

Testing the Interface Hypothesis: Acquisition of complex syntax and modality in L2 Spanish

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Abstract

Numerous studies have investigated the role of morphosyntactic variability or vulnerability at the pragmatic/semantic-syntactic interface (Prévost & White, 2000; Sorace, 2000; Haznedar, 2003; Lardiere, 2005; McCarthy, 2008; Iverson, Kempchinsky, & Rothman, 2008; Slabakova, 2009; Massery & Fuentes, 2014; Cuza, Guijarro-Fuentes, Pires, & Rothman, 2012; Santoro, 2012; among others). More recently, the Interface Hypothesis, originally put forth by Sorace and Filiaci (2006), has been a focal point within the generative framework (Tsimplici & Sorace, 2006; Sorace & Serratrice, 2009; Slabakova, 2009; Slabakova, Kempchinsky, & Rothman, 2012; Rothman, 2009; Lillo-Martin & Quadros, 2011; Montrul, 2011; Sorace, 2011; White, 2011; Kraš, 2012; Park, 2013; Sharwood Smith, 2013). In the following cross-sectional study, we provide evidence in favor of the Interface Hypothesis by examining L1 and L2 perceptions of complex nominal clauses (i.e., narrow syntax) embedded with deontic (syntax-semantics) and epistemic (syntax-discourse) modality in Spanish. In doing so, we demonstrate that advanced learners struggled more with epistemic environments than they did with deontic environments. Furthermore, the results of our study provide additional support for Slabakova, Kempchinsky, and Rothman (2012), whose research identifies a clear developmental trajectory in acquiring advanced interface properties.

Keywords Second Language Acquisition, Complex Syntax, Interface Hypothesis, Epistemic and Deontic modality, Optionality in L2

1. Introduction

Numerous studies have investigated the role of morphosyntactic variability or vulnerability at the pragmatic/semantic-syntactic interface (Prévost & White, 2000; Sorace, 2000; Haznedar, 2003; Lardiere, 2005; McCarthy, 2008; Iverson et al., 2008; Slabakova, 2009; Massery & Fuentes, 2014; Cuza et al., 2012; Santoro, 2012; Antonova-Ünlü, 2015; among others). More recently, the Interface Hypothesis (also referred to as the IH framework throughout our investigation), originally put forth by Sorace and Filiaci (2006), has been a focal point within the generative framework of L2 acquisition (Tsimplici & Sorace, 2006; Sorace & Serratrice, 2009; Slabakova, 2009; Slabakova et al., 2012; Rothman, 2009; Lillo-Martin & Quadros, 2011;

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Montrul, 2011; Sorace, 2011; White, 2011; Kraš, 2012; Park, 2013; Sharwood Smith, 2013). The fundamental principles that drive the Interface Hypothesis include the ability to explain residual variability during advanced stages of L2 acquisition³, and distinguishing between learners' ability to acquire narrow syntax and more complex discourse-dependent structures, which is where syntax and cognition intersect (Sorace 2011).

A number of earlier works support the validity of this theory, while others have questioned its capacity to truly explain residual optionality at advanced stages of acquisition. In addition, even though the Interface Hypothesis was originally posited to explain learners' difficulties during endstate grammars (i.e., primarily near-native speakers of L2), it has recently been extended to observe acquisition behaviors of intermediate and advanced learners (see Sorace & Filiaci, 2006; Slabakova et al., 2012; Rothman, 2009; Sorace, 2011; White, 2011; Lardiere, 2011; Kraš, 2012; Park, 2013; and Antonova-Ünlü, 2015, for example), as noted by Slabakova et al. (2012). Moreover, studies that employ cross-sectional research designs, such as those of Slabakova et al. (2012), Rothman (2009), Kraš (2012), and Park (2013), allow investigators to identify patterns that arise and change over time, thereby facilitating projection of endstate grammars as they relate to syntax-discourse and syntax-semantic interfaces.

Slabakova (2011) explains that "structures interfacing with formal features could be acquired and processed differently from structures interfacing with contextual features, leading to residual optionality at near-native levels..." (p. 89). Similarly, Sorace (2011) maintains that "language structures involving an interface between syntax and other cognitive domains are less likely to be acquired completely than structures that do not involve this interface" (p. 1). In agreement with earlier research, Kraš (2012), explains that "narrow syntax and internal interfaces can be completely acquired in the L2, whereas this is not necessarily true of properties relating to external interfaces" (p. 114). For the present study, we assume the position taken by, as well as employ the terminology used in, Sorace and Serratrice (2009). In their research, the investigators state that "the syntax-semantic interface involves formal features and operations within syntax and Logical Form, whereas the syntax-discourse interface involves pragmatic conditions that determine appropriateness in context" (Sorace & Serratrice, 2009, p. 197). From this point forward, the ideas presented in their study will serve as our point of departure.

To summarize, and in accordance with the explanations provided by the researchers mentioned in this section of our paper (Sorace & Serratrice, 2009; Slabakova et al., 2012; Kraš, 2012), there appear to be two distinct processes at work: (1) understanding of basic grammatical principles – or narrow syntax at the internal interface; and (2) knowledge of how grammatical principles are used in context for communicative purposes, a feature which White (2007), Sorace and Serratrice (2009), and Slabakova (2011) refer to as the syntax-discourse (or external) interface. In order to demonstrate support for the Interface Hypothesis, results of the data should

³ The Interface Hypothesis is not limited to studies in second language acquisition alone, as it was eventually extended to bilingual first language acquisition and initial stages of language attrition.

show that proficient learners are able to successfully construct and/or identify specific elements of language, including formal, semantic, and even phonological features (Rothman, 2009), while simultaneously demonstrating non-target-like behaviors in environments where pragmatics intersects with syntax. The impact of residual L1 features is not entirely clear within IH framework, although interference of learners' first language during later stages of acquisition is expected to impact L2 performance in discourse-dependent environments (see Sorace & Filiaci, 2006; Slabakova et al., 2012; Collentine, 2010).

The remainder of our paper is structured as follows: (1) we first provide a review of previous studies that center on the Interface Hypothesis, presenting research that both supports and challenges the IH framework; (2) second, we include a brief theoretical discussion of epistemic and deontic modality, followed by a review of studies that support our modal classifications; (3) we then introduce the methodology used to carry out our study, continued by a discussion of our results and findings, ultimately arguing in favor of the Interface Hypothesis.

1.1. Previous Studies

Demonstrating support for the Interface Hypothesis is a study conducted by Tsimpli and Sorace (2006), whose research involved twenty-seven adult Russian learners of Greek⁴; none of the participants recruited for the research had received formal language training prior to the study. The learners were allocated to one of three groups, depending on the number of years they had spent residing in the country (i.e., Greece) at the time of the study. Tsimpli and Sorace (2006) investigated learners' ability to distinguish between focus (i.e., a grammatical feature subject to structural restrictions in the left periphery) and clitic-left dislocation, also referred to as topicalization: a process that requires an accurate identification and understanding of previously stated information for felicitous interpretation or output. Results of the data revealed that all participants (beginning through advanced stages of acquisition) successfully analyzed structures involving focus (Tsimpli & Sorace, 2006). Topicalization (a process which requires pragmatic knowledge), however, caused problems for learners, even at advanced levels of L2, as appropriate interpretation was constrained by discourse features.

In accordance with Tsimpli and Sorace (2006), Slabakova et al. (2012) presented results that fell within the parameters of the IH framework. For their cross-sectional study, the researchers centered on clitic-left dislocation and focus fronting. Slabakova et al. (2012) maintain that specific syntactic properties of clitic-left dislocation (syntax-discourse) and focus fronting (syntax-semantics) – a procedure similar to that of English – are determined by subset features that have been shown to cause variability, even among highly proficient learners.

⁴ As one reviewer points out, while Greek is a [+pro-drop] language, Russian is only partially pro-drop.

Eighty-eight L1 English speakers participated in the investigation and several tasks were employed during the study. Among these exercises was a proficiency test used to examine L2 syntactic awareness of clitic-left dislocation and focus fronting. The researchers subsequently distributed a felicity judgment task that required learners to choose among a variety of syntactic environments and identify the structure that best represented a corresponding visual stimulus; all items displayed varying levels of grammaticality as a result of felicitous and infelicitous clitic distribution and/or availability in a given structure.

Results of the data revealed that near-native and advanced learners were generally successful in their analyses of the environments tested – a conclusion that actually goes against predictions made by the Interface Hypothesis. With this said, however, Slabakova et al. (2012) did find support for the Interface Hypothesis in that near-native and advanced learners' performance deviated from that of L1 in highly-nuanced subsets of clitic-left dislocation; this behavior was demonstrated by learners' inaccurate analyses of clitic availability and/or placement in environments where a clitic and antecedent were co-referenced. Learners were able to successfully identify errors in focus-fronting environments, however, as a result of its straightforward and English-like mapping at spell-out.

In addition to the results reported previously, Slabakova et al. (2012) identified a clear developmental trajectory in L2 acquisition of interface properties. In their study, the researchers argue that learners first acquired the syntactic principles underlying clitic distribution; second, they demonstrated knowledge of syntactic-semantic properties, a behavior displayed by participants' high performance on tasks involving focus fronting; third, advanced learners continued to indicate vulnerability at the syntax-discourse external interface, which was made apparent by their over-acceptance of objects in infelicitous environments. These findings are important in what follows, and we return to the results reported in Slabakova et al. (2012) in latter portions of our work.

Similar to the work of Slabakova et al. (2012), a very recent study by Antonova-Ünlü (2015) also demonstrated support for the IH hypothesis. In her study, the focus was L2 acquisition of case markers in Turkish among highly proficient participants whose first language was Russian. According to Antonova-Ünlü, case markers in Turkish involve morphosyntactic, semantic and discourse-related features that often require pragmatic understanding for accurate interpretation. Of the six case markers in Turkish, the accusative case marker is the only one that has the ability to assume a non-obligatory status in multiple contexts; all other case markings are required by the grammar. Despite the flexibility of accusative case markers in Turkish, Antonova-Ünlü explains that there are specific instances in which they are obligatory: direct objects that possess [+definite] features, for example, must be marked with accusative case. Preverbal direct objects possessing [-definite] features, though, are often unmarked unless they appear with a possessive suffix (see Kraš, 2012); such parametric differences yield asymmetrical patterns among the two languages (i.e., Russian and Turkish), as objects with [+indefinite] features remain unmarked in learners' first language (i.e., Russian).

Data for this study were collected via oral narratives and later transcribed using CHILDES, an online program that allows researchers to analyze oral exchanges among interlocutors. The data were then evaluated by two native speakers of Turkish trained in linguistics and compared to data provided by L1 Turkish speakers, all of whom served as the control group. The results of the data show that, while the monolingual Turkish (i.e., control) group marked case accurately throughout the task, L2 participants made errors during the exercise. More specifically, of all six case markers in Turkish, only environments involving accusative case (i.e., case used to mark direct and indirect objects) proved difficult for the highly proficient learners – perhaps pointing to residual properties of learners' first language (i.e., Russian) in L2 Turkish.

In opposition to the research arguing in favor of the Interface Hypothesis (i.e., Tsimplici & Sorace, 2006; Slabakova et al., 2012; Antonova-Ünlü, 2015), Rothman (2009) found that the results of his study did not support the Interface Hypothesis. For his research, which investigated L2 acquisition of the null subject parameter, he recruited a total of fifty-five participants and observed their collective ability to accurately rank a variety of felicitous and infelicitous syntactic environments – all of which included null and overt subject pronouns in discourse-dependent (i.e., external interface) and syntax-driven (i.e., internal interface) environments.

In order to carry out his study, Rothman assigned each participant to one of three groups: (a) L2 learners of Spanish at the intermediate-level; (b) L2 learners of Spanish at the advanced level; and (c) native Spanish speakers. All participants were asked to complete three distinct tasks, each of them requiring some form of production and/or pragmatic or grammatical judgment. Using a 1-5 interval scale, where '1' referred to an awkward or unnatural structure and '5' referred to a completely natural-sounding stimulus (as perceived by the participant), Rothman asked learners to rank the appropriateness of a variety of syntactic items in different contexts.

The results of the study indicate that native Spanish speakers and advanced learners of the language performed similarly in contexts where the use of overt subject pronouns relied on a deeper pragmatic understanding of a given item. In fact, the difference between the advanced group and native speakers was not statistically significant on any of the tasks, unlike the intermediate learners, whose results consistently deviated from the other two groups. Contributing to their lower scores in discourse-dependent environments was intermediate-level learners' over-acceptance of the null subject parameter, a feature not found in learners' first language (i.e., no evidence of L1 interference). The latter of these findings, combined with advanced learners' near-native behavior on tasks involving external interface properties, did not fit within the parameters outlined in the IH framework.

In agreement with Rothman (2009), Kraš did not find support for the Interface Hypothesis. For her study, she tested three distinct syntactic environments: (a) environments without clitics; (b) environments with infinitival verbs followed by clitics; and (c) VPs preceded by clitics. Using Magnitude Estimation, Kraš (2012) asked learners to numerically rank their preferences for the different structures in relation to a pre-selected stimulus.

The results of the data reveal that learners' performance, even those considered to be highly proficient, did not demonstrate target-like behavior. According to Kraš (2012), none of the participants in either group seemed to be cognizant of the auxiliary changes required by the verbs. Explained differently, despite their collectively advanced status, clitic climbing – which should trigger a learner's preference of *avere* (to have), not *essere* (to be) – did not prompt the use of the appropriate auxiliary change in infelicitous environments. Due to learners' unsuccessful auxiliary change at the syntax-semantics interface, Kraš (2012) concluded that participants had not fully acquired the linguistic properties predicted by the Interface Hypothesis at the time of the study.

Comparable to Kraš (2012), Park (2013) tested the validity of the IH framework. For this study, however, the research centered on L2 acquisition of English articles by L1 Korean participants. Park (2013), in agreement with Sorace and Serratrice (2009), suggests that the (in)definiteness feature in English exists as part of the syntax-discourse interface, considering that proper interpretation of its syntactic position in a sentence relies on an interlocutors' pragmatic understanding of a given environment. Contrary to the complexity of the (in)definiteness feature of discourse-dependent environments, Park suggests that the generic use of 'a' and 'the' is not discourse-dependent and should therefore be easier for learners to acquire. Park (2013) argues that sentences including [+generic] features make reference to the same generic NP, thereby restricting optionality.

For her study, seventy Korean learners of English were recruited; all participants were adults and considered to be advanced L2 speakers. A group of twenty-one L1 English speakers were also recruited for the control group. Using a timed-acceptability judgment task, Park (2013) tested learners' ability to identify NPs in (in)definite (i.e., discourse-dependent environments) and generic contexts (i.e., syntax-semantics environments). The results of the study show that learners performed better on discourse-dependent environments than they did on their structure-driven generic counterparts. Consequently, Park (2013) concluded that the Interface Hypothesis could not support the results of the data, as learners performed better on items that required pragmatic knowledge for felicitous interpretation.

To summarize, support for the Interface Hypothesis has been demonstrated by earlier research including Tsimpli and Sorace (2006) and Slabakova et al. (2012), and, more recently, Antonova-Ünlü (2015); recall that all three studies reported strong performance among learners on items involving syntax-semantic or rather, internal interface properties, while also demonstrating less successful performance on items involving discourse-driven features. Similarly, Tsimpli and Sorace (2006) and Slabakova et al. (2012) demonstrated that advanced learners performed more successfully on activities involving focus (i.e., internal interface) than they did on those involving topicalization and clitic-left dislocation (i.e., external interface).

In contrast to these findings, Rothman (2009), Kraš (2012), and Park (2013) could not explain their results using the Interface Hypothesis; recall that these studies reveal that near-native and advanced learners performed more successfully in syntax-discourse (i.e., external interface) environments than

they did in syntax-semantic environments (i.e., internal interface). Call to mind that Kraš (2012) found that advanced learners were unable to detect errors in structures involving auxiliary change in clitic climbing (i.e., syntax-semantic). Similarly, Park (2013) found that learners' highly accurate performance on tasks involving [+/- (in)definite] features in English, combined with their (i.e., participants') low performance on items involving generic features in L2, did not support the parameters outlined in the IH framework. Finally, Rothman's (2009) study shows that advanced learners' ability to detect the need for overt subject pronouns in pragmatically constrained environments, in addition to intermediate learners' over-acceptance of the null subject parameter, did not fit within the parameters outlined by the Interface Hypothesis.

Collectively, the studies reviewed in this portion of our work have investigated a number of grammar points in L2 acquisition, including the null subject parameter, distribution of clitics and auxiliary change, focus, topicalization, and the impact of (in)definite and generic features on overt subject pronouns, among others, using the IH framework. To our knowledge, no study has employed the IH framework to investigate L2 acquisition of complex nominal clauses with embedded epistemic and deontic modality. Therefore, in response to this deficiency, we tease apart the embedded modal subcategories that drive morphosyntactic/pragmatic behaviors of complex nominal clauses in L2 Spanish.

1.2. Epistemic and deontic modality: A theoretical perspective

Mood (i.e., subjunctive vs. indicative) is a grammatical term that refers to the morphosyntactic representation of modality (Collentine, 2010). Modality, though, is a semantic subcategory of mood, which has been explained as "any lexical or morphological expression of one's commitment to the truth-value of a statement" (Collentine, 2010, p. 40), and as "a category of linguistic meaning having to do with the expression of possibility and necessity" (Fintel, 2006, p. 20). More specifically, however, epistemic modality⁵ refers to varying degrees of truth-value and reality, as well as possibility and prediction (Winiharti, 2012). Deontic modality⁶, though, refers to influence, obligation, permission, and desire (Winiharti, 2012).

Some researchers have shown that the syntactic-semantic nature of deontic modality is less cumbersome for learners than epistemic modality. Iverson, Kempchinsky, and Rothman (2008), and Massery and Fuentes (2014), for instance, suggest that the less complex nature of deontic modality is due in part to its syntactic automaticity in complex nominal clauses. Matrix clauses connoting necessity, obligation, influence and desire of Subject X over Subject Y will always generate subjunctive morphology in subordinate nominal clauses (i.e., overt CP V²_[+subjunctive]) of Spanish, thereby reducing the number of morphosyntactic options in these contexts; this is not the case for complex nominal clauses of epistemic modality, however.

⁵ Winiharti (2012) summarizes work from Greenbaum (1996), which suggests that words like 'could', 'might', 'would', and 'should' belong to epistemic modality.

⁶ Winiharti (2012) summarizes work from Greenbaum (1996), which suggests that words like 'can', 'may', 'will', and 'shall' belong to deontic modality.

Unlike deontic modality, epistemic modality is difficult for learners to acquire because it requires pragmatic knowledge (Iverson et al., 2008; Massery & Fuentes, 2012) for proper discursal use in communication. Take the following examples, for instance.

(1)

Creo que él está en clase.

I believe-1p-sing [CP [C that [IP [he is-3p-sing-ind in class]]

‘I believe that he is in class.’

(2)

No creo que él esté en clase.

I do not believe-1p-sing [CP [C that [IP [he is-3p-sing-sub in class]]

‘I do not believe that he is in class.’

By looking at examples 1 and 2, we observe that not only do such utterances require morphological alternations in the subordinate clause, but they also involve knowledge of truth-value nuances. Additional complications may arise in situations where the verb *dudar* (‘to doubt’) is used instead of *no creer* (‘not to believe’) or *no pensar* (‘not to think’), as the inclusion of the negative lexical symbol *no* produces opposite meanings among matrix verbs. What’s more, even though *no dudar* (‘not to doubt’) is semantically equivalent to *creer* (‘to believe’) and *pensar* (‘to think’), it is morphosyntactically equivalent to *no creer* (‘not to believe’) and *no pensar* (‘not to think’⁷).

1.3. Previous studies in epistemic and deontic modality

Over the last ten years, studies in second language acquisition research (Tamaji, 2007; Borganovo, Bruhn de Garavito & Prévost, 2008; Iverson et al. 2008; Massery & Fuentes, 2014; Jabbari & Sedghi, 2015) have investigated learners’ acquisition of epistemic and deontic modality and have demonstrated that learners often struggle with epistemic environments (i.e., syntax-discourse interface). Iverson et al. (2008), for example, found that advanced learners’ performance differed from that of native Spanish speakers only on items that included negated epistemic environments; advanced learners’ performance on structures involving deontic modality, however, was highly target-like in comparison to the intermediate-level learners, whose judgments were significantly distinct from the other two groups.

In agreement with Iverson et al. (2008), Jabbari and Sedghi (2015) investigated L2 acquisition of deontic and epistemic modality of Persian speakers studying English as a second language. In their study of thirty-four intermediate and advanced learners, the researchers found that all participants had fully acquired modal auxiliaries referring to contexts of simple permission and obligation, such as ‘can’ and ‘must’ (i.e., deontic), for example. In opposition to these results, however, the modal auxiliary ‘may’, connoting possibility (i.e., epistemic), resulted in collectively low scores.

⁷ See Appendix B for a detailed illustration of idiosyncratic behaviors of epistemic modality in Spanish.

Massery and Fuentes (2014) is among the most relevant research to our current investigation. In their study of approximately one hundred and fifty participants, they (i.e., the investigators) found that learners' performance was highly accurate in deontic environments (i.e., syntax-semantics) at all levels of acquisition; epistemic environments (i.e., syntax-discourse), however, yielded varied outcomes and a low accuracy rate among most participants, including those at advanced stages of acquisition.

The combined results of the studies mentioned in this section of our investigation suggest that learners experience greater difficulty on items involving truth-value judgments (i.e., epistemic modality). These findings support those of previous studies; recall that collectively Iverson et al., along with Massery and Fuentes (2014), found that advanced learners of Spanish demonstrated highly target-like ability in deontic environments (i.e., syntax-semantics), while differing significantly from native speakers on items involving epistemic (i.e., syntax-discourse) stimuli. In accordance with these studies, Jabbari and Sedghi (2015) found that auxiliary verbs connoting possibility (i.e., epistemic/external domain) caused more problems for learners than those referring to permission and obligation (i.e., deontic/internal domain).

Based on the results presented in Iverson et al. (2008), Massery and Fuentes (2012), and Jabbari and Sedghi (2015), all of which found learners' performance in deontic environments to be more target-like than their performance on epistemic structures, we consider deontic modality as the syntax-semantics interface and epistemic modality as the syntax-discourse interface. Although L2 acquisition of deontic and epistemic modality has been investigated repeatedly in terms of morphological variability (Prévost & White, 2000; Sorace, 2000; White, 2003; Sorace, 2005; Iverson et al., 2008; Massery & Fuentes, 2014; among others), to our knowledge, no study has researched L2 acquisition of these modal subcategories within the IH framework. Therefore, in accordance with the criteria outlined by the Interface Hypothesis (refer to earlier sections of this article), combined with the semantic, pragmatic, and structural features of epistemic and deontic modality, we anticipate that the results of our data will support the following hypotheses:

1. *Internal interface syntax-semantic properties:* Advanced-level learners will demonstrate less vulnerability (i.e., less variation) in deontic environments (i.e., syntax-semantics interface).
2. *External interface syntax-discourse properties:* Advanced-level learners will demonstrate vulnerability (i.e., more variation) in epistemic environments (i.e., syntax-discourse interface).
3. *Signs of L1 (English) interference:* L1 interference will affect learners' perceptions of grammaticality in L2 Spanish, even at the advanced level.

In the following section of our work, we provide information about the L1 and L2 Spanish speakers who participated in our study. We then introduce the methodology we used to collect our data, followed by a discussion of the data-collection procedures we used for our research. Furthermore, we

present the design of our instrument and explain how it was distributed to the participants.

2. Methodology

2.1. Participants

Following the work of earlier studies, including Slabakova et al. (2012), for example, we employed a cross-sectional research design that involved a large number of participants and a variety of course levels, including Intermediate ($n = 169$), Post-Intermediate ($n = 20$) and Advanced ($n = 11$). Data were collected from approximately two hundred and twenty-three learners and native speakers combined ($n = 223$): two hundred L1 English speakers studying Spanish as a second language and twenty-three L1 Spanish speakers ($n = 23$). At the time of the study, learners were between the ages of eighteen and twenty-three and enrolled in Spanish courses at a small North-American university.

The intermediate-level learners were students completing the language requirement, while the post-intermediate learners were students who had begun taking classes beyond the four-semester language requirement and were working toward a major or minor in Spanish. We could not categorize these students (i.e., post-intermediate) as ‘advanced⁸’ as they did not meet the advanced-level criteria outlined by ACTFL. Advanced learners, however, had reported starting Spanish in high school and were completing upper-level content courses in literature and linguistics at the time of the study. All language and content courses were taught in an immersion-style classroom setting. Additionally, post-intermediate and advanced courses consisted of both native and non-native Spanish speakers.

Prior to distributing the instrument to the participants, a focus group was consulted that consisted of six L1 Spanish speakers, all of whom were seasoned language instructors at a large public university in northern Spain. For additional assurance regarding the instrument’s accuracy, it was evaluated four times by the L1 Spanish group; members of the focus group were not allowed to take part in the study, but rather served as editors and examiners of the instrument. We chose not to include learners taking first-semester Spanish, as they would not have been exposed to complex syntax, or the subjunctive mood, at the time of the study. Over a ten-day period, a total of fifteen classrooms were visited based on overall scheduling,

⁸ Although we did not classify the advanced learners as near-native speakers, we did consider them to be ‘advanced’ because their collective profiles complied with advanced-level criteria outlined by the ACTFL guidelines. Our analysis is supported by earlier investigations, including Rothman (2009), Kraš (2012), and Park (2013), for example, who referred to their most proficient participants as ‘advanced’. Furthermore, Slabakova et al. (2012) point out that authors including Lardiere (2011) and White (2011), for example, have questioned why the IH framework centers on near-native stages of L2 acquisition. In doing so, Lardiere and White maintain that near-native and advanced learners face (or have faced) similar linguistic challenges. Therefore, in agreement with the research mentioned here, we argue that including advanced speakers as our highest level of proficiency is warranted based on earlier research in this area of inquiry.

availability, and instructors' willingness to allow data collection in their classrooms⁹.

2.2. Instruments

A grammaticality judgment task, which we refer to as the Syntax-Modality Perception Task (or S_yMP-T), was used to collect the data. S_yMP-T included sixteen stimuli clusters: fourteen clusters (i.e., 84 sentences) were analyzed, while two clusters (i.e., 12 sentences) were used as distracter items. Each cluster contained six distinct syntactic environments, which varied in overall design and level of grammaticality; three of the six structures in each cluster included overt CPs, followed by either V²_[+subjunctive], V²_[+indicative] or V²_[+infinitive]; the remaining three environments in each cluster included a null CP with V²_[+subjunctive], V²_[+indicative] or V²_[+infinitive]. All items (i.e., environments) were randomized within each cluster in order to avoid priming effects.

Epistemic and deontic clusters with overt and null CPs were distributed evenly throughout the instrument. This distribution was important because epistemic environments can select a subordinate clause with either a V²_[+indicative] or V²_[+subjunctive], depending on the context; complex nominal clauses of deontic modality in Spanish, however, always select overt CPs and V²_[+subjunctive], thereby reducing morphosyntactic options for accurate production. By separating epistemic and deontic clusters into separate submodalities, in addition to examining a variety of felicitous and infelicitous syntactic structures, we were able to tease apart two distinct interfaces: syntax-semantics (i.e., deontic modality) and syntax-discourse (epistemic modality).

Of the ninety-six structures evaluated by participants, a total of sixty-four items were considered for examination. Similar to the work of Sorace and Serratrice (2009), Slabakova et al. (2012), Rothman (2009), Kraš (2012), and Park (2013), we used a grammaticality judgment task and Of the ninety six structures rank each item against other environments within the same stimuli cluster, each of which included six sentences that possessed distinct levels of grammaticality (see Appendix A). We designed the study this way in order to examine learners' perceptions of varied yet similar structures. Much like the work of Rothman (2009), we asked participants to rank felicitous and infelicitous¹⁰ items using an interval scale that ranged from one to six (Rothman used 1-5): one reflected the least grammatical item in a series and

⁹ We did not control for sociolinguistic variables such as age, race, or gender in the present study. Such variables were not considered feasible or necessary for our data collection.

¹⁰ Previous research, including that of Iverson et al. (2008), Rothman (2009), Slabakova et al. (2012), Kraš (2012), and Massery and Fuentes (2012), for example, have included felicitous and infelicitous environments in their instruments as a way to measure learners' knowledge of specific grammar points. Recall that Kraš (2012) reported non-target-like behavior as a result of lacking L2 features that should have evoked auxiliary change in infelicitous environments. Similarly, Slabakova et al. (2012) awarded points for rejecting ungrammatical structures (2012). In other words, learners' rankings of ungrammatical structures, whether high or low, were considered to be as equally revealing as their (i.e., learners') rankings of grammatical structures.

six reflected the most grammatical (or natural-sounding) sentence structure within an individual cluster – as perceived by the participant.

Having explained the methodology of our study, we turn now to the results of the data, which are divided into several distinct parts: first, we discuss our findings for L2 learners as they relate to syntax-discourse (i.e., epistemic) and syntax-semantic (i.e., deontic) environments, focusing primarily on learners' performance cross-sectionally. Second, we analyze data provided by L1 Spanish speakers and, in doing so, we compare learners' behavior to that of native speakers, highlighting the differences between the groups – ultimately arguing in favor of the IH framework.

3. Findings

3.1. *Modal Analysis: Results for L2*

Previous research on morphosyntactic variability suggests that non-uniform and widespread responses among learners in relation to a specific grammar point indicates interlanguage variability (Sorace, 2000; Iverson et al., 2008; Massery & Fuentes, 2014; including others). The Interface Hypothesis extends earlier morphosyntactic research in L2 by proposing that learners experience greater difficulty with external interface properties (i.e., syntax-discourse) than they do with internal interface (i.e., syntax-semantics) properties. In accordance with this line of inquiry, we present the results of our data using boxplots in order to demonstrate variation among learners' responses to different syntactic environments. Short boxes indicate little variation and greater uniformity among learners' responses (i.e., implying less vulnerability), while longer boxes indicate a wider range of numerical rankings (i.e., implying greater vulnerability) in specific contexts. Additionally, the dense black line inside each box provides us with the median score of learners' responses for each environment.

In Figure 1, for example, we see that learners at the intermediate level perceived epistemic environments as more grammatical than their deontic counterparts. Post-intermediate and advanced levels, however, found deontic environments to be more accurate, although the long boxplot displayed by post-intermediate learners indicates that variability – and therefore vulnerability – existed among learners' perceptions of deontic structures.

Additionally, in Figure 1, it appears that advanced learners' rankings of epistemic environments demonstrate less variation (i.e., less vulnerability) among learners' responses, as displayed by the shorter boxplots; this is actually not the case, however. In fact, if we look closely at Figure 2, we notice that advanced learners' responses continued to vary in epistemic subcategories, indicating vulnerability and optionality at the external interface. These results support those reported in Slabakova et al. (2012), for example, who found that advanced learners displayed non-target-like behavior in highly nuanced subsets of clitic-left dislocation, despite an overall high performance on the completed tasks.

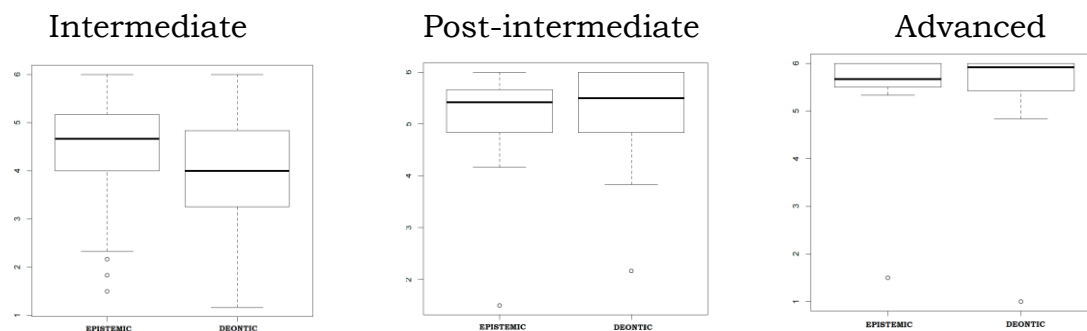


Figure 1. Cross-sectional results for learners' perceptions of epistemic and deontic modality

Figure 2 compares learners' perceptions of complex nominal clauses of deontic and epistemic modal subsets (i.e., epistemic_[+indicative] and epistemic_[+subjunctive]) at distinct levels of L2 acquisition. If we look at each level separately, we observe that learners at the intermediate level ranked epistemic_[+indicative] structures higher than epistemic_[+subjunctive] and deontic environments; the higher scores for epistemic_[+indicative] environments suggest that L1 interference is at play, considering that indicative morphology is used more often than subjunctive morphology in complex nominal clauses of English; we return to these observations in later sections of our work.

At the post-intermediate and advanced levels of acquisition, though, we begin to notice higher rankings and less variation among scores (i.e., less vulnerability) in epistemic_[+subjunctive] and deontic environments, indicating movement toward target-like behavior; intermediate and post-intermediate learners continue to display non-target-like behaviors at both interfaces, although an evolution in scores is also visible among these groups. Observe that post-intermediate learners' rankings of deontic modality (i.e., syntax-semantics) begin to rise and reflect more target-like behavior, as predicted by the Interface Hypothesis.

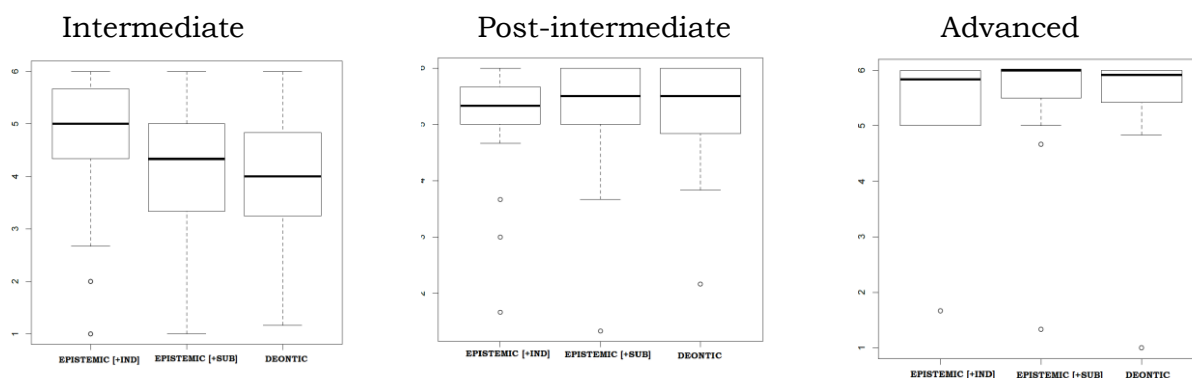


Figure 2. Cross-sectional results for learners' perceptions of epistemic and deontic modality

3.2. Modal Analysis: Results for L1

Moving on to results for L1 Spanish speakers, we look first at Figure 3, which shows that L1 participants ranked deontic (i.e., syntax-semantics) environments higher (i.e., more grammatical) than epistemic (i.e., syntax-discourse) structures, although there is noticeably less variation among learners' responses in these environments, especially at the intermediate level. Greater variation is observed among L1 Spanish speakers in epistemic environments, however, suggesting that some variability among L1 Spanish speakers occurs within the syntax-discourse interface (i.e., epistemic environments). This is not surprising, though, as L1 Spanish speakers' use of subjunctive and indicative mood has been documented in recent studies, such as Ladner (2014), for example.

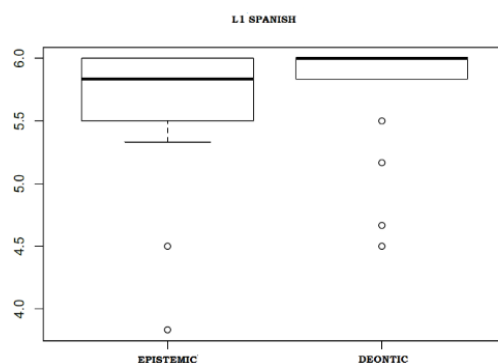


Figure 3. L1 scores for epistemic and deontic modality

If we separate the three distinct environments, looking exclusively at epistemic submodalities in Figure 4, we notice that L1 Spanish speakers' judgment of epistemic_[+indicative] environments was unanimous; this behavior is demonstrated by the dense black line that completely fills the boxplot for this environment. With this said, however, L1 Spanish speakers' judgments of epistemic_[+subjunctive] and deontic environments – both of which require $V^2_{[+subjunctive]}$ in the subordinate clause – reveal less concentration and greater variability than their epistemic_[+indicative] counterparts.

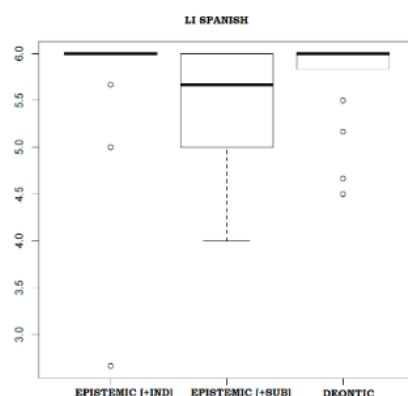


Figure 4. L1 scores for epistemic subcategories and deontic modality

3.3. Perceptions of complex nominal clauses: Results for L2

For the (narrow) syntactic analysis, we first considered a non-additive model for the observed scores in terms of 'environment', 'course level' and their

interaction. The results suggest that ‘environment’ and the interaction of ‘environment + course level’ were significant in the model. The small p-values of these variables, as shown in Table 1, suggest that learners’ grammatical perception of each syntactic structure affected their analyses of individual environments. The significance of the interaction term, ‘environment + course level’, also proposes that the effect the syntactic environment had on the observed scores was not constant for the different levels of learners’ acquisition. Note that, even though the interaction term was significant, ‘course level’ by itself was not; this finding indicates that the grammatical perceptions of individual participants were not truly explained by their respective course levels.

Table 1
Interaction of Environment & Level of instruction combined

	Df	Sum Sq	Mean Sq	F value	P-Value
Environment	5	617.677	123.535	153.6181	< 0.001
Comb. Level	2	0.002	0.001	0.0014	0.99
Env. + Comb. Level	10	57.77	5.777	7.1842	< 0.001

The ANOVA table (Table 1) only reports which variables were significant, but it does not provide further information as to how the environments were ranked, nor does it disclose how specific language levels performed on the task. To visualize this information, we need to look at the corresponding boxplots of the scores for all three levels, which are available in Figure 5. As stated previously, the longer boxes suggest widespread and varied responses among learners, which we argue here implies vulnerability and instability in learners’ interlanguage systems. The shorter boxes display a slightly more uniform performance among learners at the post-intermediate and advanced stages of acquisition, though, as predicted by the Interface Hypothesis.

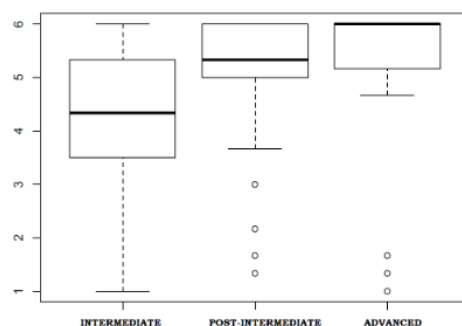


Figure 5. Scores vs. Level of Acquisition

Figure 6 reveals levels of concentration as they reflect learners’ perceptions of specific environments, while also going a step further than Figure 5 by allowing us to see how specific environments were ranked among learners. The results reported in Figure 6 point to a general preference among intermediate learners for environments that include overt CPs and indicative

morphology, which we will argue later follow English-like syntax, in accordance with examples provided in Koike and Klee (2013). At the same time, we demonstrate learners' general dislike for subjunctive clauses in null CP environments, suggesting that learners had acquired the basic syntactic principles of complex nominal clauses; these findings support those reported in Slabakova et al. (2012) and Massery and Fuentes (2012), for instance.

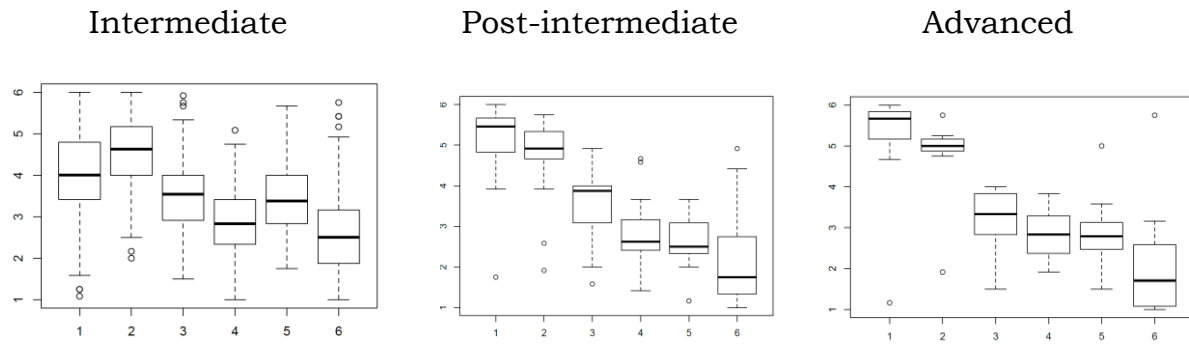
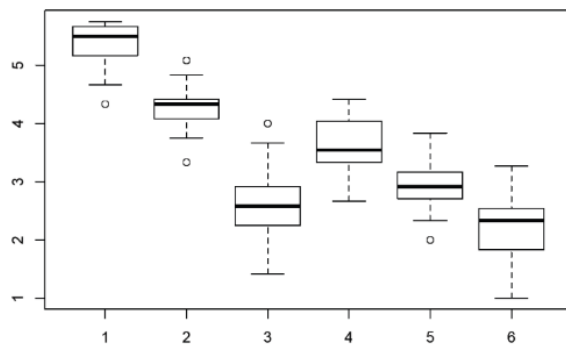


Figure 6. Environments and individual course levels

ENV 1	Overt CP	$V_{2[+subjunctive]}$
ENV 2	Overt CP	$V_{2[+indicative]}$
ENV 3	Overt CP	$V_{2[+infinitive]}$
ENV 4	Null CP	$V_{2[+subjunctive]}$
ENV 5	Null CP	$V_{2[+indicative]}$
ENV 6	Null CP	$V_{2[+infinitive]}$

3.4. Perceptions of complex nominal clauses: Results for L1

Returning now to our analysis of native Spanish speakers in Figure 7, we notice that L1 Spanish speakers found environment 1 (i.e., overt CP $V_{2[+subjunctive]}$) to be the most grammatical environment in the series. Environment 2 (overt CP $V_{2[+indicative]}$) was ranked as the second most grammatical structure in the series, followed by environments 4 (i.e., null CP $V_{2[+subjunctive]}$), 5 (i.e., null CP $V_{2[+indicative]}$), 3 (i.e., overt CP $V_{2[+infinitive]}$), and 6 (i.e., null CP $V_{2[+infinitive]}$). Figure 7 also suggests that L1 Spanish speakers' low ranking of environments 3 (i.e., overt CP $V_{2[+infinitive]}$) and 6 (i.e., null CP $V_{2[+infinitive]}$) indicates a preference for overt complementizers and $V_{2[+finite]}$ subordinate clauses. Unlike the results presented by learners, infinitive verbs, both in null and overt CP environments, were perceived as highly ungrammatical by L1 Spanish speakers.



ENV 1	Overt CP	$V_{2[+subjunctive]}$
ENV 2	Overt CP	$V_{2[+indicative]}$
ENV 3	Overt CP	$V_{2[+infinitive]}$
ENV 4	Null CP	$V_{2[+subjunctive]}$
ENV 5	Null CP	$V_{2[+indicative]}$
ENV 6	Null CP	$V_{2[+infinitive]}$

Figure 7. L1 Spanish speakers

Figure 8 allows us to observe native Spanish speakers' perceptions of grammaticality in comparison to those of L2 learners' and, in doing so, we notice that, despite the diverse scores assigned to the different environments, post-intermediate and advanced learners' behaviors follow essentially the same trajectory as L1 Spanish speakers, at least to some extent. The most notable differences between learners and native speakers are found between their rankings of environments 3 (i.e., overt CP + $V^2_{[+infinitive]}$) and 4 (i.e., null CP $V^2_{[+subjunctive]}$); we discuss these findings in greater detail in subsequent sections of our research. Furthermore, intermediate learners' responses, as predicted by the Interface Hypothesis, diverge from the other groups in a number of ways, as explained throughout our work. In the following paragraphs, we continue with our discussion of the topics presented here and introduce the implications of our investigation.

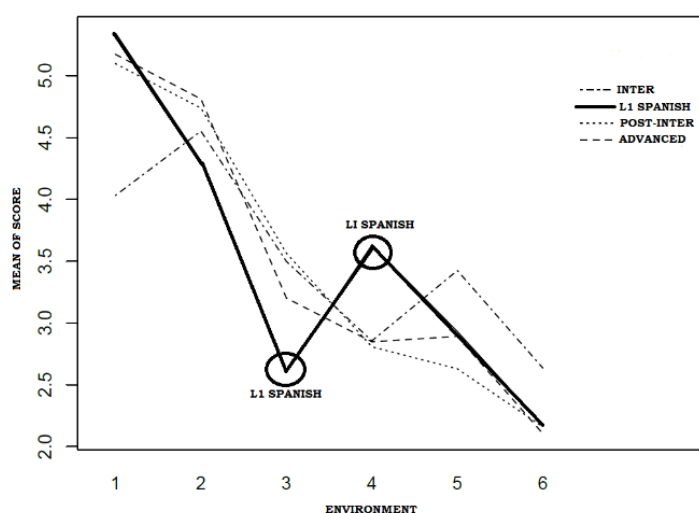


Figure 8. Interaction plot of Level with Environment

4. Conclusions and Discussion

As mentioned previously, earlier research on morphosyntactic variability suggests that non-uniform and widespread responses and intuitions among learners in relation to a specific grammar point implies optionality, variability, and/or vulnerability in learners' interlanguage (Sorace, 2000; Iverson et al., 2008; Massery & Fuentes, 2014; among others). The Interface Hypothesis extends morphosyntactic research in L2 by proposing that learners experience greater difficulty with external interface (i.e., syntax-discourse) properties than they do with internal interface (i.e., syntax-semantic) properties. Furthermore, narrow-syntax and syntax-semantic properties are thought to be acquirable with relative ease in comparison to syntax-discourse properties, where pragmatics and formal features intersect. Therefore, based on the parameters outlined by the IH framework, combined with the results reported in earlier research, we originally anticipated that learners would display more target-like behavior (and less variation) in environments of deontic modality (i.e., internal interface properties) than in environments of epistemic modality (i.e., external interface properties), even during advanced stages of L2 acquisition. The results reported in the previous sections of our work support these predictions. Call to mind that

Figure 2 demonstrates varying scores among learners in the dichotomous subdivisions of epistemic modality (i.e., epistemic_{C[+indicative]} vs. epistemic_{C[+subjunctive]}). These findings parallel the results reported in Slabakova et al. (2012), for example, who found that advanced learners displayed vulnerability in highly nuanced subsets of clitic-left dislocation, despite target-like behavior on items involving focus fronting.

In addition to these findings, we suggest that our research especially aligns with that of Slabakova et al. (2012), which identifies a developmental trajectory experienced by learners as they advance toward acquisition of external interface properties. According to their research, learners first acquire the basic syntactic principles of a given grammar point, followed by the “acquisition of syntax-semantic internal interface properties”, which ultimately gives way to acquisition of “syntax-discourse external interface properties” (p. 339); recall that Slabakova et al. argued that, prior to their study, participants had already acquired the syntactic principles that guide clitic distribution in L2 syntax; the researchers also explained that, as predicted by the Interface Hypothesis, focus-fronting environments (i.e., syntax-semantics) caused little difficulty for advanced learners, while clitic-left dislocation (i.e., syntax-discourse) continued to result in varied responses among proficient learners.

Comparable to Slabakova et al. (2012), the participants of our investigation demonstrated a general understanding of the underlying syntactic principles that govern and accommodate complex nominal clauses (i.e., narrow syntax) of deontic (i.e., internal interface) and epistemic (i.e., external interface) modality. Call to mind that participants of the study were able to detect errors in environment 4 (i.e., null CP V²_[+subjunctive]) – a feature not found in their (i.e., learners’) L1 – indicating movement toward target-like behavior and knowledge of fundamental syntactic properties of advanced syntax in L2 Spanish. Moreover, and in agreement with their research (i.e., Slabakova et al., 2012), the advanced learners in our study continued to demonstrate vulnerability and variability in epistemic environments (i.e., syntax-discourse), even during advanced stages of acquisition; rankings for deontic environments (i.e., syntax-semantics), however, gradually became more uniform and less diverse, as learners progressed in L2 – also in agreement with the Interface Hypothesis.

In addition to these findings, the results of our data highlight two major differences between L1 and L2 perceptions of grammaticality. In Figure 8, for instance, we observe that, while learners scored environment 3 (i.e., overt CP V²_[+infinitive]) higher than L1 Spanish speakers did, they also scored environment 4 (i.e., null CP V²_[+subjunctive]) lower (i.e., less grammatical) than L1 speakers did. The perceptual differences of these environments among L1 and L2 Spanish speakers does make sense, however. In English, most complex nominal clauses embedded with epistemic and deontic modality are formed with either indicative or infinitival morphology, depending on the matrix verb. The implication that L1 interference affected learners’ perceptions of environments 3 (i.e., overt CP V²_[+infinitive]) and 4 (i.e., null CP V²_[+subjunctive]) is upheld by Collentine (2010) and Koike and Klee (2013), who suggest that the following examples reflect L1 English interference in L2 Spanish.

3. **Quería que ella responder a la pregunta*¹¹.
I want-1p-sing [CP [C that [IP [I she respond-3p-sing.-inf. to the question]]
'I wanted her to respond to the question.'
4. **Quiero para él salir*¹².
I want-1p-sing [CP [C ∅ for [IP [I him leave -3p-sing.-inf.]]
'I want him to leave.'

In examples 3 and 4, we notice that the learner is mapping L1 features of English onto L2 syntax. In example 3, for instance, the complementizer phrase includes an overt CP followed by an infinitive verb. Similarly, the sentence in example 4 appears with a null CP, also followed by infinitival morphology. Furthermore, *él* ('he'), in example 3, receives accusative case from the head of CP, which differs from example 4, where *ella* ('she') assumes nominal case from the head of IP – just as it would in English (see Massery & Fuentes, 2012). Mapping errors like those found in examples 3 and 4 can be explained using earlier generative research by Radford (2004), for example, whose line of inquiry is further supported by Iverson et al. (2008), Collentine (2010), and Massery and Fuentes (2012). Collectively, their research suggests that complex nominal clauses of English, including overt and null CP structures, consist of *for*-infinitive (or *for*-deletion) verbs, a theory that allows us to directly align English and Spanish complex syntax¹³, thereby explaining why learners experience L1 interference in L2 acquisition of complex nominal clauses.

Throughout our work we have argued that the results of our study comply with the criteria outlined by the IH framework in the following ways: (1) advanced learners' rankings of deontic modality (i.e., syntax-semantics interface) demonstrated target-like behavior, as seen in Figures 1 and 3, while intermediate learners continued to diverge from the more advanced levels; (2) advanced learners' rankings of epistemic environments (i.e., syntax-discourse interface) displayed greater variation among learners, even at advanced stages of acquisition, while their scores for environments of deontic modality became more uniform and less diverse, as predicated by the Interface Hypothesis (refer to Figures 1 and 2); (3) learners' collectively low ranking of environment 4 (i.e., overt CP $V^2_{[+infinitive]}$) suggests that they (i.e., learners) were able to detect fundamental structural errors in complex nominal clauses with $V^2_{[+subjunctive]}$, thereby indicating acquisition of the narrow syntactic properties required for advanced L2 syntax, a result supported by Massery and Fuentes (2012)

¹¹ This example is taken from Koike and Klee (2013).

¹² This example is taken from Collentine (2010).

¹³ Similar analyses can be applied to structures involving epistemic modality, as demonstrated by the following examples:

5. **Creía que ella responder a la pregunta*.
I believe-1p-sing [CP [C that [IP [I she respond-3p-sing.-inf. to the question]]
'I believed that she responded to the question.'
6. **Dudo él estudiar*.
I doubt-1p-sing [CP [C ∅ [IP [I he study-3p-sing.-inf.]]
'I doubt (that) he studies.'

4.1. Summary

What makes our research different from earlier studies is that we fill a gap in second language acquisition literature through our “attempt to investigate the development of structures that belong to different interfaces”, as noted by Sorace (2011, p. 10). In addition to Sorace (2011), other investigators, including Collentine (2010¹⁴) and Antonova-Ünlü (2015), for example, have pointed out that a research focus such as ours is currently underrepresented in second language acquisition literature. In addition to these contributions, we offer further support for the results reported by Slabakova et al. (2012), who identify a three-tier acquisition process that learners experience as they acquire internal and external interface properties.

To summarize, with the present investigation, we have contributed to the IH debate, arguing in favor of the Interface Hypothesis, primarily by demonstrating that advanced learners’ behavior continued to display vulnerability in epistemic environments (i.e., external interface), where discourse and syntax intersect. And finally, following the work of Slabakova et al. (2012), we were able to tease apart learners’ acquisition of narrow-syntactic properties from syntax-semantic and syntax-discourse features, thereby supporting the identification of a tangible developmental process in L2 acquisition of advanced interface properties.

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¹⁴ Collentine (2010) maintains that the study of mood and modality exemplifies the notion of interface due to the fact that mood choice, in and of itself, is governed by “pragmatics and discourse requirements” (p. 41). Therefore, we continue with the ideas put forth by Collentine (2010) and argue that mood possesses dichotomous submodalities that have been shown to cause varying degrees of difficulty for L2 learners, which we argue is due to their distinct interface properties.

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Appendices

Appendix A

INSTRUCCIONES EN ESPAÑOL. En el siguiente ejercicio, usted verá dieciséis grupos de oraciones. Cada grupo incluye seis ejemplos que habrá que clasificar usando los números de uno a seis. **El número ‘6’ se aplicará a la frase que le resulte más gramatical; en cambio, el número ‘1’ se aplicará a la frase que Ud. encuentre menos correcta.** La oración que resulte ser la más correcta, según su perspectiva, servirá también como la “oración de referencia” – cada grupo tendrá la suya. Después de elegir la frase de referencia (es decir, la frase analizada como la más gramatical) habrá que clasificar las otras del grupo en relación a ésta. La escala empleada en cada grupo estará basada en la gramaticalidad de cada frase según la perspectiva del participante.

INSTRUCTIONS IN ENGLISH. In the following exercise, you will see sixteen groups of sentences. Each group includes six examples that you will rate using a numerical scale of one to six. **The number ‘6’ will be used to rate the sentence in each group that you find to be the most grammatically accurate, while the number ‘1’ will be used to rate the sentence that you find to be the least grammatically accurate.** You should rate each sentence in the group against the one you find to be the most grammatically accurate – each group is rated individually.

- | | | | | | |
|---------------------------|---|---|---|---|---------------------------|
| 6 | 5 | 4 | 3 | 2 | 1 |
| más gramatical | | | | | menos gramatical |
| (more grammatical) | | | | | (less grammatical) |
- 1.
- _____ María quiere que yo voy a la tienda mañana.
 _____ María quiere que yo ir a la tienda mañana.
 _____ María quiere yo vaya a la tienda mañana.
 _____ María quiere que yo vaya a la tienda mañana.
 _____ María quiere yo ir a la tienda mañana.
 _____ María quiere yo voy a la tienda mañana.
- 2.
- _____ Ángela busca un coche que es nuevo.
 _____ Ángela busca un coche que sea nuevo.
 _____ Ángela busca un coche que ser nuevo.
 _____ Ángela busca un coche ser nuevo.
 _____ Ángela busca un coche es nuevo.
 _____ Ángela busca un coche sea nuevo.

3.

- Lorena comenta que Miguel gaste mucho dinero.
- Lorena comenta que Miguel gasta mucho dinero.
- Lorena comenta Miguel gasta mucho dinero.
- Lorena comenta Miguel gastar mucho dinero.
- Lorena comenta Miguel gaste mucho dinero.
- Lorena comenta que Miguel gastar mucho dinero.

4.

- Juan exige que Marta trabaje cada fin de semana.
- Juan exige que Marta trabajar cada fin de semana.
- Juan exige que Marta trabaja cada fin de semana.
- Juan exige Marta trabajar cada fin de semana.
- Juan exige Marta trabaja cada fin de semana.
- Juan exige Marta trabaje cada fin de semana.

5.

- Alejandro cocina después de volver de la oficina.
- Alejandro cocina después de que volver de la oficina.
- Alejandro cocina después de vuelve de la oficina.
- Alejandro cocina después de que vuelve de la oficina.
- Alejandro cocina después de que vuelva de la oficina.
- Alejandro cocina después de vuelva de la oficina.

6.

- Elena duda Belén vivir con sus padres.
- Elena duda que Belén viva con sus padres.
- Elena duda Belén viva con sus padres.
- Elena duda que Belén vive con sus padres.
- Elena duda Belén vive con sus padres.
- Elena duda que Belén vivir con sus padres.

7.

- Espero que Jacobo estudiar para el examen.
- Espero Jacobo estudie para el examen.
- Espero Jacobo estudiar para el examen.
- Espero que Jacobo estudia para el examen.
- Espero Jacobo estudia para el examen.
- Espero que Jacobo estudie para el examen.

8.

- Francisco reconoce que Manuel esté en su casa.
- Francisco reconoce Manuel esté en su casa.
- Francisco reconoce que Manuel estar en su casa.
- Francisco reconoce Manuel está en su casa.
- Francisco reconoce Manuel estar en su casa.
- Francisco reconoce que Manuel está en su casa.

9.

- Raquel aconseja que David asistir a la reunión.
- Raquel aconseja David asistir a la reunión.
- Raquel aconseja que David asiste a la reunión.
- Raquel aconseja que David asista a la reunión.
- Raquel aconseja David asiste a la reunión.
- Raquel aconseja David asista a la reunión.

10.

- Pablo piensa su conocimiento es extenso.
- Pablo piensa que su conocimiento es extenso.
- Pablo piensa que su conocimiento ser extenso.
- Pablo piensa su conocimiento sea extenso.
- Pablo piensa que su conocimiento sea extenso.
- Pablo piensa su conocimiento ser extenso.

11.

- El general manda sus soldados ataquen al enemigo.
- El general manda que sus soldados ataquen al enemigo.
- El general manda que sus soldados atacan al enemigo.
- El general manda sus soldados atacan al enemigo.
- El general manda que sus soldados atacar al enemigo.
- El general manda sus soldados atacar al enemigo.

12.

- Mateo no cree que su jefe roba a los empleados.
- Mateo no cree su jefe robe a los empleados.
- Mateo no cree su jefe roba a los empleados.
- Mateo no cree que su jefe robe a los empleados.
- Mateo no cree su jefe robar a los empleados.
- Mateo no cree que su jefe robar a los empleados.

13.

- Penélope llama a sus padres antes de asistir a sus clases.
- Penélope llama a sus padres antes de que asistir a sus clases.
- Penélope llama a sus padres antes de que asista a sus clases.
- Penélope llama a sus padres antes de asista a sus clases.
- Penélope llama a sus padres antes de que asiste a sus clases.
- Penélope llama a sus padres antes de asiste a sus clases.

14.

- Marta pide que su hijo buscar trabajo.
- Marta pide su hijo busca trabajo.
- Marta pide que su hijo busque trabajo.
- Marta pide su hijo busque trabajo.
- Marta pide su hijo buscar trabajo.
- Marta pide que su hijo busca trabajo.

15.

- Estela teme que su esposo trabaja para la CIA.
- Estela teme su esposo trabaje para la CIA.
- Estela teme que su esposo trabajar para la CIA.
- Estela teme su esposo trabaja para la CIA.
- Estela teme que su esposo trabaje para la CIA.
- Estela teme su esposo trabajar para la CIA.

16.

- Sofía habla con una secretaria que es nueva.
- Sofía habla con una secretaria que ser nueva.
- Sofía habla con una secretaria que sea nueva.
- Sofía habla con una secretaria es nueva.
- Sofía habla con una secretaria ser nueva.
- Sofía habla con una secretaria sea nueva.

Appendix B

Idiosyncratic behavior of epistemic modality in nominal clauses

English examples	Epistemic Indicative	Epistemic Subjunctive	Environment analysis <ul style="list-style-type: none"> ▪ NNE = Non-negated epistemic ▪ NE = Negated Epistemic
1a. I believe (that) he is in class.	1b. <i>Creo [CP que él <u>está</u> en clase].</i>	----- ----- ----- -----	Matrix clause [^{NNE} +mental action] / Subordinate clause = V ₂ [+indicative]
2a. I don't believe (that) he is in class.	----- ----- ----- -----	2b. <i>No creo [CP que él <u>esté</u> en clase].</i>	Matrix clause [^{NE} -mental action] / Subordinate clause = V ₂ [+subjunctive]
3a. I doubt (that) he is in class.	----- ----- ----- -----	3b. <i>Dudo [CP que él <u>esté</u> en clase]</i>	Matrix clause [^{NNE} +mental action] / Subordinate clause = V ₂ [+subjunctive]
4a. I don't doubt (that) he is in class.	4b. <i>No dudo [CP que él <u>está</u> en clase].</i>	----- ----- ----- -----	Matrix clause = [^{NE} +mental action] / Subordinate clause = V ₂ [+indicative]