview in Spanish, prompted production task, and forced-choice task), the study examined the variables presented in Table 3:

Table 3. Coding guide for the variables examined in the quantitative analysis.

Variable	Levels
1. Proficiency group	0= intermediate L2 1= advanced L2 2= native speakers
2. Protocol	0= oral interview in Spanish 1= prompted production task 2= forced-choice task
3. Magnitude of the quantity	0= small (e.g., *30*) 1= large (e.g., *3,000*)
4. Type of comparison	0= neutral and defective 1= neutral and excessive 2= N/A (the variable applies only to the forced-choice task)
5. Use of NumApp vs. another lexical or prosodic device	0= NumApps (e.g., *como 30*) 1= Another lexical or prosodic device: Parenthetical verbs (e.g., *pienso que 30*), up-stepping (*30?*), numeric ranges (*de 30 a 40*)

	2= N/A (the variable does not apply to the forced-choice task)
6. NumApp used in response	0= *como* 1= *más o menos* 2= *alrededor de* 3= *aproximadamente* 5= *cerca de* 5= *casi* 6= *unos* 7= *sobre* 8= Another lexical or prosodic device (i.e., NumApps were not produced) 9= N/A (the variable does not apply to the forced-choice task)
7. Use of single and multiple devices	0= a single NumApp (e.g., *como 30*) 1= a cluster of two or more NumApps (e.g., *como unos 3,000*) 2= co-occurrence of a NumApp and another lexical or pragmatic device (e.g., *pienso que como 3,000*) 3= a single lexical or prosodic device other than a NumApp (e.g., *pienso que 30*) 4= a cluster of two or more lexical or prosodic devices other than NumApps (e.g., *pienso que quizá 3,000?*) 5= N/A (the variable does not apply to the forced-choice task)
8. NumApp category	0= defective (e.g., *casi*, *cerca de*) 1= neutral (e.g., *como*, *más o menos*) 2= excessive (e.g., *y pico*, *y tantos)* 3= none (no NumApp was produced) 4= N/A (the variable does not apply to the forced-choice task)
9. Preference for NumApps	0= expected 1= non-expected 2= N/A (the variable applies only to the forced-choice task)

The variables were defined in the following manner: The variable, *proficiency group*, coded three levels, which represent the three Spanish proficiency levels in the study (i.e., Int L2, Adv L2, or NSs). The next variable in the table identified the protocol number (i.e., oral interview in Spanish, prompted production task, or forced-choice task). Next, the variable named *magnitude of the quantity* coded the number of significant figures. This variable had two subfactors: *small* (e.g., quantities with two significant figures) and *large* (e.g., quantities with four significant figures).

The variable *type of comparison*, variable four on the chart, was only relevant for the forced-choice task since it examined the pair of NumApps that were presented to the participants so they could express their preference. The first type comparison required participants to choose between a neutral and a defective NumApp (e.g., *como* vs. *casi*), and the second type of comparison required participants to choose between a neutral and an excessive NumApp (e.g., *como* vs. *y pico*).

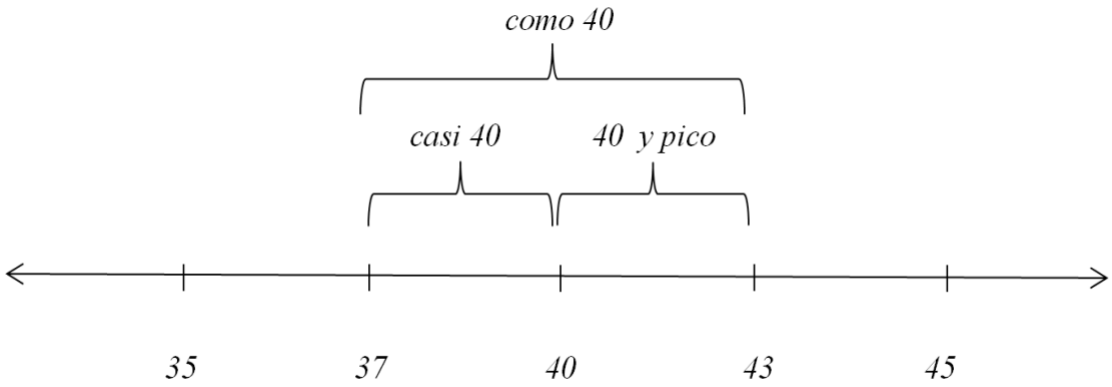
The variable *production of NumApp vs. another lexical or prosodic device* was also coded, and this variable accounted for whether the participants produced a NumApp in their oral responses or whether they produced another lexical or prosodic device (i.e., parenthetical verbs, adverbs of doubt, up-stepping, or numeric ranges) to express numeric uncertainty. The subsequent variable on the chart as number six, *NumApp used in response*, identified the lexical item produced by the participants (e.g., *como, más o menos, aproximadamente*). As we can see in Table 3, a different code was used to identify each NumApp produced. Next, the variable *use of single and multiple devices* was coded with the purpose of identifying whether the participants used a single lexical or prosodic device to approximate quantities, such as a single NumApp (e.g., *como $40*) or a single device other than a NumApp (e.g., *probablemente $40*), or whether they produced clusters of devices, such as two or more NumApps in one single clause (e.g., *como unos $8,000*), or two devices other than NumApps in a single clause (e.g., *pienso que $8,000 probablemente*), or whether they relied on a combination of a NumApp with another lexical or prosodic device (e.g., *como $8,000?*).

Another variable was *approximator category*. This variable coded NumApps according to the category to which they belong: defective, neutral, and excessive. Recall

that the criterion behind the categorization of NumApps was based on the inferences that they activate. That is, defective NumApps signal values that are lower than the exemplar number, neutral NumApps signal values that can be either lower or higher than the exemplar number, and excessive NumApps signal values that are higher than the exemplar number.

The next variable, *preference for NumApps*, was also relevant only for the forced-choice task because this variable identified the participants' preference for one approximator over another (e.g., *como* vs. *casi* or *como* vs. *y pico*), based on the inferences these lexical items activate. The participants' answer was considered *expected* when they preferred the NumApps that set specific limits (i.e., *casi* and *y pico*) to approximate small quantities and the NumApp that does not set specific limits (i.e., *como*) to approximate large quantities. Recall that, *casi* and *y pico* are NumApps that set specific limits since *casi* can only be interpreted as signaling values that are slightly lower than the exemplar number (i.e., the number that is used as the reference in an approximation), and *y pico* only signals values that are slightly higher than the exemplar number. In contrast, *como* does not specify a limit because it can signal values that are in the vicinity of the exemplar number and can be either lower or higher. Figure 4 illustrates the inferences that each type of NumApp activates.

Figure 4. Inferences activated by defective, neutral, and excessive approximators.



Based on Figure 2, in a numeric approximation that contains the defective NumApp *casi* (e.g., *casi 40*), the interpretation is that the quantity is lower than 40, and numeric approximations containing the excessive *y pico* (e.g., *40 y pico*) can only be interpreted as referring to a number that is higher than the exemplar number. Therefore, *casi* and *y pico* are considered to activate specific limits in relation to the exemplar number. However, the use of the neutral NumApp *como* (e.g., *como 40*), signals values that can be either lower than 40 or higher than 40. Therefore, *como* does not set a specific limit.

Having presented the variables analyzed in the quantitative data, the next section provides a description of the statistical models that I used to conduct the quantitative analysis, as well as the steps for coding the qualitative data.

3.3.2 Analysis of the data.

I conducted a quantitative analysis using R (version 3.4.4), a language and environment for statistical computing. Also, I used the variables listed in the Coding Guide (Table 3) in the quantitative analysis of the data generated by the following protocols: The oral interview in Spanish, the prompted production task, and the forced-

choice task. With the purpose of generating descriptive information on the frequency and distribution of the participants' responses in the aforementioned protocols, I conducted Chi-square tests of independence using the xtab package. Then, with generalized linear mixed-effects models (GLMMs) using the lme4 package (Bates, Maechler, Bolker, Walker, 2015), I estimated the effect of the predictors (i.e., the independent variables) on my response variables (i.e., dependent variables). GLMMs represent mixed-effects logistic regressions that allow binary responses and can include both fixed and random effects (hence mixed models).

In order to substantiate the quantitative findings obtained from the Spanish interview and the prompted production task, I conducted a qualitative analysis of the data gathered by the oral interview in English. The aim of this task was to generate data from the L2 learner groups with the sole purpose of comparing their use of approximators in their L1 and L2. Recall that in order to have a more comprehensive understanding of how numeric approximation develops among the Spanish L2 learners, and to be able to discuss instances of lexical-pragmatic transfer or the transfer of certain devices that are commonly employed in the learners' L1, it was necessary to examine the learners' behavior in their dominant language.

Furthermore, I conducted a qualitative analysis to examine the linguistic behavior in which the Int L2 learners, the Adv L2 learners, and the Spanish NSs employed devices other than NumApps during the oral interview in Spanish and the prompted production task. The quantitative analysis could not fully elucidate such instances; therefore, a qualitative approach to these data unveiled alternative devices in the expression of numeric uncertainty.

The qualitative analysis was conducted using discourse analysis, which, in Brown and Yule's (1983) words, refers to the analysis of language in use, taking into consideration the purposes or functions that linguistic forms perform. In order to code and analyze the qualitative data, the analysis involved the transcription of relevant fragments (i.e., the clauses containing numeric uncertainty) as well as the implementation of Saldaña's (2009) steps for coding the qualitative data, which involve the identification, examination, and interpretation of patterns and categories. The coding process consisted of two steps: (1) identifying lexical and prosodic devices employed for expressing numeric uncertainty and (2) creating categories that were representative of a particular linguistic behavior.

The use of multiple sources of data collection, as well as a mixed-methods approach to analyzing the data, made triangulation of the findings possible. The data triangulation validated and addressed the robustness of the results through the convergence of information from different sources. Therefore, the study generated a comprehensive and multidimensional view of NumApps among L2 Spanish learners

Chapter 4

Quantitative Results

This chapter discusses the results yielded by a quantitative analysis of the production and interpretation of numeric approximation in Spanish by intermediate L2 learners, advance L2 learners, and a comparison group of native Spanish speakers (henceforth, Int L2, Adv L2, and NSs). As a reminder, the oral production data were gathered using two protocols: A Spanish interview (see Appendix A), which elicited spontaneous speech, and a prompted production task (see Appendix B), which elicited controlled speech. Also, the interpretation of numeric approximators (NumApps) was examined using a forced-choice task (see Appendix C).

The aim of this study was to examine the role of Spanish proficiency in the development of pragmatic knowledge with regard to the expression and interpretation of uncertainty regarding money-related quantities with two different magnitudes (i.e., small and large). The RQs that guided the study are the following:

1. Does the magnitude of a quantity (i.e., number of significant figures) have an effect on the production of NumApps among intermediate L2, advanced L2, and native speakers of Spanish (i.e., according to proficiency), and to what extent do L2 learners resemble native Spanish speakers in their production of NumApps?

    1a. Are there differences in the frequency in which NumApps are produced in comparison to other lexical and prosodic devices?

    1b. Are there differences in the range (i.e., variety) and frequency of NumApps produced?

1c. Does the expression of numeric uncertainty vary in terms of the number of lexical or prosodic devices produced (e.g., a single device vs. multiple devices)?

1d. Can we provide an in-depth depiction of the most representative devices employed by the L2 learners to express numeric uncertainty in Spanish?

2. Do intermediate and advanced learners experience cross-linguistic influence from English to Spanish when they express numeric uncertainty?
3. Does the interpretation of NumApps vary according to the magnitude of the quantity among the three groups, and to what extent do the L2 Spanish learners resemble the native Spanish speakers?

The quantitative analysis addressed RQs 1a, 1b, 1c, and 3. To enable me to respond to RQs 1a, 1b, and 1c, I conducted chi-square tests and ran generalized linear mixed-effect models (GLMMs) in order to examine the interactions between the level of Spanish proficiency and the magnitude of the quantities in the expression of numeric uncertainty. In order to respond to RQ 3, I also conducted a chi-square test and ran a GLMM to examine the interactions between the level of Spanish proficiency and the magnitude of the quantities with regard to how the participants interpreted numeric approximations.

This chapter is organized in the following manner: First, I present the analysis of the first oral production protocol (i.e., Spanish interview), which generated spontaneous production data. The data gathered from the Spanish interview addressed RQs 1a, 1b, and 1c, and the findings from the Spanish interview are presented in Tables 4, 5, and 6, as well as in Figure 5. Second, I provide an analysis of the second oral production protocol

(i.e., prompted production task). This protocol generated controlled production data to further respond to RQs 1a, 1b, and 1c, and the data pertaining to this protocol are presented in Tables 7, 8, and 9, and Figure 6. Third, I analyze the data obtained from the forced-choice task. The data obtained responded to RQ 3, which inquired about the interpretation of NumApps. The findings related to the forced-choice task are provided in Table 10 and Figure 7. Fourth, I present a summary of the most relevant quantitative findings generated by the Spanish interview, the prompted production task, and the forced-choice task, and I address how the data responded to the RQs.

4.1 Quantitative results gathered from protocol one: The Spanish interview

The purpose of the Spanish interview was to examine the spontaneous production of NumApps by asking the participants open-ended questions that touched on different topics related to their daily life and related to money (e.g., *¿Cuánto cuesta un boleto para el cine los fines de semana?* 'How much is a ticket to the movies on the weekends?') (see Appendix A). The protocol also aimed at capturing the effects of the magnitude of the quantity (i.e., small and large) and the level of Spanish proficiency (i.e., Int L2, Adv L2, and NSs) with respect to the following variables:

- The use of NumApps as opposed to other lexical and prosodic devices,
- the lexical items produced as NumApps and,
- the use of single and multiple devices.

4.1.1. The use of numeric approximators and other devices in the Spanish interview.

This section discusses the results from the analyses conducted to address RQ 1a, which examined the effect of the magnitude of the quantity (i.e., small and large) and the level of Spanish proficiency (i.e., Int L2, Adv L2, and NSs) in the use of:

- NumApps (e.g., *como, más o menos, alrededor de)* and
- other lexical and prosodic devices (e.g., parenthetical verbs, up-stepping).

The following table (Table 4) illustrates the results of a chi-square test that probed the distribution of responses containing NumApps (e.g., *como* 'like', *más o menos* 'more or less'), as well as other lexical and prosodic devices, such as parenthetical verbs (e.g., *pienso que 50* '(I) think 50'), adverbs of doubt (e.g., *probablemente* 80 'probably 80'), numeric ranges (e.g., *entre 10 y 15* 'between 10 and 15'), and up-stepping (*40?*).

Table 4. The distribution of numeric approximators and other lexical and prosodic devices in Spanish interview according to the magnitude of the quantity and the level of Spanish proficiency (*n*= 860).

		Devices produced in the interview responses		
Magnitude	Proficiency	NumApps	Other lexical and prosodic devices	Total
Small	Int L2	28.3% (41)	71.7% (104)	100% (145)
	Adv L2	58.0% (83)	42.0% (60)	100% (143)
	NSs	80.6% (116)	19.4% (28)	100% (144)
	Total	55.3% (239)	44.7% (193)	100% (432)
Large	Int L2	29.6% (42)	70.4% (100)	100% (142)
	Adv L2	61.3% (87)	38.7% (55)	100% (142)
	NSs	97.9% (141)	2.1% (3)	100% (144)
	Total	63.1% (270)	36.9% (158)	100% (428)

($p < .000$)

The results of the chi-square test revealed a statistically significant relationship between the use of NumApps, the magnitude of the quantity, and the participants' level of Spanish proficiency ($X^2(7) = 224.47$, $p <. 000$). From Table 4, we gather that the majority of the responses included NumApps (55.3% with small quantities and, 63.1% with large quantities). However, a closer examination reveals other findings: When we focus on between-group differences among the small quantities, we note that the Int L2 showed the lowest production of NumApps (28.3%) compared to their counterparts. That is, the Adv L2 produced a high frequency of NumApps (58.0%), a behavior that resembled more closely that of the NSs, who favored the use of NumApps (80.6%).

When approaching large quantities, the data reflected similar results. The Int L2 produced fewer NumApps than the Adv L2 and the NSs (29.6%, 61.3%, and 61.3%, respectively).

In sum, Table 4 addressed RQ 1a, which inquired about the effect the magnitude of a quantity (i.e., number of significant figures) has in the use of NumApps vs. other devices among Int L2, Adv L2, and NSs. The findings point to a progression in which a higher level of Spanish proficiency increases the production of NumApps in contexts in which small and large uncertain quantities were discussed.

In order to delve into the findings presented in Table 4 further, a GLMM was run. The GLMM determined the variables that had a statistically significant effect on the production of NumApps as opposed to other lexical and prosodic devices in the interview responses. The model examined the instances in which NumApps were produced by the three participant groups (i.e., Int L2, Adv L2, and NSs), and among the two quantity magnitudes (i.e., small and large).

The model revealed that proficiency level had a significant effect when comparing the NSs with the Int L2 learners (β= 2.71, *SE*= 0.41, *z*= 6.57, *p*< .000)[8] and with the Adv L2 learners (β=1.25, *SE*= 0.40, *z*= 3.120, *p*= .002). Also, the analysis yielded an effect of proficiency level when comparing the Adv L2 with the Int L2 (β=1.46, *SE*= 0.38, *z*= 3.86, *p*= .000). In other words, for every NumApp produced by the Int L2 learners, the NSs' use of these lexical items increased 2.71 times (based on the β coefficient). With regard to the NSs and the Adv L2 learners, the NSs were 1.25 times more likely to produce a NumApp than the Adv L2 learners. Regarding the comparison

[8]The beta coefficients (β) are the standardized estimates resulting from the regression. The β coefficients provide information regarding the likelihood of an event occurring. *SE* refers to the *standard errors* associated with the coefficients. The *z*-values are the regression coefficients divided by their standard error, and they have a standard normal distribution. Exact *p*-values are reported unless the *p*-value is less than .000.

between the Adv L2 and the Int L2, the analysis revealed that the Adv L2 were 1.46 times more likely to produce a NumApp than the Int L2.

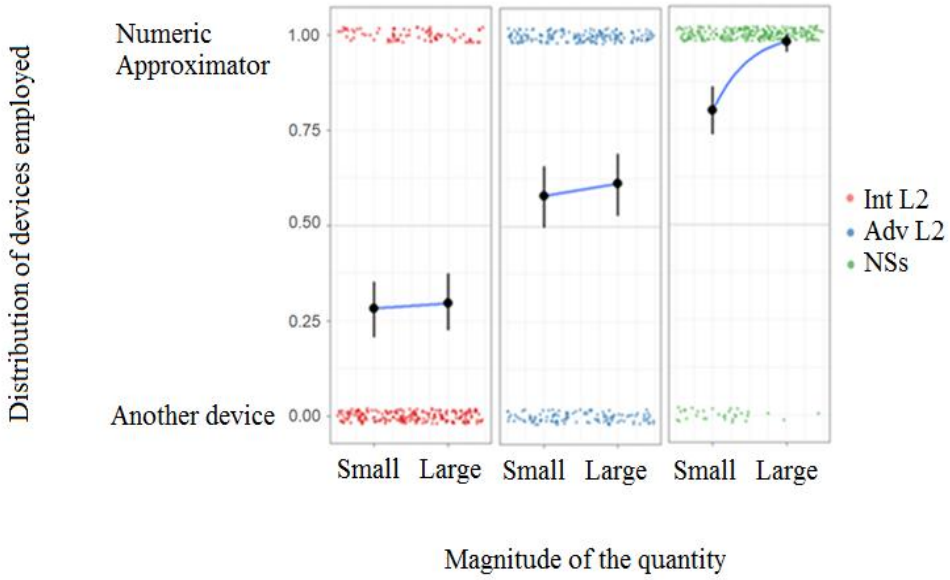
The GLMM also revealed an effect with regard to the magnitude of the quantity (β=-2.16, *SE*= .63, *z* = -4.13, *p*< .000). That is, the three participant groups were 2.16 times *less* likely to produce a NumApp with small quantities than with large quantities. In addition, there was an interaction between quantity magnitude and proficiency level when comparing the NSs to the Int L2 (β= 2.54, *SE*= 0.69, *z*= 3.68, *p*= .000) and to the Adv L2 (β= 2.48, *SE*= 0.69, *z*= 3.62, *p*=.000), but no effect was found with regard to the magnitude of the quantity and the level of proficiency when comparing the Adv L2 with the Int L2 (β= .07, *SE*= .38, *z*= .17, *p*= .864). In other words, the frequency in which NumApps were produced did not change significantly between the Int L2 and Adv L2 when the magnitude of the quantity changed from small to large.

There were no random intercept effects for participants or items. That is, the results were not based on the data from one particular participant or one particular item; the results were representative of each proficiency group.

To summarize, the model revealed that the participants' use of NumApps increased significantly when the level of Spanish proficiency increased, and that larger quantities yielded more NumApps. However, when examining the interaction between Spanish proficiency and quantity magnitude in the use of NumApps (i.e., the two variables together), only the comparison between the NSs with the two L2 groups was statistically significant (i.e., NSs vs. Int L2 and NSs vs. Adv L2). In other words, the L2 groups were not significantly different from each other.

Figure 5 illustrates the distribution of responses containing NumApps as opposed to other lexical or prosodic devices with small and large uncertain quantities. The x-axis presents the magnitude of the quantities (i.e., small and large), and the y-axis contains the distribution of responses with NumApps and with other lexical and prosodic devices.

Figure 5. The use of NumApps and other lexical and prosodic devices in Spanish interview according to the magnitude of the quantity and the level of Spanish proficiency.



From Figure 5, we can see patterns that suggest that, as Spanish proficiency increased, the production of NumApps increased as well with both quantity magnitudes. The Int L2 learners produced the fewest amount of NumApps. In contrast, the Adv L2 learners exhibited an increased use of NumApps approaching the NS, who exhibited the highest amount of NumApps. With regard to the effect of quantity magnitude in the use of NumApps, Figure 2 shows that there were no marked differences among the Int L2 and the Adv L2 when they discussed small and large quantities. However, the NSs exhibited a significant increase of NumApps with large quantities.

In sum, Figure 5 illustrates the patterns that point to the following correlation for this particular study: An increase in proficiency correlates to a higher production of NumApps. However, the magnitude of the quantity seems to have an effect only on the NSs, who exhibited a significant increase in the use of NumApps with large quantities. That is, the frequency of NumApps produced by the Int L2 and the Adv L2 learners did not change significantly with different quantity magnitudes. This finding suggests that the L2 learner groups are still developing their pragmatic sensitivity towards the constraint of quantity magnitude.

The previous section presented the findings related to the use of NumApps in comparison to other lexical and prosodic devices (i.e., parenthetical verbs, adverbs of doubt, numeric ranges, up-stepping) in the interview responses with small and large uncertain quantities. In order to examine these findings in more detail, the next section focuses exclusively on the lexical items that were employed as NumApps by the participants in the study.

4.1.2. The numeric approximators produced in the Spanish interview.

The following section addresses RQ 1b, which inquired about the differences in the range and frequency of NumApps produced. With that in mind, the following table illustrates the results of a chi-square test that examined the NumApps produced according to the participants' level of Spanish proficiency and the magnitude of the quantity.

Table 5. The distribution of numeric approximators in Spanish interview according to the magnitude of the quantity and the level of Spanish proficiency (*n*=860).

		NumApps produced in the Spanish interview answers								
Magnitude	Proficiency	*Como*	*Más o menos*	*Cerca de*	*Unos*	*Casi*	*Alrede-dor de*	*Aprox.*	Other devi-ces	Total
Small	Int L2	7.6% (11)	4.8% (7)	13.8% (20)	0% (0)	2.1% (3)	0% (0)	0% (0)	71.7% (104)	100% (145)
	Adv L2	39.9% (57)	3.5% (5)	3.5% (5)	2.1% (3)	4.2% (6)	4.2% (6)	0.7% (1)	42.0% (60)	100% (143)
	NSs	66% (95)	5.6% (8)	0% (0)	5.6% (8)	0% (0)	3.5% (5)	0.% (0)	19.4% (28)	100% (144)
	Total	38.7% (167)	4.6% (20)	4.9% (21)	2.5 (11)	2.1% (9)	2.5% (11)	0.2% (1)	44.4% (192)	100% (432)
Large	Int L2	6.3% (9)	7.0% (10)	10.6% (15)	0% (0)	4.9 (7)	0% (0)	0.7% (1)	70.4% (100)	100% (142)
	Adv L2	36.6% (52)	9.2% (13)	2.8% (4)	2.8% (4)	5.0% (7)	4.2% (6)	0.7% (1)	38.7% (55)	100% (142)
	NSs	77.1% (111)	2.1% (3)	0% (0)	12.5% (18)	1.4% (2)	4.1% (6)	0.7% (1)	2.1% (3)	100% (144)
	Total	41.6% (178)	6.1% (26)	3.0% (13)	5.1% (22)	3.7 (16)	2.3% (10)	0.7% (3)	37.4% (160)	100% (428)

(p=. 000)

The data in Table 5 show a statistically significant relationship between the magnitude of a quantity, the level of Spanish proficiency, and the distribution of NumApps produced ($X^2(37)= 327$, $p= .000$). We also find in Table 5 a wide range of NumApps produced by the speakers in the study. Among the most frequent lexical items, we find the defective NumApps (i.e., approximators that signal values that are below the exemplar number), such as *cerca de* 'close to' and *casi* 'almost', as well as neutral NumApps (i.e., approximators that signal values that are both below and above the exemplar number), such as *como* 'like', *más o menos* 'more or less', and *unos* 'some'. The neutral NumApps *alrededor de* 'around' and *aproximadamente* 'approximately' were not produced frequently. Interestingly, excessive NumApps (e.g., *y pico* '-ish', *y*

tantos ‘or so’) were not produced by the speakers of this study. Excessive NumApps are the lexical items that signal values that are only above the exemplar number.

Overall, *como* was produced with the highest frequency in the context of both small and large quantities (38.7% and 41.6%, respectively). However, from Table 5 we also gather that there were marked differences in the frequency in which the NumApps were produced according to the level of Spanish proficiency and the magnitude of the quantity. For example, when we examine the NumApps employed with small quantities, we gather that the Int L2 favored the use of *cerca de,* followed by *como,* and *más o menos* (13.8%, 7.6%, and 4.8%, respectively). However, the Adv L2 favored *como,* followed by *casi*, and *alrededor de* (39.9%, 4.2%, and 4.2%, respectively). Similarly, the NSs favored *como* (66%); however, the second and third most frequent forms were *más o menos* and *unos* (5.6% in both cases).

Regarding the large quantities, the Int L2 favored *cerca de* (10.6%), followed by *más o menos* (7.0%) and *como* (6.3%). The Adv L2 favored *como*, *más o menos*, and *casi* (36.6%, 9.2%, and 5.0%, respectively). The NSs also favored *como* (77.1%), but the second most frequently used NumApps for this group were *unos* and *alrededor de* (12.5% and 4.1%).

With regard to the instances in which NumApps were not produced, the data show that the Int L2 and the Adv L2 relied on other lexical and prosodic devices (i.e., parenthetical verbs, adverbs of doubt, and numeric ranges, and up-stepping). I will discuss and exemplify this tendency in further detail in the qualitative analysis (Chapter 5).

In sum, RQ1b addressed the frequency and range of NumApps produced by participants. The findings revealed that *como* was the most frequently expressed NumApp with large and small quantities. However, while the Adv L2 and the NSs favored the use of this lexical item with both quantity magnitudes, the most frequent NumApp among the Int L2 was *cerca de.* Interestingly, *cerca de* was not common among the Adv L2 learners, and it was absent in the oral production of the NSs.

In order to provide a more comprehensive analysis of the production patterns that emerged from the Spanish interview, the section that follows examines the use of single vs. multiple devices (i.e., single devices, clusters, and co-occurrences of devices) employed to convey numeric uncertainty by the participants of the study.

4.1.3 The use of single and multiple devices during the Spanish interview.

This section further explores the differences in the expression of single and multiple devices during the Spanish interview. In particular, it discusses the patterns across groups and quantity magnitudes by addressing RQ 1c, which focuses on whether there were changes in the number of devices (i.e., single vs. multiple) based on the level of Spanish proficiency and the magnitude of the quantity.

The data presented in Table 6 show the use of single devices, such as a single NumApp or another device (i.e., single parenthetical verb, adverb of doubt, up-stepping, or numeric ranges), as well as the use of multiple devices, such as a cluster of NumApps, or the co-occurrence of a NumApp with another lexical or prosodic device. A chi-square test was conducted with the purpose of determining whether there was a statistically significant relationship between the number of devices, the magnitude of the quantity, and the participants' Spanish proficiency level.

Table 6. The distribution of single and multiple devices in Spanish interview according to the magnitude of the quantity and the level of Spanish proficiency (*n*= 860).

Magnitude	Proficiency	Single and multiple devices in the interview responses					Total
		A single NumApp	A single other device	A cluster of two or more NumApps	Co-occurrence of a NumApp and another device	A cluster of two or more other devices	
Small	Int L2	24.1% (35)	66.2% (96)	0% (0)	3.4% (5)	6.2% (9)	100% (145)
	Adv L2	40.6% (58)	41.3% (59)	3.5% (5)	11.9% (17)	2.8% (4)	100% (143)
	NSs	61.8% (89)	20.1% (29)	13.2% (19)	4.9% (7)	0% (0)	100% (144)
	Total	42.1% (182)	42.6% (184)	5.6% (24)	6.7% (29)	6.7% (29)	100% (432)
Large	Int L2	7.7% (11)	21.8% (31)	0% (0)	32.4% (46)	38.0% (54)	100% (142)
	Adv L2	14.7% (21)	10.1% (15)	2.8% (4)	47.2% (67)	24.7% (35)	100% (142)
	NSs	11.1% (16)	1.4% (2)	72.2% (104)	13.1% (21)	0.57 (1)	100% (144)
	Total	11.2% (48)	14.8% (63)	25.2% (108)	27.8% (119)	21.0% (90)	100% (428)

(p=.000)

As shown in Table 6, the chi-square test revealed that there was a statistically significant relationship between the magnitude of the quantity, the level of Spanish proficiency, and the number of devices employed ($X^2(32)= 758.2$, $p= .000$). Table 6 shows the distribution of numeric approximations expressed with single devices such as:

- A single NumApp (e.g., *como $40*) or
- a single device other than a NumApp (e.g., *pienso que $90*).

Table 6 also shows the use of multiple devices, which involved:

- A cluster of NumApps (e.g., *como unos $1,000*),

- co-occurrence of a NumApp and another lexical or prosodic device (e.g., *como $4,000, creo*) and,
- a cluster of two or more lexical or prosodic devices other than NumApps (e.g., *creo que $2,000, posiblemente).*

In Table 6, we find several patterns in the expression of numeric approximation. With regard to the small quantities, the Int L2 learners favored the use of a single lexical or prosodic device other than a NumApp (66.2%). The Adv L2 also showed a tendency to prefer single devices. However, this latter group produced a single NumApp and a single other lexical and prosodic device with similar frequencies (41.3% and 40.6%, respectively). In contrast, the NSs exhibited a strong preference for using a single NumApp (61.8%).

When the speakers in the study discussed large quantities, the Int L2 relied on the use of clusters of lexical and pragmatic deceives other than NumApps (38%) and on the co-occurrence of a NumApp with another lexical and prosodic device (32.4%). The Adv L2 favored the use of a NumApp combined with another lexical and prosodic device (47.2%), followed by a cluster of lexical and prosodic devices other than NumApps (24.7%). In contrast, the NSs exhibited a marked tendency to prefer clusters of NumApps (72.2%) when their responses involved large quantities. Interestingly, clusters of NumApps, which were favored by the NSs, were produced by the Adv L2 only in few instances (2.8%) and they were absent in the production of the Int L2.

In sum, the data in Table 6 suggest that increased proficiency in Spanish correlates to an increased number of devices employed to express numeric uncertainty with regard to large quantities. However, the NSs were the only group that relied on

clusters of NumApp when they discussed large quantities. The findings suggest that, while the two L2 learner groups have acquired the ability to use multiple devices to convey uncertainty in relation to small quantities, they have not yet acquired the ability to employ NumApp clusters with large quantities.

In sum, the Spanish interview set out to generate spontaneous oral production data to respond to RQs 1a, 1b, and 1c, which addressed the use of NumApps and other devices, the NumApps employed, and the use of single vs. multiple devices, respectively. The analysis of the data obtained from the Spanish interview addressed the effect of the magnitude of the quantity and the level of Spanish proficiency in the expression of uncertain quantities.

The response to RQ 1a, which probed if there were differences in the use of NumApps as opposed to other devices, is affirmative, and the hypothesis was confirmed. The most relevant findings can be summarized as the following:

- A higher level of proficiency in Spanish correlated to a more frequent production of NumApps.
- Only the NSs were found to increase their production of NumApps with large quantities.
- The Int L2 and Adv L2 did not seem to have developed pragmatic sensitivity with regard to changes in the magnitude of the quantity.

Next, concerning RQ 1b, which addressed whether there were differences in the frequency and range of NumApps employed, the answer is also positive, and the hypothesis was also confirmed. There were significant differences, which are addressed as follows:

- Each group exhibited unique preference patterns regarding the use of NumApps.
- A progression in the expression of NumApps was found, suggesting that a higher level of Spanish proficiency generates more frequent use of the NumApp *como*.

The next RQ, 1c, which focused on the use of single and multiple devices to express numeric uncertainty, was positive and the hypothesis was confirmed. The findings revealed that there were both similarities and differences across proficiency groups.

- The three participant groups favored the use of a single device when discussing small quantities.
- The Adv L2 and the NSs exhibited more frequent use of multiple devices with large quantities than the Int L2.
- Only the NSs, the baseline comparison group, relied on clusters of NumApps to express numeric uncertainty with large quantities.

Having presented the analysis of the data generated by the Spanish interview, in the next section, I proceed to the analysis of the prompted production task. This task was the second oral production protocol administered in the study.

4.2 Quantitative results gathered from protocol two: The prompted production task

The prompted production task addressed RQs 1a, 1b, and 1c, which focused on the effect of the level of Spanish proficiency (i.e., Int L2, Adv L2, and NSs) and the magnitude of the quantity (i.e., small and large) regarding the following variables:

- The use of NumApps vs. other lexical and prosodic devices,

- the lexical items produced as NumApps and,
- the use of single and multiple devices to express numeric uncertainty.

Recall that the prompted oral production task provided the participants with a controlled linguistic context in order to create a felicitous condition for the production of the NumApps. In this protocol, the participants had to listen to the questions (e.g., *¿Cuánto cuesta un permiso de estacionamiento?* 'How much does a parking permit cost?') and were asked to supply oral responses containing lexical items that conveyed uncertainty or doubt (e.g., *Un permiso de estacionamiento cuesta* _____*$40 dólares.* 'A parking permit costs _____ $40 dollars.) (see Appendix B).

4.2.1 The use of numeric approximators and other devices in the prompted production task.

This section begins with descriptive information obtained from a chi-square test. The chi-square test was conducted in order to determine the relationship between the magnitude of the quantity (i.e., small and large) and the level of Spanish proficiency (i.e., Int L2, Adv L2, and NSs) with regard to the use of:

- NumApps (e.g., *como, más o menos, alrededor de*) and
- other lexical and prosodic devices (e.g., parenthetical verbs, adverbs of doubt),

Table 7 presents the instances in which NumApps were produced in the prompted production task in comparison to other devices.

Table 7. The distribution of numeric approximators and other lexical and prosodic devices in prompted production task according to the magnitude of the quantity and the level of Spanish proficiency (*n*= 900).

		Devices produced in the prompted production task		
Magnitude	Proficiency	NumApps	Other lexical and prosodic devices	Total
Small	Int L2	72% (108)	28% (42)	100% (150)
	Adv L2	80.1% (121)	19.3% (29)	100% (150)
	NSs	90% (135)	10% (15)	100% (150)
	Total	80.9% (364)	19.1% (86)	100% (450)
Large	Int L2	71.3% (107)	28.7% (43)	100% (150)
	Adv L2	82.7% (124)	17.3% (26)	100% (150)
	NSs	91.3% (137)	8.67% (13)	100% (150)
	Total	81.8% (368)	18.2% (82)	100% (450)

(p= .000)

The chi-square test revealed a statistically significant relationship between the use of NumApps vs. other lexical and prosodic devices, the magnitude of the quantity, and the level of Spanish proficiency ($X^2(7)= 36.01$, $p< .000$). As noted in Table 7, although the three groups favored the use of NumApps over other lexical and prosodic devices, this table illustrates a progression in relation to proficiency. That is, the expression of NumApps was found to increase in tandem with proficiency.

When we examine the distribution of responses supplied by each group according to the magnitude of the quantity, we note the following tendencies: With small quantities, the Int L2 produced the lowest frequency of NumApps (72%), followed by the Adv L2

(80.1%), and the NSs (90%). With regard to large quantities, we find a similar pattern: The Int L2 produced NumApps with a lower frequency (71.3%) than the Adv L2 (82.7%) and the NSs (91.3%).

To summarize, the prompted production task elicited a controlled expression of numeric uncertainty. This protocol responded to RQ 1a, which inquired about the differences in the use of NumApps as opposed to other lexical and prosodic devices. The data suggest that, regardless of the magnitude of the quantity, the level of Spanish proficiency seems to condition the use of NumApps. In other words, the higher the level of proficiency, the higher the number of NumApps produced in the prompted production task.

The chi-square test provided valuable information to determine whether there were statistically significant differences regarding the use of NumApps among the three participant groups and the magnitude of the quantities. With the purpose of further responding RQ 1a, and to identify the statistical significance of every variable, a logistic regression was run using a generalized mixed-effects model (GLMM).

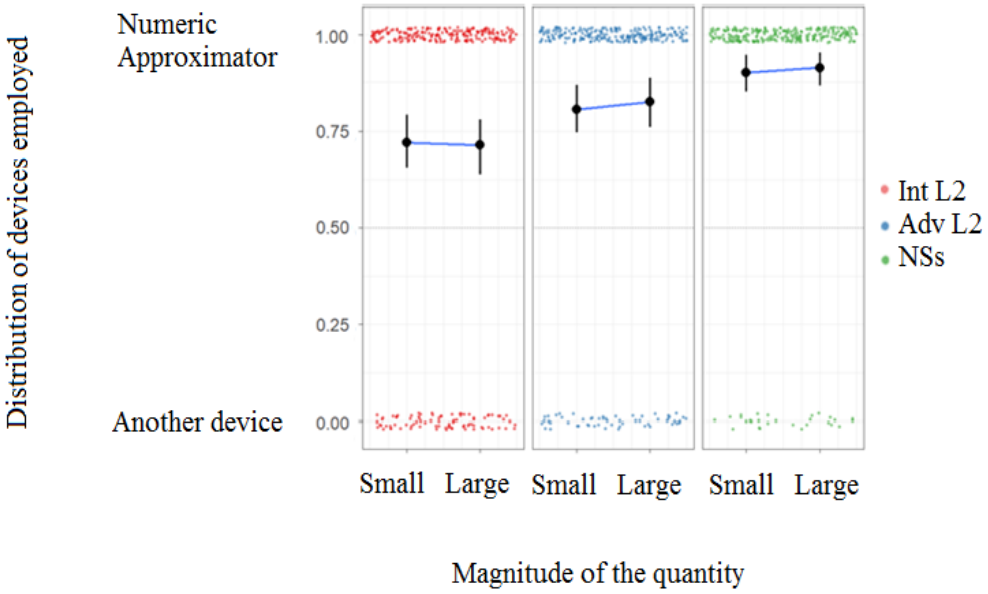
The GLMM compared the use of NumApps in the prompted production task responses as a function of quantity magnitude (i.e., small or large) and Spanish proficiency level (i.e., Int L2, Adv L2, and NSs). The GLMM used the instances in which NumApps were produced and the responses related to small quantities as reference categories, and *participant* and *item* were entered in the model as random effects. The model revealed a significant effect only for the comparison between the NSs and the Int L2 (β= 1.53, *SE*= .58, *z*= 2.64, *p*= .008). In other words, and by observing the estimate (β), we find that for every time the Int L2 produced a NumApp, the odds of the NSs

producing a NumApp increased by a factor of 1.53. That is, the NSs were 1.53 times more likely to use NumApps than the Int L2. No effects were found neither for the NSs compared to the Adv L2 (β= 0.90, *SE*= .59, *z*= 1.51, *p*= .131) nor for the Adv L2 compared to the Int L2 (β= 0.90, *SE*= .60, *z*= 1.50, *p*= .111). Said differently, the Adv L2 speakers resembled the NSs and the Int L2.. Also, no effect was found for magnitude (β= -.18, *SE*= .42, *z*= -.43, *p*=.671). In addition, there were no intercepts for proficiency and magnitude. Furthermore, there were no random intercept effects for *participant* or for *item*, which suggests that the data were an accurate representation of each proficiency group.

In conclusion, the GLMM responded to RQ 1a, which investigated the differences in the use of NumApps and other lexical and prosodic devices in the prompted production task according to the level of Spanish proficiency and the magnitude of the quantity. The GLMM revealed that the participants' level of Spanish proficiency only had a significant effect when comparing the NSs with the lowest proficiency (i.e., Int L2). The level of Spanish proficiency was not found significant when the NSs were compared to the Adv L2 learners or when the two L2 learner groups were compared with each other (i.e., Adv L2 vs. Int L2). Also, the magnitude of the quantity was not a significant predictor for the use of NumApps in this particular protocol.

The following figure illustrates the distribution of responses in the prompted production task in which NumApps were produced as opposed to other lexical and prosodic devices according to the magnitude of the quantity and the level of Spanish proficiency.

Figure 6. The use of NumApps and other lexical and prosodic devices in prompted production task according to the magnitude of the quantity and the level of Spanish proficiency.



From figure 6, we gather that the use of NumApps increased among the participants with higher proficiency in Spanish, suggesting that proficiency was a significant predictor in the use of these lexical items. However, the results from the GLMM showed that only the comparison between the Int L2 with the NSs was statistically significant. In other words, the Adv L2 resembled the NSs with regard to the frequency of NumApps they supplied.

Also, Figure 6 illustrates that there were no marked differences with regard to the effect of quantity magnitude. At this juncture, it is possible to suggest that the comparison between small and large quantities was not significant due to a task effect. Recall that the prompted production task used a controlled and experimental setting in which the participants did not convey an uncertainty that was authentic or that reflected their own experience. This setting, therefore, may have conditioned the responses.

In order to examine the use of NumApps in more detail, the next section will present the frequency and range of NumApps that were employed by the speakers in this study.

4.2.2 The numeric approximators produced in the prompted production task.

This section provides a detailed depiction of the NumApps produced by the Int L2, Adv L2, and NSs, in order to respond to RQ 1b, which inquired about the differences in the lexical items that were produced by the participants of the study. A chi-square test was conducted in order to examine the relationship between the NumApps produced (e.g., *como, más o menos, alrededor de*), the magnitude of the quantity (i.e., small and large), and the level of Spanish proficiency (i.e., Int L2, Adv L2, and NSs).

Table 8. The distribution of numeric approximators in prompted production task according to the magnitude of the quantity and the level of Spanish proficiency (*n*= 900).

	NumApps produced in the prompted production task	Total

Magnitude	Proficiency	*Como*	*Más o menos*	*Cerca de*	*Aprox.*	*Casi*	*Alre-dedor de*	*Unos*	*Sobre*	Other devi-ces	
Small	Int L2	7.3% (11)	17.3% (26)	20.7% (31)	11.3% (17)	10% (15)	3.3% (5)	1% (2)	.07% (1)	28% (42)	100% (150)
	Adv L2	8.7% (13)	20.7% (31)	14.7% (22)	14% (21)	5.3% (8)	9.3% (14)	6% (9)	2% (3)	19.3% (29)	100% (150)
	NSs	42% (63)	17.3% (26)	0% (0)	12% (18)	4.7% (7)	10% (15)	4% (6)	0% (0)	10% (15)	100% (150)
	Total	19.3% (87)	18.4% (83)	11.6% (52)	12.7% (57)	6.7% (30)	7.6% (34)	3.4% (15)	.9% (4)	19.1% (86)	100% (450)
Large	Int L2	4.7% 7(7)	18% (27)	22% (33)	9.3% (14)	14% (21)	2.7% (4)	0% (0)	7% (1)	28.7% (43)	100% (150)
	Adv L2	4% (6)	23% (35)	18.7% (28)	10% (15)	6% (9)	10.7% (16)	6.7% (10)	3% (5)	17.3% (26)	100% (150)
	NSs	36% (57)	23% (35)	0% (0)	16% (24)	2% (3)	10.7% (16)	2.7% (4)	0% (0)	8.67% (13)	100% (150)
	Total	14.9% (67)	22.9% (103)	12.2% (55)	11.8% (53)	7.3% (33)	8% (36)	3.1% (14)	1.3% (6)	18.2% (82)	100% (450)

($p < .000$)

The chi-square test revealed significant differences in the distribution of the lexical items across groups and across quantity magnitudes ($X^2(42) = 286.17$, $p < .000$). Table 8 illustrates such differences and presents the lexical items that were produced by the participants in the study. From Table 8, we gather that the participants produced a wide range of NumApps, such as *como* 'like', *más o menos* 'more or less', *cerca de* 'close to', *aproximadamente* 'approximately', *casi* 'almost', *alrededor de* 'around', *unos* 'some', and *sobre* 'around'.

If we examine the NumApps supplied in the prompted production task involving small quantities, we note that the Int L2 learners favored the use of *cerca de* (20.7%) followed by *más o menos* (17.3%). The Adv L2 exhibited slightly similar production patterns, but they produced *más o menos* with the highest frequency (20.7%) followed by *cerca de* (14.7%). The NSs produced *como* (42%) with the highest frequency, and *más o menos* was the second most frequent NumApp produced by this group (17.3%).

When we examine the NumApps supplied with large quantities, we find a similar distribution to the one we observed in small quantities. The Int L2 favored *cerca de* (22%) and *más o menos* (18%). The Adv L2 favored *más o menos* (23%) and *cerca de* (18.7%). The NSs supplied *como* (36%) with the highest frequency, followed by *más o menos* (23%).

With regard to the instances in which NumApps were not produced, the data show that the Int L2 and the Adv L2 relied on other lexical and prosodic devices, such as parenthetical verbs, adverbs of doubt, numeric ranges, and up-stepping. These data will be discussed in more detail in the qualitative analysis (Chapter 5).

In sum, the data in Table 8 respond to the RQ 1b, which attended to the different NumApps that the participants produced according to the magnitude of the quantity and the participants' level of Spanish proficiency in the prompted production task. The data revealed that, with both small and large quantities, the Int L2 and the Adv L2 resembled each other in that they both favored *más o menos* and *cerca de*. However, the NSs supplied *como* and *más o menos* in high frequencies. The findings suggest that, in the prompted production task, the two L2 learner groups did not exhibit similar tendencies when compared to the NSs with regard to the lexical choices.

Having discussed the distribution of NumApps produced in the prompted production task, the following section presents the use of single and multiple devices employed to discuss uncertain quantities.

4.2.3 The use of single and multiple devices in the prompted production task.

This section delves into the use of single and multiple devices to discuss uncertain quantities, with the purpose of addressing the RQ 1c. This RQ examines whether the

number of devices (i.e., a single NumApp, a single other device, a cluster of NumApps, co-occurrence of a NumApp with another device, and a cluster of devices other than NumApps) varied according to the magnitude of the quantity (i.e., small and large) and the level of Spanish proficiency (i.e., Int L2, Adv L2, and NSs). A chi-square test was conducted to determine whether there was a significant relationship between the number of devices employed based on the magnitude of the quantity and the level of proficiency.

Table 9. The distribution of single and multiple devices in prompted production task according to the magnitude of the quantity and the level of Spanish proficiency (*n*= 900).

		Single and multiple devices produced in the prompted production task					
Magnitude	Proficiency	A single NumApp	A single other device	A cluster of two or more NumApps	Co-occurrence of a NumApp and another device	A cluster of two or more other devices	Total
Small	Int L2	66% (99)	28% (42)	0% (0)	4.7% (7)	1.3% (2)	100% (150)
	Adv L2	77.3% (116)	18% (27)	0.7% (1)	2.7% (4)	1.3% (2)	100% (150)
	NSs	82.7% (124)	8.7% (13)	4% (6)	4% (6)	0.7% (1)	100% (150)
	Total	75.3% (339)	18.2% (82)	1.6% (7)	3.8% (17)	1.1% (5)	100% (450)
Large	Int L2	67.3% (101)	24% (36)	1.3% (2)	3.3% (5)	4% (6)	100% (150)
	Adv L2	75.3% (113)	12.7% (19)	3.3% (5)	4.7% (7)	4% (6)	100% (150)
	NSs	57.3% (86)	8% (12)	25.3% (38)	8.7% (13)	0.7% (1)	100% (150)
	Total	66.7% (300)	14.9% (67)	10% (45)	5.6% (25)	2.9% (13)	100% (450)

($p < .000$)

A chi-square test revealed a statistically significant relationship in the distribution of single vs. multiple devices according to the participants' level of Spanish proficiency

and the magnitude of the quantity ($X^2(22) = 178.3$, $p < .000$). The table shows the distribution of numeric approximations expressed with single devices such as:

- A single NumApp (e.g., *como $40*) and
- a single other device (e.g., *pienso que $90*).

Table 9 also shows the use of multiple devices, which involved:

- Clusters of NumApps (e.g., *como unos $1,000*),
- co-occurrences of a NumApp and another device (e.g., *creo que como $7,000)* and,
- clusters of devices other than NumApps (e.g., *creo que probablemente* $*6,000*).

As noted in Table 9, in the prompted production task, the three participant groups exhibited an overall preference for supplying a single NumApp regardless of the magnitude of the quantity. For instance, if we examine the responses that involved a small quantity, we find that the three participant groups favored the use of a single NumApp: Int L2 (66%), Adv L2 (77.3), and NSs (82.7%). The second most frequent form of numeric approximation among the Int L2, Adv L2, and NSs was the use of a single device other than a NumApp (28%, 18%, and 8.7%, respectively). Recall that *a single other device* refers to the use of a parenthetical verb, an adverb of doubt, a numeric range, or up-stepping.

Interestingly, even though the large quantities were also expressed with a single NumApp by the Int L2 (67.3%), Adv L2 (75.3%), and NSs (57.3%), we find that the second most frequent approximation among the Int L2 and the Adv L2 was the use of a

device other than a NumApp (24% and 12.7%, respectively). In contrast, the NSs exhibited a favoring to supply clusters of NumApps (25.3%).

In sum, the prompted production task set out to obtain controlled oral production data to respond to RQs 1a, 1b, and 1c, which focused on the use of NumApps vs. other devices, the NumApps employed, and the use of single vs. multiple devices, respectively. The data generated by the prompted production task was used to examine the effect that the level of Spanish proficiency and the magnitude of the quantity had in the expression of numeric uncertainty in Spanish.

First, the answer to RQ 1a, which focused on whether there were differences in the production of NumApps as opposed to other lexical and prosodic devices, is negative and the hypothesis was not confirmed. The differences across groups and magnitudes were not highly marked. The most relevant findings suggested that:

- The magnitude of the quantity was not a significant predictor for the use of NumApps.
- There was no interaction between the level of Spanish proficiency and the magnitude of the quantity.
- There was an increase in the production of NumApps that correlated to increased Spanish proficiency only when comparing the Int L2 with the NSs.

Next, the answer to RQ 1b, which addressed if there were differences in the use of NumApps, is positive. The hypothesis is thus confirmed. The most significant differences were the following:

- The Int L2 and Adv L2 resembled each other in that they favored the use of the NumApps *cerca de* and *más o menos* with both small and large quantities.

- The NSs favored the NumApp *como* regardless of the magnitude of the quantity.

Finally, regarding RQ 1c, which investigated whether there were differences in the use of single vs. multiple devices was not affirmative and the hypothesis was not confirmed. The results uncovered significant similarities across groups and one minor difference. The findings are summarized here:

- The Int L2, Adv L2, and NSs resembled each other in the expression of small uncertain quantities. They favored the use of a single NumApp (e.g., *como, cerca de*).
- The Int L2, Adv L2, and NSs also resembled each other by using a single NumApp with large quantities (e.g., *como, cerca de*).
- The NSs were the only participants that produced clusters of NumApps (e.g., *como unos*) with high frequency, but they were not significantly different from the L2 groups.

Overall, the findings suggest that, in the prompted production task, the magnitude of the quantity did not play a significant role in determining whether the participants provided single or multiple devices to respond to the task questions. This finding can be attributed to an effect of the task since, as mentioned previously, the task constrained the participants to supply vague lexical items without experiencing an authentic uncertainty. I will further address this limitation in the discussion chapter (Chapter 6).

This section concluded the analysis of the data generated by the two oral production tasks (i.e., Spanish interview and prompted production task). The next section

in this chapter presents the results of the forced-choice task, which was used to examine the participants' choice of NumApps to express numeric uncertainty in Spanish.

4.3 Quantitative results gathered from protocol three: The forced-choice task

The forced-choice task was employed to address the RQ 3, which inquired whether the magnitude of a quantity influenced the preference for NumApps in a context involving uncertain quantities. Recall that, in the forced-choice task, the participants listened to questions about quantities and they were given two options (i.e., two NumApps) from which they had to select the most appropriate for each quantity. The participants were asked to decide whether they preferred to express small and large quantities with a NumApp that set a specific limit, such as the defective *casi* 'almost' and the excessive *y pico* '-ish' or a NumApp that does not set any specific boundaries, such as the neutral *como*. Recall that the term *defective* is being used in this study to refer to NumApps that signal values that are below the exemplar number; the term *excessive* refers to NumApps that signal values above the exemplar number; and *neutral* NumApps do not signal values that are both below and above the exemplar number.

Previously, in the Literature Review chapter, I explained that the number of significant figures in a quantity (i.e., quantity magnitude) affects the range of possible interpretations for a quantity. For instance, small quantities tend to generate an interval of possible interpretation that is more precise. Therefore, defective and excessive NumApps are expected to be preferred to approximate small quantities. The reason for this preference can be attributed to the fact that defective and excessive NumApps convey specific inferences since they signal values that are either lower or higher in relation to the exemplar number. For instance, *casi 40* 'almost 40' is usually interpreted as a

quantity that is lower but close to 40, and *40 y pico* '40-ish' signals a value that is above but close to the exemplar number. In other words, the interpretations of approximations containing these lexical items tend to be more specific than those using neutral NumApps.

In contrast, when speakers discuss large quantities that are uncertain, they seem to have a wider range of possible interpretations. Therefore, neutral NumApps are expected to be favored since these lexical items do not establish a specific limit, as opposed to defective and excessive NumApps. For instance, *como $4,000* 'like $4,000' can be interpreted as referring to a quantity that is in the vicinity of '$4,000' and this quantity can be either lower or higher than '$4,000'. That is, the interpretation that is generated by *como* is less restricted than the interpretation generated by NumApps such as *casi* and *y pico*.

The effect of the magnitude of the quantity (i.e., small and large) and level of Spanish proficiency (i.e., Int L2, Adv L2, and NSs) was examined with regard to whether the participants in the study preferred *casi* or *y pico* with small quantities and *como* with large quantities. The variable *preference for NumApps* was used to evaluate whether the participants provided *expected* or *non-expected* preferences. *Expected preference* refers to instances in which the participants preferred either *casi* or *y pico* with small quantities and preferred *como* with large quantities. In contrast, *non-expected* preferences entail that the participants preferred *como* with small quantities and either *casi* or *y pico* with large quantities.

An initial statistical analysis using a chi-square test generated data about the distribution of preferences for small and large approximated quantities among the three

participant groups. Table 10 shows that there was a statistically significant relationship between the level of Spanish proficiency (i.e., Int L2, Adv L2, and NSs), the magnitude of the quantity (i.e., small and large), and the preference for NumApps (i.e., expected and non-expected responses).

Table 10. The preference for numeric approximators in forced-choice task according to the magnitude of the quantity and the level of Spanish proficiency (*n*=1,800).

		Preference for NumApps in the forced-choice task		
Magnitude	Proficiency	Expected	Non-expected	Total
Small	Int L2	63.3% (199)	33.7% (101)	100% (300)
	Adv L2	69.7% (209)	30.3% (91)	100% (300)
	NSs	84.7% (254)	15.3% (46)	100% (300)
	Total	73.6% (662)	26.4% (238)	100% (900)
Large	Int L2	41.7% (125)	58.3% (175)	100% (300)
	Adv L2	46.7% (140)	53.3% (150)	100% (300)
	NSs	78% (234)	22% (66)	100% (300)
	Total	55.4% (499)	44.6% (401)	100% (900)

($p < .000$)

The chi-square test revealed significant differences in the preference for NumApps according to the magnitude of the quantity and the participant's level of Spanish proficiency ($X^2(7) = 184.25$, $p < .000$). Table 10 shows that the frequency of expected preference (i.e., the preference for *casi* or *y pico* with small quantities and the

preference for *como* with large quantities) increased when the level of Spanish proficiency increased.

When we examine the interpretation of small quantities, we find the following progression: The Int L2 provided an expected preference (i.e., selecting *casi* or *y pico* which are the NumApps that set specific limits) in 63.3% of their responses. The Adv L2 provided an expected preference (i.e., a preference for *casi* or *y pico*) more frequently than the Int L2 (69.7%). The NSs supplied the highest frequency of expected preferences (84.7%).

With regard to large quantities, we also find an increase in the frequency of expected preference that correlates to the level of Spanish proficiency. For instance, the Int L2 preferred *como* with the least frequency among the three participant groups (41.7%), followed by the Adv L2 (46.7%), and the NSs (78%). As we noted, based on the frequencies reported, the NSs provided significantly more expected preferences with large quantities than the two L2 groups. This finding is suggestive of a challenge that is posed to both Int L2 and Adv L2 when they need to interpret uncertain quantities and select a NumApp that is appropriate based on the magnitude of the quantity.

We also note that, with regard to the magnitude of the quantity, small quantities yielded more expected interpretations than large quantities (73.6% and 55.4%, respectively). This finding may suggest that there is more variability in the acceptance of NumApps with large quantities than with small quantities. In other words, the participants were less categorical with their preference for a NumApps with large quantities than with small quantities.

In sum, the interpretation of small quantities yielded preference patterns that reflected a favoring of NumApps that do not set specific limits (i.e., *casi* and *y pico*) among the Int L2, Adv L2, and NSs. This finding suggests that the two L2 learner groups behaved closer to the NSs when they were presented with a context that contained small quantities. With regard to the interpretation of large quantities, the Int L2 and Adv L2 were ambivalent in their preference patterns and did not exhibit a strong preference for *como* (i.e., the expected preference). However, the Adv L2 provided expected preferences more frequently than the Int L2. In contrast, the majority of the interpretations for large quantities provided by the NSs included *como* (i.e., the expected NumApp). Based on the data, it is possible to suggest that a higher level of Spanish proficiency results in higher pragmatic sensitivity, which is reflected in the ability to adapt preference patterns based on the magnitude of the quantity.

To further analyze the effect of quantity magnitude and Spanish proficiency level in the forced-choice task, a GLMM was run. The model compared the expected preference for NumApps (i.e., the preference for *casi* or *y pico* with small quantities and *como* with large quantities) as a function of quantity magnitude (i.e., small or large) and Spanish proficiency level (i.e., Int L2, Adv L2, and NSs). The following categories were set as the comparison levels: expected preference and small magnitude.

The model also examined the variable *comparison* (i.e., defective vs. neutral and neutral vs. excessive) to ensure that the preference patterns provided by the participants were generated based on the magnitude of the quantities and not because certain items included a defective NumApp and other items included an excessive NumApp. Also, *participant* and *item* were entered as random factors to ensure that the data were

representative of each proficiency group and not only of a few participants or a few task items.

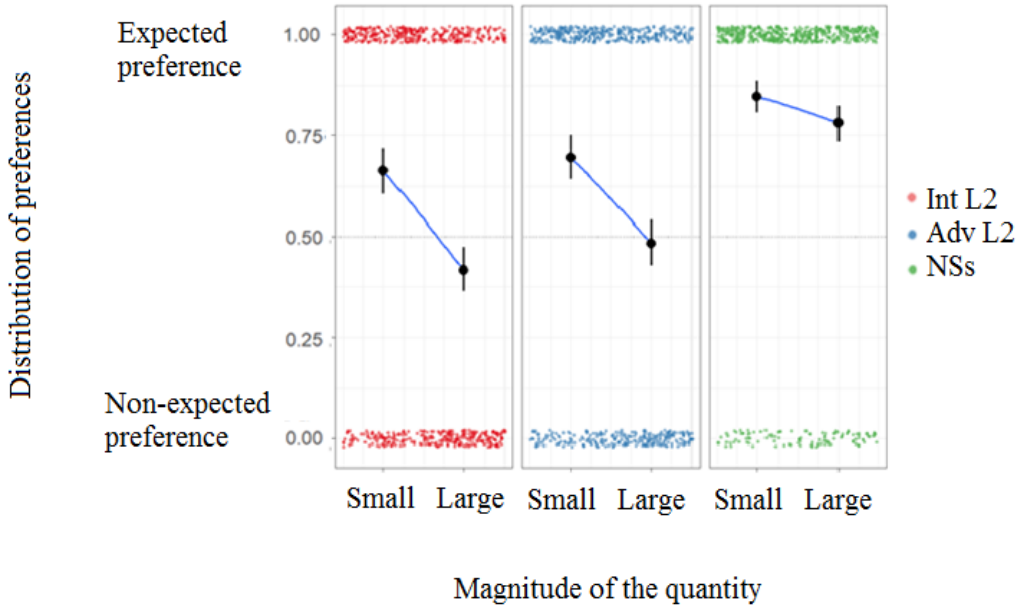
The model revealed a significant effect with regard to the Spanish proficiency level. According to results, the NSs were significantly more likely to provide an expected preference than the Adv L2 learners (β=.91, *SE*= .23, *z*= 3.90, *p*< .000) and the Int L2 learners (β= .1.07, *SE*= .23, *z*= 4.62, *p*< .000). Said differently, the estimate β coefficient indicates that the NSs were .23 more likely to provide an expected preference than the Adv L2, and 1.07 times more likely than the Int L2. Recall that the β is an exponential coefficient, which gives the change in the *log odds* (i.e., likelihood) of the outcome (i.e., dependent variable) for a one unit increase in the predictor variables. The differences between the Adv L2 and the Int L2 were not significant (β=.16, *SE*= .21, *z*= 0.77, *p*= 0.439).

The model also revealed an effect of magnitude (β= .46, *SE*= .23, *z*= 1.96, *p*= .050). That is, the participants in the study were .46 times more likely to provide an expected preference for a NumApp when the quantity was small and not large. In addition, there were interactions between magnitude and proficiency in the comparison between the NSs and the Int L2 group (β= .60, *SE*= .28, *z*= 2.19, *p*= .046) and the NSs and the Adv L2 group (β= .55, *SE*= .28, *z*= 2.00, *p*= .029). Overall, the NSs were .55 times more likely to provide an expected preference than the Adv L2, and the Adv L2 were .60 times more likely to provide an expected preference than the Int L2. No interaction between magnitude and proficiency level was found when comparing the Adv L2 with the Int L2 (β= .12, *SE*=.24, *SE*= .49, *p*= .628).

No effect was found for the variable *comparison* (i.e., defective vs. neutral or neutral vs. excessive) (β= -.15, *SE*= .14, *z*= -1.02, *p*= .308). That is, this finding suggests that the differences in the participants' preference patterns were caused by the effect of the quantity magnitude and Spanish proficiency alone and not by task items per se. In other words, the items that contrasted a defective NumApp with a neutral (i.e., *casi* with *como*) and the items that contrasted a neutral NumApp with an excessive (i.e., *como* with *y pico*) did not yield significantly different preference patterns. Furthermore, there was no random intercept effect for participant or item. Together, the non-significance of the variable *comparison* and the lack of random intercept effects for participant or item provide statistical evidence for the methodological validity of the forced-choice task.

Figure 7 illustrates the difference in the preference patterns provided by the participants according to their level of Spanish proficiency and the magnitude of the approximated quantity. On the horizontal axis, we find the magnitude of the quantity (i.e., small or large), and on the vertical axis, we see the participants' preference based on whether they were expected or non-expected (i.e., the higher the distribution of the plot, the more frequent the *expected preferences* were). Each group is presented in a separate column and with a different color to facilitate the interpretation of the figure.

Figure 7. Expected and non-expected preference for NumApps in forced-choice task according to the magnitude of the quantity and the level of Spanish proficiency.



As noted in Figure 7, the level of Spanish proficiency had an effect on the frequency of expected preferences provided by the participants. Recall that, in the forced-choice task, an expected preference consisted of selecting *casi* or *y pico* with small quantities and *como* with large quantities. Specifically, we can observe that, for both quantity magnitudes, the frequency of expected preferences was significantly higher among the NSs in comparison to the two L2 learner groups. Also, we note that the difference in the frequency of expected preferences between the Int L2 and the Adv L2 was not marked.

Another observation that can be made is that the preference for NumApps with small quantities yielded more expected responses than with large quantities. For instance, the Int L2 and the Adv L2 learners exhibited greater difficulty using their pragmatic knowledge to change their preference for NumApps from more restricted (i.e., *casi* and *y pico*) with small quantities to less restricted (i.e., *como*) with large quantities. The two L2

groups performed above chance (above 50%) when they interpreted small approximations; however, their interpretations or large quantities were below chance (below 50%). In contrast, the NSs speakers' pragmatic awareness regarding the use of NumApps with large quantities allowed them to adapt their preference and to favor *como,* a neutral NumApp.

To summarize the findings from this section, the forced-choice task set out to examine respond to RQ 3, which investigated whether the preference for NumApps varied according to the magnitude of the quantity (i.e., small and large) and according to the participants' level of Spanish proficiency (i.e., Int L2, Adv L2, and NSs). The purpose of this task was to determine whether the participants exhibited pragmatic sensitivity to change their preference for NumApps according to the magnitude of the quantity. More specifically, this task tested if the participants preferred a NumApp that sets specific limits to their interpretation (i.e., the defective *casi* and the excessive *y pico*) with small quantities and a NumApp that does not set a specific boundary (i.e., the neutral *como*) with large quantities.

The answer to RQ 3 is affirmative, and the hypothesis was therefore confirmed. The analysis of the forced-choice task, which examined the preference for NumApps, revealed significant differences across groups and quantity magnitudes:

- The Int L2 and the Adv L2 were not significantly different with regard to their preference for NumApps with small and large quantities.
- The NSs provided significantly more expected preferences than the two L2 groups.

- The magnitude of the quantity significantly affected the frequency of expected preferences. That is, small quantities had a higher frequency of expected responses than large quantities.

The following section provides a summary of the findings from Chapter 4. It presents the quantitative findings generated by the statistical analyses and addresses how the RQs were responded.

4.4 Summary of Chapter 4

The quantitative analysis was set out to uncover tendencies and patterns in the production and interpretation of NumApps in the context of money-related numeric uncertainty. The goal of the quantitative analysis was to determine whether there was an effect of the participants' level of Spanish proficiency (i.e., Int L2, Adv L2, and NSs) and the magnitude of the quantity (i.e., small and large) with regard to the following behaviors:

- The production of NumApps vs. other devices,
- the range of NumApps produced,
- the distribution of single vs. multiple devices and,
- the distribution of preferences for NumApps.

In this summary section, I address how the RQs 1a, 1b, 1c, and 3 were responded based on the results generated by the statistical analyses (i.e., chi-square tests and the GLMMs). I also point to similarities and differences in the behavior of the participants in the study according to their level of Spanish proficiency and the magnitude of the quantity.

First, RQ 1a inquired whether there were differences in the frequency of NumApps as opposed to other lexical and prosodic devices (i.e., parenthetical verb, adverb of doubt, numeric ranges, and up-stepping) produced to express numeric uncertainty in Spanish. The answer to this RQ was affirmative. Additionally, the hypothesis for this RQ, which suggested that the level of L2 proficiency affects the use of NumApps as opposed to other devices to express numeric uncertainty of small and large quantities, was confirmed. There were differences with regard to the frequency in which Int L2, Adv L2, and NSs produced NumApps, which are summarized as the following:

The analysis revealed that there was a progression in which an increased proficiency in Spanish correlated to a more frequent use of NumApps. More specifically, the Adv L2 group was found to resemble the NSs more than the Int L2 since they were significantly more likely to produce NumApps (e.g., *como* 'like', *más o menos* 'more or less') as opposed to other devices (e.g., parenthetical verbs, adverb of doubt, up-stepping).

To further respond to RQ 1a, another statistically significant difference was found with regard to the magnitude of the quantity, but only during spontaneous production (i.e., Spanish interview). The NSs were significantly more likely to produce NumApps with large quantities than the Int L2 and the Adv L2, and there were no marked differences between the two L2 groups. In other words, it is possible to suggest that the two L2 learner groups are still developing pragmatic sensitivity with regard to the magnitude of the quantity. With regard to controlled oral production (i.e., prompted production task), no effect was found for quantity magnitude.

Next, RQ 1b examined the differences in the frequency and range of NumApps produced by the three participant groups in Spanish. The answer to this research question was also positive. Furthermore, the hypothesis (i.e., the level of L2 proficiency affects the use of NumApps employed to express numeric uncertainty with small and large quantities) was also confirmed. The analysis revealed that there was one similarity with regard to the wide range of NumApps produced, but that there were statistically significant differences with regard to how the NumApps were distributed.

One similarity identified among the three participant groups is the wide range of NumApps with that the participants used with small and large quantities (e.g., *más o menos* 'more or less', *cerca de* 'close to', *aproximadamente* 'approximately', *casi* 'almost', *alrededor de* 'around', *unos* 'some').

With regard to the differences in the NumApps that were favored by each group, the analysis revealed that, with both small and large quantities, the Int L2 differed from the Adv L2 and NSs. The Int L2 favored the defective NumApp *cerca de* (e.g., *cerca de $15* 'close to $15'), while the Adv L2 and NSs in that they favored the use of neutral NumApps, such as *como* (e.g., *como* $25). Recall that defective NumApps signal values that are below the exemplar number, while neutral NumApps do not establish a specific limit and can signal values that are either below or above the exemplar number.

Next, RQ 1c addressed the differences in the distribution of single vs. multiple devices (e.g., a single NumApp vs. a cluster of NumApps). The answer to this RQ was affirmative. Also, it was possible to confirm the hypothesis for RQ 1c, which suggested that the level of L2 proficiency affects the number of devices employed to express

numeric uncertainty of small and large quantities. There was one similarity and several differences in the distribution of single and multiple devices.

The similarity that was found across groups involved the use of single devices with small quantities. That is, there was a tendency among the Int L2, Adv L2, and NSs to only rely on single NumApp or a single other device (e.g., a parenthetical verb).

After examining the category of single and multiple devices employed, it was noted that each group exhibited different oral production patterns. For instance, during spontaneous production of small uncertain quantities, the Int L2 favored the use of single devices other than NumApps (e.g., *pienso que $60* '(I) think that $60') while the Adv L2 provided both NumApps (e.g., *más o menos $25* 'more or less $25') and other devices (e.g., *quizá $40* 'perhaps $40') with similar frequencies, and the NSs exhibited a strong reliance on single NumApps (e.g., *como* 'like 50').

With regard to large quantities, the Int L2 favored the use a cluster of other devices (e.g., *pienso que $12,000?* '(I) think that $12,000?'), while the co-occurrence of a NumApp with another device (e.g., *como $5,000, creo* 'like $5,000, (I) believe') was more frequent among the Adv L2. In contrast, the NSs used either a single NumApp (e.g., *como $15,000* 'like $15,000') or a cluster of NumApps (e.g., *como unos* $9,000 'like some $9,000').

The responses provided during controlled oral production did not exhibit marked changes between small and large quantities. The three participant groups relied on the use of single NumApps (e.g., *como $40* 'like $40') regardless of the magnitude of the quantity. In other words, the pragmatic constraint of quantity magnitude had less effect during controlled production than during a spontaneous production since the participants

were asked to supply lexical items and they did not experience authentic uncertainty in the prompted production task.

Finally, RQ 3 investigated differences in the frequency of preferences for NumApps, and the answer to this RQ was positive. Also, the hypothesis (i.e., the level of Spanish proficiency determines how L2 learners interpret small and large uncertain quantities) was confirmed. The results revealed statistically significant differences across groups and quantity magnitudes. Recall that the favoring for NumApps was analyzed based on whether the participants provided expected or non-expected preferences. An *expected* preference refers to the favoring of NumApps that set a specific semantic limit (e.g., *casi* 'almost' and *y pico* '-ish') with small uncertain quantities, and a NumApp that does not set specific limits (e.g., *como* 'like') with large uncertain quantities.

The analysis of the participants' preference patterns revealed that there was a significant effect with respect to the participants' proficiency level when comparing the NSs with the Int L2 and Adv L2. That is, the NSs provided expected preferences with higher frequency than the two L2 learner groups. Also, there was a significant effect of magnitude. More specifically, large quantities generated less frequent expected preferences than small quantities. Furthermore, there was an interaction between the participants' Spanish proficiency and quantity magnitude. That is, the NSs were significantly more likely to provide an expected interpretation than the two L2 groups with both small and large quantities. Since there were no statistically significant differences between the Int L2 and Adv L2, the findings suggest that the two L2 learner groups are not pragmatically sensitive to the changes in the magnitude of the quantities.

Chapter 5

Qualitative Results

This chapter presents the qualitative analyses of the data gathered from the Spanish oral interview, the prompted production task, and the English oral interview. The qualitative analysis sought to provide a robust and homogeneous description of the devices employed to express numeric uncertainty in Spanish and English. In general, the qualitative analysis of the Spanish interview (see Appendix A) and the prompted production task (see Appendix B) generated results that substantiated the quantitative findings presented in Chapter 4 with regard to the expression of numeric uncertainty. In contrast, the English interview (see Appendix D) elicited the expression of numeric uncertainty in the Spanish learners' L1, with the purpose of uncovering whether the linguistic and pragmatic behavior in Spanish was influenced by their knowledge of English.

Recall that the study was guided by the following questions:

1. Does the magnitude of a quantity (i.e., number of significant figures) have an effect on the production of NumApps among intermediate L2, advanced L2, and native speakers of Spanish (i.e., according to proficiency), and to what extent do L2 learners resemble native Spanish speakers in their production of NumApps?

    1a. Are there differences in the frequency in which NumApps are produced in comparison to other lexical and prosodic devices?

    1b. Are there differences in the range (i.e., variety) and frequency of NumApps produced?

    1c. Does the expression of numeric uncertainty vary in terms of the number of

lexical or prosodic devices produced (e.g., a single device vs. multiple devices)?

1d. Can we provide an in-depth depiction of the most representative devices employed by the L2 learners to express numeric uncertainty in Spanish?

2. Do intermediate and advanced learners experience cross-linguistic influence from English to Spanish when they express numeric uncertainty?
3. Does the interpretation of NumApps vary according to the magnitude of the quantity among the three groups, and to what extent do the L2 Spanish learners resemble the native Spanish speakers?

Chapter 5 responds to RQs 1d and 2. One of the goals of the study was to do identify specific uses of language in the expression numeric uncertainty in Spanish. Therefore, RQ 1d sought to exemplify the use of lexical and prosodic devices that characterized the responses provided by the intermediate learners, advanced learners, and native speakers (henceforth Int L2, Adv L2, and NSs) when they experienced uncertainty regarding small and large quantities (e.g., $40 and $40,000) during the Spanish interview and the prompted production task.

In this chapter, RQ 1d is addressed with a qualitative analysis of the data generated by the Spanish interview and the prompted production task. The purpose of this analysis is to triangulate findings and provide a robust depiction of the participants' lexical and pragmatic resources to express numeric uncertainty in Spanish. Another goal of the study was to examine instances of L1 lexical and pragmatic transfer among the two L2 learner groups. For this reason, RQ 2 investigated whether the L2 learners' expression of uncertain small and large quantities in Spanish is influenced by English, their first language. RQ 2 is addressed using the data generated by the English interview. Two

sample questions and their respective responses are provided in order to illustrate how the participants in the study expressed uncertain small quantities, as well as two sample questions that elicited the approximation of large quantities. The examples provided were extracted from the corpus of the study, and the responses are representative of several speakers in the study.

As I explained in the method chapter (Chapter 3), the qualitative analysis involved the transcription of relevant fragments obtained during the oral production tasks, as well as the implementation of Saldaña's (2009) steps for coding the qualitative data. These steps involve the identification, examination, and interpretation of patterns and categories. The coding process consisted of two steps: (1) identifying lexical and prosodic devices employed in English and Spanish for expressing numeric uncertainty and (2) creating categories that were representative of a particular linguistic behavior.

Chapter 5 is organized in the following manner:

- First, the findings obtained from protocol one (i.e., the Spanish interview) are illustrated, explained, and summarized.
- Second, protocol two (i.e., the prompted production task) is addressed, and the findings are exemplified, discussed, and summarized.
- Third, the findings obtained from protocol four (i.e., the English interview) are presented together with the findings gathered by protocol one (i.e., Spanish interview) with the purpose of providing a comparison of the L2 learners' oral production in the two languages. The findings are illustrated, explained, and also summarized.

- Fourth, a summary of the findings from the qualitative analysis is presented at the end of this chapter.

5.1 Qualitative findings obtained from protocol one: The Spanish interview

This section exemplifies the use of lexical and prosodic devices that, according to the quantitative analysis (Chapter 4), were representative of the Int L2, Adv L2, and NSs in the Spanish interview when they expressed uncertainty with small and large quantities. This section addresses RQ 1d, which aimed to provide an in-depth depiction of how the participants conveyed numeric uncertainty in Spanish, and in turn, substantiate the quantitative findings.

Recall that the Spanish interview elicited the spontaneous production of numeric approximations among the three proficiency groups in the study, by asking questions related to money and to their hobbies, daily routine or education (see Appendix A). Sample interview questions are the following:

- *¿Cuánto cuesta un almuerzo barato en el campus?*
  'How much is an inexpensive meal on campus?

- *¿Cuánto cuesta tu renta con todo y los servicios cada semestre?*
  'How much is your rent with utilities each semester?'

As I discussed in the quantitative results (Chapter 4), single devices (i.e., single NumApps and other single lexical and prosodic devices) co-occurred with small quantities in several instances among the Int L2, Adv L2, and NSs. In contrast, multiple devices (i.e., the co-occurrence of a NumApp with another device, clusters of NumApps, and clusters of devices other than NumApps) were found to co-occur in several instances with large uncertain quantities.

With that in mind, the first part of the qualitative analysis of the Spanish interview focuses on the use of single devices to express uncertainty regarding small quantities. Later, the analysis focuses on the use of multiple devices with regard to large quantities.

5.1.1 The use of single devices in the Spanish interview.

Single devices were employed by the three participant groups when they discussed small quantities, but each group exhibited a different behavior with regard to the lexical and pragmatic choices. This section addresses the use of single devices based on what was characteristic of each proficiency group.

The use of single numeric approximators.

As we attested in the quantitative analysis in Chapter 4, the Int L2, Adv L2, and NSs provided responses that contained a single NumApp when they discussed small quantities. The examples that follow illustrate the NumApps that characterized the responses of each group:

7. *¿Cuánto cuesta un boleto para el cine los fines de semana?*
   'How much is a ticket to the movies on the weekends?'

(Int L2 17)
Un ticket cuesta <u>cerca de</u> $12 dólares.
'A ticket costs <u>close to</u> $12 dollars.'

(Adv L2 23)
<u>Como</u> $7 dólares en campus. En un cine regular no sé.
'<u>Like</u> $7 dollars on campus. At a regular theater (I) don't know.'

(NS 03)
<u>Como</u> $40 porque viernes, sábado o domingo le aumentan.
'<u>Like</u> $40 because on Fridays, Saturdays or Sundays they increase it.'

8. *¿Cuánto cuesta un almuerzo barato en el campus?*
   'How much is an inexpensive meal on campus?'

(Int L2 10)

Hay muchos lugares con diferentes precios, pero no es barato, cerca de $15 dólares.

'There are many places with different prices, but it is not cheap, close to $15 dollars.'

(Adv L2 25)

Un almuerzo cuesta como $10.

'A meal costs like $10.'

(NS 13)

Como $14 pesos un burrito.

'Like $14 pesos a burrito.'

As we can observe in examples 7 and 8, the Adv L2 resembled the NSs in the use of the NumApp *como*. In contrast, several Int L2 preferred to use the NumApp *cerca de*. In other words, the Int L2 exhibited an oral production behavior that was group-specific.

As it was noted in the quantitative results (Chapter 4), the use of lexical and prosodic devices other than NumApps was highly frequent among the two L2 learner groups. In conducting the qualitative analysis, I was able to identify the most common devices: parenthetical verbs (e.g., *pienso que $45*), adverbs of doubt (e.g., *quizá $20*), numeric ranges (e.g., *de $10 a $15*), and changes in prosody using up-stepping (which is marked with a question mark, as in $*30?*). The use of the aforementioned devices is illustrated below. Since the expression of devices other than NumApps was not representative of the NSs (as attested in the quantitative results chapter), no excerpts from the NSs are provided.

The use of single parenthetical verbs.

9. *¿Cuánto cuesta un boleto para al cine los fines de semana?*
'How much is a ticket to the movies on the weekends?'

(Int L2 13)

En Orange City es pienso que $8 dólares.

'At Orange City is (I) think that $8 dollars.'

(Adv L2 03)
Los fines de semana, $12, creo.
'On the weekends, $12, (I) believe.'

10. *¿Cuánto cuesta un almuerzo barato en el campus?*
'How much is an inexpensive meal on campus?

(Int L2 08)
Hum, $13 por un plato básico yo pienso que [sic].
'Hum, $13 for a basic dish I think.'

(Adv L2 01)
Creo que $10 dólares en los restaurantes de Johnson Avenue.
'(I) believe that $10 dollars at the restaurants on Johnson Avenue.'

From examples 9 and 10, we can gather that both the Int L2 and Adv L2 produced parenthetical verbs in their responses when they conveyed numeric uncertainty. However, I should note that the analysis revealed that the Int L2 employed *pienso que*, while the Adv L2 used *creo que.* I will further discuss differences in *pienso que* and *y creo que* in the discussion chapter.

The use of single adverbs of doubt.

The use of adverbs of doubt, such as *quizá* 'perhaps' and *probablemente* 'probably' was also found among the Int L2 and Adv L2. Examples 11 and 12 present instances in which the two L2 learner groups expressed numeric uncertainty using adverbs of doubt.

11. *¿Cuánto cuesta un boleto para el cine los fines de semana?*
'How much is a ticket to the movies on the weekends?'

(Int L2 12)
Un cine normal es muy caro, es [sic] *quizás $15 dólares.*
'At a normal theatre (it) is very expensive, it's perhaps $15 dollars.'

(Adv L2 21)

Sé que el cine de Orange City es más barato. Nunca he estado, pero cuesta quizá $8 dólares.

'(I) know that the theater at *Orange City* is cheaper. (I) have never been, but (it) costs perhaps $8 dollars.'

12. *¿Cuánto cuesta un almuerzo barato en el campus?*

'How much is an inexpensive meal on campus?'

(Int L2 17)

Honey Grow es un poco más caro, probablemente $10 dólares por stir fry [sic].

'Honey Grow is a little more expensive, probably $10 dollars for stir fry.'

(Adv L2 07)

Probablemente $15 dólares si quieres algo grande.

'Probably $15 dollars if you want something large.'

From examples 11 and 12 we gather that, both the In L2 and Adv L2 exhibited similar linguistic behavior with regard to the use of adverbs of doubt. The two groups provided responses using *quizás* and *probablemente.* However, we note the difficulty experienced by an Int L2 (in example 11) when discussing the price of a ticket. The speaker used the verb *ser* 'to be' instead of *costar* 'to cost', which is usually employed in Spanish to provide the price of an item.

The use of single numeric ranges.

Parenthetical verbs and adverbs of doubt were not the only lexical devices employed to convey numeric uncertainty. Numeric ranges were also evidenced among the Int L2 and Adv L2, as the following examples show.

13. *¿Cuánto cuesta un boleto para el cine los fines de semana?*

'How much is a ticket to the movies on the weekends?'

(Int L2 18)

Una boleta [sic] *de cine es $9 o $10 dólares.*

'A movie ticket is $9 or $10 dollars.'

(Adv L2 01)
$12 o $13 dólares. Hay diferentes precios si es regular o 3D.
'$12 or $13 dollars. There are different prices if (it) is regular or 3D.'

14. *¿Cuánto cuesta un almuerzo barato en el campus?*
'How much is an inexpensive meal on campus?'

(Int L2 03)
$10 a $20 si es lujoso.
'$10 to $20 if (it) is luxurious.'

(Adv L2 14)
De $5 a $10 dólares, depende dónde vas [sic].
'From $5 to $10, depending on where you go.'

Example 13 and 14 show that numeric ranges were expressed using several structures (e.g., *$9 o $10, de $5 a $10,* or *$10 a $20*) and that there were no notable differences between how the Int L2 and Adv L2 used numeric ranges. Both groups employed similar structures. One observation that can be made is the use of the verb *ser* 'to be' and not *costar* 'to cost' by the Int L2 in example 13 to discuss the price of a movie ticket. Even though the question that was asked used the verb *costar,* the Int L2 in the examples above opted to use *ser* as they would normally do in English.

After discussing the lexical devices employed by the two L2 learner groups to express uncertainty regarding small quantities, I will now focus on the prosodic device that was only found among the Int L2: Up-stepping.

The use of up-stepping.

The Int L2 produced up-stepping in the responses given during the Spanish interview. Up-stepping is a prosodic strategy that involves raising the intonation in a declarative sentence with the purpose of conveying uncertainty. Up-stepping is marked with a question mark (i.e., *?*) and is illustrated in the following examples:

15. *¿Cuánto cuesta un boleto para el cine los fines de semana?*
‘How much is a ticket to the movies on the weekends?

(Int L2 21)
El cine normal es $11 dólares? Siempre voy al cine en la universidad porque es muy barato.
‘The normal theatre is $11 dollars? (I) always go to the theatre at the university because (it) is very cheap.’

16. *¿Cuánto cuesta un almuerzo barato en el campus?*
‘How much is an inexpensive meal on campus?’

(Int L2 02)
Hum, $10? Hay diferentes lugares en el campus.
‘Hum, $10? There are different places on campus.’

In examples 15 and 16 we can attest to the use of up-stepping as the only indicator of a lack of certainty. It is crucial to mention that the Adv L2 and NSs did not use up-stepping in Spanish. In other words, the use of this prosodic device was characteristic of only the Int L2. Up-stepping is a frequent pragmatic strategy employed to convey uncertainty in English, and up to this juncture, it is possible to suggest that examples 15 and 16 present a case of L1 pragmatic transfer. It should be noted that up-stepping is strategy has been found to be commonly used in English to convey uncertainty in oral discourse, and thus, I will further discuss the use of up-stepping in the English interview as well as in the Discussion Chapter.

Having discussed the most common lexical and prosodic devices employed to discuss uncertain quantities with small magnitude (e.g., $20, $70), the next section of the analysis addresses how large quantities were expressed (e.g., $10,000, $25,000).

5.1.2 The use of multiple devices in the Spanish interview.

The qualitative analysis of the Spanish interview revealed that large quantities were expressed with multiple devices, such as clusters of NumApps (e.g., *como unos*

$30,000 'like some *$30,000*'), co-occurrence of a NumApp with another lexical or prosodic device (e.g., *yo pienso que cerca de $6,000* 'I think that close to $6,000'), or clusters of devices other than NumApps (e.g., *$5,000? yo creo* '$5,000? I believe'). The following section exemplifies the most common uses of multiple devices among the Int L2, Adv L2, and NSs with regard to large quantities.

The use of numeric approximator clusters.

The use of NumApp clusters was only characteristic of the NSs, as the quantitative analysis (Chapter 4) revealed. The following excerpts are exemplary instances in which the NSs produced clusters of two and three NumApps to convey uncertainty regarding large quantities:

17. *¿Cuánto cuesta tu renta con todo y los servicios cada semestre?*
'How much is your rent with utilities each semester?'

(NS 24)
Yo vivo con mi familia, y es casa propia, pero de servicios, pagamos como unos $10,000.
'I live with my family, and we own the house, but for utilities, we pay like some $10,000.'

(NS 13)
Como unos $13,000 pesos por ahí.
'*Like some* $13,000 pesos around that.'

18. *¿Cuánto cuesta asistir a tu universidad al semestre?*
'How much does it cost to attend your university per semester?'

(NS 15)
Como unos $3,000 pesos. Cambia dependiendo de la carrera.
'Like some $3,000 pesos. (It) changes depending on the major.'

(NS 21)
Como unos $3,000 pesos al año más o menos.
'Like some $3,000 pesos per year more or less.'

Examples 17 and 18 illustrate the use of NumApp clusters among several NSs, a behavior that was elucidated in Chapter 4 and was exemplified with the qualitative

analysis. These clusters were employed with the purpose if signaling a high degree of uncertainty that was triggered by the large magnitude of the quantities.

The use of multiple devices to express uncertainty regarding large quantities was also found with co-occurrences of a NumApp and another lexical and prosodic device (e.g., a NumApp with a parenthetical verb, a NumApp with up-stepping) among the Adv L2. Also, clusters of two or more devices other than NumApps were found in the analysis (e.g., a parenthetical verb with an adverb of doubt, a parenthetical verb with up-stepping) among the Int L2.

The co-occurrence of a numeric approximator and a parenthetical verb.

The examination of the use of lexical and prosodic devices in the expression of large uncertain quantities revealed that the Int L2 and Adv L2 provided responses in which a NumApp co-occurred with a parenthetical verb:

19. *¿Cuánto cuesta tu renta con todo y los servicios cada semestre?*
'How much is your rent with utilities each semester?'

(Int L2 06)
Yo pienso que cerca de $6,000.
'I think that close to $6,000.'

(Adv L2 13)
Hum, creo que como $4,000. Vivo en un departamento cerca de la universidad con amigos.
'Hum, (I) believe that like $4,000. (I) live in an apartment close to the university with friends.'

20. *¿Cuánto cuesta asistir a tu universidad al semestre?*
'How much does it cost to attend your university per semester?'

(Int L2 02)
No sé qué es el amante [sic] *de una tuición* [sic]. *Es pienso que cerca de $15,000.*
'(I) don't know what the amount for tuition is. (It) is (I) think that (it) is close to $15,000.'

(Adv L2 03)
El costo total es como $50,000, creo.
'The total cost is like $50,000, (I) believe.'

Examples 19 and 20 illustrate that while the Int L2 and Adv L2 resembled each other with regard to the use of NumApps with parenthetical verbs, there were between-group differences in relation to the lexical choices. This finding was elucidated by the quantitative analysis in Chapter 4, and the qualitative analysis further substantiated this behavior.

As noted in examples 19 and 20, the Int L2 produced *cerca de*, while *como* was used by the Adv L2. Also, there were differences related to the parenthetical verbs employed. While the Int L2 provided responses with *pienso que* the Adv L2 relied on *creo que.* These findings suggest that there were similarities between the L2 groups in their ability to issue multiple lexical items to express uncertainty with large quantities. This behavior suggests that the L2 learners are pragmatically aware of the possibility of conveying a greater degree of uncertainty by using multiple devices.

The co-occurrence of a numeric approximator and up-stepping.

NumApps were also combined with up-stepping. However, this co-occurrence was only characteristic of the responses provided by the Int L2.

21. *¿Cuánto cuesta tu renta con todo y los servicios cada semestre?*
'How much is your rent with utilities each semester?'

(Int L2 06)
Eh, $4,000? más o menos.
'Uh, $4,000? more or less.'

22. *¿Cuánto cuesta asistir a tu universidad al semestre?*
'How much does it cost to attend your university per semester?'

(Int L2 23)
Cerca de $20,000?
'Close to $20,000?'

Excerpts 21 and 22 are exemplary of the Int L2 reliance on the use of up-stepping to express uncertainty regarding large quantities. Recall that up-stepping refers to a prosodic strategy in which the pitch is raised in order to signal uncertainty in declarative sentences. From the examples above, we note that the Int L2 combined up-stepping with NumApps in order to convey a higher degree of uncertainty with large quantities. This finding shows that, while the Int L2 exhibited a group-specific behavior that could be attributed to influence from their L1 (i.e., the use of up-stepping), this group also showed that they have an awareness of the pragmatic effect that is conveyed by using multiple devices (i.e., conveying a high degree of uncertainty). The use of up-stepping and its pragmatic implications will be addressed in more detail in the Discussion chapter.

While co-occurrences of a NumApp with an adverb of doubt (e.g., *cerca de $15,000 probablemente*) or with a numeric range (e.g., *más o menos de $10,000 a $12,000*) were evidenced in the data, they were not pervasive in the oral production of the Int L2 and Adv L2 during the Spanish interview. Therefore, those co-occurrences are not addressed in this section.

The use of clusters of lexical and prosodic devices other than numeric approximators.

Another group-specific behavior revealed by the analysis is the use of clusters of devices other than NumApps among the Int L2. The following examples illustrate this category of clusters:

23. *¿Cuánto cuesta tu renta con todo y los servicios cada semestre?*
'How much is your rent with utilities each semester?'

(Int L2 24)
$5,000? yo pienso cada semester [sic].
'$5,000? I think every semester.'

24. *¿Cuánto cuesta asistir a tu universidad al semestre?*
'How much does it cost to attend your university per semester?'

(Int L2 08)
En general, $15,000? yo pienso que [sic]. *Depende si vives en este estado o no*.
'In general, $15,000? (I) believe. (It) depends if you live in this state or not.'

In examples 23 and 24, we note that the Int L2 expressed their uncertainty regarding large quantities by combining prosodic and lexical items (e.g., up-stepping with a parenthetical verb). This finding provides further evidence to suggest that, even though the Int L2 are aware of the pragmatic effect that clustering devices has (i.e., signaling a degree of uncertainty), their choice of lexical items (i.e., clusters of devices other than NumApps) was unique to this group.

In sum, the Spanish interview addressed RQ 1d, which sought to provide an in-depth depiction of the lexical and prosodic devices employed by the Int L2, Adv L2, and NSs with small and large uncertain quantities. The findings revealed both similarities and differences across the groups, which are presented in the following summary.

The similarities between the groups were the following:

- Small quantities were expressed with single devices by the three participant groups.
- Large quantities were expressed with multiple devices among the three groups.

The analysis also revealed differences across proficiency groups with regard to the expression of small and large quantities in the Spanish interview:

- With small quantities, the Int L2 employed single lexical and prosodic devices other than NumApps, the Adv L2 produced both NumApps and other lexical items, and the NSs responded using NumApps.
- With large quantities, the Int L2's responses were characterized by a clustering of two devices other than NumApps, the Adv L2 combined NumApps with other lexical devices, and the NSs used clusters of NumApps.
- Up-stepping was only found among the Int L2 in both small and large quantities.

The following section presents the qualitative analysis of the second oral production protocol: The prompted production task. Unlike the Spanish interview, which elicited spontaneous oral production, the prompted production task elicited numeric approximation in a controlled setting.

5.2 Qualitative findings gathered from protocol two: The prompted production task

The qualitative analysis of the prompted production task responded to RQ 1d, which investigated specific uses of lexical and prosodic devices. The prompted production task had the goal of eliciting the controlled production of numeric uncertainty with regard to money and prices of items (see Appendix B). This protocol explicitly asked the participants to express uncertainty and doubt when responding to a series of questions about the cost of buying food on campus, book prices, and tuition. The participants had to listen to the questions and respond to each one orally by supplying a lexical item that conveyed uncertainty or doubt. The following examples were extracted from the prompted production task:

- *¿Cuánto cuesta un permiso de estacionamiento?*
  Un permiso de estacionamiento cuesta _____$40 dólares.
  'How much does a parking permit cost?'
  'A parking permit costs _____ $40 dollars.'

- *¿Cuánto cuesta estudiar un verano en España?*
  Estudiar un verano en España cuesta _____ $6,000 dólares.
  'How much does it cost to study in Spain in the summer?'
  'Studying in Spain in the summer costs_____ $6,000 dollars.'

In this section, I present examples extracted from the prompted production task with the purpose of illustrating the expression of numeric uncertainty among Int L2, Adv L2, and NSs. The first section focuses on small quantities and presents two sample questions in order to exemplify the most characteristic lexical items supplied by each group. The second section focuses on large quantities, and also provides two sample questions with the purpose of illustrating the most representative lexical items.

5.2.1 The use of single devices in the prompted production task.

As it was noted in the quantitative findings (Chapter 4), the expression of uncertain quantities in the prompted production task involved the use of single NumApps and other lexical and prosodic devices was not prevalent in this protocol. This section of the qualitative analysis seeks to present specific uses of NumApps with the purpose of exemplifying and substantiating the findings presented in Chapter 4.

The use of single numeric approximators.

25. *¿Cuánto cuesta un permiso de estacionamiento?*
'How much does a parking permit cost?'

(Int L2 13)
Un permiso de estacionamiento cuesta <u>cerca de</u> $40 dólares.
'A parking permit costs <u>close to</u> $40 dollars.'

(Adv L2 09)
Un permiso de estacionamiento cuesta <u>más o menos</u> $40 dólares.
'A parking permit costs <u>more or less</u> $40 dollars.'

(NS 10)

Un permiso de estacionamiento cuesta como $40 dólares.
'A parking permit costs like $40 dollars.'

26. *¿Cuánto cuesta un pase de autobús al semestre?*
'How much does a bus pass cost per semester?'

(Int L2 20)

Un pase de autobús al semestre cuesta más o menos $60 dólares.
'A bus pass per semester costs more or less $60 dollars.'

(Adv L2 01)

Un pase de autobús al semestre cuesta cerca de $60 dólares.
'A bus pass per semester costs close to $60 dollars.'

(NS 07)

Un pase de autobús al semestre cuesta más o menos $60 dólares.
'A bus pass per semester costs more or less $60 dollars.'

From examples 25 and 26, we gather that the two L2 learner groups behaved similarly in that they both supplied the NumApps *cerca* and *más o menos.* In contrast, the use of *como* was more pervasive among the NSs, as noted in the quantitative analysis and evidenced in the examples above. That is, although the three participant groups supplied single NumApps to express uncertainty regarding small quantities, the two L2 groups did not resemble the NSs with regard to their lexical choices. This finding points to differences in the participants' lexical preferences, which seem to be conditioned by the level of Spanish proficiency.

The next section will address the responses that contained large quantities.

5.2.2 The use of a single numeric approximator with large quantities in the prompted production task.

In the prompted production task, the participants from the three proficiency groups supplied single lexical items to express uncertainty regarding large quantities, as it

was noted in the quantitative analysis. The following examples provide evidence of this behavior.

The following examples are illustrative of this behavior:

27. *¿Cuánto pagan los estudiantes por sus libros de texto al año?*
'How much do students pay for their textbooks per year?'

(Int L2 03)
Los estudiantes pagan <u>más o menos</u> $2,000 dólares.
'The students pay <u>more or less</u> $2,000 dollars.'

(Adv L2 15)
Los estudiantes pagan <u>más o menos</u> $2,000 dólares.
'The students pay <u>more or less</u> $2,000 dollars.'

(NS 13)
Los estudiantes pagan <u>como</u> $2,000 dólares.
'The students pay <u>like</u> $2,000 dollars.'

28. *¿Cuánto cuesta un semestre de intercambio en Perú?*
'How much does a semester abroad in Peru cost?'

(Int L2 10)
Un semestre de intercambio en Perú cuesta <u>cerca de</u> $9,000 dólares.
'A semester abroad in Peru costs <u>close to</u> $9,000 dollars.'

(Adv L2 24)
Un semestre de intercambio en Perú cuesta <u>cerca de</u> $9,000 dólares.
'A semester abroad in Peru costs <u>close to</u> $9,000 dollars.'

(NS 11)
Un semestre de intercambio en Perú cuesta <u>como</u> $9,000 dólares.
'A semester abroad in Peru costs <u>like</u> $9,000 dollars.'

Examples 27 and 28 illustrate that there were similarities between the three proficiency groups in terms of the number (i.e., single) and the category of lexical items (i.e., NumApps) employed. However, we also note a different behavior between the two L2 groups and the NSs. While the Int L2 and Adv L2 supplied *más o menos* and *cerca de* in several responses, the NSs relied on the use of *como*.

5.2.3 The use of multiple numeric approximators with large quantities in the prompted production task.

Although the majority of the speakers in the study showed a preference to use a single NumApp to express an uncertain large quantity (as it was evidenced in the quantitative results in Chapter 4), the NSs provided several responses in which they supplied clusters of NumApps when they discussed large quantities. This behavior was not characteristic of the L2 learner groups. The following examples illustrate the NSs' use of NumApps clusters:

29. *¿Cuánto pagan los estudiantes por sus libros de texto al año?*
'How much do students pay for their textbooks per year?'

(NS 23)
Los estudiantes pagan como unos $2,000 dólares.
'The students pay like some $2,000 dollars.'

30. *¿Cuánto cuesta un semestre de intercambio en Perú?*
'How much do a semester abroad in Peru cost?'

(NS 19)
Un semestre de intercambio en Perú cuesta como unos $9,000 dólares.
'A semester abroad in Peru costs like some $9,000 dollars.'

Examples 29 and 30 show the use of the cluster *como unos* among the NSs. As it was mentioned earlier, the use of clusters of NumApps was only characteristic of the NSs.

To sum up, the prompted production task set out to address RQ 1d, which investigated specific uses of lexical and prosodic devices employed by Int L2, Adv L2, and NSs to express small and large uncertain quantities. To answer this RQ, we can say that there were both similarities and differences across groups. The qualitative analysis provided an in-depth depiction of how the participants conveyed numeric uncertainty in

Spanish, and the following summary presents the similarities and differences among the groups:

The following similarities were uncovered:

- The three participant groups supplied single devices with small quantities.
- The three groups supplied NumApps with small and large quantities.

Differences were also revealed by the analysis:

- The use of the NumApps *cerca de* and *más o menos* was characteristic of the Int L2 and Adv L2 learners. The NSs relied on the NumApp *como* when discussing uncertain small and large quantities.
- Large quantities were commonly expressed with single NumApps among the Int L2 and Adv L2, and only the NSs supplied both single and multiple lexical items.

The next section focuses on the expression of numeric uncertainty among the Int L2 and Adv L2 in their dominant language (i.e., English). This section analyzes the uses of NumApps and other lexical and prosodic devices among the two L2 groups during the English interview.

5.3 Qualitative findings gathered from protocol four: The English interview

An English interview was administered to the two L2 learner groups (i.e., Int L2 and Adv L2) with the purpose of responding to RQ 2. The RQ inquired whether it was possible to detect pragmatic transfer from the learners' L1 (i.e., English) with respect to the choices of devices they issued when they conveyed numeric approximation in Spanish. The English interview was administered after all the other tasks (i.e., Spanish interview, prompted production task, and forced-choice task) were completed by the

participants. The English interview was similar to the Spanish interview; it asked the same questions but only in English. The questions that were asked in English were slightly modified to ensure that the participants were providing authentic responses and not repetitions of what they had already responded in the Spanish interview (see Appendix D). For example, instead of asking about the price for a movie ticket *on the weekends*, as it appeared in the in the Spanish interview protocol, the English interview asked about the price of a movie ticket *on a weekday* (i.e., How much is a ticket to the movies on a weekday?).

This section is organized in the following manner: First, I address how small quantities were expressed among the three participant groups, and to draw comparisons, I provide examples of the responses that characterized the oral production in English first and then in Spanish. After addressing the data related to small quantities, I focus on the analysis of the expression of large quantities.

5.3.1 The use of single devices in the English interview.

The use of a single NumApp was characteristic of the expression of uncertainty concerning small quantities. The following section addresses the use of NumApps among the Int L2 and Adv L2.

The use of a single numeric approximator.

With regard to small uncertain quantities in English, the Int L2 and Adv L2 responded using NumApps such as *like*, *around*, and *about*. These responses are exemplified below:

31. How much is a ticket to the movies on a weekday?

(Int L2 20)

It's about $5 dollars for students.

(Adv L2 13)
Man, it's like $14 a ticket.

32. How much is an expensive meal on campus?

(Int L2 10)
It varies, but it's usually like $10 dollars.

(Adv L2 14)
About $18 dollars if you go to the restaurants on Johnson Street.

From the English 31 and 32, above, we gather that both Int L2 and Adv L2 provided responses using a single NumApp. The NumApps *like* and *about* were the most prevalent in the data generated by the English interview. The following examples illustrate speakers from the Int L2 and Adv L2 groups responding to similar questions in Spanish:

33. *¿Cuánto cuesta un boleto para el cine los fines de semana?*
'How much is a ticket to the movies on the weekends?'

(Int L2 17)
Un ticket cuesta cerca de $12 dólares.
'A ticket costs close to $12 dollars.'

(Adv L2 23)
Como $7 dólares en campus. En un cine regular no sé.
'Like $7 dollars on campus. At a regular theater (I) don't know.'

34. *¿Cuánto cuesta un almuerzo barato en el campus?*
'How much is an inexpensive meal on campus?'

(Int L2 10)
Hay muchos lugares con diferentes precios, pero no es barato, cerca de $15 dólares.
'There are many places with different prices, but it is not cheap, close to $15 dollars.'

(Adv L2 25)
Un almuerzo cuesta como $10.
'A meal costs like $10.'

Excerpts 33 and 34 are exemplary of the use of *cerca de* 'close to' among the Int L2 and the use of *como* 'like' among the Adv L2 in the Spanish interview. When we compare the Spanish responses with the English examples provided in 31 and 32, we note that the Adv L2 employed the same NumApp in the two languages: *como* and *like*. These observations reveal that both the Int L2 and Adv L2 are cognizant of the functions of NumApps in both English and Spanish and that these lexical items can be employed to convey numeric uncertainty. The finding also reveals that the Adv L2 seem to have a robust knowledge regarding the use of NumApps in Spanish. However, and as shown in examples 31 and 32, the Int L2 opted to use a different approximator in Spanish. Instead of using the NumApps *como* or *alrededor de*, which are the Spanish equivalents of the NumApps that they produced in English (i.e., *like* and *about*), the Int L2 used *cerca de* 'close to'. It is plausible to suggest at this juncture that the Int L2 are not fully aware that *cerca de* is a defective approximator that means 'close to' in English, and that does not convey the same meaning as *like* or *about*, which are neutrals approximators.

The English interview also generated responses in which small quantities were expressed using multiple devices. In the following section, I discuss the use of these devices in English, as well the extent to which the L2 learners' oral production in Spanish and English resembled each other.

5.3.2 The use of multiple devices with small quantities in the English interview.

The English interview yielded several responses in which small quantities were expressed with a NumApp that co-occurred with another lexical or prosodic device (i.e., parenthetical verb, adverb of doubt, numeric range, and up-stepping). The following

examples illustrate the co-occurrence of devices employed to convey numeric uncertainty with small quantities.

The co-occurrence of a numeric approximator and a parenthetical verb.

35. How much is a ticket to the movies on a weekday?

(Int L2 16)
I think it's around $12 dollars. I know it can be more expensive on the weekends.

(Adv L2 17)
On Campus B, it's like $8 dollars, I think.

36. How much is an expensive meal on campus?

(Int L2 23)
Hum, I think you can get a falafel sandwich for like $8 dollars, I think.

(Adv L2 21)
About $12 dollars, I think, for a meal.

From examples 35 and 36, we gather that the Int L2 and Adv L2 produced the NumApps *like*, *about*, and *around*, which co-occurred with the parenthetical verb *I think.* The Int L2 and Adv L2 also produced parenthetical verbs to express uncertainty in Spanish, as shown in the following examples (37 and 38). However, these forms were employed as single devices and not in combination with a NumApp. The following examples illustrate the use of parenthetical verbs in the Spanish interview:

37. *¿Cuánto cuesta un boleto para el cine entre semana?*
'How much is a ticket to the movies during the week?'

(Int L2 13)
En Orange City es pienso que $8 dólares.
'At Orange City (it) is (I) think that $8 dollars.'

(Adv L2 03)
En la semana $12, creo.
During the week '$12 (I) believe.'

38. *¿Cuánto cuesta un almuerzo barato en el campus?*
'How much is an inexpensive meal on campus?

(Int L2 08)

Hum, $13 por un plato básico yo pienso que [sic].
'Hum, $13 for a basic dish I think.'

(Adv L2 01)

Creo que $10 dólares en los restaurantes de Johnson Avenue.
'(I) believe that $10 dollars at the restaurants on Johnson Avenue.'

From the English examples (35 and 36), we note that the parenthetical verb *I think* co-occurred with a NumApp. In contrast, from the Spanish examples (37 and 38), we gather that parenthetical verbs were issued alone and did not co-occur with a NumApp. This finding suggests that the two L2 learner groups resembled the NSs in that they used a single device to express small quantities. Regarding the lexical choices, we find the use of *I think* in English among the Int L2 and Adv L2, but only the Int L2 supplied several responses using *pienso que* '(I) think' in Spanish. This finding reveals that the Int L2 relied on a lexical form that is commonly employed in English, while the Adv L2 opted to use a different parenthetical verb: *creo que*.

The co-occurrence of a numeric approximator and an adverb of doubt.

Another co-occurrence of lexical items that was attested in the English interview involves the use of a NumApp with an adverb of doubt. The examples below show the use of the adverb *probably* combined with the NumApps *around* and *like*.

39. How much is a ticket to the movies on a weekday?

(Int L2 18)

Probably around $10 dollars. It really depends on where you go.

(Adv L2 14)

It varies but probably like $15 dollars.

40. How much is an expensive meal on campus?

(Int L2 21)

Probably like $15.

(Adv L2 12)
Probably around $15 dollars, unless you have a meal plan.

Excerpts 39 and 40 are exemplary of the use of a NumApps co-occurring with an adverb of doubt in English, such as *probably like $15* and *probably around $15*. Adverbs of doubt were also evidenced among the Int L2 and Adv L2 in Spanish; however, these forms did not co-occur with a NumApp or with any other device.

41. *¿Cuánto cuesta un boleto para el cine los fines de semana?*
'How much is a ticket to the movies on the weekends?'

(Int L2 12)
Un cine normal es muy caro, es [sic] *quizás $15 dólares.*
'At a normal theatre is very expensive, it's perhaps $15 dollars.'

(Adv L2 21)
Sé que el cine de Orange City es más barato. Nunca he estado, pero cuesta quizá $8 dólares.
'(I) know that the theater at *Orange City* is cheaper. (I) have never been, but (it) costs perhaps $8 dollars.'

42. *¿Cuánto cuesta un almuerzo barato en el campus?*
'How much is an inexpensive meal on campus?'

(Int L2 17)
Honey Grow es un poco más cara, probablemente $10 dólares por stir fry [sic].
'Honey Grow is a little more expensive, probably $10 dollars for stir fry.'

(Adv L2 07)
Probablemente $15 dólares si quieres algo grande.
'Probably $15 dollars if you want something large.'

In the English examples (39 and 40), we saw that small quantities were expressed with multiple devices (e.g., probably like $15). The Int L2 and Adv L2 combined the adverb of doubt *probably* with a NumApp on several occasions. In contrast, and as shown in examples 41 and 42, the adverbs of doubt that were produced in the Spanish interview were expressed as single lexical items.

The use of a numeric approximator combined with a numeric range.

The following examples illustrate numeric ranges that co-occurred with NumApps. This co-occurrence was attested in the responses provided by both Int L2 and Adv L2 in the English interview.

43. How much is a ticket to the movies on a weekday?

(Int L2 24)
It ranges between <u>about $13 to $30</u> dollars.

(Adv L2 11)
It's usually <u>like $12 to $15</u> dollars depending on how new the movie is.

44. How much is an expensive meal on campus?

(Int L2 03)
<u>Like $13, $14</u>.

(Adv L2 15)
<u>About $9 to $10</u> dollars.

Excerpts 43 and 44 are exemplary of the use of numeric ranges among the Int L2 and Adv L2 in the English interview when the participants discussed small quantities. Numeric ranges were also attested in the Spanish interview. However, these forms were used as single devices, as the following examples illustrate:

45. *¿Cuánto cuesta un boleto para el cine los fines de semana?*
'How much is a ticket to the movies on the weekends?'

(Int L2 18)
Una boleta [<u>sic</u>] *de cine es <u>$9 o $10</u> dólares.*
'A movie ticket is <u>$9 or $10</u> dollars.'

(Adv L2 01)
<u>$12 o $13</u> dólares. Hay diferentes precios si es regular o 3D.
'<u>$12 or $13</u> dollars. There are different prices if (it) is regular or 3D.'

46. *¿Cuánto cuesta un almuerzo barato en el campus?*
'How much is an inexpensive meal on campus.'

(Int L2 03)

$10 a $20 si es lujoso.

'$10 to $20 if (it) is luxurious.'

(Adv 14)

De $5 a $10 dólares, depende dónde vas [sic].

'From $5 to $10, depending on where you go.'

When we compare examples 43 and 44 in English and 45 and 46 in Spanish, we note that the English interview generated responses with numeric ranges that were combined with NumApps, and the Spanish interview yielded responses in which numeric ranges were employed as the only marker of uncertainty. It is important to note that, as we saw in the analysis of the Spanish interview in an earlier section, single devices were employed by the Spanish NSs when they expressed small uncertain quantities. In other words, the two L2 learner groups resembled the NSs in terms of the number of devices employed. However, the Int L2 and Adv L2 behaved differently from the NSs with regard to their lexical choices. The NSs produced NumApps and the L2 learners provided several responses in which they produced numeric ranges to convey numeric uncertainty.

The co-occurrence of a numeric approximator and up-stepping.

The last co-occurrence found in the responses containing small quantities concerns the use of a NumApp with up-stepping. Recall that up-stepping is the change in prosody (i.e., pitch raise) employed to convey uncertainty in declarative sentences. The following examples show the co-occurrence of *about* and *like* with the prosodic device of up-stepping in English.

47. How much is a ticket to the movies on a weekday?

(Int L2 08)

About $10 dollars?

(Adv L2 20)
On campus, it's usually not very expensive, about $9 dollars?

48. How much is an expensive meal on campus?

(Int L2 11)
Like $15? It's a little expensive.

(Adv L2 22)
Like $20 dollars?

From examples 47 and 48, we gather that up-stepping was produced by both the Int L2 and Adv L2 during the English interview. In contrast, and as we will note in the following examples (49 and 50), up-stepping in the Spanish interview was only attested among the Int L2. The Adv L2 learners did not produce up-stepping in Spanish. For this reason, only examples from the Spanish responses provided by the Int L2 are presented in this section:

49. *¿Cuánto cuesta un boleto para el cine los fines de semana?*
'How much is a ticket to the movies on the weekends?'

(Int L2 21)
El cine normal es $11 dólares? Siempre voy al cine en la universidad porque es muy barato.
'The normal theatre (it) is $11 dollars? (I) always go to the theatre at the university because it is very cheap.'

50. *¿Cuánto cuesta un almuerzo barato en el campus?*
'How much is an inexpensive meal on campus?'

(Int L2 02)
Hum, $10? Hay diferentes lugares en el campus.
'Hum, $10? There are different places on campus.'

A comparison between the English (47 and 48) and Spanish (49 and50) responses with regard to the use of up-stepping shows that this pragmatic behavior was found among the Int L2 and Adv L2 in English, but only the Int L2 produced up-stepping in Spanish. Recall that in the qualitative analysis of the Spanish interview it was noted that

the NSs did not produce up-stepping. Therefore, we find that the Int L2 learners still rely on a pragmatic and prosodic device that is commonly employed in English, which might suggest a case of L1 transfer. With regard to the Adv L2, while they produced up-stepping in English, their pragmatic sensitivity in the L2 prevented them from using up-stepping in Spanish. It is also important to note that, in English, up-stepping was combined with a NumApp (e.g., like $15?), while in Spanish, the Int L2 produced up-stepping alone ($10?). Even though the Int L2 exhibited L1 transfer with regard to the use of up-stepping Spanish, they resembled the Adv L2 and the NSs in that they did not produce multiple devices with small quantities.

The following section presents the analysis of the expression of large uncertain quantities in English, as well as a comparison with the responses provided in Spanish.

5.3.3 The use of multiple devices with large quantities in the English interview.

This section addresses the analysis of the English interview responses regarding the use of multiple devices employed to convey uncertainty regarding large quantities. This section also compares the responses provided in the English interview and the Spanish interview with the purpose of detecting instances of L1 transfer. Similar to the previous section, the English responses are presented first, followed by the Spanish responses that include an English translation.

The co-occurrence of a numeric approximator and a parenthetical verb.

The English interview yielded several responses in which the Int L2 and Adv L2 expressed uncertainty regarding large quantities using a NumApp that co-occurred with a parenthetical verb. Examples 51 and 52 illustrate this co-occurrence:

51. How much are your rent and utilities each year?

(Int L2 23)
I think it's about $6,000 dollars for a semester. So that times two.

(Adv L2 07)
I live off campus, so I pay like $6,000, I think.

52. How much does tuition cost at your university per year?

(Int L2 01)
It was about $24,000 a semester, I think. As bougie as it sounds, my parents paid for it.

(Adv L2 01)
Hum, I think it's around $25,000 dollars.

Examples 51 and 52 illustrate the use of the parenthetical verb *to think* co-occurring with the NumApps *around, about,* and *like*. The Int L2 and Adv L2 responded to similar questions in Spanish in the following manner:

53. *¿Cuánto cuesta tu renta con todo y los servicios cada semestre?*
'How much is your rent with utilities each semester?'

(Int L2 06)
Yo pienso que cerca de $6,000.
'I think that close to $6,000.'

(Adv L2 13)
Hum, creo que como $4,000. Vivo en un departamento cerca de la universidad con amigos.
'Hum, (I) believe that like $4,000. (I) live in an apartment close to the university with friends.'

54. *¿Cuánto cuesta asistir a tu universidad al semestre?*
'How much does it cost to attend your university per semester?'

(Int L2 02)
No sé qué es el amante [sic] *de una tuición* [sic]. *Es pienso que es cerca de, hum $15,000, no sé.*
'(I) don't know what the amount for tuition is. (It) is (I) think that (it) is close to hum, $15,000, (I) don't know.'

(Adv L2 03)

El costo total es como $50,000, creo.
'The total cost is like $50,000 (I) believe.'

From the English examples (51 and 52), we can gather that the Int L2 and Adv L2 learners produced NumApps *about, around,* and *like,* which co-occurred the parenthetical verb *I think.* The Spanish examples (53 and 54) also show the co-occurrence the NumApps *cerca de* and *como* with the parenthetical verbs *pienso que* and *creo que*. Recall that, in the qualitative analysis of the Spanish interview, I reported that the Spanish NSs relied on the use of clusters of NumApps (e.g., *como unos*) when they expressed large uncertain quantities and did not produce NumApps that co-occurred with parenthetical verbs. Also, although the two groups produced the parenthetical verb *I think* in English to express numeric uncertainty (as shown in examples 51 and 52), only the Int L2 used this verb to Spanish (as evidenced in examples 53 and 54). The aforementioned findings suggest that the responses provided by the two L2 groups were influenced by their L1. For instance, the L2 learners transferred the co-occurrence of a NumApp and a parenthetical verb, and the Int L2 also exhibited L1 transfer with regard to the use of the parenthetical verb *pienso que* in Spanish.

The co-occurrence of a numeric approximator and up-stepping.

The Int L2 and Adv L2 also responded using a NumApp that co-occurred with the prosodic device of up-stepping. The following examples are illustrative of this behavior.

55. How much are your rent and utilities each year?

(Int L2 11)

About $6,000? I am not completely sure.

(Adv L2 05)

It's about $5,000? Yeah, I would say that.

56. How much does tuition cost at your university per year?

(Int L2 07)
I would say like $15,000? I don't know if more or less, but that sounds right.

(Adv L2 06)
Like 18,000? Yeah, it's $9,000 a semester. That sounds right.

The co-occurrence of up-stepping and a NumApp in Spanish was only evidenced among the Int L2, as the following examples illustrate:

57. *¿Cuánto pagas de renta con todo y los servicios cada semestre?*
'How much are your rent and utilities each semester?'

(Int L2 06)
Eh, $4,000? más o menos.
'Uh, $4,000? more or less.'

58. *¿Cuánto cuesta asistir a tu universidad al semestre?*
'How much does it cost to attend your university per semester?'

(Int L2 23)
Cerca de $20,000?
'Close to $20,000?'

From examples 57 and 58, we note that both the Int L2 and Adv L2 combined a NumApp with up-stepping with the purpose of expressing uncertainty regarding large quantities in English. However, only the Int L2 used up-stepping together with a NumApp in Spanish. Also, recall that, in the qualitative analysis of the Spanish interview, the use of up-stepping was not evidenced among the NSs. Therefore, we find another instance of L1 pragmatic transfer among the Int L2. Furthermore, with regard to the Adv L2, we note that they resembled the NSs since the Adv L2 that they did not rely on up-stepping to express uncertainty. This finding may suggest that the Adv L2 were cognizant that while up-stepping is commonly used in English, it is not what NSs would use. The

use of up-stepping in English and Spanish will be further addressed in the Discussion chapter.

The co-occurrence of a numeric approximator and a cluster of other devices.

The use of multiple devices in English to express large uncertain quantities was also evidenced with regard to the co-occurrence of a NumApp and a cluster of two or more other devices. The following examples illustrate responses provided by several Int L2 and Adv L2:

59. How much are your rent and utilities each year?

(Int L2 24)
Uh, between like $3,000 and $4,000? maybe?

(Adv L2 15)
Hum, I think it's about 6,000? It might be more, but around that price.

60. How much does tuition cost at your university per year?

(Int L2 15)
That's a harder question, maybe like 30,000? I think?

(Adv L2 12)
For semester maybe like $5,000?, $6,000?

From examples 59 and 60, we note that the Int L2 and Adv L2 produced NumApps such as *like* and *about* together with two or more other devices other than NumApps, such as parenthetical verbs, adverbs of doubt, numeric ranges, and up-stepping.

In Spanish, the participants did not produce NumApps that co-occurred with clusters of other devices. However, clusters of devices other than NumApps were found among the Int L2, as the following examples show:

61. *¿Cuánto cuesta tu renta con todo y los servicios cada semestre?*
'How much is your rent with utilities per semester?'

(Int L2 24)
$5,000? yo creo cada semester [sic].
'$5,000? I believe every semester. '

62. *¿Cuánto cuesta asistir a tu universidad al semestre?*
'How much does it cost to attend your university per semester?'

(Int L2 08)
En general, $15,000? yo pienso que [sic]. *Depende si vives en este estado o no*.
'In general, $15,000? (I) believe. (It) depends if you live in this state or not.'

From examples 61 and 62, we note that only the Int L2 produced clusters of devices other than NumApp (e.g., *$15,000? yo pienso que*). However, in the English examples (59 and 60), we attested to the Int L2 and Adv L2 learners' use of a NumApp co-occurring with clusters of two or more other devices (e.g., I think it's about 6,000?). With regard to the Adv L2, the use of clusters of devices other than NumApps was only characteristic of their English responses. This finding suggests there is no evidence of pragmatic transfer with regard to the Adv L2 since they resembled the Spanish NSs in that they did not provide clusters of devices other than NumApps (as noted in the qualitative analysis of the Spanish interview). However, the Int L2 learners' responses containing clusters of devices other than NumApps could have been influenced by the structure of English.

5.4 Summary of Chapter 5

Chapter 5 presented the qualitative analysis of three oral production protocols: The Spanish interview, the prompted production task, and the English interview. The analysis of the Spanish interview and the prompted production task addressed RQ 1d. The purpose of this RQ was to generate data that exemplified specific language use employed by the participants in the study to express numeric uncertainty. Protocol four (i.e., the English interview) was administered with the purpose of addressing RQ 2, which examined the

L2 learners' expression of uncertainty in English. The purpose of this RQ was to obtain data in the learners' dominant language (i.e., English) in order to examine instances of lexical and pragmatic transfer in the L2.

RQ 1d focused on identifying specific uses of lexical and prosodic devices employed to approximate quantities according to the level of Spanish proficiency (i.e., Int L2, Adv L2, and NSs) and the magnitude of the quantity (i.e., small and large). The answer to this RQ is positive. Although there was a similarity in the pragmalinguistic behavior among the three groups, the analysis uncovered several uses of lexical and prosodic devices that were group-specific.

The only similarity uncovered concerns the use of single devices with small quantities (i.e., a single NumApp or a single lexical or pragmatic device other than a NumApp). This behavior was attested among the three proficiency groups.

The qualitative analysis also revealed several differences in the pragmalinguistic behavior of each group, and it is important to note that differences were also found based on the type of task. That is, the responses seemed to be affected by whether the task generated spontaneous speech (i.e., Spanish interview) or controlled oral production (i.e., prompted production task). For instance, with regard to the use of single devices with small quantities, in spontaneous production, the Int L2 expressed small uncertain quantities using lexical and prosodic devices other than a NumApp (e.g., parenthetical verb, adverb of doubt, numeric range, and up-stepping), the Adv L2 produced both NumApps and other lexical items, and, the NSs responded using NumApps (e.g., *como, más o menos*). Furthermore, the pragmatic strategy of up-stepping (e.g., *40?*) was only attested among the Int L2. In contrast, the responses provided by the three groups during

the controlled production concerning small quantities contained mostly NumApps. However, there were marked differences in the lexical choices depending on whether the participants were L2 learners of NSs. The NumApps *cerca de* and *más o menos* were employed by the Int L2 and Adv L2 learners, and the use of *como* was characteristic of the NSs.

Differences were also found with regard to the expression of large quantities. Large quantities were expressed with multiple devices among the three groups, but only during spontaneous production (i.e., Spanish interview). For instance, the Int L2 produced clusters of devices other than NumApps (e.g., *pienso que $5,000 quizá*), the Adv L2 produced NumApps that co-occurred with another device (e.g., *creo que como $2,000*), and the NSs produced clusters of NumApps (e.g., *como unos $8,000*).

In contrast, during the controlled production task (i.e., prompted production), the three groups were characterized as supplying single NumApps with large quantities (e.g., *más o menos $1,000*), and only the NSs produced exhibited a marked use of clusters of NumApps (e.g., *como unos $10,000*). With regard to differences in lexical choices during the controlled production task, the analysis uncovered the use of *cerca de* and *más o menos* among the Int L2 and Adv L2 and *como* among the NSs.

RQ 2 was also addressed by means of a qualitative analysis. The purpose of RQ 2 was to investigate instances of lexical and pragmatic transfer among the two L2 learner groups. The analysis examined how Int L2 and Adv L2 expressed uncertainty regarding small and large quantities in English and in Spanish, with the purpose of determining whether the L2 learners' behavior in Spanish was conditioned by their knowledge of English. The answer to RQ 2 is affirmative. Also, the hypothesis for this RQ, which

suggested that cross-linguistic influence from English to Spanish occurs when L2 learners express numeric uncertainty, was confirmed. In the paragraphs that follow, I address the extent to which the responses in English and Spanish were similar and different, and I also discuss the ways in which the comparison between languages informs us about the presence of L1 transfer.

The analysis revealed that the Int L2 and Adv L2 behaved similarly in English and in Spanish when they expressed large uncertain quantities: The two groups produced multiple devices in the two languages.

In contrast, several differences were evidenced. For instance, the Int L2 and Adv L2 expressed small quantities in English with either a single NumApp (e.g., about $30) or with multiple devices, such as with a NumApp co-occurring with a parenthetical verb (e.g. about $40, I think), an adverb of doubt (e.g., maybe like $80), a numeric range (like between $20 or $30), and up-stepping (about $70?). In contrast, the participants only produced single devices in Spanish, such as a single NumApp (e.g., *cerca de $30*) or a single other device (e.g., *pienso que $60*). Another important difference concerns the use of the prosodic device of up-stepping. The Int L2 and Adv L2 used up-stepping in English ($50?). However, only the Int L2 transferred up-stepping to Spanish.

Another difference between languages that was attested among the Int L2 and Adv L2 concerns the use of a NumApp co-occurring with a cluster of other lexical and prosodic devices (e.g., maybe like $5,000) in English. In Spanish, only the Int L2 produced clusters of devices other than NumApps (e.g., *$6,000 probablemente*).

With regard to the instances of L1 transfer, an influence of English was detected in the use of parenthetical verbs adverbs of doubt, and numeric ranges among the Int L2 and

Adv L2. These devices were produced by the two L2 learner groups, but they were not characteristic of the response provided by the NSs of Spanish. More importantly, the Int L2 learners were more susceptible to using lexical and prosodic devices other than NumApps in Spanish than the Adv L2.

Also, the analysis showed that the Int L2 were the only group that used up-stepping in Spanish. Recall that up-stepping was not employed by the Spanish NSs, which might suggest that the Int L2 learners' use of up-stepping in Spanish was similar to their behavior in English where we found up-stepping. Further evidence that might be suggestive of L1 transfer among the Int L2 is the use of clusters of devices other than NumApps in Spanish (e.g., *$5,000? yo creo*). The use of this category of clusters was only found among the Int L2. In conclusion, Chapter 5 provided an analysis of the data obtained from the Spanish interview and the prompted production task with the purpose of exemplifying the use of lexical and prosodic devices that characterized the expression of small and large uncertain quantities among Int L2, Adv L2, and NSs in Spanish. These findings illustrated and substantiated the oral production tendencies that were uncovered in Chapter 4.

Chapter 5 also presented the findings from the English interview, which was administered to the L2 learners' L1, in order to determine if instances of lexical and pragmatic transfer could be detected. Collectively, the findings provided a robust depiction of the expression of numeric uncertainty in money-related situations in Spanish. Furthermore, the findings evaluated the extent to which L2 learners resembled NSs of Spanish and whether their behavior in Spanish was influenced by English.

Chapter 6

Discussion

The objective of the present study was to examine the acquisition of pragmatic competence with regard to the expression and interpretation of numeric uncertainty in L2 Spanish. Taguchi (2015, p. 1) refers to *pragmatic competence* as the "ability to deal with a complex interplay of language, language users, and context of interaction". The triangulation of the data generated by the quantitative and qualitative analyses revealed significant findings regarding the relationship between the level of Spanish proficiency (i.e., Int L2, Adv L2, and NSs) and the participants' sensitivity to the pragmatic constraint of quantity magnitude (i.e., small and large quantities). Thus, the most relevant findings are discussed in this chapter.

The study was guided by three RQs, which were addressed by using a mixed-methods approach. This approach allowed the cross-validation of results and provided a robust depiction of how numeric uncertainty manifests among the L2 learners of this current study. The RQs were the following:

1. Does the magnitude of a quantity (i.e., number of significant figures) have an effect on the production of NumApps among intermediate L2, advanced L2, and native speakers of Spanish (i.e., according to proficiency), and to what extent do L2 learners resemble native Spanish speakers in their production of NumApps?

    1a. Are there differences in the frequency in which NumApps are produced in comparison to other lexical and prosodic devices?

    1b. Are there differences in the range (i.e., variety) and frequency of NumApps produced?

1c. Does the expression of numeric uncertainty vary in terms of the number of lexical or prosodic devices produced (e.g., a single device vs. multiple devices)?

1d. Can we provide an in-depth depiction of the most representative devices employed by the L2 learners to express numeric uncertainty in Spanish?

2. English to Spanish when they express numeric uncertainty?

3. Does the interpretation of NumApps vary according to the magnitude of the quantity among the three groups, and to what extent do the L2 Spanish learners resemble the native Spanish speakers?

The study took an interlanguage pragmatics (ILP) approach to examine numeric uncertainty in L2 Spanish, and combined Pragmatics theory and theories of SLA to investigate the use and interpretation of NumApps. The study also addressed the acquisition of NumApps from a developmental perspective, using a cross-sectional design to determine the stages in which Int L2 and Adv L2 learners acquired the pragmalinguistic knowledge needed to communicate in contexts involving numeric uncertainty.

Chapter 6 discusses the study's findings with regard to:

- The evidence in which the type of task (i.e., controlled vs. spontaneous) conditioned the expression of numeric uncertainty (i.e., task effect),
- The stages in the acquisition of lexical and pragmatic knowledge and the development of pragmatic sensitivity towards the constraint of quantity magnitude,

- L1 transfer at the lexical level (i.e., the use of lexical items in Spanish that are characteristic of English) and the pragmatic level (e.g., the use of prosodic features in Spanish that are commonly employed in English) and,
- The importance of incorporating L2 pragmatics in the classroom, as well as the pedagogical approaches that could be effective in the teaching of VL, specifically with regard to numeric approximation.

To begin, several studies have noted that the constraints on a study task (e.g., explicit vs. implicit) can lead to measurable differences in the participants' performance across a variety of modalities such as oral production, writing, and processing (e.g., Cieślicka, Heredia, & García, 2017; Gablasova, Brezina, Mcenery, & Boyd, 2015; Schwartz, Sap, Konstas, Zilles, Choi, & Smith, 2017). The present study revealed that there were task effects (i.e., the effect that the constraints of the tasks have on the outcome) with regard to the oral production of NumApps in Spanish. For instance, while the prompted production task uncovered that the Int L2 and Adv L2 are able to produce NumApps, the study found that this protocol was not successful at measuring the participants' sensitivity to the changes in the magnitude of the quantity.

In the quantitative results chapter, Chapter 4, I noted that the participants did not exhibit changes in their behavior while approximating small and large quantities. For instance, the three participant groups tended to rely on the use of single NumApps (e.g., *como $40* 'like $40', *más o menos $70* 'more or less $70') regardless of the magnitude of the quantity. In contrast, during the Spanish interview, all three groups produced multiple devices with large quantities (e.g., *pienso que como $4,000* '(I) think like $4,000', *como unos $10,000* 'like some $10,000'). Based on this observation, it would be possible to

suggest that the lack of sensitivity towards the pragmatic constraint of quantity magnitude during the prompted production task may be due to the fact that this protocol used a controlled setting. In this controlled setting, the participants did not experience authentic uncertainty, which, according to Wallsten, Budescu, and Erev (1988), arises when the evidence is sparse, vague, or imprecise. The Spanish interview, on the other hand, elicited the spontaneous recollection of quantities, which generated authentic uncertainty among the participants.

To substantiate these findings, I point to several studies on L2 pragmatics. For instance, Kasper and Dahl (1991) noted that, in pragmatics research, there is variability induced by different instruments of data collection. Furthermore, Beebe and Cummings (1985) posited that instruments that elicit naturally occurring pragmatic behavior tend to yield data that reflect more hedging, more repetition, and more elaboration in comparison to instruments that elicit controlled speech. Hence, the aforementioned research supports the findings from the present study. Therefore, I maintain that since the prompted production task did not provide a context in which the participants retrieved information from their memory (i.e., they only supplied lexical items), the task setting may have conditioned the participants' responses.

The study also uncovered another difference between the Spanish interview and the prompted production task. The findings discussed in Chapter 4 explained that the expression of NumApps was more pervasive in the prompted production task than in the Spanish interview. The difference in the amount of NumApps produced between the tasks could be related to the protocol settings. For instance, the prompted production task used a controlled setting in which the participants were asked to complete sentences

orally by supplying lexical items that conveyed uncertainty. In contrast, the Spanish interview generated spontaneous responses to questions that required the participants to retrieve quantities from their memory. Also, this protocol had an open setting in which the participants were not constrained by a prompt. Thus, the Spanish interview protocol generated data that included a wide variety of responses.

The difference in the outcome based on the type of task (i.e., controlled vs. spontaneous) has also been substantiated by Geeslin and Gudmestad (2008) and by Steel, Rose, Eadie, and Thornton (2013), who have found that controlled elicitation tasks tend to increase the opportunities for the production of a particular construction. Also, this finding is in line with Rebuschat and Mackey (2012) and Thornton (1996), who noted that elicited production protocols set up a context using prompts that create a felicitous condition for the production of the target structure. With this in mind, it is plausible to attribute the higher amount of NumApps in the prompted production task (in comparison to the Spanish interview) to the difference between a controlled elicitation and a spontaneous elicitation protocol.

As it was previously mentioned, the prompted production task contributed relevant data which revealed that both the Int L2 and Adv L2 are able to employ NumApps to express numeric uncertainty. However, this protocol could not be used to examine the participants' sensitivity to the pragmatic constraint of quantity magnitude. It is important to emphasize that the present study aimed to examine the effect of both Spanish proficiency level and the magnitude of the quantity in the expression of numeric uncertainty. Therefore, the prompted production task could not be employed to discuss the findings related to the developmental stages of pragmatic competence regarding the

magnitude of the quantity. For this reason, this chapter will discuss the oral production findings based solely on the data obtained from the Spanish interview.

Another point I discuss is the process of acquisition of lexical and pragmatic knowledge in the interlanguage of Spanish L2 learners. Therefore, in the following section, I will attend to the developmental stages in relation to the following aspects:

- The use of NumApps (e.g., *como* 'like', *cerca de* 'close to'),
- the use of other lexical and prosodic devices (i.e., parenthetical verbs, adverbs of doubt, numeric ranges, and up-stepping),
- the effect that the pragmatic constraint of quantity magnitude (i.e., small and large quantities) had in the expression numeric uncertainty in Spanish and,
- the sensitivity in the interpretation of numeric approximations involving small and large quantities.

The oral production data revealed that the level of Spanish proficiency was a significant predictor in the expression of NumApps. Namely, the two L2 learner groups (i.e., Int L2 and Adv L2) exhibited a significant reliance in the use of lexical and prosodic devices other than NumApps (e.g., parenthetical verbs, adverbs of doubt, numeric ranges, and up-stepping). In particular, the Int L2 learners were found more likely to use these forms than the Adv L2. Therefore, the study uncovered a progression in which we found that the higher the proficiency, the more likely the participants were to produce NumApps to express numeric uncertainty.

The relationship between Spanish proficiency and the use of NumApps is supported by previous research that has suggested that low-proficiency L2 learners tend to exhibit limitations in their linguistic knowledge (e.g., grammatical and lexical), which

has implications in their pragmatic performance (e.g., Andersen, 1984, 1990; Bardovi-Harlig, 1999, 2013; Blum- Kulka & Levenston, 1987; Cohen & Olshtain, 1993; Eisenstein & Bodman, 1986; Koike, 1989, 1996; Takahashi & Beebe, 1987; Trosborg, 1987). For instance, several scholars have observed that low-proficiency L2 learners tend to be more explicit, to use simpler means of expression, and to rely more on semantically transparent language in oral interactions than higher-proficiency L2 speakers (e.g., Faerch & Kasper, 1989; Félix-Brasdefer, 2007; Han & Burgucu-Tazegül, 2016; Koike, 1989; Nguyen, 2008; Scarcella, 1979).

As noted by Channell (1994), NumApps can pose a challenge to lower proficiency L2 learners because they require both semantic knowledge and a high degree of pragmatic competence in order to use them correctly. Therefore, it is plausible to suggest that parenthetical verbs (e.g., *pienso que $40* '(I) think $40'), adverbs of doubt (e.g., *probablemente $90* 'probably $90'), and numeric ranges (e.g., *de $20 a $30* 'from $20 to $30') were more pervasive than NumApps among the Int L2 because these devices are semantically more explicit than NumApps and require less pragmatic knowledge. Furthermore, Trosborg (1987) suggested that higher linguistic proficiency seems to go in tandem with increased use of lexical items that carry significant pragmatic weight. For instance, Channell (1994) noted that there are pragmatic considerations that are relevant to the use and interpretation of NumApps (e.g., the purpose of the approximation, the nature of the item, and the magnitude of the approximated quantity). That is, NumApps seem to be less semantically transparent than other lexical devices (e.g., parenthetical verbs, adverbs of doubt, and numeric ranges) since there are several pragmatic factors that constrain the use of NumApps. Based on this observation, I propose here that the

appropriate use of NumApps requires a high degree of pragmatic competence that the Int L2 learners are still in the process of acquiring.

The present study also investigated the pragmatic constraint of quantity magnitude (i.e., small magnitude and large magnitude). In particular, the study examined whether the magnitude of the number affected the expression of numeric uncertainty. As discussed in Chapters 4 and 5, there were three main findings related to the effect of quantity magnitude: First, the increased use of NumApps with large quantities. Second, the use of single and multiple devices based on the magnitude of the quantity. Third, the use of NumApp clusters. I will now discuss each of the findings.

As noted in Chapter 4, the Int L2 and Adv L2 did not increase their use of NumApps based on the magnitude of the quantity. Only the NSs increased their production of NumApps when discussing large quantities. Interestingly, this finding is not substantiated by previous research. Researchers have found that there is a positive correlation between the level of proficiency and pragmatic competence (e.g., Bardovi-Harlig & Bastos, 2011; Félix-Brasdefer, 2007; Han & Burgucu-Tazegül, 2016; Nguyen, 2008; Scarcella, 1979). For instance, Bardovi-Harlig and Bastos (2011) suggested that L2 proficiency plays an important role in pragmatics-related oral production (e.g., refusals, criticisms, and complaints) since it is implicated in a wide range of developmental patterns. Furthermore, Clark (1979) observed that proficiency in the L2 correlates to better access to linguistic strategies and more robust awareness of social and discourse appropriateness.

However, the results yielded by the present study suggest that, regardless of the proficiency level in the L2, the participants' use of NumApps did not change based on the magnitude of the quantity. In other words, they did not resemble the NSs. Therefore, this finding may be indicative of the fact that the two L2 learner groups in this particular study are still developing pragmatic sensitivity with regard to the constraint of quantity magnitude in contexts involving numeric uncertainty.

With regard to the use of single and multiple devices, Chapter 4 revealed that the magnitude of the quantity conditioned the number of devices employed by the participants (e.g., a single device vs. a cluster of devices). As mentioned earlier, the study showed that the L2 learner groups did not resemble the NSs because they did not increase their use of NumApps with large quantities. However, when focusing the analysis on the use of single vs. multiple devices, the findings reported that the three groups behaved similarly. That is, they shared a pragmatic need to only employ single devices with small quantities. Also, the three groups resembled each other in that they only employed multiple devices with large quantities. Said differently, I suggest here that the use of multiple devices in the responses represents a pragmatic strategy that modulates the degree of certainty regarding the truth value of a proposition, and I underscore that this strategy was employed by the three groups. This finding is also supported by Blakemore (2008, p. 1), who stated that "the apposition of two (or more) segments with similar, but not identical, interpretations […] can be used to communicate an impression of emphasis or intensification which can be compared with the effects achieved by repetitions". Thus, I maintain that the use of multiple devices in the present study represents a pragmatic strategy that signaled a high degree of uncertainty. For that reason, large quantities,

which tend to generate a higher degree of uncertainty in comparison to small quantities, were expressed with multiple devices.

Although the three groups resembled each other in that they produced single devices with small quantities and multiple devices with large quantities, a fine-grained qualitative analysis (reported in Chapter 5) revealed important differences with regard to lexical and prosodic devices employed by the participants. That is, each group favored a different category of devices. For instance, when discussing small quantities, the following preferences were uncovered:

- The Int L2 were found to use devices *other* than NumApps (e.g., *pienso que $40* '(I) think $40'),
- the Adv L2 produced NumApps and other lexical and prosodic devices (e.g., *como $70* 'like $70', *creo que* $20 '(I) believe that $20') and,
- the NSs favored the use of NumApps (e.g., *como $60* 'like $60').

In contrast, when discussing large quantities (e.g., $40,000), the participants behaved in the following manner:

- The Int L2 produced clusters of devices other than NumApps (e.g., *pienso que probablemente $8,000* '(I) think probably $8,000'),
- The Adv L2 produced NumApps that co-occurred with another lexical or prosodic device (e.g., *probablemente como $5,000* 'probably like $5,000') and,
- The NSs produced clusters of NumApps (e.g., *como unos $3,000* 'like some $3,000').

Concerning the use of NumApp clusters, the finding aligns with Channell (1994), who noted that NumApps could be used in clusters with the purpose of increasing the level of uncertainty that is being conveyed. However, NumApp clusters were coupled with the expression of large quantities only among the NSs, which suggests that this pragmatic strategy has not been acquired yet by either of the L2 groups. In addition, and according to Blakemore (2008), the apposition of segments with close meaning allows speakers to communicate, in the best possible way, their own thoughts. . In addition, and according to Blakemore (2008), the apposition of segments with close meaning allows speakers to communicate, in the best possible way, their own thoughts. Interestingly, the Int L2 and Adv L2 did not produce NumApp clusters in their native language (i.e., English). Thus, the findings from this current study seem to suggest that the L2 learner groups are still in the process of developing the pragmatic competence necessary to modulate the degree of uncertainty in Spanish as they have not yet acquired NumApp clusters.

Another finding that addresses the stages of acquisition of NumApps is related to the range of NumApps produced and the lexical items that were favored. The study documented that the Int L2 exhibited a strong preference to express the defective NumApp *cerca de*, a finding that was also attested in the initial study described in Chapter 2. Recall that defective NumApps are those that activate negative inferences and signal values that are below the exemplar number (e.g., *cerca de* 'close to', *casi* 'almost', *prácticamente* 'practically'). Based on this finding, I propose that the pervasive use of *cerca de* in the interlanguage of the Int L2 is due to developing knowledge of the meaning of this lexical item.

The aforementioned finding may be explained using Jiang's (2000) model of vocabulary acquisition in an L2 context. In this model, Jiang (2000) proposes three stages in which lexical representation and development occur. The first stage is when a lexical entry with formal specifications is established. The second stage is the *first language (L1) lemma mediation stage*, in which the lemma information of the L1 counterpart is copied into the L2 lexical entry and mediates L2 word use. The third stage is the *L2 integration stage*, which refers to the semantic, syntactic, and morphological specifications and how they are integrated into the lexical entry. Therefore, and following Jiang (2000), I may put forward that, for the Int L2, the specifications of the semantic meaning of *cerca de* have not yet been fully integrated into the lexical entry. That is, the Int L2 may have integrated the specifications of the meaning of *cerca de* differently, as a neutral approximator instead of as a defective approximator. This proposal is substantiated by the initial study I conducted, which revealed that the Int L2 interpreted the meaning of *cerca de* as signaling values that are both below and above the exemplar number. The incomplete integration of specifications, as explained by Jiang (2000, p. 47), is part of the "practical constraints imposed on L2 learning" and is associated to the lexical development of L2 learners.

Unlike the Int L2, who favored the use of *cerca de*, the Adv L2 resembled the NSs in that they both favored the neutral NumApp *como* 'like'. In other words, I noted a progression in which a high level of L2 proficiency resembled a native-like use of NumApps in Spanish. In addition, the favoring of *como* was consistent with both small and large quantities among the Adv L2 and NSs, which may be suggestive of the fact that the magnitude of the quantity does not influence the selection of NumApps.

The last aspect of pragmatic development that I would like to address is related to the interpretation of NumApps and the participants' sensitivity to the pragmatic constraint of quantity magnitude. In the quantitative analysis described in Chapter 4, the study examined the preference for NumApps based on the magnitude of the quantity. Specifically, the study investigated whether the participants preferred NumApps with semantic boundaries such as *casi* 'almost' and *y pico* '-ish' with small quantities and whether they preferred a NumApp with no specific boundary such as *como* 'like' with large quantities. In other words, I examined whether the interpretation of approximated quantities was more precise with small quantities and less precise with large quantities.

The rationale behind the examination of the interpretation of approximated quantities according to their magnitude is based on Channell (1980, 1994), who posited that changes in the number of significant figures in a quantity might influence how individuals interpret numeric approximations. The present study revealed that there was an overall tendency across groups to prefer the NumApps *casi* 'almost' and *y pico* '-ish' (i.e., the NumApps that set specific boundaries) with small quantities (e.g., $20, $40, $60). With regard to large quantities, the Int L2 and Adv L2 groups also preferred *casi* and *y pico.* In contrast, the NSs favored *como* 'like' (i.e., the NumApp that does not set specific boundaries) when they were presented with large quantities (e.g., $2,000, $4,000, $6,000). This observation suggests that only the NSs were pragmatically sensitive to the magnitude of the quantity. Channell (1994) noted that approximations of numbers with four significant figures (e.g., $2,000, $6,000) activate intervals of possible interpretations that are wider than those for numbers with only two significant figures (e.g., $20, $60). Therefore, this behavior somewhat aligns with Channell (1994), but only when speaking

of the NSs. Hence, it seems that the interlanguage of the Int L2 and Adv L2 is still developing the pragmatic sensitivity needed to be able to interpret the meaning of approximated quantities based on their magnitude.

In addition to examining the stages in which Int L2 and Adv L2 developed the pragmalinguistic knowledge needed to express and interpret numeric uncertainty in Spanish, the study also addressed cross-linguistic influence, specifically regarding L1 transfer. L1 transfer is a central process of L2 acquisition, and it is defined as "the influence resulting from similarities and differences between the target language and any other language that has been previously (and perhaps imperfectly) acquired" (Odlin, 1989, p. 27).

Earlier in Chapter 6, I explained that the L2 learner groups tended to produce more lexical and prosodic devices other than NumApps (i.e., parenthetical verbs, adverbs of doubt, numeric ranges, and up-stepping) in comparison to the NSs. In several contexts, I found that the expressions of these devices instead of NumApps could be attributed to transfer from the learners' L1. Thus, I will now address this phenomenon at the lexical and pragmatic level.

To recapitulate and in order to investigate transfer, the study also examined the L2 learners' expression of numeric uncertainty in English (i.e., their L1), and these data were analyzed qualitatively and reported in Chapter 5. The data showed that the devices the two L2 learner groups employed to expressed uncertainty in English were mapped into Spanish in several instances (e.g., the use of parenthetical verbs, adverbs of doubt, numeric ranges, and up-stepping). However, it is important to note that L1 transfer was more pervasive among the Int L2 than the Adv L2. This finding is also in line with

Takahashi (1996), who found that lower-proficiency L2 learners are more susceptible to transferring pragmatic action than higher-proficiency L2 speakers.

Interestingly, although parenthetical verbs, adverbs of doubt, and numeric ranges are lexical devices commonly employed in English to convey numeric uncertainty, as noted earlier, they also have more transparent meanings than NumApps. Thus, there is a possibility that transfer could have been further motivated by the Int L2 learners' need to produce lexical items that did not demand a high degree of pragmatic knowledge. This finding is also supported by Faerch and Kasper (1989) who noted that, in oral production, lower-proficiency L2 speakers tend to communicate using "explicit, transparent, unambiguous means of expression" (p. 233).

Thus, in the following paragraphs, I will discuss the use of the lexical and prosodic devices other than NumApps, a behavior that was attested in the learners L1 and L2.

As mentioned earlier, the Int L2 and Adv L2 used parenthetical verbs to convey numeric uncertainty. The two most frequent parenthetical verbs were *pensar* 'to think' and *creer* 'to believe'[9], which, as noted by Haverkate (1994), lessen the degree of commitment to the truth value of a proposition. Interestingly, the parenthetical verb *to think* was found in the English responses of the Int L2 and Adv L2, but only the Int L2 employed *pensar* 'to think' in Spanish. In contrast, the Adv L2 used *creer* 'to believe'. In other words, the Int L2 used the same parenthetical verb regardless of the language (i.e., English or Spanish), but the Adv L2 exhibited a lexical preference depending on the

[9] When I discuss the use of the verbs *creer* and *pensar* in this study, I am also referring to instances in which *que* was issued by the participants (i.e., *pensar que* and *creer que*). For example, the participants produced both *creo que $80* and *$50, creo*, in several instances.

language (i.e., *to think* in English and *creer* ‘to believe’ in Spanish). That is, the Adv L2 seem to have acquired the difference between *pensar* and *creer*.

The use of *pensar* and *to think* characterized the responses provided by the Int L2. The verbs were employed as epistemic verbs that lessened the degree of commitment to the content of an utterance. The speakers used *pensar* and *to think* to signal that the information they were providing was not necessarily a fact, but that it was merely an opinion. This finding aligns with Hennemann (2012) and Cappelli (2007), who noted that both *pensar* and the English counterpart *to think* can be used to reduce the degree of commitment to a proposition. Furthermore, Hennemann (2012, p. 159) noted that these verbs have a “very general meaning, roughly equivalent to ‘cognize’ which, according to the context, is construed as a judgment over available evidence or as a personal opinion”.

It is important to note that the Spanish NSs did not use *pensar* to express numeric uncertainty. Rather, they tended to employ NumApps (e.g., *como* ‘like’) or, in some instances, the parenthetical verb *creer* ‘to believe’. Therefore, while we may consider that there is no grammatical or semantic violation with regard to the use of *pensar* in the context of numeric uncertainty, the Int L2 exhibited behavior that was not consistent with the baseline comparison group (i.e., NSs). Thus, this behavior may suggest that the Int L2 relied on a lexical item that is only commonly employed in their L1 to convey numeric uncertainty.

The use of parenthetical verbs among the Adv L2 could also be considered L1 transfer. However, I make this claim with a note of caution since although the Adv L2 exhibited a pervasive use of parenthetical verbs in Spanish, this group favored a different verb based on the language. For example, as opposed to the Int L2, who used the same

parenthetical verb in Spanish and English (i.e., *pensar* and *to think*), the Adv L2 opted for a different verb and used *creer* 'to believe'. In other words, the Adv L2 learners were able to distinguish the meaning of *pensar* and *creer* and employ them according to the language they were using.

We should note that *pensar* and *creer* are epistemic verbs, but each verb has different specifications integrated into their meaning. For instance, the first involves a judgment based on available evidence or personal opinion. The latter seems to lexicalize a high degree of commitment by involving the affective evidence experienced by the evaluator. Affective predicates, as noted by Potts and Schwarz (2010), convey information about the experiencer's attitudes and emotions and have, as well, close association with evaluative predication. In this vein, Hennemann (2012) has suggested that *creer* points towards the epistemic domain by involving affection (i.e., attitudes and emotions) and evidentiality (i.e., the nature of evidence). For instance, Hennemann (2012) suggested that *creer* 'to believe' encodes an affective dimension and posits that, when using the verb *creer*, "the speaker signals that he/she is ready to support his/her assertion with the strength of his/her subjective, affective commitment" (p. 157). In other words, *creer* signals that the evaluator is not certain but fairly committed to the content of the proposition.

With the aforementioned explanations in mind, I posit that, given that the questions that were asked during the interviews were related to the participants' lives and daily experiences, the expression of numeric uncertainty in Spanish involves an epistemic, affective, and evidential domain. In fact, the use of *creer* to express numeric uncertainty in Spanish has been also documented by González Rodríguez (2008). Also,

recall that in the instances in which the NSs did not express numeric uncertainty using a NumApp, they employed the verb *creer* and not *pensar*. Therefore, even though the pervasive use of parenthetical verb *creer* among the Adv L2 may signal an influence from their L1, this group showed an ability to distinguish the meaning of each verb and to produce responses that resembled those of the NSs.

With the purpose of expanding the discussion about the use of *pensar* and *creer* in Spanish, I would like to propose that, in addition to representing evidence of L1 transfer, these data are relevant to further address the process of lexical development in the L2. For instance, it would be possible to suggest that the Int L2 transferred *pensar* from English and that the use of this form in Spanish was overgeneralized (Bardovi-Harlig, 2009). Following Andersen (1984), it could be suggested that the Int L2 relied on the *one-to-one principle*, in which *one form* is assigned to *one function.* Thus, *pensar* may be the only device the Int L2 group has acquired to express general uncertainty and they have not learned that *pensar* is not the preferred form to express numeric uncertainty in Spanish. In other words, the Int L2 still need to learn that the parenthetical verb *creer* could convey a more pragmatically appropriate meaning than *pensar*.

The qualitative analysis also revealed that, with regard to the Adv L2 learners, it was noted that this group was able to adapt their lexical preference based on the language (i.e., *to think* in English and *creer* in Spanish). With this in mind, it could be suggested that this group has reached what Anderson (1990) has referred to as the *multifunctionality stage* in the interlanguage (i.e., the use of *multiple forms* for *one function*). Thus, although the Adv L2 exhibited an English-like behavior when employing parenthetical verbs, this group seems to have developed both linguistic and pragmatic knowledge to

differentiate between two forms (i.e., *to think* and *creer*) when they express numeric uncertainty.

The English data also uncovered the use of adverbs of doubt among the Int L2 and Adv L2, specifically the adverb *probably* (e.g., probably $40). However, only the Int L2 employed adverbs of doubt in Spanish. The most common adverb in English was *probably*, and the most common adverb in Spanish was *probablemente* 'probably'. *Probably* and *probablemente* are cognates, and share similar semantic values, which might also have facilitated the use of the adverb in Spanish. As suggested by Arabski (1979) and Ringbom (1992), cognates have been found to play a significant role at the early stages in the development of the interlanguage since they simplify production tasks by activating formally similar equivalents in the L1.

Regarding the semantic equivalence of *probablemente* and *probably*, Hennemann (2012) posited that both lexical items express likelihood (of a state of affairs) and uncertainty. In fact, the use of *probablemente* in the specific context of money-related uncertainty in Spanish would not represent an ungrammatical construction. However, the use of this adverb does not resemble the responses provided by the baseline comparison group, who produced NumApps instead. Therefore, this behavior may suggest that the Int L2 might have transferred a lexical item that is commonly employed in their L1 to express numeric uncertainty in Spanish.

The last point regarding lexical transfer uncovered by this study involves the use of lexical items that signal a range of numbers or quantities (e.g., *entre $50 y $60* 'between $50 and $60'). The use of numeric ranges was pervasive in English among the two L2 groups (i.e., Int L2 and Adv L2). However, only the Int L2 produced numeric

ranges frequently in Spanish. This finding aligns with previous research that has observed that, in English, constructions such as *between x and y* (e.g., between $50 and $60) and *m or n* (e.g., $20 or $30) are a category of hedged numerical expressions employed to express numeric approximation (e.g., Channel, 1994; Drave, 2002; Ferson, O'Rawe, Antonenko, Siegrist, Mickley, Luhmann, Sentz, & Finkel, 2015; Yu, 2005).

Similarly to the observation made with the use of parenthetical verbs and adverbs of doubt in Spanish, employing numeric ranges to convey numeric uncertainty does not represent a grammatical violation. However, researchers such as Camacho (2011) and Kern (2012) have suggested that, in Spanish, the expression of numeric uncertainty is commonly performed using approximators (e.g., *como* 'like'). This observation is also supported by the data gathered in the initial study described in Chapter 2. For example, in both studies, the baseline comparison groups of Spanish NSs were found to rely on the use of NumApps to express numeric uncertainty, but, the numeric ranges were not representative of the NSs. With this in mind, this finding also suggests that the pervasive use of numeric ranges among the Int L2 may not be related to the input the L2 learners have received in Spanish, but rather to how they express uncertainty in their L1.

In addition to transferring lexical items from the L1, the Int L2 also exhibited transfer at the pragmatic and prosodic level. In Spanish, only the Int L2 used prosody (i.e., up-stepping) to convey numeric uncertainty. Up-stepping refers to a prosodic strategy commonly employed in English in which speakers raise their pitch (i.e., using a question intonation) in order to signal uncertainty (e.g., Ward & Hirschberg, 1985; Yang & Esposito, 2000). Moreover, several scholars have suggested that certain prosodic features, such as unit-final pitch movements, can be used to identify the speakers' degree

of correctness, definiteness, and certainty regarding the message they are conveying (e.g., Brennan & Williams, 1995; Gumperz, 1993; Samkovska, 2013). Interestingly, both the Int L2 and Adv L2 used up-stepping as an indicator of numeric uncertainty in English. However, in Spanish, only the Int L2 employed this prosodic strategy. Furthermore, the NSs did not make use of up-stepping to express numeric uncertainty.

To better explain the use of up-stepping in the present study, I point to previous research addressing the pragmatic effect of prosody in Spanish. In Spanish, prosodic changes have often been associated with the softening of propositional content (e.g., Cabedo Nebot, 2016; Hidalgo Navarro, 2009). However, according to Cabedo Nebot (2016), most of the studies addressing changes in prosody for pragmatic reasons have identified *politeness* (e.g., the fear of losing face) as the main motivation. Only a few studies, such as Estellés and Albelda (2014) and Cabedo Nebot (2016), have discussed prosody as a marker of evidentiality (i.e., the indication of the nature of evidence). In addition, to my knowledge, there are no studies that indicate that numeric uncertainty is expressed in Spanish only using prosody. As it was noted earlier, the NSs in both the initial study described in Chapter 2 and the present study did not rely on the use of prosodic cues to express uncertainty; instead, they marked numeric uncertainty lexically. Thus, I propose here that the use of up-stepping in Spanish among the Int L2 may be suggestive of a case of pragmatic transfer, a behavior that involved the use of a prosodic cue that is typically employed in the L1 to convey uncertainty in the L2. To support this finding, I refer to Rasier and Hiligsmann (2007) and Ramírez Verdugo (2005), who have suggested that L2 learners are susceptible to transferring prosodic cues from their L1,

which can lead to pragmatic differences that might affect the expression of certainty and uncertainty in the L2.

The last aspect I discuss in this chapter is the role of L2 pragmatics instruction in the acquisition of NumApps. As explained in the Review of the Literature (Chapter 2), the significant differences in the performance of L2 learners and NSs can be generally attributed to the absence of classroom instruction related to how vague language (VL) is expressed. With this in mind, I would like to discuss the findings from this study in terms of their pedagogical implications. More specifically, I will discuss the role of authentic language exposure, alternatives for including the use of VL in the classroom, and the role of explicit instruction in the development of pragmatic competence in the L2.

Previous research on VL categories such as hedges (e.g., sort of, kind of) and general extenders (e.g., and stuff, and something) has reported differences in the pragmatic behavior of L2 learners, especially with regard to the range and frequency of vague words employed by L2 in comparison to native speakers (e.g., Cheng & Warren, 1999; De Cock et al., 1998; Holmlander, 2011; Metsä-Ketelä, 2006; Nikula, 1997; Ruzaite, 2004; Sabet & Zhang, 2015; Yu, 2009). Such differences have been attributed to factors related to the limited exposure L2 learners have to naturally-occurring language. Previous research has also attributed the differences between L2 learners and NSs due to the lack of explicit instruction on VL in the classrooms and textbooks (Channell, 1994; Cutting, 2007; De Cock et al., 1998). In addition, Channel (1994) has posited that approximators might pose a challenge to L2 learners since these lexical items lie at a complex intersection between semantics and pragmatics.

Taguchi (2015) noted that L2 learners are challenged in learning pragmatics because it involves more than just focus-on-form(s). Also, Kasper (1997) and Taguchi (2011a) raised the question of whether pragmatic competence could be actually taught, and whether a traditional approach would be efficient to teach pragmatics effectively. For example, Cohen and Ishihara (2013) suggested that pragmatic competence can be taught. However, Cohen and Ishihara (2013) also posited that there is a need to enrich instruction with several components, such as raising learners' awareness of both pragmalinguistic forms and sociocultural norms, creating activities in which the learners' are expected to produce pragmatically-focused output, providing learners with opportunities to reflect on their metapragmatic knowledge and reflect on cross-cultural differences, as well as guiding language learners so that they can discover pragmatic rules.

Félix-Brasdefer (2008, p. 479) noted the issue related to the effect of the type of instruction in the acquisition of pragmatic competence and posited that "research on pragmatics in instructed language-learning has examined the issue of whether pragmatic development may be facilitated by means of implicit or explicit instruction". In fact, the importance and effectiveness of explicit instruction has been addressed by Cohen (2008, p. 2013), who argued that "pragmatic performance benefits from explicit instruction – learners do not just get it through osmosis".

Several scholars have found that providing explicit instruction (e.g., metapragmatic instruction and focus on forms) in addition to exposure, significantly improves L2 learners' pragmatic competence (e.g., Aufa, 2011; Bardovi-Harlig, 2001; Cohen, 2008, 2012; Cohen & Ishihara; 2013; Ellis & Shintani, 2014; Félix-Brasdefer, 2008; Koike & Pearson, 2005; Rose & Kasper 2001; Taguchi & Roever, 2017; Wishnoff, 2000; Xiao-Le,

2011). For instance, Bardovi-Harlig (1996), Ishihara (2009), and Tanaka (1997) discussed the positive instructional impact that raising pragmatic awareness explicitly has on the development of pragmatic competence. This explicit awareness-raising approach, as noted by the aforementioned authors, can enrich learners' pragmatic knowledge when it is combined with exposure to appropriate language use, natural language samples, empirically established pragmatic information to the classroom, and activities in which learners make their own observations and comparisons regarding pragmatic-related behavior in the L1 and L2.

The effects of explicit L2 pragmatics instruction have also been investigated with regard to the mitigating speech employed in refusals or requests (e.g., Félix-Brasdefer, 2008; Xiao-le, 2011), and, overall, the findings suggest that explicit instruction increases the learners' appropriate level of formality, directness, and politeness. Mitigated speech and the expression of uncertainty are similar in that both involve epistemic modality. Epistemic modality, according to Coates (1987) and Lyons (1977), is a linguistic modality in which the speaker qualifies his or her degree of commitment and confidence with regard to the truth value of a proposition. Therefore, given that explicit instruction has been found to increase L2 pragmatic competence in areas that involve epistemic modality, and the expression of numeric uncertainty has an epistemic component, it is plausible that L2 learners could also benefit from receiving explicit instruction regarding the use of NumApps in Spanish.

Research on L2 pragmatics instruction has also investigated the effect of the quantity and the quality of the input in the classroom. According to Bardovi-Harlig (1996), the classroom setting should expose learners to appropriate and sufficient

pragmatics input, and, as noted by Shea (1994, p. 378), "the quality of conversational participation can be seen as a critical locus for the development of second language proficiency". In other words, instructional arrangements are needed in order to ensure that L2 learners are exposed to and participate in authentic communicative interactions that maximize the learning opportunities of pragmatic content in the target language.

An alternative for integrating VL and numeric approximation in meaningful classroom interactions is by creating activities in which the students' experience authentic uncertainty. For instance, the Spanish interview protocol used in the present study can serve as a pedagogical tool to address the expression of uncertainty regarding money. The questions asked in the interview involve situations that are relevant to the learners' daily life, and therefore, represent a context that is meaningful for learning how to communicate when uncertainty is experienced.

In addition, several scholars have made available pedagogical resources (e.g., books, teaching units, practical examples, and instructional websites) to assist instructors in the incorporation of pragmatics in the classrooms. For instance, those materials address the strategies involved when performing requests, complaints, and apologies, and include, as well, resources for identifying the grammatical features that are needed when performing pragmatic acts (e.g., Bardovi-Harlig & Mahan-Taylor, 2003; Cohen, 2008, 2012, 2017; Félix-Brasdefer, 2018; Félix-Brasdefer & Cohen, 2012; Ishihara & Cohen, 2010; Houck & Tatsuki, 2011; Sykes & Cohen, 2008). These pedagogical resources can be used in relation to the teaching of VL and approximators.

As noted by Taguchi (2015, p. 2), the instructional material involving strategies for learning and performing pragmatics, such as the abovementioned, "provide a context

for pragmatics teaching by illustrating how we can incorporate key elements of pragmatics – social context, functional language use, and norms of interaction – into classroom activities and tasks". In other words, resources exist that can offer useful suggestions to increase language instructors' understanding of pragmatics, provide practical examples of how to teach pragmatics, and promote teacher and student reflections with the purpose of assisting learners in the development of pragmatic competence. Furthermore, with regard to the instruction of VL, the aforementioned sources can be applied to the creation of explicit instructional approaches for addressing numeric approximation in the classroom.

To summarize, this chapter discussed the most relevant findings yielded by the quantitative and qualitative analyses regarding the effect that Spanish proficiency has in the production and interpretation of small and large uncertain quantities. The discussion addressed four main areas: Task effect, development of pragmatic competence, L1 transfer, and the role that language instruction plays in the acquisition of pragmatic competence.

In the next chapter, I will conclude the dissertation by addressing its limitations and proposing several ideas for future research.

Chapter 7

Conclusion

The present study documented the expression and interpretation of numeric uncertainty in Spanish by examining the interlanguage of Int L2 and Adv L2 learners of Spanish and a baseline comparison group of NSs. The purpose of the study was to investigate the acquisition of NumApps, as well as the development of pragmalinguistic knowledge regarding the approximation of quantities with small and large magnitudes.

The findings documented in the study point to a progression in which higher level of L2 proficiency correlates with more frequent use of NumApps. Also, the study uncovered that the lower-proficiency L2 learners were more vulnerable to L1 transfer than their advanced counterparts. Furthermore, the findings revealed that both the Int L2 and Adv L2 are still in the process of developing pragmatic sensitivity with regard to the use of NumApps since the two groups were not sensitive to changes in the magnitude of the quantity (i.e., small and large quantities). Based on the findings, it can be suggested that in the context of numeric approximation, L2 lexical acquisition occurs prior to the development of pragmatic knowledge. In addition, given that L1 lexical transfer was more pervasive among the Int L2 than the Adv L2, these findings suggest that the integration of lexicon in the L2 seems to be mediated by the L1 at an early stage of L2 acquisition. While these findings provided a robust depiction of the development of interlanguage pragmatics in the specific case of numeric approximation, the study has limitations which I address here. In this chapter, I also provide suggestions for future research.

7.1 Limitations of the study

The first limitation is related to the constraints associated with the oral production tasks in Spanish employed in this investigation. Recall that the study used a controlled elicitation protocol (e.g., prompted production task) and a spontaneous elicitation protocol (i.e., Spanish interview), and the task's settings (i.e., controlled vs. spontaneous) affected how the participants approximated small and large quantities. That is, the prompted production task used a controlled and experimental setting in which the participants did not experience authentic uncertainty. Therefore, I was unable to attest to how they made the distinction between expressing numeric uncertainty with small and large quantities. Thus, the data obtained from the prompted production task could not be employed to discuss the L2 learners' development of pragmatic sensitivity towards the constraint of quantity magnitude. Following Cohen and Olshtain (1994, p. 148), it could be said that the prompted production task in the present study challenged the examination of pragmatic competence since the utterances produced in this type of elicitation task "may not truly reflect those used when having to speak relatively naturally".

The second limitation of the study is related to the data obtained from the language background questionnaire (i.e., LEAP-Q). The study gathered data regarding the amount of exposure the L2 learners had to Spanish inside and outside the classroom. However, the study did not investigate how much exposure the learners had specifically to Mexican Spanish, which the Spanish variety spoken by the comparison group. Thus, it is possible that the behavior of the comparison group of Mexican speakers reflected a dialect-specific production and interpretation of numeric approximation that did not reflect the input received by the L2 learners. To address this limitation, it would be

necessary to include questions regarding exposure to Mexican Spanish in the language background questionnaire or include more than one NS group. For instance, the questionnaire could include questions inquiring whether the participants had been exposed to Mexican Spanish with friends, language instructors, and community members. It is also important to consider that there is pragmatic variation within the Mexican dialect. In fact, Félix-Brasdefer (2006) noted that the pragmatic behavior of Mexican speakers might change depending on the regional variation they speak. Thus, it would be relevant to inquire about the participants' exposure to different varieties of Mexican Spanish and to determine whether those varieties have different forms of conveying numeric uncertainty.

The third limitation is related to the exposure the L2 learners had to other varieties of Spanish. As noted by the Pew Research Center (2011), in addition to Mexican Spanish, the Puerto Rican and Cuban varieties (i.e., Caribbean Spanish) are predominant in the areas surrounding the institution the L2 learners attend and in which the study was conducted. Since the present study did not have a comparison group that included speakers of Caribbean Spanish, the Spanish input the L2 learners have received could have been underrepresented in this study. This limitation points to the need to include a baseline comparison group that is representative of the Spanish varieties to which the L2 learners had been exposed to (i.e., Caribbean and Mexican Spanish). In addition, this limitation suggests the need to inquire about the amount of contact the participants may have to the two most predominant Spanish varieties to which they are exposed to.

7.2 Future research

Based on the findings of the current study, three directions for future research are proposed in this section: A further examination of the input the L2 learners receive in the language classroom, the inclusion of a broader range of L2 learners, and the investigation of the effect that explicit instruction has in the acquisition of NumApps.

The first point I would like to make is that researchers need to closely examine the input L2 learners receive from their instructors and textbooks. For example, future research should investigate the Spanish varieties spoken by the language instructors, as well as how numeric uncertainty is expressed in those varieties. Also, future research should investigate the role that textbooks and instructional materials have in the acquisition of NumApps. I discussed in Chapters 2 and 6 that several researchers have noted the absence of VL in the textbooks (Channell, 1994; Cutting, 2007; De Cock et al., 1998). Therefore, it would be necessary to investigate whether the Spanish textbooks used by the students address the use of NumApps and the expression of numeric uncertainty. By investigating how numeric uncertainty is conveyed by the language instructors and to what extent it is addressed in the textbooks, it would be possible to determine if the behavior of the L2 learners is being mediated by the input they receive in the classroom.

A second direction for future research involves expanding the range of L2 proficiency groups by including beginners. The present study only recruited L2 learners at the intermediate and advanced levels. Therefore, the limited range of proficiency levels restricted the conclusions that could be drawn with regard to the development of pragmatic competence. For example, both the initial study described in Chapter 2 and the

present dissertation study uncovered that L2 learners, at the intermediate level, have acquired NumApps. However, they use and understand NumApps differently than their advanced counterparts. Therefore, by adding a group of L2 beginners, it would be possible to unpack, in more detail, the developmental stages of the acquisition of NumApps. For example, Li (2012) noted that the majority of research in L2 pragmatics has focused on learners beyond the beginner level. Thus, examining the use and interpretation of NumApps among L2 learners at the beginner level could make a significant contribution to the field of L2 pragmatics since it would inform us about early pragmatic development.

A third direction for future research concerns teaching NumApps using explicit instruction. For instance, an instructional intervention, such as a pre-test and a post-test after an instructional period, could be employed to assess whether explicit instruction has a positive impact on the acquisition of NumApps. In fact, previous studies have used the *pretest, instruction, and posttest* sequence and have found significant improvement in L2 pragmatic performance (e.g., requests, suggestions, refusals), as well as in the development metapragmatic and metalinguistic awareness, and in the acquisition of suprasegmental features (e.g., prosody) (e.g., Alcon-Soler, 2007; Koike & Pearson, 2005; Félix-Brasdefer, 2008; Martínez-Flor & Alcón Soler, 2007; Missaglia, 1999; Safont Jordà, 2004; Sykes, 2009, 2011). Also, the incorporation of authentic materials and technology (e.g., recordings, videos, and instructional websites) have been shown to increase L2 learners' pragmatic awareness and to improve their performance (e.g., Bardovi-Harlig & Mahan-Taylor, 2003; Cohen, 2008, 2012, 2017; Félix-Brasdefer, 2018; Félix-Brasdefer & Cohen, 2012; Ishihara & Cohen, 2010; Houck & Tatsuki, 2011; Sykes

& Cohen, 2008). Therefore, by incorporating authentic materials and technology in the classroom instructors may provide their learners with meaningful exposure to how numeric approximation is expressed and interpreted in Spanish.

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Appendices

Appendix A: Oral interview in Spanish (experimental items only)

Questions that elicited the approximation of small quantities:

1. ¿Cuánto cuesta un almuerzo barato en el campus?
2. ¿Cuánto cuesta una pizza individual en tu pizzería favorita?
3. ¿Cuánto cuesta un boleto para el cine los fines de semana?
4. Si sales el fin de semana a cenar ¿cuánto gastas?
5. ¿Cuánto cuesta un platillo económico en tu restaurante favorito?
6. ¿Cuánto dinero gastan las personas en transporte por día?

Questions that elicited the approximation of large quantities:

1. ¿Cuánto cuesta tu renta con todo y los servicios cada semestre?
2. ¿Cuánto cuesta asistir a tu universidad al semestre?
3. ¿Cuánto gastas en comidas fuera de casa al año?
4. ¿Cuánto gastas en actividades para divertirte al año?
5. ¿Cuál ha sido el viaje más caro de tu vida? ¿Cuánto costó el viaje en total?
6. Y si un amigo o amiga tuya que nunca ha salido de esta ciudad te dijera que quiere visitar ese lugar y quedarse dos semanas ¿qué lugares debería visitar y cuánto dinero debería llevar?

Appendix B: Prompted production task (experimental items only)

Contexto: Hay un estudiante nuevo en tu universidad. Él está un poco confundido y tiene muchas preguntas sobre cosas relacionadas a la escuela. El chico nuevo te hace preguntas, pero tú no sabes la información exacta. Sin embargo, tú intentas ayudarlo y respondes sus preguntas.

Instrucciones: Ayuda al estudiante respondiendo a sus preguntas, pero hazle saber que tú no estás 100% seguro o segura de la información que le estás dando. Responde oralmente a cada pregunta del estudiante expresando incertidumbre o duda.

Questions that elicited the approximation of small quantities:

1.¿Cuánto cuesta un almuerzo en la cafetería?

Un almuerzo cuesta en la cafetería _____ $10 dólares.

2.¿Cuánto cuesta un permiso de estacionamiento?

Un permiso de estacionamiento cuesta _____$40 dólares.

3.¿Cuánto cuesta una membresía en el gimnasio por mes?

Una membresía en el gimnasio cuesta_____ $20 dólares.

4.¿Cuánto cuesta un libro de español en la librería del campus?

Un libro de español en la librería del campus cuesta _____ $50 dólares.

5.¿Cuánto cuesta un pase de autobús al semestre?

Un pase de autobús al semestre cuesta_____ $60 dólares.

6.¿Cuánto cuesta un diccionario inglés-español en la librería?

Un diccionario inglés-español cuesta _____ $30 dólares.

Questions that elicited the approximation of large quantities:

1. ¿Cuánto cuesta rentar un dormitorio por año?

   Rentar un dormitorio por año cuesta _____ $8,000 dólares.

2. ¿Cuánto cuesta estudiar un verano en España?

   Estudiar un verano en España cuesta _____ $6,000 dólares.

3. ¿Cuánto pagan los estudiantes por sus libros de texto al año?

   Los estudiantes pagan_____ $2,000 dólares.

4. ¿Cuánto cuesta un semestre de intercambio en Perú?

   Un semestre de intercambio en Perú cuesta _____ $9,000 dólares.

5. ¿Cuánto cuesta un semestre de clases en esta universidad?

   Un semestre de clases en esta universidad cuesta _____ $7,000 dólares.

6. ¿Cuánto cuesta tomar un curso de español al semestre?

   Tomar un curso de español al semestre cuesta _____ $1, 000 dólares.

Appendix C: Forced-choice task (experimental items only)

Contexto: Conociste a una chica que está haciendo un programa de intercambio en tu ciudad. La chica no conoce nada de esta ciudad y tiene muchas dudas sobre el costo de vida y sobre las actividades que podrá hacer con sus amigos y amigas.

Instrucciones: Escucha las preguntas de la chica. Después, observa la información dentro de la nube. La nube indica que no estás 100% seguro o segura de la cantidad. El siguiente paso será decidir de qué manera responderías tú a sus preguntas. En otras palabras, deberás decidir qué respuesta te gusta más. Para cada pregunta, deberás escoger una opción (A o B) dependiendo de la que te guste más a ti. Escribe tu respuesta (A o B) en la hoja.

Table 4 Sample if items for the forced-choice task.

Magnitude	**Question**	**Reference number**	**Option A**	**Option B**	**Exemplar number**
Small	¿Cuánto cuesta rentar un carro por un día?	$19	*Casi*	*Como*	$20
	¿Cuánto dinero gastan las personas cuando salen el fin de semana?	$21	*Como*	*Y pico*	$20
	¿Cuánto cuesta el seguro de auto por mes?	$28	*Como*	*Casi*	$30
	¿Cuánto dinero gastan las personas en gasolina por semana?	$32	*Y pico*	*Como*	$30
	¿Cuánto dinero gastan las personas en compras por internet al mes?	$37	*Casi*	*Como*	$40
	¿Cuánto dinero gastan las personas en restaurantes a la semana?	$43	*Como*	*Y pico*	$40
	¿Cuánto gastan los estudiantes en un libro para sus clases?	$47	*Casi*	*Como*	$50
	¿Cuánto cuesta un boleto de autobús a la capital del país?	$51	*Y pico*	*Como*	$50

	¿Cuánto dinero gastan las personas en transporte público cada mes?	$67	*Como*	*Casi*	$70
Large	¿Cuánto cuesta rentar un carro por un año?	$1,199	*Casi*	*Como*	$2,000
	¿Cuánto dinero gastan las personas en salidas con amigos al año?	$2,102	*Como*	*Y pico*	$2,100
	¿Cuánto dinero gastan las personas en compras por internet al año?	$2,298	*Como*	*Casi*	$2,300
	¿Cuánto cuesta el seguro de auto por año?	$3,303	*Y pico*	*Como*	$3,300
	¿Cuánto gastan los estudiantes en libros para todas sus clases?	$2,397	*Como*	*Casi*	$2,400
	¿Cuánto dinero gastan las personas en transporte público cada año?	$3,202	*Como*	*Y pico*	$3,200
	¿Cuánto cuesta un boleto de avión a la ciudad de Buenos Aires?	$1,198	*Casi*	*Como*	$1,200
	¿Cuánto dinero gastan los estudiantes en restaurantes al año?	$2,099	*Y pico*	*Como*	$2,100

Appendix D: Oral interview in English (experimental items only)

Questions that elicited the approximation of small quantities:

1. How much is an expensive meal on campus?
2. How much is a large pizza on campus?
3. How much is a ticket to the movies on a weekday?
4. If you go out with friends on the weekends, how much money do you spend?
5. How much is an inexpensive meal at your favorite restaurant?
6. How much money do commuters spend on transportation per week?

Questions that elicited the approximation of small quantities:

1. How much is your rent with utilities each year?
2. How much does tuition cost in your university per year?
3. How much do you spend eating out per semester?
4. How much do you spend in entertainment each semester (e.g., outing, parties, trips, etc.)?
5. What trip has been the second most expensive? How much money did you spend?
6. If a friend of yours told you he/she wants to visit that city and wants to spend two weeks there, how much money does he/she would need to take?

Appendix E: Language Experience and Proficiency Questionnaire in English

Participant ID: Today's Date:

Age: Date of Birth: Male: Female:

(1) Please list all the languages you know in order of dominance:

1 2 3 4 5

(2) Please list all the languages you know in order of acquisition (your native language first):

1 2 3 4 5

(3) Please list what percentage of the time you are currently and on average exposed to each language. (Your percentages should add up to 100%):

List language here:
List percentage:

(4) When choosing a language to speak with a person who is equally fluent in all your languages, what percentage of time would you choose to speak each language? Please report percent of total time. (Your percentages should add up to 100%):

List language here:
List percentage:

(5) Do you consider yourself monocultural or bicultural? Please list the other cultures you identify with and rate the extent to which you identify with each culture. (Examples of possible cultures include US-American, Chinese, Spanish, Jewish-Orthodox, etc.):

List cultures here:
Scale (1-10)

(6) Please circle your highest education level:

Less than High School	Some College	Masters
High School	College	PhD/MD/JD

(7) If you have ever lived in another country, please provide name of country dates of residence, and reason:

English is my second / third / fourth language.
All questions below refer to your knowledge of this language: English

(1) Age when you…:

Began acquiring it: Became fluent: Started reading: Became a fluent reader:

(2) Please list the number of years and months you spent in each language environment:

	Years	Months
A country where this language is spoken		
A family where this language is spoken		
A school and/or working environment where this language is spoken		

(3) On a scale from zero to ten, please select your *level of proficiency* in speaking, understanding, and reading:

Speaking		Understanding spoken language		Reading	

Please, list any formal instruction (years, level, and place) you have received in this language, as well as results of any official tests you may have taken:

_____

_____

(4) On a scale from zero (not a contributor) to ten (most important contributor), please select how much the following factors contributed to you learning:

Interacting with friends		Language tapes / self-instruction	
Interacting with family		Watching TV	
Reading		Listening to the radio	

(5) Please rate to what extent you are currently exposed to this language in the following contexts (0= never, 10= always):

Interacting with friends		Listening to radio / music	
Interacting with family		Reading	
Watching TV		Language-lab/self-instruction	

Spanish is my second / third / fourth language.
All questions below refer to your knowledge of this language: Spanish

(1) Age when you…:
Began acquiring it: Became fluent: Started reading: Became a fluent reader:

(2) Please list the number of years and months you spent in each language environment:

	Years	Months
A country where this language is spoken		
A family where this language is spoken		
A school and/or working environment where this language is spoken		

(3) On a scale from zero to ten, please select your *level of proficiency* in speaking, understanding, and reading:

Speaking		Understanding spoken language		Reading	

Please, list any formal instruction (years, level, and place) you have received in this language, as well as results of any official tests you may have taken:

_____

_____

(4) On a scale from zero (not a contributor) to ten (most important contributor), please select how much the following factors contributed to you learning:

Interacting with friends		Language tapes / self-instruction	
Interacting with family		Watching TV	
Reading		Listening to the radio	

(5) Please rate to what extent you are currently exposed to this language in the following contexts (0= never, 10= always):

Interacting with friends		Listening to radio / music	
Interacting with family		Reading	
Watching TV		Language-lab/self-instruction	

Appendix F: Language Experience and Proficiency Questionnaire in Spanish

Número de participante: Fecha:

Edad: Fecha de nacimiento: Hombre: Mujer:

(1) Por favor indique todos los idiomas que conozca **en orden de dominio:**

1 2 3 4 5

(2) Por favor indique todos los idiomas que conozca **en orden de adquisición** (su idioma materno primero):

1 2 3 4 5

(3) Por favor indique qué porcentaje del tiempo Ud. *actualmente* y *en promedio* está expuesto a cada idioma. (*Los porcentajes deben de sumar 100%*):

Indique idioma				
Indique porcentaje				

(4) ¿Al escoger qué idioma usar para hablar con una persona igualmente fluida a Ud. en todos sus idiomas, que porcentaje del tiempo escogería Ud. hablar en cada idioma? Por favor indique el porcentaje del tiempo total. (*Los porcentajes deben de sumar a 100%*):

Indique idioma				
Indique porcentaje				

(5) Por favor indique las culturas con las cuales Ud. se identifica. En una escala del cero al diez, por favor valore hasta qué punto Ud. se identifica con cada cultura. (Ejemplos de culturas posibles incluyen estadounidense, china, judío-ortodoxo, etc.):

Culturas:				
Escala (0-10)				

(6) Indique su nivel más alto de educación (o su equivalente):

☐ Menos que la secundaria ☐ Universidad trunca ☐ Maestría terminada

☐ Escuela preparatoria ☐ Universidad terminada ☐ Doctorado

☐ Escuela técnica ☐ Posgrado trunco ☐ Otro:

(7) Si ha vivido en otros países, por favor indique el nombre del país, las fechas de residencia y la razón:

_____

_____

El español es mi primer/segundo/tercer/cuarto idioma
Todas las preguntas que siguen se refieren a su conocimiento de <u>español</u>

(1) Edad cuando Usted comenzó a:

Empezó a adquirirlo: Llegó a ser fluido: Empezó a leer: Llegó a ser lector fluido:

(2) Por favor indique el número de años y meses que Ud. pasó en cada ambiente lingüístico:

	Años y meses	Motivo
Un país donde el español es hablado		
Una familia donde el español es hablado		
Una escuela/ambiente de trabajo donde el español se hable		

(3) En una escala del cero al diez, por favor seleccione su *nivel de* ***<u>competencia</u>*** al hablar, comprender, y leer en inglés

Hablar Comprender Leer

Por favor escriba cualquier tipo de instrucción formal (duración, nivel y lugar) que haya recibido en esta lengua, así como los resultados de pruebas oficiales que haya realizado:

_____

(4) En una escala del cero al diez, por favor seleccione cuánto los siguientes factores contribuyeron a su aprendizaje del español:

Con amistades		Material de auto instrucción	
Con la familia		Viendo televisión	
Leyendo		Escuchando la radio	

(5) Por favor valore, del cero al diez, hasta qué punto Ud. actualmente está expuesto al español:

Con amistades		Material de auto instrucción	
Con la familia		Viendo televisión	
Leyendo		Escuchando la radio	

(6) Por favor valore, del cero al diez, qué tan frecuentemente los demás lo identifican a Ud. como un hablante no nativo debido a su acento:

El inglés es mi primer/segundo/tercer/cuarto idioma
Todas las preguntas que siguen se refieren a su conocimiento de inglés

(1) Edad cuando Usted comenzó a:

Empezó a adquirirlo: Llegó a ser fluido: Empezó a leer: Llegó a ser fluido:

(2) Por favor indique el número de años y meses que Ud. pasó en cada ambiente lingüístico:

	Años y meses	Motivo
Un país donde el inglés es hablado		
Una familia donde el inglés es hablado		
Una escuela/ambiente de trabajo donde el inglés se habla		

(3) En una escala del cero al diez, por favor seleccione su *nivel de* ***competencia*** al hablar, comprender, y leer en inglés

Hablar Comprender Leer

Por favor escriba cualquier tipo de instrucción formal (duración, nivel y lugar) que haya recibido en esta lengua, así como los resultados de pruebas oficiales que haya realizado:

_____

_____

(4) En una escala del cero al diez, por favor seleccione cuánto los siguientes factores contribuyeron a su aprendizaje del inglés:

Con amistades		Material de auto instrucción	
Con la familia		Viendo televisión	
Leyendo		Escuchando la radio	

(4) Por favor valore, del cero al diez, hasta qué punto Ud. actualmente está expuesto al inglés:

Con amistades		Material de auto instrucción	
Con la familia		Viendo televisión	
Leyendo		Escuchando la radio	

(5) Por favor valore, del cero al diez, qué tan frecuentemente los demás lo identifican a Ud. como un hablante no nativo debido a su acento:

Appendix G: Spanish proficiency exam

PART 1: MULTIPLE CHOICE VOCABULARY

Instructions: Each of the following sentences contains a blank space ___ indicating that a word or phrase has been omitted. From the four choices select the one which, when inserted in the space ___, best fits in with the meaning of the sentence as a whole.

1. Al oír del accidente de su buen amigo, Paco se puso _____ . a. alegre b. fatigado c. hambriento d. desconsolado	**2**. No puedo comprarlo porque me _____ dinero. a. falta b. dan c. presta d. regalan
3. Tuvo que guardar cama por estar _____ . a. enfermo b. vestido c. ocupado d. parado	**4**. Aquí está tu café, Juanito. No te quemes, que está muy _____ . a. dulce b. amargo c. agrio d. caliente
5. Al romper los anteojos, Juan se asustó porque no podía _____ sin ellos. a. discurrir b. oír c. ver d. entender	**6**. ¡Pobrecita! Está resfriada y no puede _____ . a. salir de casa b. recibir cartas c. respirar con pena d. leer las noticias
7. Era una noche oscura sin _____ . a. estrellas b. camas c. lágrimas d. nubes	**8**. Cuando don Carlos salió de su casa, saludó a un amigo suyo: - Buenos días, _____ . a. ¿Qué va? b. ¿Cómo es? c. ¿Quién es? d. ¿Qué tal?
9. ¡Qué ruido había con los gritos de los niños y el _____ de los perros! a. olor b. sueño c. hambre d. ladrar	**10**. Para saber la hora, don Juan miró el _____ . a. calendario b. bolsillo c. estante d. despertador

11. Yo, que comprendo poco de mecánica, sé que el auto no puede funcionar sin _____ . a. permiso b. comer c. aceite d. bocina	**12**. Nos dijo mamá que era hora de comer y por eso _____ . a. fuimos a nadar b. tomamos asiento c. comenzamos a fumar d. nos acostamos pronto
13. ¡Cuidado con ese cuchillo o vas a _____ el dedo! a. cortarte b. torcerte c. comerte d. quemarte	**14**. Tuvo tanto miedo de caerse que se negó a _____ con nosotros. a. almorzar b. charlar c. cantar d. patinar
15. Abrió la ventana y miró: en efecto, grandes lenguas de _____ salían llameando de las casas. a. zorros b. serpientes c. cuero d. fuego	**16**. Compró ejemplares de todos los diarios pero en vano. No halló ____. a. los diez centavos b. el periódico perdido c. la noticia que deseaba d. los ejemplos
17. Por varias semanas acudieron colegas del difunto profesor a _____ el dolor de la viuda. a. aliviar b. dulcificar c. embromar d. estorbar	**18**. Sus amigos pudieron haberlo salvado pero lo dejaron _____ . a. ganar b. parecer c. perecer d. acabar
19. Al salir de la misa me sentía tan caritativo que no pude menos que _____ a un pobre mendigo que había allí sentando. a. pegarle b. darle una limosna c. echar una mirada d. maldecir	**20**. Al lado de la Plaza de Armas había dos limosneros pidiendo ____. a. pedazos b. paz c. monedas d. escopetas
21. Siempre maltratado por los niños, el perro no podía acostumbrarse a _____ de sus nuevos amos. a. las caricias b. los engaños c. las locuras	**22**. ¿Dónde estará mi cartera? La dejé aquí mismo hace poco y parece que el necio de mi hermano ha vuelto a _____ . a. dejármela b. deshacérmela c. escondérmela

d. los golpes	d. acabármela

23. Permaneció un gran rato abstraído, los ojos clavados en el fogón y el pensamiento _____ . a. en el bolsillo b. en el fuego c. lleno de alboroto d. Dios sabe dónde	**24**. En vez de dirigir el tráfico estabas charlando, así que tú mismo _____ del choque. a. sabes la gravedad b. eres testigo c. tuviste la culpa d. conociste a las víctimas
25. Posee esta tierra un clima tan propio para la agricultura como para _____ . a. la construcción de trampas b. el fomento de motines c. el costo de vida d. la cría de reses	**26**. Aficionado leal de obras teatrales, Juan se entristeció al saber _____ del gran actor. a. del fallecimiento b. del éxito c. de la buena suerte d. de la alabanza
27. Se reunieron a menudo para efectuar un tratado pero no pudieron _____ . a. desavenirse b. echarlo a un lado c. rechazarlo d. llevarlo a cabo.	**28**. Se negaron a embarcarse porque tenían miedo de_____ . a. los peces b. los naufragios c. los faros d. las playas
29. La mujer no aprobó el cambio de domicilio pues no le gustaba _____ . a. el callejeo b. el puente c. esa estación d. aquel barrio	**30**. Era el único que tenía algo que comer pero se negó a _____ . a. hojearlo b. ponérselo c. conservarlo d. repartirlo

Prueba de llenar espacios en blancos

En esta prueba algunas palabras han sido elididas y remplazadas por números de 1 al 20. Primero, lea el texto completo para que lo pueda entender. Luego, léalo después y escoja la palabra correcta que corresponde de la hoja de respuestas. Marque su respuesta con un circulo en la hoja de respuesta y no llenando el espacio en blanco en el texto.

Hoy se inaugura muestra fotográfica dedicada a Javier Pérez de Cuéllar

Mañana se _____(1) en el centro cultural Inca Garcilaso del Ministerio de Relaciones Exteriores una muestra fotográfica _____(2) Javier Pérez de Cuéllar. Se espera que la exposición _____ (3) en honor a su servicio diplomático y su posterior desempeño _____(4) una década como secretario de las Naciones Unidas. Las fotos presentarán etapas _____(5) la vida profesional del destacado peruano. De acuerdo con los organizadores, esta exhibición _____(6) que el público se_____(7) de la manera en que el embajador Pérez de Cuéllar ha _____(8) con sus responsabilidades como diplomático y de los logros _____(9) alcanzó durante más de cuatro décadas de forjada labor.

En el material seleccionado para la ocasión se_____(10), por ejemplo, diversas imágenes del diplomático nacional _____(11) figuras destacadas como la madre Teresa de Calcuta y Juan Pablo II, _____(12) como diferentes líderes internacionales como Nelson Mandela. Es una muestra fiel de la labor pacifista realizada por el diplomático, que luego lo _____(13) en uno de los estadistas más conocidos del mundo.

La muestra recoge material que _____(14) en el archivo fotográfico de las Naciones Unidas y en otros numerosos medios. Cabe señalar que en los _____(15) días el embajador Javier Pérez de Cuéllar _____ (16) numerosos homenajes al _____(17) a los 90 años de vida. Por ejemplo, la universidad San Ignacio de Loyola lo _____(18) con otros personajes sobresalientes. Hace pocos días se inauguró la nueva _____ (19) de la ONU en el Perú, siendo bautizada con su nombre. En su amplia experiencia profesional se _____(20) como embajador del Perú en Suiza, la desaparecida Unión Soviética, Polonia y Venezuela.

(Adaptado del diario *El comercio,* Enero 22, 2010)

Hoja de respuestas

1	a. iniciará	b. inició	c. iniciaba
2.	a. en	b. sobre	c. acerca
3.	a. sea	b. será	c. es
4.	a. por	b. en	c. con
5.	a. para	b. a	c. de
6.	a. persigue	b. sigue	c. revoluciona
7.	a. enterara	b. entere	c. enteró
8.	a. completado	b. cumplido	c. terminado
9.	a. que	b. el que	c. lo que
10.	a. darán	b. ha enseñado	c. mostrarán
11.	a. en	b. con	c. por
12.	a. ya	b. así	c. para
13.	a. convirtiera	b. haya convertido	c. hubiera convertido
14.	a. habría	b. había	c. hubo
15.	a. últimos	b. pasado	c. anteriores
16.	a. hubiera recibido	b. había encontrado	c. ha recibido
17.	a. haber llegado	b. llega	c. hubo llegado
18.	a. condecoraba	b. condecoró	c. condecoraría
19.	a. sede	b. recinto	c. casa
20.	a. desempeñó	b. hubo desempeñado	c.había desempeñado