Studies in Second Language Acquisition **40** (2018), 579–603
doi:10.1017/S0272263117000262

Research Article

EXPLORING LEXICAL EFFECTS IN SECOND LANGUAGE INTERPRETATION

THE CASE OF MOOD IN SPANISH ADVERBIAL CLAUSES

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Abstract

The Spanish mood contrast is a good test case for research on acquiring form-meaning connections in contexts where input is variable and multiple areas of the grammar are implicated (e.g., syntax, semantics, pragmatics). Nevertheless, research on interpretation of this contrast lags and little is known about how individual lexical items and patterns of co-occurrence of adverbial clauses with subjunctive forms influence interpretation. Addressing this void, we compare interpretation of the present subjunctive by native speakers (NSs) and nonnative speakers (NNSs) at three relatively high levels of experience. Participants completed an interpretation task containing clauses with indicative and subjunctive forms paired with one of six adverbial conjunctions, categorized as co-occurring with subjunctive, indicative, or both forms. Our analysis suggests individual lexical items play a role in morphosyntactic variation and that nuanced differences in interpretation exist for NSs and highly advanced NNSs, even on items that prescriptively co-occur with only one form.

Across research paradigms, second language (L2) acquisition is often characterized as the process of making use of information in the language to which learners are exposed (i.e., the input) to develop competence in that language. Usage-based approaches to language, compatible with the variationist perspective adopted in the current paper, afford a primary role to input in the L2 acquisition process. While some usage-based approaches include a role for learning strategies, learner differences, and the

We are thankful to the language learners and native Spanish speakers who participated in our study and to Juan Escalona Torres for his assistance with our frequency searches. All errors are our own.

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development of generalizations over time, input remains the driving force behind acquisition. Consequently, the goal of research on L2 acquisition within this paradigm is to examine the way in which patterns in the input are incorporated into learner grammars over time. This developing competence includes knowledge of the grammatical properties in a language as well as the ability to use and interpret language according to the norms of a given speech community and within the given discourse context (Canale & Swain, 1980). Studies such as the present one enhance our understanding of how learners connect form and meaning, how these connections may differ according to lexical items, and how this is made more complex when native speakers (NSs) demonstrate some variability in use and interpretation.

The acquisition of form-meaning connections is not straightforward. Across approaches to L2 acquisition we see that forms that carry a single (semantic/grammatical) meaning show less complex paths of acquisition than forms that are used in different contexts to denote different meanings (e.g., Andersen, 1984). In the case where a function can be fulfilled by multiple forms, we may see stages of overgeneralization as learners gradually identify the appropriate contexts for each form-meaning combination (e.g., the copula contrast in Spanish; VanPatten, 1987). This can also be the case when a form fulfills more than one function, such as use of the present perfect to express an action that is perfect (i.e., especially relevant at speech time, "I have indeed seen that movie") or one that is perfective (i.e., a completed action traditionally associated with a simple past or preterit, "I have eaten this morning"). Finally, the input learners receive in instructed contexts may not fully represent the range of contexts in the outside world and this can further extend the time it takes to acquire structures that vary according to social context. Sociolinguistic research has shown that forms can convey different social and geographic meaning in adult native speech (e.g., Labov, 1972; Silva-Corvalán, 1994). Furthermore, linguistic structures that vary in native speech are often indicative of a change in progress and, thus, the acquisition of such structures has been described in the literature as catching a moving target because languages are continually evolving (Roberts, 1997). Another important factor in understanding the process of making use of cues in the input is that learners appear to be affected by the frequency with which a given form (or form-meaning combination) occurs in the input, such that more frequent forms are likely to be acquired earlier than less frequent forms (e.g., Bybee, 2010).[1] Taking these points together, we can hypothesize that infrequent forms that also show variability in the input present unique challenges for learners and, thus, stand to provide essential information about the process of L2 acquisition more broadly precisely because their interpretation is more complex than a singleton form-meaning pairing.

To explore this issue, the present study examines the acquisition of the subjunctive mood in Spanish, which is variable in its patterns of use (with the indicative) among NSs, and is undergoing a gradual process of loss over time (Blas Arroyo & Porcar Miralles, 1997; Murillo Medrano, 1999; Silva-Corvalán, 1994). Additionally, the subjunctive mood is characterized by low frequencies of occurrence. For example, we performed a search of the web corpus version of the *Corpus de Español*, which revealed that subjunctive forms have a relative frequency of 10% to indicative forms (at 90%, corpusdeespanol.com, N = 8,0328,591). For English-speaking learners of Spanish, the lack of a productive first language (L1) counterpart adds to this challenge as does its low communicative value and occurrence in sentence medial, rather than initial or final

https://doi.org/10.1017/S0272263117000262 Published online by Cambridge University Press

position, which tend to be noticed only after more prominent positions are (Collentine, 2014). Thus, it is not surprising that in L2 Spanish, the mood contrast is known to be acquired late and to present challenges to learners even at relatively high levels of proficiency. It has been argued that to acquire this contrast, learners must be able to use complex syntactic structures (Collentine, 2003), to apply semantic and pragmatic constraints rather than simply employing a lexical strategy (Quesada, 1998), and to adjust their rates of use of subjunctive and indicative forms in contexts that allow variation and the degree to which a variety of linguistic and social constraints come to bear on those rates of use (Gudmestad, 2012). Although there are few studies that address interpretation (as opposed to production), recent research has shown that not only do learners fail to produce the subjunctive forms with nativelike frequency, but also that even highly advanced nonnative interpretation of these variable forms may differ from that of NSs (Kanwit & Geeslin, 2014). The current study is designed to better understand the acquisition of these interpretive abilities in L2 Spanish.

One finding that appears to generalize across production studies is that learners begin by adopting a lexically based strategy for using the subjunctive. That is, subjunctive mood forms appear sooner and with greater frequency with a subset of lexical "triggers" for its use (Lafford & Salaberry, 2003). For example, the verb *querer* "to want" is more likely to be followed by a subjunctive form than other, less prototypical lexical triggers, even when the semantic class is the same (e.g., *exigir* "to demand"). Such a strategy is explained by usage-based accounts as an effect of frequency in the input (Bybee, 2010; Goldberg, 2006). Progress beyond this initial stage has been viewed as evidence of moving from item-based learning toward rule (or constraint)-governed patterns of use (e.g., Ellis, 1990). Nevertheless, in one of the few studies on the interpretation of the subjunctive, Kanwit and Geeslin (2014) found that the NSs in the study demonstrated greater differences in interpretation across lexical items than the most advanced learners did. In other words, at least in the adverbial clauses examined in that study, the NSs demonstrated less constraint-governed patterns of interpretation than the nonnative speakers (NNSs), who in turn demonstrated more generalized and less lexically specific patterns of interpretation. It remains unclear, however, to what extent variability, on the one hand (i.e., the degree to which both subjunctive and indicative mood forms are possible in a given context), and lexical items and their semantic properties, on the other hand (i.e., the degree to which patterns of use are dependent on particular words in the context), explain these contrasting findings. Taking the potential relationship between morphosyntactic variation and individual lexical items as the point of departure, the current study presents an in-depth examination of the patterns of interpretation in adverbial clauses in L2 Spanish across several levels of proficiency.

THE RESEARCH CONTEXT

The patterns of use in contexts where both the indicative and the subjunctive are attested for adult NSs (e.g., following certain adverbial conjunctions) can be characterized according to social characteristics of the speaker, the discourse context, and the linguistic context, including but not limited to morphosyntactic, pragmatic, and lexical factors. Among the approaches that best account for variability linked to several different factors, both social and linguistic, are the so-called usage-based approaches, such as that

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espoused by Bybee (2006). Under accounts like hers, as well as others, such as connectionism (Bates & MacWhinney, 1987) and variationist approaches (e.g., Adamson, 2009; Labov, 1972), both first and second language learners perceive common patterns of co-occurrence and create mental maps or links between a particular form and the characteristics of the context (both sentential and beyond) in which it occurs. Those combinations (i.e., collocations) that occur most frequently will be connected more tightly, or with stronger links, than those that do not often appear together.[2] These accounts tend to allow a role for generalizations such that rule-governed behavior is evident after a certain amount of experience has been gained, and they allow for social and linguistic factors to influence patterns of production and interpretation. Additionally, they afford a role for frequency, which is not necessarily exclusive but through which more frequent forms may exhibit unique patterns of use as compared to less frequent forms, and they focus on patterns of use in context.[3] The present study contributes to this body of theoretical work because it examines the role that individual lexical items play in patterns of use for NSs and language learners, and it connects the process of interpretation to existing accounts of L2 production.

THE SPANISH MOOD CONTRAST

With some exceptions, the subjunctive-mood forms in Spanish are used to indicate conditions of irrealis, hypotheticality, or subjectivity and often occur in subordinate clauses. Some contexts prescriptively allow only one mood, others allow both but with different meanings, and still others may allow both but with very little meaning contrast. Because the contexts of use are varied, Collentine (2003) and others have advocated for an examination of single contexts of use so that findings related to one context do not obscure patterns of use in another. To this end, we will focus on subjunctive and indicative forms in adverbial clauses, as illustrated in (1) and (2).

(1) Cuando tiene tiempo, Marta me visita (y normalmente tiene tiempo los miércoles).

"When she has (INDIC) time, Marta visits me (and she normally has time on Wednesdays)."

(2) Cuando tenga tiempo, Marta me visitará (y ahora está muy ocupada y por eso no ha venido).

"When she has (SUBJUNC) time, Marta will visit me (and now she is very busy and because of that she has not come)."

According to prescriptive accounts, in contexts such as (1) and (2), both forms may co-occur with *cuando* "when," but the interpretation of the indicative form is that this is a habitual occurrence whereas the subjunctive form should be taken to mean that the event has not yet taken place (i.e., will occur in the future, as indicated by the morphological future [MF] verb form in *visitará* "will visit"). Other adverbials, such as *después de que* "after," follow the same pattern (in prescriptive accounts). In contrast with adverbial phrases that allow both indicative and subjunctive forms, some adverbs, such as *para que* "so that" and *antes de que* "before" are said to occur categorically with the subjunctive mood (as in 3), whereas others, such as *ya que* "given that" and *puesto que* "since," are said to occur only with indicative forms (as in 4):

(3) *Antes de que Natalia salga de aquí, iremos al cine.*

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"Before Natalia leaves (SUBJUNC) here, we will go to the theater."

(4) Puesto que sus amigos tienen mucha tarea, Natalia va al cine sola.

"Since her friends have (INDIC) a lot of homework, Natalia is going to the theater alone."

The prescriptive accounts of the mood contrast in Spanish and the examples provided here illustrate that within the class of adverbial conjunctions,[4] several different patterns of co-occurrence are attested. What is more, recent sociolinguistic research has demonstrated variation for (1) even when the event is known to be habitual and for (2) even when the event is future occurring.[5] We know that NSs do not produce subjunctive forms categorically in contexts that may prescriptively require one mood and this variability is conditioned by a range of linguistic and social factors (e.g., for Mexico City, Bayerová, 1994; Blake, 1981; García & Terrell, 1977) and this variability also occurs for the mood distinction in adverbial clauses. For NSs in Albuquerque, New Mexico, the subjunctive was favored in clauses with *antes de que* "before," whereas *hasta que* "until," *después de que*, and *cuando* disfavored the subjunctive (de la Puente-Schubeck, 1992). In fact, decreased use of the subjunctive in adverbial clauses is consistent with subsequent findings for Castellón, Spain (Blas Arroyo & Porcar Miralles, 1997) and Costa Rica (Murillo Medrano, 1999). Although in the Castellón study's sentence completion task participants were more likely to use the subjunctive in future contexts than nonfuture contexts, participants accepted the MF (indicative) in the acceptability task in such clauses (Blas Arroyo & Porcar Miralles, 1997). Thus, some speakers viewed the use of the indicative as acceptable in adverbial clauses for events that had not yet occurred. An analysis of Costa Rican Spanish indicated greater rates of use of the subjunctive in clauses with nonspecific (i.e., not traceable to a particular moment), as opposed to specific, time reference (Murillo Medrano, 1999). Research has also revealed approximately 90% subjunctive use in "obligatory" contexts in adverbial clauses in Reno, Nevada, for first generation Mexican-Americans (Isabelli, 2006), along with the subsequent second and third generations. Finally, a recent study demonstrated that college-educated native Spanish speakers from several nations of origin now residing in the midwestern United States were not categorical in interpreting adverbial clauses headed by *cuando*, *hasta que*, and *después de que*. For example, clauses that contained *después de que* and a verb in the present indicative (PI) were interpreted as having not yet occurred 9.4% of the time (Kanwit & Geeslin, 2014). In sum, across different tasks and Spanish-speaking communities, one notes variable use and interpretation of subjunctive mood forms within adverbial clauses, such that the indicative is allowed in some contexts formerly occupied exclusively by the subjunctive (e.g., events that have not yet occurred). As will be seen in the following text, this variation creates an additional challenge for learners.

THE SECOND LANGUAGE ACQUISITION OF THE SUBJUNCTIVE

Research on the acquisition of the mood contrast in Spanish encompasses the properties associated with the production of subjunctive mood forms across linguistic contexts (e.g., Collentine, 1995), contexts of learning (e.g., Quesada, 1998), and levels of proficiency (e.g., Gudmestad, 2012). However, recent reviews (e.g., Collentine, 2014; Kanwit & Geeslin, 2014) note several common findings. For example, for adult English-speaking learners of Spanish, the subjunctive mood is late acquired (Collentine, 1995;

https://doi.org/10.1017/S0272263117000262 Published online by Cambridge University Press

Geeslin & Gudmestad, 2008; Gudmestad, 2006; Quesada, 1998). Furthermore, the subjunctive has been shown to involve properties related to several different areas of the grammar (e.g., morphology, syntax, semantics, and pragmatics), and the patterns of use and interpretation attested among learners are variable across learners, tasks, and linguistic contexts (Gudmestad, 2012). The NS variability attested in sociolinguistic research (e.g., Silva-Corvalán, 1994) makes the SLA of the subjunctive an excellent test case for usage-based approaches to acquisition that seek to understand the role of variability in the acquisition process. Numerous studies of mood-form production and preference exist, but studies of interpretation, by NNSs or NSs, are relatively scarce. Perhaps one of the most important insights that has emerged over the past several decades is that a study of the mood contrast in Spanish is most informative when it addresses a single syntactic context (e.g., nominal clauses), and sometimes by further limiting the scope of the study (e.g., McNulty's 2011 study of subjunctive mood with *cuando*). Although we will focus our study on mood contrast in adverbial clauses, we also seek to understand the role that several different factors play in the acquisition of the interpretation of these adverbial clauses.

In early work that considered adverbial clauses, Quesada (1998) noted that intermediate learners studying in Mexico produced low rates of subjunctive with the temporal adverbial *cuando* at the first measurement time and, by the second time, learners still only produced subjunctive forms about half the time in *cuando* matrices where subjunctive would be expected (i.e., for actions that had not yet occurred). This rate was higher than rates with *hasta/sin/para/lo que*. Interestingly, Quesada contrasted the prototypical uses by NSs developed in Lunn (1989), whereby the subjunctive is used most often with events that cannot be asserted because they are hypothetical or have not yet occurred (i.e., a semantic/pragmatic strategy), with the prototype attested by learners, which involved higher rates of use of subjunctive forms with the verb *querer* and also in future-time contexts and with irregular verb forms (i.e., those that differ from the stem). In short, learners appeared to adopt a lexical strategy (i.e., when *querer* occurred the subjunctive was more likely to follow) and NSs applied a semantic strategy to indicate hypotheticality, regardless of the lexical items. To be clear, the lexical strategy attested in Quesada's study is not identical to the claim that frequent lexical items or collocations explain patterns of acquisition because the verb following triggers such as the prototypical *querer* could be any lexical form. Were we to apply this finding to the adverbial clause setting we might predict that certain adverbials lead to more consistent interpretations than others.

Adopting a variationist framework, Gudmestad (2006) examined responses from intermediate and advanced-level learners on a preference task designed to manipulate regularity of verbal morphology and the presence of three different linguistic triggers for the subjunctive: futurity, expressions of desire, and expressions of emotion. Only the regularity of the verbal morphology predicted preferences at the intermediate level whereas for advanced learners, the subjunctive was more likely to be selected with irregular verb forms and in contexts of desire. Even within a single semantic category, such as verbs of desire, the individual lexical items displayed different rates of selection for the intermediate learners, ranging from 94.1% with *espero que* "I hope that" down to 59% with *quiero que* "I want that." The advanced learners selected the subjunctive more than 90% of the time for all lexical triggers within this semantic class. These findings suggest that not only is the

semantic class important for understanding patterns of acquisition, researchers must also examine the individual lexical items within those classes.

Geeslin and Gudmestad (2008) compared subjunctive and indicative contrasts on a sociolinguistic interview and a written preference task for NSs and highly advanced L2 speakers. The NS group used subjunctive significantly more than NNSs, but in addition, the preference task showed significantly higher rates of selection of the subjunctive than the interview task. On the preference task both groups showed differing rates for different contexts (e.g., more subjunctive in volitional contexts than ones of uncertainty) and the same order held for the interview. Likewise, Gudmestad (2012) examined patterns of use across three tasks for NSs and L2 learners at five levels of proficiency. At the lowest learner level, only task significantly predicted subjunctive forms, but by the second level, and continuing all the way up to NSs, semantic category predicted patterns of subjunctive use. As with Geeslin and Gudmestad (2008), the semantic categories presented a hierarchy of rates of subjunctive across all verb types and tenses that was the same for all groups. These findings suggest that even though learners do not use subjunctive as often as NSs until very high levels of proficiency, they are sensitive to the likelihood (Preston, 1993) at which subjunctive co-occurs with different semantic classes.

In addition to the analyses of production data described thus far, there is limited research on interpretation of subjunctive forms. Quer (2001) sought to explain the fact that mood choice is at times determined lexically, as seen in the co-occurrence of *pensar que* "to think that" with indicative mood and *querer que* "to want that" with subjunctive mood. As with the current study, Quer focused on adverbial clauses and argued that in these contexts linguistic elements indicated whether an event had already occurred and that this cue was used in interpreting these forms. Kanwit and Geeslin (2014) also investigated the interpretation of subjunctive and indicative forms in adverbial clauses by NSs of Spanish and learners at three levels of instruction, ranging from fifth semester to graduate-level learners. Their 24-item written task, which manipulated the linguistic variables verb form (subjunctive or indicative), position of the main clause (preposed or postposed), and regularity of the verbal morphology (regular or irregular), asked participants to indicate whether an event was habitual or had not yet taken place. The prompts on the instrument contained three different adverbial conjunctions: *cuando*, *después de que*, and *hasta que.* The responses revealed that the interpretation of items containing subjunctive as events that had "not yet occurred" increased as learner level increased, as did the interpretation of items containing indicative as "habitual" events. When the items were analyzed separately according to mood, the NS models for both indicative and subjunctive forms showed that the adverb was a significant predictor of interpretation, suggesting that the lexical item influences interpretation, even when all items in the study belong to the same semantic class (e.g., temporality per Gudmestad, 2012). What cannot be answered through the 2014 analysis is whether it is the lexical item or the tendency to co-occur with a particular mood form in native speech, or both of these factors, that explains this pattern.

Throughout this review, we have seen that adverbials may differ in several ways, including by individual lexical item and by their propensity to co-occur with subjunctive forms (i.e., collocational frequency). In fact, there are several theoretical approaches that invoke frequency to explain patterns of acquisition and of language change (e.g., Bybee, 2010, for usage-based approaches), and research on other variable structures has profited

https://doi.org/10.1017/S0272263117000262 Published online by Cambridge University Press

from this approach (e.g., Linford, Solon, Long, & Geeslin, 2016). Thus, in the present study, we not only limit our focus to adverbial clauses, we look at three patterns of co-occurrence and two lexical items within each co-occurrence group, thereby allowing us to tease apart these factors to a greater degree.

THE CURRENT STUDY

Our research questions in the current study were:

1. What is the frequency of selection of the present indicative, morphological future, or "both" when interpreting main clauses that follow adverbial clauses?[6]
2. What linguistic factors predict interpretation in a multinomial regression?
   a. Are these predictors the same for indicative and subjunctive contexts?
   b. What role do patterns of co-occurrence between classes of adverbs and mood forms play?
   c. What role do individual lexical items (i.e., different adverbs) within a given adverbial class play?
3. How do NSs and three groups of learners differ from one another in terms of frequencies of selection of interpretations and their linguistic predictors?

Based on previous research, we predict that the frequency of selection of the PI following clauses with habitual interpretations and the MF following clauses with future-time interpretations will increase with proficiency and that the highest level will pattern with the NSs.[7] However, given the evidence of variability in these contexts we do not predict categorical patterns of selection for any group. We predict significantly different rates of selection for each pattern of co-occurrence (e.g., typically occurs with subjunctive, appears often with both, typically appears with indicative) and for different lexical items within these classes. We further believe that those adverbial phrases that usually co-occur with one verbal mood form (e.g., *para que* with subjunctive) may allow greater variability in interpretation of temporality precisely because the lack of contrast generally found with these adverbials means that the verb form is not associated with whether an event has occurred. In contrast, those adverbials that do typically co-occur with both forms (e.g., *cuando*) may demonstrate less variability in interpretation because changes in mood form may be taken to carry greater semantic weight. In short, our prediction is that the semantic value of the inflected verb form in adverbial clauses will contribute to the degree of variability we see. Aside from overall frequency, however, the predictions for NSs as compared to various levels of L2 learners are less clear. This is because there is support in the literature for lexically based strategies as a starting point for learners (e.g., Quesada, 1998) and for NSs who show a greater tendency toward lexically variable patterns as compared to L2 learners (e.g., Kanwit & Geeslin, 2014). The present study was designed precisely to reconcile these competing hypotheses.

PARTICIPANTS

The current study included 93 participants across three levels of English-speaking learners and one NS group. The first learner group (i.e., Level 1) included learners of Spanish enrolled in a fifth-semester course that serves as a bridge between the language requirement courses and the content courses for majors and minors (n = 30). This group

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was chosen as our lowest instructional level because adverbial clauses are not presented until the fourth semester at the university where participants were enrolled. On the language background questionnaire (described in the following text), all participants reported having completed the fourth-semester course at the same institution (i.e., rather than testing in). This ensures that all participants had already received instruction on the mood contrast in adverbial clauses and on the forms of the MF and PI (as applies to main clauses here). The second group consisted of learners in a 400-level linguistics course (n = 30). The final learner group included graduate students in the department of Spanish at the same institution (n = 18). Whereas only approximately one-tenth (Level 1) and one-third (Level 2) of the previous groups had spent more than three weeks in a Spanish-speaking country,[8] participants in Level 3 differed from the first two levels in that all reported extensive experience (two months to 1.5 years, M = 7.5 months) living or studying abroad in Spain, Argentina, Mexico, Puerto Rico, Chile, Peru, or Panama. This group was included to determine whether learners with extensive experience studying Spanish and living abroad can overcome some of the challenges indicated in the preceding review. The final participant group contained 15 NS instructors of Spanish who had all resided in the midwestern United States for at least two years. Their countries of origin included Mexico (6), Spain (3), Puerto Rico (2), Argentina (2), Peru, and Colombia. Instructors from numerous nations were included to reflect the makeup of the department of Spanish at the university, where learner-directed speech reflects varied experiences with a range of countries. We share the opinion of other scholars (e.g., Cook, 2008; Ortega, 2010) that a pan-dialectal, educated bilingual group of NSs is a more appropriate comparison group for L2 learners because our learners have received input from a diverse array of dialects based on the nationality of their classroom instructors and their experiences abroad and because this NS group provides us with an understanding of the range of nativelike behaviors that might be attested. A comparison to a single dialectal group to which a learner has no exposure (which would be the case for some of our participants regardless of the dialect selected) provides little information about progress toward that learner's actual target. It is important to note that our NSs continue to use Spanish professionally and in personal interactions and maintain ties with their home countries. The participants' characteristics are summarized in Table 1.

DATA COLLECTION

All participants spent approximately five minutes on a language background questionnaire, 15 minutes on a grammar test, and 20 to 25 minutes on a mood interpretation

TABLE 1. Summary of participant characteristics

			Grammar test results		
Group	# of participants	Mean age	Mean proficiency	Range	SD
Level 1 (5th semester)	30	19.3	12.0	5–16	2.4
Level 2 (400 level linguistics)	30	20.9	17.3	10–22	3.7
Level 3 (graduate students)	18	27.2	23.7	19–25	1.0
Native speakers	15	31.5	24.3	23–25	1.0

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task. The language background questionnaire included questions about the language(s) spoken at home, language instruction experience, time spent abroad, and other questions related to their personal and language-learning histories. The task was performed in English for the learner groups and Spanish for the NS group. The discrete-point grammar test is an independent measure used to assess participants' level of Spanish and to confirm their placement in the groups described in the preceding text. The test included 25 multiple-choice items that together formed a contextualized story and can be found in its entirety in our online materials. This instrument was relatively difficult for the lowest proficiency group, and it was also able to distinguish between the two more advanced learner groups (Table 1). Moreover, although the task focused on formal grammar properties typically covered in the classroom, NSs exhibited some variability. One also notes that the standard deviations and ranges of scores are generally smaller as proficiency increases. A one-way between-subjects ANOVA was run to identify significant differences between participant groups according to their grammar scores. There was a statistically significant difference between groups, F (3, 93) = 114.8, $p < .001$. A Tukey's post-hoc test revealed that all learner groups were significantly different from each other. The Level 1 group ($M = 12.00$, $SD = 2.40$) scored significantly lower on the grammar test than the Level 2 group ($M = 17.30$, $SD = 3.70$, $p < .001$), the Level 3 group ($M = 23.70$, $SD = 1.00$, $p < .001$), and the NS group ($M = 24.30$, $SD = 1.00$, $p < .001$). The Level 2 group also scored significantly lower than the Level 3 group, $p < .001$, and the NS group, $p < .001$. The only comparison that was not significant was that between the Level 3 group and the NS group, $p = .930$.

The mood interpretation task contained 24 items. Participants read an adverbial clause with a verb in the PI or subjunctive and then selected whether they preferred a main clause verb in the present (indicative) or (morphological) future based on their interpretation that the action in the adverbial clause had not yet occurred or occurred habitually.[9] Participants could also indicate when they thought both options in the main clause were possible. Throughout the task, the adverbial clause always preceded the main clause, and verbs in the main clause were always dynamic (i.e., nonstative). To avoid bias in interpretation, aside from the adverbial clause, additional temporal indicators and lexical items that indicated futurity (e.g., *en dos semanas* "in two weeks") or habitualness (e.g., *con frecuencia* "with frequency") were avoided. The order of the response options was randomized. Two NSs of Spanish (from Mexico and Argentina) reviewed the items to ensure that all items were comprehensible and followed native norms of expression.

Each item on the interpretation task was coded for three independent linguistic variables. The dependent variable was the participant's selection of the form of the verb in the main clause (i.e., PI, MF, or that both were possible), based on her interpretation of the adverbial clause that preceded it. The independent variables included the mood of the verb in the adverbial clause, the morphological regularity of the verb in the adverbial clause, and the adverb used. With respect to mood, 12 items included adverbial clauses with a verb conjugated in the PI, and 12 contained a verb conjugated in the present subjunctive. For the independent variable morphological regularity, 12 items contained an irregular verb in the adverbial clause, and 12 contained a regular verb. We classify as irregular those verbs that have a subjunctive stem that differs from that of the indicative (e.g., *viene* "come," *venga* "might come") (e.g., Gudmestad, 2006; Kanwit & Geeslin, 2014). The third linguistic variable we manipulated was the adverb present in the

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adverbial clause, for which there were three categories: adverbs that typically co-occur with a verb in the subjunctive both in pedagogical materials and NS patterns of use (i.e., *para que* "so that," *antes de que* "before"), adverbs that typically co-occur with a verb in the indicative (i.e., *ya que* "since/considering that," *puesto que* "since/given that"), and adverbs that commonly occur with both moods (i.e., *cuando* "when," *después de que* "after"). To ensure that native patterns of use do, in fact, coincide with the pedagogical materials we consulted when designing the instrument, we referred to the web corpus of the *Corpus del español* (corpusdeespanol.com) and searched the patterns of occurrence of each adverbial. The number of tokens and their relative frequency are provided in Table 2 and confirmed our expectations, with adverbs that typically occur with only one form falling above 90% in the predicted direction (although the results, similar to the cited NS literature, were not categorical). The two adverbs that tend to occur with both forms did show opposite tendencies such that a smaller percentage of the *cuando* tokens occurred with the subjunctive and a smaller percentage of the *después de que* tokens occurred with indicative, even though both showed about one-third of the tokens with the less frequent form. Our independent variables are summarized in Table 3.

Each of the six adverbs was used four times on the task, with those in the first group only co-occurring with a verb in the subjunctive in the adverbial clause, those in the second group only co-occurring with the indicative, and those in the final group occurring twice with the indicative and twice with the subjunctive. In other words, our instrument did not include strongly dispreferred combinations (i.e., those that are ungrammatical by prescriptive accounts). Example (5) demonstrates a sample item from the task, followed by how the item was coded:[10]

(5) *Después de que el niño tome la siesta, su madre…*

a. ….va al supermercado.

b. …irá al supermercado.

c. Las dos son posibles.

(Mood of *tome*: subjunctive; verbal morphological regularity of *tome*: regular; adverb: *después*)

"After the child takes (SUBJUNC) a nap, his mother…

a. …goes to the grocery store.

b. …will go to the grocery store.

c. Both are possible."

DATA ANALYSIS

Following data collection, the distribution of the responses was tabulated for each participant group. Next, a multinomial logistic regression was performed for each participant group, to determine which of the independent variables contributed to the prediction of response choice (i.e., a main clause response in the PI, MF, or that both were possible) when all factors were considered simultaneously in a single statistical model. Once the overall effects of the independent variables on interpretation were explored, we

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TABLE 2. Results of *Corpus del español* adverbial searches (2 billion-word web corpus)

Adverb + mood	Number of tokens	Relative %
Cuando + subjunctive	146,135	27.5%
Cuando + indicative	385,319	72.5%
Después de que + subjunctive	2,052	66.5%
Después de que + indicative	1,032	33.5%
Antes de que + subjunctive	20,715	98.3%
Antes de que + indicative	350	1.7%
Para que + subjunctive	213,495	94.5%
Para que + indicative	12,496	5.5%
Puesto que + subjunctive	291	2.0%
Puesto que + indicative	14,555	98.0%
Ya que + subjunctive	1,351	1.0%
Ya que + indicative	138,995	99.0%

divided the items according to the verb form (subjunctive or indicative) included in the adverbial clause for each item. This subsequent analysis enables us to determine whether the relationship of these variables to interpretation is the same, or whether it differs for subjunctive and indicative interpretation. Throughout our analysis, cross-tabulations were performed for each of the independent variables to better interpret the regression tests and to understand the direction of their effect.

RESULTS

We present the results of the analysis beginning with the distribution of responses for the entire dataset and then the separate analyses in which the items with verb forms in the subjunctive mood are separated from those with forms in the indicative mood. These analyses help us to answer the research questions regarding the effects of patterns of co-occurrence (adverbial class) and of lexical items (differences between adverbs within the same class) as well as the similarities and differences between NSs and NNSs at various stages of development.

TABLE 3. Summary of coding scheme

Linguistic factors	Categories
Dependent variable	
Response	PI
	MF
	Both possible
Independent linguistic variables	
Mood	Subjunctive
	Indicative
Verbal morphology regularity	Regular (*come/coma*)
	Irregular (*hace/haga*)
Adverb/conjunction used	*Para que, antes de que* (typically with subjunctive)
	Ya que, puesto que (typically with indicative)
	Cuando, después de que (commonly with both)

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DISTRIBUTION OF RESPONSES

The distribution of responses (RQ1) for all participants by level is summarized in Table 4.[11] Selection of the PI decreased with proficiency, whereas selection of the MF remained relatively stable across the learner levels, all of which were lower than the NSs. The selection of the "both" response differed most for the advanced L2 group, rather than showing a linear trend across proficiency levels. Recall that there was an equal number of subjunctive and indicative forms in the dependent clause, such that prescriptive accounts would predict that 50% of the contexts would prompt selection of the MF and the other half the PI. Considering this, the NSs did, in fact, approximate this 50% rate for selection of the MF but tended to allow both forms more than would be predicted. The highly advanced group did not reach a nativelike rate of selection of the MF, but they did indicate acceptance of this form with especially high rates of selection of the "both" form vis-à-vis the other participant groups. Between-group comparisons with chi-square tests were performed to compare the distribution of form selection of each group with the other three groups.[12] All comparisons were significant (at the $p < .001$ level), except for the comparison of Level 1 with Level 2 ($p > .05$). The tests indicate a general trend by which the Level 3 and NS groups selected the PI significantly less frequently than the Level 1 and Level 2 groups. Significant differences between the Level 3 learners and the NSs were the by-product of higher NS selection of the MF and learner selection of the "both" response.

PREDICTORS OF INTERPRETATION

Next, we turn to the results of a multinomial regression analysis (RQ2) conducted for all test items for each participant group separately.[13] For each independent variable in a multinomial logistic regression, a base category is chosen and the model compares the remaining categories of each variable to the base. The category is not significantly different from the base when the upper and lower limits of the 95% confidence interval contain the value one. If those values are greater than one, then the odds of choosing the other variant are greater than those of choosing the base category (i.e., PI). If the values are less than one, then the odds of choosing the other variant are less than the odds of choosing PI. The exact values for these comparisons can be found in the online

TABLE 4. Distribution of form selection

Group	MF		PI		Both		Total
	#	%	#	%	#	%	
Level 1 (n = 30)	204	28.4	284	39.5	231	32.1	719
Level 2 (n = 30)	238	33.1	253	35.2	227	31.6	718
Level 3 (n = 18)	130	30.2	89	20.7	211	49.1	430
NSs (n = 15)	187	52.4	72	20.2	98	27.5	357

https://doi.org/10.1017/S0272263117000262 Published online by Cambridge University Press

supplementary materials. Table 5a summarizes the results when the PI interpretation response is compared to the MF interpretation; the other half of the regression compares the PI interpretation and the response that both interpretations are possible (Table 5b). The two comparisons together summarize the output for the multinomial regression models for each level. Recall that, because we performed multinomial rather than binomial regressions, it was possible to keep all three categories of our dependent variable.

In the MF versus PI comparison (Table 5a), the mood of the adverbial clause verb was a significant predictor of the main-clause response choice for Levels 1 and 3 and the NSs and in the same direction. Specifically, participants were less likely to select the MF (vs. the PI) in the indicative mood contexts than in the subjunctive mood contexts. The adverb variable was significant for all groups, but to differing effects. At Level 1, the presence of *después* raised the odds of choosing the MF over the PI, as compared to *ya*, while it had the opposite effect for Levels 2 and 3 and the NSs, as it lowered the odds of choosing the MF over the PI. For Level 3 and the NSs, the presence of *antes*, *para*, and *cuando* also lowered the odds of choosing the MF over the PI, as compared to *ya*. Regularity was not significant for any group.

The same regression also included a comparison of the "both" and PI responses (Table 5b). The results were similar to those of the MF and PI comparison, with two exceptions: (a) for Level 1, verbs in the indicative did not affect the odds of selecting the "both" response over the PI in comparison to verbs in the subjunctive and (b) for Level 2, *después* did not affect the odds of selecting "both" over the PI as compared to *ya*.

Overall, we can note overarching differences between Levels 1 and 2 and Level 3 and the NSs groups, the latter two of which were identical for every factor in both comparisons. First, Level 1 had some significant adverbials in either the opposite direction or a direction that was not significant from the three other groups (e.g., *puesto* and *después* in the both vs. PI comparison). Second, for Level 2, unlike the other three groups, mood was not a significant predictor of interpretation.

RESULTS OF ANALYSIS BY CONDITION: INDICATIVE VERSUS SUBJUNCTIVE

To better determine whether the patterns described for all items together correspond to both subjunctive and indicative forms in the dependent clause or whether different patterns are attested in the interpretation of these forms, we divided the items into those

TABLE 5a. Multinomial regression: MF vs. PI response in the main clause

Group	Mood		Adverb					
	Indic	Subjunc	*Puesto*	*Ya*	*Cuando*	*Después*	*Antes*	*Para*
Level 1	<	Base	=	Base	=	>	=	=
Level 2	NA	Base	=	Base	=	<	=	=
Level 3	<	Base	=	Base	<	<	<	<
NSs	<	Base	=	Base	<	<	<	<

Note: < indicates odds of choosing MF over PI are lower. > indicates odds are higher. = indicates odds are not different. NA indicates a result that is not significant.

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TABLE 5b. Multinomial regression: "Both" vs. PI response in the main clause

Group	Mood		Regularity		Adverb					
	Indic	Subjunc	Regular	Irregular	*Puesto*	*Ya*	*Cuando*	*Después*	*Antes*	*Para*
Level 1	=	Base	Base	NA	>	Base	=	>	=	=
Level 2	NA	Base	Base	NA	=	Base	=	=	=	=
Level 3	<	Base	Base	NA	=	Base	<	<	<	<
NSs	<	Base	Base	NA	=	Base	<	<	<	<

Note: < indicates odds of choosing "Both" over PI are lower. > indicates odds are higher.
= indicates odds are not different. NA indicates a result that is not significant.

that contained the subjunctive form from those that contained the indicative form in the dependent clause (Table 6).

The prediction that NSs will select the MF when there was a subjunctive form in the dependent clause and the PI when there was a PI form in the dependent clause was not borne out (Table 6). However, for the dependent clauses with subjunctive forms, the NS rate of selection of the MF in main clauses was 77%. Additionally, in this same context learners began with near-chance rates of selection (i.e., 33% for each response type) and increased their rate of selection of the MF gradually as proficiency increased. Chi-square comparisons indicated that, when there is a subjunctive verb in the adverbial clause, Level 3 learners and NSs selected the MF significantly more frequently than Level 1 and Level 2 learners (at the $p < .001$ level in each of the four comparisons). Although the Level 3 learners selected the MF significantly more frequently than the two lower levels, they still demonstrated significantly lower rates than the NSs ($p < .001$). Level 1 and Level 2 learners had highly similar distributions for subjunctive items ($p > .05$).

TABLE 6. Selection according to the mood of the verb in the adverbial clause

Group	Response	Indicative		Subjunctive	
		#	%	#	%
Level 1	MF	74	20.6%	130	36.2%
	PI	164	45.5%	120	33.4%
	Both	122	33.9%	109	30.4%
	Totals	360	100%	359	100%
Level 2	MF	91	25.3%	147	41.1%
	PI	146	40.6%	107	29.9%
	Both	123	34.2%	104	29.1%
	Totals	360	100%	358	100%
Level 3	MF	19	8.9%	111	51.4%
	PI	75	35.0%	14	6.5%
	Both	120	56.1%	91	42.1%
	Totals	214	100%	216	100%
NSs	MF	48	27.1%	139	77.2%
	PI	61	34.5%	11	6.1%
	Both	68	38.4%	30	16.7%
	Totals	177	100%	180	100%

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When the dependent clause contained a PI form, however, there was considerably more variability for all learner levels and for the NSs. For sentences that included the indicative in the adverbial clause, Levels 1 and 2 again were not significantly different from each other ($p > .05$). Level 1 was again significantly different from Level 3 and the NSs, and Level 2 was significantly different from Level 3 but not from the NSs. Although Level 3 and the NSs selected the PI at nearly identical rates, they again had significantly different distributions, based on the former's preference for the "both" response and the latter's more even distribution of responses.

To tease apart the possible relationship between the individual lexical item (i.e., adverb) and the mood of the verb in the same adverbial clause, we have further analyzed our data according to each adverb. Beginning with items with subjunctive verb forms, the distribution of responses by adverb and participant group is summarized in Table 7.

Because *cuando* and *después* (*de que*) commonly occur with both moods and typically involve the manipulation of mood to indicate whether the action has already occurred, it is perhaps not surprising that NSs and Level 3 learners selected the future in the main clause at high rates when these adverbs co-occurred with the subjunctive. In fact, at each of those two levels participants selected the PI only once following *cuando* + subjunctive and zero times following *después (de que)* + subjunctive. Given the strong preference for the MF in these contexts for Level 3 and NS participants, small cells render chi-square comparisons inappropriate, although Level 1 and Level 2 participants demonstrated a notably different pattern: at those levels, selection of the MF was starkly lower, with both groups close to 45%.

In the case of the adverbs that typically occur with the subjunctive (i.e., *antes* and *para* [*que*]), once again Level 3 and the NSs patterned differently from Levels 1 and 2. Levels 1 and 2 selected the MF following these clauses at rates that were similar to those of

TABLE 7. Selection according to adverbial (accompanied by a verb in the subjunctive)

Group	Response	*Antes*		*Para*		*Cuando* (Subjunctive)		*Después* (Subjunctive)	
		#	%	#	%	#	%	#	%
Level 1	MF	41	34.5%	44	36.7%	18	30.0%	27	45.0%
	PI	49	41.2%	41	34.2%	21	35.0%	9	15.0%
	Both	29	24.4%	35	29.2%	21	35.0%	24	40.0%
	Totals	119	100%	120	100%	60	100%	60	100%
Level 2	MF	52	43.3%	49	41.2%	18	30.5%	28	46.7%
	PI	42	35.0%	34	28.6%	21	35.6%	10	16.7%
	Both	26	21.7%	36	30.3%	20	33.9%	22	36.7%
	Totals	120	100%	119	100%	59	100%	60	100%
Level 3	MF	44	61.1%	9	12.5%	33	91.7%	25	69.4%
	PI	3	4.2%	10	13.9%	1	2.6%	0	0%
	Both	25	34.7%	53	73.6%	2	5.6%	11	30.6%
	Totals	72	100%	72	100%	36	100%	36	100%
NSs	MF	51	85.0%	33	55.0%	29	96.7%	26	86.7%
	PI	4	6.7%	6	10.0%	1	3.3%	0	0%
	Both	5	8.3%	21	35.0%	0	0%	4	13.3%
	Totals	60	100%	60	100%	30	100%	30	100%

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cuando and *después*, doing so between 30% and 47% in all cases. Level 3 and the NSs selected the MF at lower rates following clauses with *para (que)* than they did for *cuando* and *después (de que*). Also different from Levels 1 and 2 was Level 3's and the NSs' high selection of the MF with *antes* (*de que*). Participants at the latter levels showed rates of response for *antes* more like those for *cuando* and *después* (and less like *para*). In other words, Level 3 and the NSs treated *para* differently from the other three adverbs in subjunctive contexts, selecting the MF at much lower rates than with the other adverbs. This was not the case, however, for Levels 1 and 2.

For example, at Levels 1 and 2, selection of the MF, as compared to the "both" response, was not significantly different for *antes* as compared to *para* ($p > .05$ in both cases), although we note significantly more selection of the MF with *antes* than *para* for Level 3 and the NSs ($p < .001$ in both cases).

In sum, we note that Level 3 and the NSs treated the *cuando/después* class differently from the *antes/para* class, whereas the two lower levels responded to the four adverbs in a rather fixed range (e.g., approximately 30–45% MF selection following all four adverbs at Levels 1 and 2). We also note that Level 3 and the NSs demonstrated an additional nuance in showing a subdifferentiation between *antes* and *para*, selecting the MF much less with the less temporal *para*. Finally, although the lower levels had relatively even response rates across the four adverbs, *después* received the highest percentage of MF selection at both levels, with a more notable difference at Level 1.

Table 8 shows that Level 3 and the NSs again interpreted adverbs that commonly occur with both moods (i.e., *cuando* and *después*) in ways that are consistent with the correspondence of mood and temporality—they selected the PI at high rates following clauses that contained *cuando* + indicative or *después* + indicative.[14]

Levels 1 and 2 again did not show the same tendency, selecting the PI about 30% of the time in such contexts. Note, however, that the high rates of PI selection in these contexts for the NSs and Level 3 (76–77% for NSs, 71–83% for Level 3) were generally lower than the equivalents were for MF selection with the same two adverbs plus subjunctive (87–97% for NSs, 69–92% for Level 3).

With respect to adverbs that typically appear only with the indicative (i.e., *puesto* and *ya*), for Level 3 and the NSs we again see much lower selection of the expected temporality in the main clause than for the adverbs that commonly occur with both moods. In this case, Level 3 and the NSs selected the PI at much lower rates (11–17%) than they did for *cuando* and *después* (71–83%). In fact, the "both" response was the most frequent response for these two groups for both *puesto* and *ya*, although rates were particularly high for Level 3. Once again, Levels 1 and 2 treated these adverbs (41–57% PI for Level 1 and 43–45% for Level 2) much more similarly to those that commonly occur with both moods (32–47% PI for Level 1 and 28–38% for Level 2) than did Level 3 and the NSs. In fact, in addition to showing less differentiation by adverb type, Levels 1 and 2 also demonstrated an opposite directionality, as they generally selected the PI *less* following *cuando* + indicative and *después* + indicative than they did following *puesto* and *ya*.

What is more, recall that for subjunctive items, the MF versus "both" comparison did not reveal significant differences when comparing the two adverbs that traditionally occur with the subjunctive (i.e., *antes* and *para*) for the two lower levels although differences were significant for Level 3 and the NSs. In a similar comparison of MF versus "both" for the two adverbs that traditionally occur with the indicative (i.e., *puesto*

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TABLE 8. Selection according to adverbial (accompanied by a verb in the indicative)

Group	Response	*Puesto*		*Ya*		*Cuando* (Indicative)		*Después* (Indicative)	
		#	%	#	%	#	%	#	%
Level 1	MF	28	23.3%	20	16.7%	9	15.0%	17	28.3%
	PI	49	40.8%	68	56.7%	28	46.7%	19	31.7%
	Both	43	35.8%	33	26.7%	23	38.3%	24	40.0%
	Totals	120	100%	120	100%	60	100%	60	100%
Level 2	MF	29	24.2%	27	22.5%	11	18.3%	24	40.0%
	PI	54	45.0%	52	43.3%	23	38.3%	17	28.3%
	Both	37	30.8%	41	34.2%	26	43.3%	19	31.7%
	Totals	120	100%	120	100%	60	100%	60	100%
Level 3	MF	2	2.8%	9	12.7%	0	0%	8	22.9%
	PI	8	11.1%	12	16.9%	30	83.3%	25	71.4%
	Both	62	86.1%	50	70.4%	6	16.7%	2	5.7%
	Totals	72	100%	64	100%	36	100%	35	100%
NSs	MF	17	28.8%	23	39.0%	4	13.3%	4	13.8%
	PI	9	15.3%	7	11.9%	23	76.7%	22	75.9%
	Both	33	55.9%	29	49.2%	3	10.0%	3	10.3%
	Totals	59	100%	59	100%	30	100%	29	100%

and *ya*), yet again differences were not significant for the two lower levels ($p > .05$ in each case). The difference was significant for Level 3 ($p < .05$), although for the NSs it was not ($p > .05$), meaning that for NSs a difference between lexical items within patterns of occurrence that was present in the subjunctive contexts was not present for the indicative contexts.

DISCUSSION

We now return to the overarching questions the present study was designed to answer. First, we examined the distribution of forms selected (i.e., interpretations of habitual vs. future actions) for all three learner groups and the NSs. When all tokens were considered together, Levels 1 and 2 were not significantly different but all other comparisons were. Only the NSs approached the predicted 50% rate of selection of the MF, whereas all learner groups showed rates of selection of MF closer to 30%. When considering the subjunctive and indicative contexts separately, the differences between all groups other than Levels 1 and 2 held across context types. However, the division of contexts reveals a more linear path of development. For example, we see a gradual increase toward NS rates of selection of MF in subjunctive contexts (77%) across levels (36.2% to 41.1% to 51.4%). The findings in this context demonstrate not only that NSs do not exhibit categorical selection in this context despite prescriptive rules, but also that there is development between fifth semester and fourth year, even though overall patterns of distribution do not reflect this.

The second set of questions explored the relationship of various factors (context type, lexical item, and pattern of co-occurrence) to interpretation. We investigated the

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predictors of the patterns of responses using a series of analyses. The regression analysis for all contexts together showed that adverb was a significant predictor of interpretation for all levels and mood was a predictor for all groups except for Level 2, whereas the regularity of verbal morphology is not a significant predictor for any of our groups. In the case of the role for adverb, it is important to remember that the relationship for Level 1 is in the opposite direction of the NSs and, thus, the lack of significance at Level 2 is likely a sign of development. In subjunctive contexts, the individual lexical adverbs are different (*cuando* and *después* remain but *antes* and *para* occur in these contexts rather than *puesto* and *ya*), but the overarching results are similar. In addition to a decreased connection between the adverb *después* and the interpretation of futurity at Level 2, we see a move toward more categorical rates of selection with particular adverbs across levels. For example, no learner in Level 3 ever selected the PI with *después* in subjunctive contexts and one NS selected the option only once. In short, learners are generally moving toward nativelike patterns for individual adverbs.

There are several reasons why we might see differential patterns across individual lexical items, and each has implications for second language learning more broadly. First, the lower level learners show patterns of selection in contexts with *después* that differ from patterns for other adverbs. This may be because *después* invokes temporal semantics as well as mood and, thus, provides a more transparent cue for learners, albeit one that for adverbial clauses would only lead to a traditional future (i.e., not yet occurred) interpretation in conjunction with the subjunctive mood. The fact that for Level 1 learners the presence of *después* is associated with a higher likelihood of selection of the MF, regardless of whether the context has a verb form in the subjunctive or indicative moods further supports this hypothesis. Likewise, an explanation along these lines would account for the Level 3 participants' significant difference in subjunctive contexts seen between *para* and *antes*, where the latter is more clearly temporal (e.g., *antes de que coman* "before they eat") and was associated with a higher rate of selection of the MF (relative to PI), whereas the former is causative and has more implicit temporality (e.g., *para que coman* "so that they eat"). We acknowledge, however, that this explanation may be undermined by the fact that this was only true for the most advanced learner group, rather than the lower levels. This is consistent with cross-linguistic work that has demonstrated that L2 English learners acquire tense and aspect restrictions prior to mood restrictions (Bardovi-Harlig, 2004).

An additional line of hypotheses about the differences between adverbs might invoke properties of language use more generally. For example, the relative frequency of a given lexical item, such as *cuando*, might influence patterns of acquisition. Following usage-based theories that afford a role for lexical frequency (e.g., Bybee, 2006; Bybee & Hopper, 2001), the general assumption would be that adverbs like *cuando*, which are likely to be more frequent in learner-directed language (i.e., input) than adverbials such as *puesto*, are the first to show patterns of interpretation that are not based on chance.[15] A related explanation might invoke patterns of co-occurrence, such that those that are least variable in the input are interpreted in nativelike ways sooner than those that are more variable. This is supported by the comparison of *para* and *antes*, on the one hand, to *después* and *cuando*, on the other, where the first two are associated with near categorical subjunctive co-occurrence and the second two allow greater variability. Accordingly, for example, with subjunctive items our Level 3 learners and NSs generally treated *antes* and

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para differently from *cuando* and *después*, whereas Levels 1 and 2 did not. Furthermore, Level 3 and the NSs also differentiated between *antes* and *para*, even though they are both adverbs that we might expect to co-occur with the subjunctive, with both groups selecting the MF more following *antes*. Learners at Levels 1 and 2 did not make this differentiation between *antes* and *para* (in addition to not treating those adverbs as a different class from *cuando and después*), although we have noted that they generally had higher rates of future selection with *después,* albeit still within a more compact range. Taken together, our findings support recent research on contexts of co-occurrence (Edmonds & Gudmestad, 2014, investigating adjectives and their intensifiers) that has shown that NSs make selections based on collocational strength (as shown here by general differentiation of the *cuando/después* class from *puesto/ya* or *antes/para*). However, our results also indicate that NSs and learners likely make use of a combination of both collocational strength, as outlined in the previous sentence, and a role for individual lexical items (e.g., in differentiating *para* from *antes*). The implication for learning more broadly, then, is that we are reminded that no single cue or factor explains acquisition (VanPatten & Williams, 2015) and, instead, we find support for multifactorial modeling that accounts for a variety of linguistic properties (Gries & Wulff, 2005). We note that in contrast to the detailed work on input directed at native child learners, work detailing the nature of learner-directed input is still somewhat scarce. Gurzynski-Weiss et al. (in press) showed that input differs across modes (written and oral) and from instructor conversation and preference patterns outside the classroom and this avenue of research is an important direction for future inquiry.

Regardless of the explanation for the lexically based patterns attested in the current study, there are important implications for the way we view the subjunctive mood in second-language Spanish and the processes of SLA more generally. For example, the current focus on only adverbial clauses within a controlled selection task (i.e., in contrast with free production of multiple clause types) has not reduced the variability across items, and this indicates that learners do indeed employ lexically based strategies, at least to some extent. Perhaps the more surprising finding is that highly advanced learners and NSs do the same. We have seen in other studies of variable structures that NSs tend to respect semantic constraints to a greater degree than NNSs (e.g., Geeslin & Guijarro-Fuentes, 2006) and the findings in the current study are likely similar in nature. That is, in addition to general morphosyntactic restrictions, individual lexical items behave in specific ways and these patterns may override more general constraints. This also means that proposals such as prototype theory (Adamson, 2009; Goldberg, 2006; Quesada, 1998), which have been conceptualized as a combination of general factors that describe the most typical context of use for a given form (e.g., the subjunctive in contexts of desire, futurity, and with irregular verbal morphology), might need to be reconceived as also containing lexical items that typically co-occur with certain forms. For instance, the current study lends credibility to a model that includes the adverb *después* as part of the prototypical interpretation of actions in contexts with the subjunctive mood as states or events that have not yet occurred.

The current study also addresses issues related to models of language change. Because subjunctive is undergoing a gradual process of loss over time (e.g., Silva-Corvalán, 1994) which is accelerated for bilinguals such as our learner and NS participants, when the form is used, it may be interpreted less variably, whereas indicative mood offers multiple interpretations: either the canonical indicative function that corresponds with

realis or the terrain previously occupied by the subjunctive (i.e., irrealis). The claim of less variable interpretation of the subjunctive than the indicative is supported by our data. For example, for those adverbs that occur to a relatively high degree with both moods (i.e., *cuando* and *después*), Level 3 and especially the NSs selected the MF following these adverbs with subjunctive at even higher rates (87–97% for NSs, 69–92% for Level 3) than they selected the PI following this context in the indicative (76–77% for NSs, 71–83% for Level 3). We can further test for possible change in variability of interpretation by determining how frequently participants select an interpretation that does not correspond with the canonical. For example, when the subjunctive is used in adverbial clauses, NSs interpreted the action as habitual (i.e., selected PI in the main clause) only 6.1% of the time, and Level 3 learners similarly did so only 6.5% of the time, whereas the lower level groups both did so approximately 30% of the time. When the indicative is used in adverbial clauses, NSs interpreted the action as having not yet occurred (i.e., selected MF in the main clause) 27.1% of the time. In this case, Level 3 participants were about equally as prescriptive as they were with the previous comparison, with a low 8.9% rate. The lower-level learners also demonstrate similar behavior across moods, likely confirming that sociolinguistic variation, perhaps especially as it relates to language change in progress, is very late acquired.

TABLE 9. Proposed developmental stages for the interpretation of variable adverbial conjunctions

Stage	Description	Evidence
1	Strong tendency to interpret events as already occurred or occurring habitually (i.e., correlating with indicative mood) General lack of differentiation by adverb or adverb class (i.e., patterns of co-occurrence)	High rate of selection of the PI in main clauses Rates of selection for the PI/MF are similar across adverbial classes
2	Slight increase in interpreting events in subjunctive as not yet occurring, but continued tendency to interpret events as having already occurred Continued lack of differentiation across adverbial class, although some signs of differentiation	High rate of selection of the PI in main clauses, but lower than Stage 1. Rates of selection for the PI/MF are similar across classes of adverbs, although slightly higher MF with subjunctive and PI with indicative for adverbs that are typically used with both moods
3	Lower likelihood of interpreting events as habitual and greater likelihood of permitting multiple interpretations. Much greater differentiation in interpretation according to adverb class, although the two moods do not behave identically	Lower rate of selection of the PI in main clauses; large increase in selection of the "both" response Much higher selection of MF with subjunctive and PI with indicative for adverbs that are typically used with both moods. This tendency is greater with subjunctive.
Target	Likely to interpret events with subjunctive as having not yet occurred rather than permitting both interpretations Differentiation in interpretation according to adverb type, although the two moods do not behave identically	For indicative contexts, selection of MF, PI, and "both" evenly distributed; In subjunctive contexts, MF is selected 77% of the time High selection of MF with subjunctive and PI with indicative for adverbs that are typically used with both moods. This tendency is even greater when subjunctive mood is used.

https://doi.org/10.1017/S0272263117000262 Published online by Cambridge University Press

To summarize, we see that there is a relationship between all three factors examined: the context (subjunctive vs. indicative), the lexical adverbial phrase, and the patterns of co-occurrence. The third research question, which has been answered indirectly, is how the NSs and three learner groups differ from one another. Perhaps the best way to explore these differences is in the context of stages of acquisition. Thus, considering frequency and predictors and contextualizing the earlier findings documenting lexically based or class-based strategies, we propose stages of development, one for each participant group in our study, outlined in Table 9.

The stages proposed in Table 9 suggest that, like acquisition of production, the acquisition of interpretation is reflected in a variety of ways over time, including changes in the distribution of interpretations and their predictors. The implications of these findings are that although patterns of co-occurrence and individual lexical items do contribute to interpretation, they do so to varying degrees and in different ways across levels of proficiency.

CONCLUSIONS AND FUTURE DIRECTIONS

In general, our study has confirmed that patterns of co-occurrence and individual lexical items play a role in the acquisition of grammatical contrasts and that these factors interact with other linguistic factors, such as mood contrasts, in complex ways. Additionally, we see that learners require extensive experience with the language to demonstrate nativelike patterns in the interpretation of the subjunctive. More specifically, our Level 1 and Level 2 learners do not show great distinctions in their patterns of interpretation between adverbs that co-occur with both subjunctive and indicative and those that occur primarily with only one mood. In contrast, the Level 3 group and the NSs do treat adverbs differentially according to their patterns of co-occurrence. Additionally, whereas *después* appears to show unique patterns of interpretation with lower-level learners, there are additional lexical effects for Level 3 and NS participants. Neither factor provides a singular explanation for patterns of interpretation but rather, they represent parts of a complex whole.

Despite the importance of these findings for our general understanding of how second languages are acquired, we see the need for additional research. For example, the present study is limited to sentence-level analysis, but future research would do well to explore broader, discourse-level factors. Likewise, the possibility that the PI also expresses future time reference may have influenced the degree to which this verb form was allowed, even in prescriptively MF contexts (with subjunctive), and it is likely that additional tasks, such as think aloud protocols, might shed light on the interplay of these factors. Related to this, the periphrastic future is also attested in these same contexts and future research might allow for a closer look at the degree to which interpretation is linked not simply to the concept of future-time reference, but rather to a given form used to express this meaning. In terms of viewing patterns of co-occurrence in contrast with different lexical items, an expansion of the range of items included in the design is necessary for future work to continue to tease apart these two factors. Finally, there is a considerable gap in our participant group between the lowest level and the Level 2 participants and we seek to track development between these two stages in the future. Likewise, it is important to connect the individual characteristics of learners and NSs to patterns of interpretation.

Although the current study demonstrated that NSs and advanced learners invoke mood, adverbial class, and individual adverbs in determining interpretations whereas lower-level learners do not, future studies will continue to explore these complex relationships.

SUPPLEMENTARY MATERIAL

To view supplementary material for this article, please visit https://doi.org/10.1017/S0272263117000262

NOTES

[1]In general, the term "frequent forms" within usage-based approaches refers to the frequency with which a particular form (or its lexical root) occurs, and this is documented through corpus studies (e.g., Gries & Wulff, 2005). However, frequency may also refer to how often a particular group of lexical items (i.e., a collocation) occurs together or to how often a given morphological form occurs. These distinctions will be made as we develop the goals and methods of the current study.

[2]In the present study, we investigate frequently occurring lexical forms (to ensure comprehensibility across proficiency levels), rather than including a range of lexical items that diverge in collocational frequency (i.e., rates of co-occurrence of subjunctive or indicative forms of particular verbs with particular adverbial clauses), but such a line of research is also potentially valuable. We do, however, report rates of co-occurrence in corpus data in Table 2 of our method section.

[3]For further discussion on the many ways in which lexical frequency might influence patterns of use for both NS and NNSs, see Linford et al. (2016).

[4]Whereas some previous work differentiates between adverbs as single-word entities (e.g., *cuando*) and adverbial conjunctions as multiple word forms (e.g., *hasta que*), for the sake of brevity we generally refer to both as adverbs for the remainder of the paper.

[5]Although our focus is on the contrast between subjunctive and indicative forms in adverbial clauses, there are also several mechanisms through which future time may be marked (i.e., use in the main clause of MF or periphrastic future). In the present study, we hold these forms constant to better focus on the contrast under investigation, but future research may introduce this additional verb form variable in the main clause.

[6]We begin with research question one because it provides a baseline for rates of selection. The detailed description of the task that follows will show that the prediction in the absence of variation would be 50% selection of PI and 50% MF.

[7]Recall that adverbial clauses in the indicative usually co-occur with main-clause verbs in the PI and convey actions that have already happened, whereas adverbial clauses with verbs in the subjunctive usually co-occur with main-clause verbs in the future and indicate actions that have not yet taken place.

[8]Three Level 1 learners reported spending 3 to 6 weeks in Spain, although their grammar test scores and behavior on the interpretation task were similar to their level classmates. Of the 30 Level 3 learners, eight had spent a maximum of one semester in Spain (4 to 15 weeks), two in Argentina (4 to 15 weeks), and one in Peru (24 weeks). These participants also behaved similarly to their level colleagues on the grammar test and interpretation task.

[9]We view the current methodology as preferable to Kanwit and Geeslin's (2014) interpretation task for two reasons. First, to not reveal whether the action had already occurred, the earlier study required all main-clause verbs to occur in the PI, which can be unnatural, especially following adverbial clauses that contain the subjunctive. Second, the earlier study included responses that were English interpretations of the adverbial clause content, and we argue that performing the entire task in the target language is a better way to tap target abilities.

[10]Additional sample items can be found in the online supplementary materials.

[11]For each group, between one and three items were left blank, and this explains why, for example, the Level 1 total is one greater than that of Level 2.

[12]The specific results of each chi-square test referenced in the paper can be found in the online supplementary tables.

[13]As an anonymous reviewer notes, individual item and participant analyses would provide further information about our task and participants. We agree but for reasons of space cannot report these findings here. We also note that research on L2 variation has demonstrated that individual learner grammars are consistent with group grammars (Bayley & Langman, 2004) and, thus, this is an appropriate starting point for reporting our findings.

[14]High PI rates again obviated the ability to run chi-square tests that did not contain small cells.

[15]We further note that researchers have found a range of interactions and effects for lexical frequency, any of which could be at play. For example, lexical frequency could have a direct effect or an amplifying effect (Erker & Guy, 2012). The current task is not designed to explore this in greater depth and, thus, further research is needed to confirm this hypothesis.

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