The Acquisition of the Phrase Accent
by Beginning Adult Learners
of Spanish as a Second Language

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1. Introduction

The acquisition of intonation by adult learners is one of the least explored areas of second language acquisition (SLA) research. While some studies have been carried out on the L2 acquisition of French intonation (cf. Ramsey 1997, Konopczynski 1998), few studies seem to exist on the acquisition of Spanish intonation by adult learners. Elliott (2003), for example, in a recent review of the literature on the SLA of Spanish phonology, makes no mention of empirical research on the acquisition of intonation, although there have been various studies on the acquisition of individual Spanish sounds (e.g., Zampini 1994, 1998a, 1998b, Elliott 1997, and González-Bueno 1997, to name a few).[1] This paucity of SLA research on Spanish intonation is in part due to the less transparent nature of the structure and meaning of intonation in general (as opposed to the structure of the segment or the syllable, for example). Recently, substantial progress has been made in understanding the phonology of Spanish intonation within the autosegmental-metrical (AM) model. Some studies include Sosa (1991, 1999), Prieto et al. (1995, 1996), Nibert (1999, 2000), Face (2001, 2002a, 2002b, 2002c), Hualde (2002), Beckman et al. (2002), Díaz-Campos and McGory (2002), and McGory and Díaz-Campos (2002). As the structure, meaning, and phonetic implementation of tonal categories in the language are elucidated, progress in SLA research on Spanish intonation can follow.
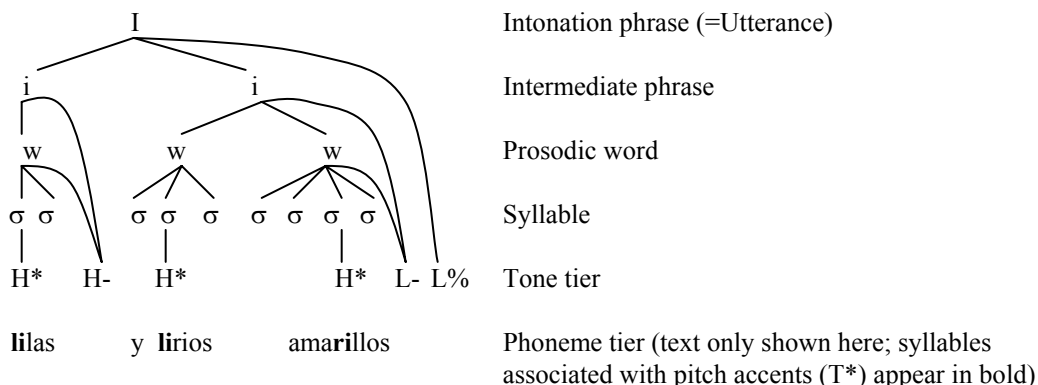
A recent study, namely Nibert (2005), examined the acquisition of one particular tonal category in Spanish by intermediate and advanced adult learners of the language who speak English as an L1. This tonal category, the phrase accent (T-), which may be high (H-) or low (L-), is employed in utterance-medial position in both English and Spanish to clarify meaning in utterances containing syntactic and semantic ambiguities (cf. for English, Pierrehumbert 1980, Beckman and Pierrehumbert 1986, Pierrehumbert and Beckman 1988, and Pierrehumbert and Hirschberg 1990; for Spanish, Nibert 1999, 2000 and Hualde 2002). More specifically, in both languages, there are two hierarchical levels of phonological phrasing beyond the level of the prosodic word, namely, the intermediate phrase and the intonation phrase. An intermediate phrase minimally contains one pitch accent (T*) and is delimited by a phrase accent (T-) at its right edge (i.e., [T* T-]). An intonation phrase minimally contains one intermediate phrase and is marked by a boundary tone (T%) at its right edge (i.e.,[[T* T-] T%]). These two distinct levels of phrasing may be exploited to create meaning contrasts. For example, the Spanish utterance [[*lilas y lirios amarillos*]L-]L%, realized with one intermediate phrase, conveys the meaning 'yellow lilies and irises,' where both flower types are yellow. In contrast, the utterance [[*lilas*]H- [*y lirios amarillos*]L-]L%, with two intermediate phrases, provokes the reading 'lilies and yellow irises,' where only the irises are specified for color. Figure (1) illustrates the intonation structure underlying this second meaning within the AM framework, where elements on the

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[1] In general, theories of the acquisition of L2 phonology address the level of the segment (e.g., the speech learning model (SLM) outlined in Flege 1988, 1995) or the assignment of stress (e.g., Dresher and Kaye 1990, especially as regards L1 acquisition) and do not incorporate intonation (refer, for example, to the phonological parameters of Universal Grammar (UG) outlined in Ayoun 2003:73-5).

tone tier are linked autosegmentally to constituents in the prosodic hierarchy (in addition to the above references for English intonation, see also Ladd 1996).

(1) Intonation structure: associations between tonal elements and constituents in the prosodic hierarchy

I	Intonation phrase (=Utterance)
i	Intermediate phrase
w	Prosodic word
σ	Syllable
H* H- H* H* L- L%	Tone tier
lilas y **li**rios ama**ri**llos	Phoneme tier (text only shown here; syllables associated with pitch accents (T*) appear in bold)

Given the non-transparent nature of intonation, coupled with the fact that this aspect of Spanish phonology generally is not addressed in the L2 classroom in the United States, Nibert (2005) aimed to see if intermediate and advanced L2 learners perceive a H- phrase accent in intonation contours and, if so, whether the meanings they assign to them approximate the judgments of native Spanish listeners, employing the results in Nibert (1999, 2000) from L1 Spanish subjects as a reference point. The results from the two groups of L2 learners indicate that: 1) both intermediate and advanced learners attend to utterance-medial H- phrase accents in Spanish, and 2) the advanced learners' assessments of meaning approximate native-listener judgments more closely than do the intermediate learners' responses, which are less restrictive in nature. Said results point to different stages of development in the acquisition of this tonal category. In other words, an L2 learner's perception and interpretation of utterance-medial H- in Spanish develop gradually over time.

Furthermore, the results from the advanced learners reveal a native-like level of attainment in the L2 acquisition of utterance-medial H-. Said native-like competence is demonstrated, despite the fact that the intermediate phrasing choices examined interacted with syntactic structures not present in the L1, despite the lack of any instruction about the structure of Spanish intonation, and despite the sure scarcity of positive evidence from previous L2 input regarding the types of meaning contrasts provoked by utterance-medial H-. Within generative theory, and within the perspective that L2 acquisition is constrained by Universal Grammar (UG), these findings lend support to the view that there is full access to UG during the L2 acquisition process (see, for example, White 2003).[2] Without full access, and thus the possibility of parameter resetting, a native-like level of L2 attainment is not predicted. The results in Nibert (2005), however, do not shed light on the debate over whether full access occurs with L1 transfer (the Full Transfer Full Access Hypothesis) or not (the Full Access without Transfer Hypothesis) (cf. Schwartz and Sprouse 1994, 1996 and White 2003). The Full Transfer Full Access Hypothesis holds that the starting point, or initial state, of L2 acquisition is the learner's L1 grammar. Subsequently received L2 input that cannot be generated by the L1 grammar triggers a restructuring of the system, according to the options of UG (hence the term Full Access). Thus, this hypothesis predicts evidence of L1 transfer in the learner's L2 interlanguage, especially at the earliest stages of L2 acquisition. The Full Access without Transfer Hypothesis, on the other hand,

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[2] For studies on the SLA of Spanish syntax that support the Full Access Hypothesis, see, for example, Montrul and Slabakova (2001) and Valenzuela (2002). In Montrul and Slabakova (2001), near-native speakers of Spanish demonstrated unconscious knowledge of subtle meaning differences between preterite and imperfect verbal forms, even though their L1 English does not mark aspect similarly. In Valenzuela (2002), learners demonstrated native-like competence with respect to the properties of topic constructions in Spanish, even though these properties are not instantiated in their L1 English.

claims that the starting point of L2 acquisition is the same as that of L1 acquisition, in other words, UG. Thus, evidence of L1 transfer is not predicted.

With this debate in mind, the present study was undertaken. Data were collected from beginning L2 learners of Spanish with L1 English in order to seek evidence regarding the initial state of L2 acquisition. Three research questions are considered: 1) do true beginners perceive disambiguating H-phrase accents in Spanish intonation contours, despite limited experience with the language?; 2) if so, do the beginners' assessments regarding the meaning of these utterances conform to the pattern observed for intermediate and advanced learners, where interpretations are less restrictive the earlier the stage of L2 acquisition?; and 3) do the beginner responses show evidence of L1 transfer? The first two research questions are carried over from Nibert (2005) in order to facilitate a coherent comparison of the results from all three groups of L2 learners (beginning, intermediate, and advanced). As regards the first research question specifically, if the beginner responses display an absence of knowledge (or widespread uncertainty) regarding disambiguating H- phrase accents in L2 Spanish contours, then the Full Access without Transfer Hypothesis is lent support, since, even though the learners have received no instruction about this aspect of the L2, this tonal category is operant in the learners' L1 English. If, on the other hand, the beginners demonstrate some level of competence with the L2 Spanish contours, then the third research question (i.e., the issue of L1 transfer) requires further examination. Given no previous instruction, and assuming a scarcity of positive evidence from previous L2 input, L1 transfer as a learner strategy is supported if: 1) learners display L2 accuracy where the L1 and L2 *converge* in the use of a H- phrase accent, and 2) learners display a *lack* of competence in the L2 where the L1 and L2 *diverge* in the use of a H- phrase accent. In other words, learner behavior at the initial state of L2 acquisition is clearly attributable to L1 transfer if it reflects competence where the L1 and L2 are similar *and* incompetence where the L1 and L2 are dissimilar.

2. Test design and methodology

The intonation contours examined in Nibert (1999, 2000, 2005) and in the present study originate from three male native speakers of Peninsular Spanish (of ages 24, 27, and 30), all from northeastern Spain. The data set consists of groups of minimal pairs of F0 contours, the term *minimal pair* being employed similarly as in segmental phonology. The F0 contours of a group represent different intonational renditions of a single text. Each F0 contour in a group differs minimally, i.e., in *one* way and one way *only*, from at least one other contour in the same group. Thus, a group is a series of minimal pairs of F0 contours of the same segmental make-up. For ease of reference, such a group will be referred to as a *minimal group*. An example of a minimal group is presented below in (2).[3]

(2) An example of a minimal group, using the text *lilas y lirios amarillos*

Tonal structure of the intonation contours: Possible meanings:

a. [[lilas] [y lirios amarillos]]   →   A. 'lilacs and yellow irises'
         H-   L- L%

b. [[lilas y lirios] [amarillos]]   →   B. 'yellow lilacs and yellow irises'
              H-   L- L%

c. [[lilas y lirios amarillos]]   →   A or B. No disambiguating medial H- phrase
                     L- L%   accent is present.

Each text used to elicit the contours had the potential to generate a number of intonational

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[3] It should be noted that this particular format of presentation reflects the *predictions made* for a minimal group as regards the experimental design for the study. The actual results obtained for a minimal group will be presented in Section 3 of this paper in the form of tables.

renditions by containing a syntactic and/or semantic ambiguity that might be clarified by intermediate phrasing choices. Syntactic ambiguities arose from the conjunction *y* ('and') and the preposition *de*, which in Spanish can mean either 'of' or 'from.' Semantic ambiguities were related to the information structure and the overall function of the text. Disambiguation in the contours occurred through the three native speakers' intermediate phrasing choices, which varied in a number of ways: 1) by the absence vs. the presence of a phrase accent; 2) by the position of the phrase accent in the F0 contour; 3) by the presence of H- vs. L-; and 4) in the case of an intermediate phrase in intonation phrase-final position, by the presence of H- or L- in combination with each boundary tone H% or L%. These first two ways are illustrated in the minimal group just presented in (2).

The perception test used to explore the meanings assigned to these contours included five minimal groups. These groups involved a total of nineteen utterances, taken from all three native speakers. Test items were created by pairing each utterance with each of the proposed possible meanings in its minimal group. For example, the minimal group shown in (2) includes three F0 contours or tunes (labeled 'a', 'b', and 'c' for ease of reference) potentially corresponding to one or both of two meanings (labeled A and B). By pairing each utterance with each meaning, six utterance-meaning correspondences were generated: 1) tune 'a'-meaning A, 2) tune 'a'-meaning B, 3) tune 'b'-meaning A, 4) tune 'b'-meaning B, 5) tune 'c'-meaning A, and 6) tune 'c'-meaning B. By making such pairings for all five minimal groups of utterances, a total of 67 correspondences were generated. Each constituted an item on the perception test. No distracters were included. The order of the test items was randomized. In this order, the appropriate utterances were transferred from computer to cassette tape. The use of the cassette tape assured for equal, consistent conditions across test sessions.

The response booklet for the perception test consisted of three parts: 1) a language background questionnaire, 2) test instructions and four practice items, and 3) the 67 test items. These three parts together required approximately thirty-five minutes to complete. Each individual practice and test item required twenty seconds and was structured as follows. After the item number prompt was heard on the cassette tape, five seconds of silence elapsed to allow subjects to read a meaning written in the response booklet. An example of how this information was presented appears in (3). This sample test item is number 38 and corresponds to the tune 'a'-meaning A correspondence from the minimal group presented earlier in (2).

(3)   An example of a perception test item in the response booklet

> 38. This utterance refers to two types of flowers: lilacs (=*lilas*) of
>   some unknown color, and yellow irises (=*lirios*).
>
>   yes   no

After the aforementioned five seconds of silence, the corresponding utterance (e.g., tune 'a' in the case of test item number 38) was heard a first time, followed by a few seconds of silence, and then a second time. Ten seconds of silence then followed to allow subjects to circle one of two possible responses: 'yes' if the meaning given was a possible interpretation of the utterance heard, or 'no' if it was not a possible interpretation of the utterance heard. Subjects were asked to respond to all items (i.e., to not leave any blank).

In Nibert (1999, 2000), the subjects for the perception test were 33 native listeners of Peninsular Spanish, including 17 males and 16 females, all between the ages of 23 and 55, and from various regions of Spain. In Nibert (2005), the subjects were 18 advanced-level learners and 37 intermediate-level learners of Spanish as an L2, with English as an L1, all speakers of the Midwestern American variety of English. Of the 18 advanced-level learners, 7 were males and 11 were females. Of the 37 intermediate-level learners, 7 were males and 30 were females. The advanced learners ranged in age from 20 to 44; however, 11 of the 18, or 61%, were between the ages of 20 and 24. The intermediates ranged in age from 18 to 27; however, 32 of the 37, or 87%, were between the ages of 19 and 22. The

advanced level was defined as the ability to understand and maintain a conversation in Spanish with near-native proficiency, while the intermediate level was defined as the ability to understand and maintain a conversation in Spanish with good proficiency.[4] The results obtained from these three groups of subjects (i.e., the L1, the L2 advanced, and the L2 intermediate groups) serve as reference points for assessing the beginner results obtained in the study at hand.

Subjects in the present study were 22 beginning learners enrolled in different sections of a first-semester Spanish language course. All learners were true beginners, having had no prior study of the language, and were in the last week of instruction of a 14-week semester. Of the 22 learners, 10 were males and 12 were females. They ranged in age from 18 to 40; however, 19 of the 22, or 86%, were between the ages of 18 and 23. The perception test was administered to them following the same procedures just described, with one exception. The beginners were given a reference sheet on which were written the five Spanish texts to be heard during the perception test. Under each text, which included anywhere from one to four content words, the English equivalent of each word was provided. So, for example, after the text *lilas y lirios amarillos*, a list of three translations appeared as follows: *lilas* = lilies, *lirios* = irises, *amarillos* = yellow. Subjects could refer to this reference sheet at any time before or during the perception test. Its purpose was to minimize the possibility that unfamiliarity with a lexical item might interfere with the global interpretation of the utterance as contributed by the intonation-syntax interface.

3. Results and discussion

The prediction (as regards the perception test design) was for all subjects to respond either 'yes' or 'no' to each test item. A 'yes' response indicated that the meaning given was a possible interpretation of the utterance heard, and a 'no' response indicated that it was not. For ease of presentation and comparison of the results, the actual number and percentage of only the 'yes' responses were recorded in the cells of data tables.[5] A separate table was created for each minimal group, and each table cell represented one item or utterance-meaning correspondence from the perception test. A key to the information given in each cell is provided in (4).

(4) Key to cell data

Symbols:	
y=X	← number of *yes* responses
%	← percentage of the responses that were *yes*

Furthermore, each cell is coded by a particular shade to evaluate categorically the subjects' responses to the correspondence. Three categories were established, indicated by a light, medium, or dark shading. Based on our samples, if a correspondence was accepted by subjects 33 1/3% or less of the time, it was given a light shading. If a correspondence was accepted by subjects more than 33 1/3% and up to 66 2/3% of the time, it was given a medium shading. If a correspondence was accepted by subjects more than 66 2/3% of the time, it was given a dark shading.
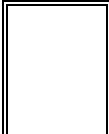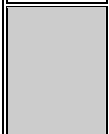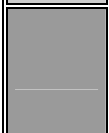
In the dark category, the percentage of subjects who responded 'yes' is significantly *greater*

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[4] For additional information about the advanced and intermediate subjects, see Nibert (2005).

[5] To clarify further, each cell is *independent* of all others in its table. As just stated, only the 'yes' responses are shown explicitly in a cell. However, the number of 'no' responses for that same cell is easily revealed by subtracting the number of 'yes' responses shown from the number of subjects for that table. For instance, if a cell for the 22 beginners reads 'y = 18,' the 'no' responses equal 22 minus 18, or 'n = 4.' To arrive at the percentage of 'no' responses, subtract the percentage shown in a cell from 100%. In other words, if 'y = 18' for the 22 beginners, or 18 / 22 = 82%, then the 'no' responses represent the remaining percentage, which is 100% minus 82% = 18% (or also 4 / 22 = 18%).

(statistically) than 50% (=chance, or randomness), at a p ≤ .05. In other words, in this category, there is only a 5% chance that, using an entire population-- as our data is based only on a small sample of them--, the 'yes' responses would be *only 50%* or *less*, and not the higher percentage actually obtained from the sample. Similarly, in the light category, the percentage of subjects who responded 'yes' is significantly *less* (statistically) than 50%, at a p ≤ .05. In other words, there is only a 5% chance that, using an entire population, the 'yes' responses would turn out to be *50%* or *more*, and not the lower percentage actually obtained from the sample. While we can draw strong conclusions about the acceptability of a correspondence marked dark or light (=clearly *acceptable* or *not acceptable*, respectively), we cannot be sure about the acceptability of one with medium shading, since the 'yes' responses were too close to 50%, or chance, to confidently say. Thus, the phrase accent variants are clearly crucial to meaning in the cases marked light or dark. The above information and the shadings used are summarized in (5).

(5) Key to cell shading

Shade: If the percentage of *yes* responses falls within the range of:

← 33 1/3% (~33%) or less: is a strong *no* to a correspondence; % who responded *yes* is significantly *less* (statistically) than 50% (=chance), at a p ≤ .05

← more than 33 1/3% up to 66 2/3% (~67%): is a weak response to a correspondence; % who responded *yes* is too close to 50% for a confident reading

← more than 66 2/3% (~67%): is a strong *yes* to a correspondence; % who responded *yes* is significantly *greater* (statistically) than 50%, at a p ≤ .05

The results from two of the five minimal groups now will be presented and discussed. Only two minimal groups are included in this paper in order to limit and lend coherence to its scope. The two minimal groups selected involve the same source of ambiguity occasioning the need for a H- phrase accent, namely, the modification of two coordinated noun phrases by one or more adjective phrases. The experimental design for the first minimal group was shown earlier in (2) and is repeated below in (6) for ease of reference.

(6) Minimal group 1: *lilas y lirios amarillos* (literally, 'lilies and irises yellow')

Tonal structure of the intonation contours: Possible meanings:

a. [[lilas] [y lirios amarillos]]   →   A. 'lilacs and yellow irises'
         H-   L- L%

b. [[lilas y lirios] [amarillos]]   →   B. 'yellow lilacs and yellow irises'
              H-   L- L%

c. [[lilas y lirios amarillos]]   →   A or B. No disambiguating medial H- phrase
                   L- L%   accent is present.

The text *lilas y lirios amarillos* is syntactically ambiguous because of the conjunction *y*, which allows the scope of modification of the adjective phrase (AP) *amarillos* to extend beyond the adjacent noun to the first one as well. Two possible interpretations, or readings, are created from this ambiguity. In reading A, the AP *amarillos* refers to only the adjacent noun *lirios*; in other words, it has a narrow scope of modification. In reading B, *amarillos* refers to both noun phrases (NPs) or flower types, and the AP has a wide scope of modification. The syntactic tree configurations corresponding to these possible meanings are given in (7). In these and subsequent syntactic figures, we follow standard assumptions about phrase structure held within X-bar theory (where X"= XP), as presented, for example, in Haegeman (1991).

(7) a. Meaning A: *amarillos*= narrow-scoped

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                        NP
            ┌───────────┼───────────┐
           NP          conj         NP
            │                        │
           N'                       N'
            │                      ┌──┴──┐
            │                      │      AP
            │                      │      │
            │                      │      A'
            │                      │      │
            N                      N      A
            │                      │      │
          lilas        y         lirios  amarillos
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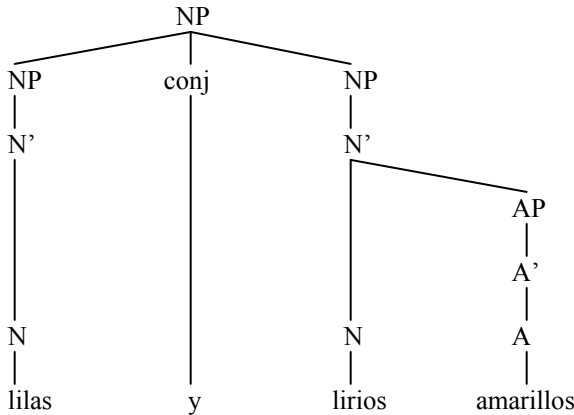
   b. Meaning B: *amarillos*= wide-scoped

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                    NP
            ┌───────┴────────────────┐
           NP                        AP
      ┌─────┼─────┐                   │
     NP   conj    NP                 A'
      │           │                   │
     N'          N'                   A
      │           │                   │
      N           N                   │
      │           │                   │
    lilas   y   lirios            amarillos
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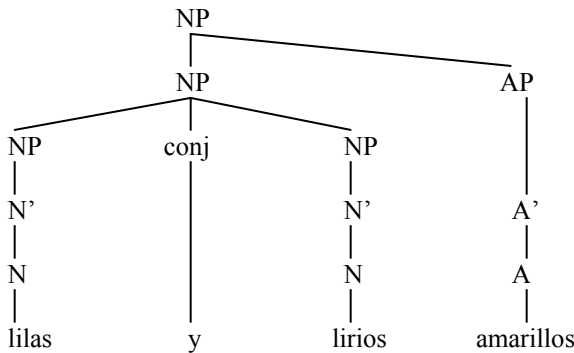
Three different intonation patterns, or tunes, mapped onto the text were tested for meaning correspondence. Tune 'a' contains a H- phrase accent after *lilas* that sets the word off from the remainder of the utterance. Native Spanish listeners assign only reading A to this tune, interpreting that *amarillos* refers to *lirios* only. Tune 'b' has a H- after the word *lirios* that sets *amarillos* off from both nouns preceding it. Native listeners accept only meaning B for this tune. Tune 'c' contains no utterance-medial phrase accent to disambiguate its meaning, yet native listeners assign it only one reading: meaning B. As Nibert (1999, 2000) explains in detail to account for this result, in an absence of tonal information indicating otherwise, a default meaning creating symmetry is assigned to conjunct structures, in Spanish as well as in English. In the case of tune 'c', the wide-scoped meaning B is assigned exclusively because, of the two possible meanings, it is the only one where the coordinated NPs are modified in a symmetrical or equal fashion by the AP *amarillos*.

The native listener results just discussed, along with the results for the three groups of L2 learners, are presented in the tables below in (8). In these and subsequent tables, the possible meanings

considered appear in columns and are labeled with capital letters. The tunes examined appear in rows and are labeled with small case letters. The intermediate and intonation phrase structure posited for each tune also is indicated, with H= a high tone and L= a low tone. The tone appearing outside of all bracketing is the boundary tone (T%) marking the right edge of the intonation phrase, while all other tones are phrase accents (T-) marking the right edges of intermediate phrases. This labeling makes it easy to see how the placement of the phrase accent (i.e., the grouping of prosodic words into intermediate phrases) and the use of a high (H-) vs. low (L-) phrase accent vary over each tune.

The first table in (8a) shows the previously discussed responses of the native listeners, the second table (8b) shows the responses of the advanced L2 learners, the third table (8c) presents the responses of the intermediate L2 learners, and the fourth table (8d) presents the responses of the beginning L2 learners.

(8) Results for minimal group 1: *lilas y lirios amarillos* (literally, 'lilies and irises yellow')

    a. Results obtained from 33 native listeners of Peninsular Spanish

TUNE		MEANING	
		A irises= yellow	B lilies & irises= yellow
	a [[lilas]$_{H-}$ [y lirios amarillos]$_{L-}$]$_{L\%}$	y=31 **94%**	y=3 9%
	b [[lilas y lirios]$_{H-}$ [amarillos]$_{L-}$]$_{L\%}$	y=8 24%	y=32 **97%**
	c [[lilas y lirios amarillos]$_{L-}$]$_{L\%}$	y=8 24%	y=31 **94%**

=6

    b. Results obtained from 18 advanced-level learners of Spanish as a second language

TUNE		MEANING	
		A irises= yellow	B lilies & irises= yellow
	a [[lilas]$_{H-}$ [y lirios amarillos]$_{L-}$]$_{L\%}$	y=16 **89%**	y=4 22%
	b [[lilas y lirios]$_{H-}$ [amarillos]$_{L-}$]$_{L\%}$	y=7 39%	y=18 **100%**
	c [[lilas y lirios amarillos]$_{L-}$]$_{L\%}$	y=3 17%	y=13 **72%**

=6

c. Results obtained from 37 intermediate-level learners of Spanish as a second language

		MEANING	
		A irises= yellow	B lilies & irises= yellow
T U N E	a $[[lilas]_{H\text{-}}\ [y\ lirios\ amarillos]_{L\text{-}}]_{L\%}$	y=34 **92%**	y=5 14%
	b $[[lilas\ y\ lirios]_{H\text{-}}\ [amarillos]_{L\text{-}}]_{L\%}$	y=11 30%	y=36 **97%**
	c $[[lilas\ y\ lirios\ amarillos]_{L\text{-}}]_{L\%}$	y=8 22%	y=35 **95%**

=6

d. Results obtained from 22 beginner-level learners of Spanish as a second language

		MEANING	
		A irises= yellow	B lilies & irises= yellow
T U N E	a $[[lilas]_{H\text{-}}\ [y\ lirios\ amarillos]_{L\text{-}}]_{L\%}$	y=16 **73%**	y=13 59%
	b $[[lilas\ y\ lirios]_{H\text{-}}\ [amarillos]_{L\text{-}}]_{L\%}$	y=11 50%	y=17 **77%**
	c $[[lilas\ y\ lirios\ amarillos]_{L\text{-}}]_{L\%}$	y=11 50%	y=18 **82%**

=6

As tables (8a-c) clearly illustrate, the results from the first two groups of L2 learners are very similar to the results from native listeners. Tune 'a,' with a H- phrase accent after *lilas*, is assigned meaning A, the narrow-scoped interpretation. Tune 'b,' with a H- after *lirios*, is assigned meaning B, the wide-scoped interpretation. Finally, tune 'c,' with no utterance-medial H-, is assigned meaning B exclusively, since only this meaning corresponds to a symmetrical conjunct structure. The results in (8d) show that the beginning learners strongly accept these same three tune-meaning correspondences, as indicated by the dark shading. However, the beginners' responses diverge from those of the L1, advanced L2, and intermediate L2 groups as regards the other three tune-meaning correspondences in the table, which for the beginners show medium shadings and percentage rates either at or not far from the 50% level, or randomness, instead of a light shading indicating their clear rejection. In sum, it can be said that the beginners do indeed display some level of competence in parsing these tunes for meaning, since a zero knowledge level would predict an absence of any dark or light shading and the exclusive presence of medium shading (i.e., uncertainty) in the table.

The accurate interpretation of tunes 'a' through 'c' requires knowledge of various components of grammar: 1) intonational structure, including intermediate phrasing marked by a H- phrase accent; 2) syntax, including word order as well as the scope of modification of an AP in a structure with two coordinated NPs; and 3) the intonation-syntax interface. Nine weeks prior to this experiment, the beginners received in-class instruction regarding word order in Spanish (i.e., NPs are head-initial; thus an AP follows the NP it modifies). However, the beginners received no prior instruction in any of the other components indicated above (e.g., intonation or its interaction with syntax). Given the grammatical complexity of the Spanish utterances heard, it seems unlikely that, at the beginning level, a learner would possess an L2 interlanguage grammar capable of accommodating such L2 input, assuming that L1 transfer does not occur and that the initial state of L2 acquisition is UG (where no parameters have yet been set). Similarly, it seems unlikely that a beginning learner of L1 Spanish, unquestionably parting from UG as the initial state of L1 acquisition, would have the linguistic

competence to interpret these tunes accurately. Since the beginner responses in (8d) reveal the *accurate* strong acceptance of three tune-meaning correspondences, as opposed to widespread uncertainty or randomness, the Full Access without Transfer Hypothesis is not upheld.

Rather, the composite results point to L1 transfer as a learner strategy for processing the complex L2 input. While the beginners' L2 Spanish may accommodate the NP-AP word order in the text for minimal group 1, it surely cannot yet accommodate the structure of intermediate phrasing and its interplay with syntactic structure, all components necessary for the accurate interpretation of the tunes. L1 transfer accounts for the beginners' three accurate responses in (8d): similar to Spanish, their L1 English allows for intermediate phrasing choices marked by a H- phrase accent to elucidate ambiguous syntax, such that an AP may be given a wide or narrow reading in a structure with two coordinated NPs (e.g., [[*red*]H- [*balloons and streamers*]L-]L%, where both the balloons and streamers are red, versus [[*red balloons*]H- [*and streamers*]L-]L%, where only the balloons are red, respectively) (cf. Pierrehumbert and Hirschberg 1990). Furthermore, the assertion that the beginners' accurate responses are due to L1 transfer, and not to fully acquired components in their L2 Spanish, accounts for the learners' *inaccurate* responses, as well (where the medium shadings are shown, instead of light shadings indicating a clear rejection of these correspondences). The beginners are not yet able to discern what is *ungrammatical* in the L2 at this early stage of development. In contrast, the responses of the intermediate L2 learners indicate that, at a later stage of development, learners of L2 Spanish with L1 English possess an L2 interlanguage grammar that fully accommodates these utterances. These results conform to the pattern discussed in Nibert (2005), where the learners' responses are less restrictive the earlier the stage of L2 acquisition. Additional discussion of these results will follow shortly, in conjunction with the discussion of results from minimal group 2.

Turning now to minimal group 2, like minimal group 1, it involves a text with ambiguous meaning due to the conjunction *y* ('and'). Unlike group 1, however, the text for group 2 contains two adjectives, one in prenominal and one in postnominal position, both capable of modifying both nouns in terms of their agreement in number and gender. The experimental design for minimal group 2 is shown in (9).

(9) Minimal group 2: *numerosos niños y niñeras leales* (literally, 'numerous children and nursemaids loyal')
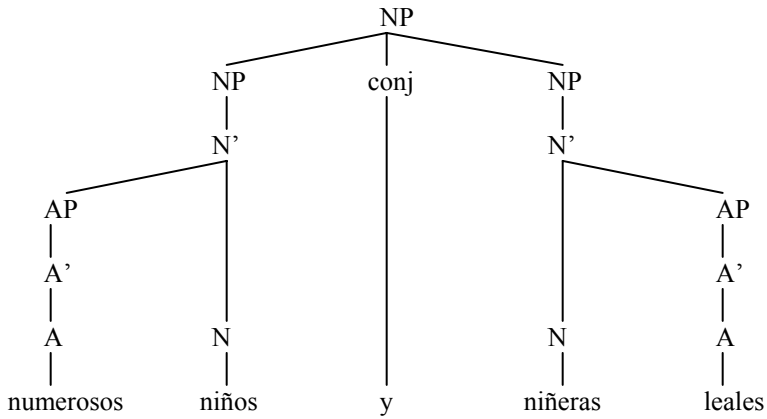
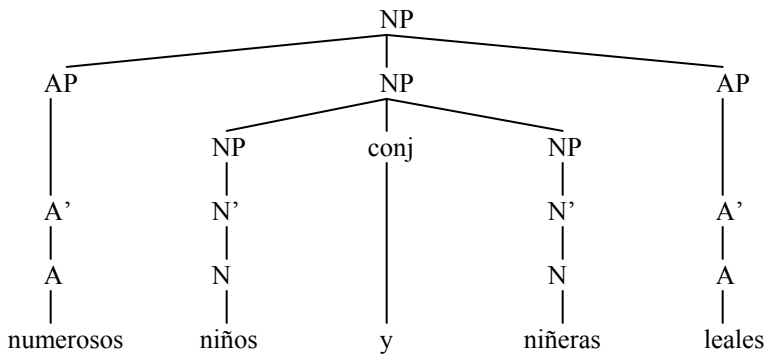Tonal structure of the intonation contours: Possible meanings:

a. [[numerosos niños] [y niñeras leales]] → A. 'numerous children and loyal nursemaids'
                    H-   L- L%

b. [[numerosos] [niños y niñeras] [leales]]→ B. 'numerous loyal children and numerous loyal
            H-   H-   L- L%   nursemaids'

c. [[numerosos] [niños y niñeras leales]] → C. 'numerous children and numerous loyal
            H-   L- L%   nursemaids'

d. [[numerosos niños y niñeras] [leales]] → D. 'numerous loyal children and loyal nursemaids'
                    H-   L- L%

e. [[numerosos niños y niñeras leales]]   → A, B, C, or D. No utterance-medial H- is present
                    L- L%   for disambiguation.

The text *numerosos niños y niñeras leales* potentially allows for four logical interpretations: 1) each adjective modifies only its adjacent noun (meaning A), 2) each adjective modifies both nouns (meaning B), 3) *numerosos* modifies both nouns, and *leales* modifies only its adjacent noun (meaning C), and 4) *leales* modifies both nouns, and *numerosos* modifies only its adjacent noun (meaning D). These four logical possibilities are represented in (10).
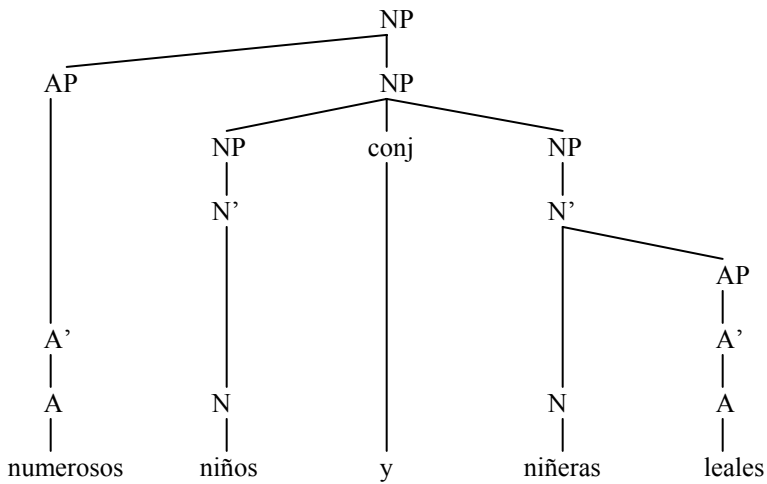
(10) a. Meaning A: *numerosos*= narrow-scoped; *leales*= narrow-scoped

```
                              NP
                ┌─────────────┼─────────────┐
              NP            conj            NP
               │                             │
              N'                            N'
         ┌─────┤                       ┌─────┴─────┐
        AP      │                       │          AP
         │      │                       │           │
        A'      │                       │          A'
         │      │                       │           │
         A      N           y           N           A
         │      │                       │           │
     numerosos niños                 niñeras      leales
```

b. Meaning B: *numerosos*= wide-scoped; *leales*= wide-scoped

```
                              NP
         ┌────────────────────┼────────────────────┐
        AP                    NP                    AP
         │           ┌────────┼────────┐            │
         │          NP       conj      NP           │
         │           │                  │           │
        A'          N'                  N'          A'
         │           │                  │           │
         A           N        y         N           A
         │           │                  │           │
     numerosos     niños              niñeras     leales
```

c. Meaning C: *numerosos*= wide-scoped; *leales*= narrow-scoped

```
                              NP
         ┌────────────────────┤
        AP                    NP
         │           ┌────────┼────────┐
         │          NP       conj      NP
         │           │                  │
         │          N'                 N'
         │           │              ┌───┴───┐
         │           │              │      AP
         │           │              │       │
        A'           │              │      A'
         │           │              │       │
         A           N        y     N       A
         │           │              │       │
     numerosos     niños          niñeras leales
```

d. Meaning D: *numerosos*= narrow-scoped; *leales*= wide-scoped
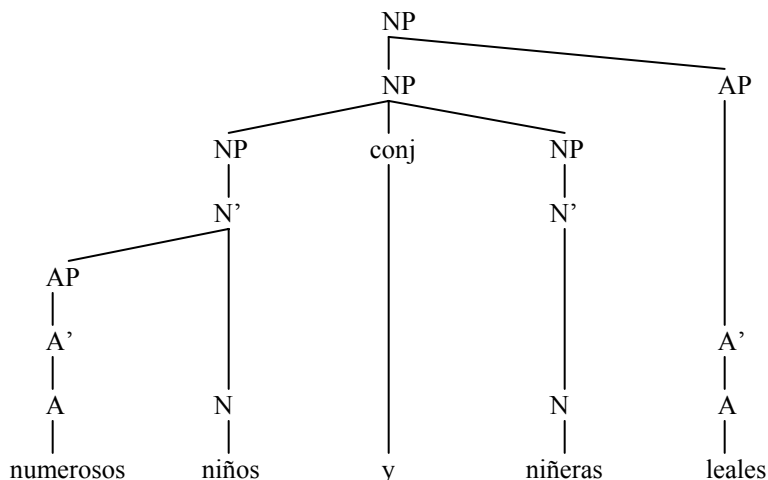
Five different intonation patterns were tested for correspondence with these meanings. Tune 'a' contains a H- phrase accent after the first two words, *numerosos niños*. As shown in table (11a) below, native Spanish listeners assign only meaning A to this tune, giving each AP a narrow scope of modification. Tune 'b' has two non-final phrase accents, a H- after *numerosos* and a H- after *niñeras*. These tones separate the nouns from their adjacent adjectives, giving both APs a wide scope of modification. Indeed, native listeners accepted only meaning B for this tune. Tune 'c' contains a H-only after the adjective *numerosos*, and tune 'd' has one only after *niñeras*. Assuming a preference for symmetry in the modification of conjuncts, the native listener results indicate that the presence of a H-near only one AP suffices to widen the scope of modification of the other AP as well. In other words, the perception of one H- between a noun and its adjacent AP is enough evidence to discard meaning A and opt for the only other symmetrical possibility: meaning B. Native listeners give strong acceptance exclusively to meaning B for both tunes 'c' and 'd.' Meanings C and D are not preferred, since they both involve asymmetrically modified conjunct structures. Lastly, for tune 'e,' with no utterance-medial H- phrase accent, an acceptance of both symmetrical meanings A and B would be expected. Yet, native listeners do not strongly accept either one. The 64% acceptance rating for meaning A almost reaches the 67% level required for a dark shading. Thus, meaning A tends more in the direction of possible than not possible for this tune. The 52% acceptance rating for meaning B, however, approaches the level of chance at 50%. Both medium shadings for tune 'e' suggest that native listeners benefit from the presence of utterance-medial H- when parsing ambiguous syntax. In other words, native listeners extract meaning more easily when more than one intermediate phrase comprises the intonation phrase. To summarize the native listener results, an utterance-medial H- phrase accent disambiguates the syntax of conjunction where: 1) a marked, asymmetrically modified conjunct structure is involved, as in minimal group 1's tune 'a,' or 2) more than one symmetrically modified conjunct structure is possible, and therefore clarification is needed, as in all tunes for minimal group 2.

Again, the native listener results for minimal group 2 appear in (11a) below, while tables (11b-d) present the results for the three groups of L2 learners.

(11) Results for minimal group 2: *numerosos niños y niñeras leales* (literally, 'numerous children and nursemaids loyal')

    a. Results obtained from 33 native listeners of Peninsular Spanish

		MEANING			
		A num.= child.; loyal= nurse.	B num.= both; loyal= both	C num.= both; loyal= nurse.	D num.= child.; loyal= both
T U N E	a [[numerosos niños]$_{H-}$ [y niñeras leales]$_{L-}$]$_{L\%}$	y=30 **91%**	y=4 12%	y=4 12%	y=6 18%
	b [[numerosos]$_{H-}$ [niños y niñeras]$_{H-}$ [leales]$_{L-}$]$_{L\%}$	y=2 6%	y=32 **97%**	y=2 6%	y=4 12%
	c [[numerosos]$_{H-}$ [niños y niñeras leales]$_{L-}$]$_{L\%}$	y=8 24%	y=26 **79%**	y=14 42%	y=7 21%
	d [[numerosos niños y niñeras]$_{H-}$ [leales]$_{L-}$]$_{L\%}$	y=2 6%	y=29 **88%**	y=9 27%	y=13 39%
	e [[numerosos niños y niñeras leales]$_{L-}$]$_{L\%}$	y=21 64%	y=17 52%	y=7 21%	y=9 27%

=20

    b. Results obtained from 18 advanced-level learners of Spanish as a second language

		MEANING			
		A num.= child.; loyal= nurse.	B num.= both; loyal= both	C num.= both; loyal= nurse.	D num.= child.; loyal= both
T U N E	a [[numerosos niños]$_{H-}$ [y niñeras leales]$_{L-}$]$_{L\%}$	y=18 **100%**	y=4 22%	y=1 6%	y=3 17%
	b [[numerosos]$_{H-}$ [niños y niñeras]$_{H-}$ [leales]$_{L-}$]$_{L\%}$	y=1 6%	y=18 **100%**	y=3 17%	y=3 17%
	c [[numerosos]$_{H-}$ [niños y niñeras leales]$_{L-}$]$_{L\%}$	y=2 11%	y=15 **83%**	y=3 17%	y=6 33%
	d [[numerosos niños y niñeras]$_{H-}$ [leales]$_{L-}$]$_{L\%}$	y=1 6%	y=14 **78%**	y=9 50%	y=6 33%
	e [[numerosos niños y niñeras leales]$_{L-}$]$_{L\%}$	y=14 **78%**	y=6 33%	y=3 17%	y=3 17%

=20

c. Results obtained from 37 intermediate-level learners of Spanish as a second language

		MEANING			
		A num.= child.; loyal= nurse.	B num.= both; loyal= both	C num.= both; loyal= nurse.	D num.= child.; loyal= both
T U N E	a [[numerosos niños]$_{H\text{-}}$ [y niñeras leales]$_{L\text{-}}$]$_{L\%}$	y=33 **89%**	y=6 16%	y=4 11%	y=4 11%
	b [[numerosos]$_{H\text{-}}$ [niños y niñeras]$_{H\text{-}}$ [leales]$_{L\text{-}}$]$_{L\%}$	y=1 3%	y=33 **89%**	y=13 35%	y=13 35%
	c [[numerosos]$_{H\text{-}}$ [niños y niñeras leales]$_{L\text{-}}$]$_{L\%}$	y=19 51%	y=27 **73%**	y=18 49%	y=9 24%
	d [[numerosos niños y niñeras]$_{H\text{-}}$ [leales]$_{L\text{-}}$]$_{L\%}$	y=10 27%	y=20 54%	y=25 **68%**	y=6 16%
	e [[numerosos niños y niñeras leales]$_{L\text{-}}$]$_{L\%}$	y=28 **76%**	y=19 51%	y=9 24%	y=10 27%

=20

d. Results obtained from 22 beginner-level learners of Spanish as a second language

		MEANING			
		A num.= child.; loyal= nurse.	B num.= both; loyal= both	C num.= both; loyal= nurse.	D num.= child.; loyal= both
T U N E	a [[numerosos niños]$_{H\text{-}}$ [y niñeras leales]$_{L\text{-}}$]$_{L\%}$	y=16 **73%**	y=5 23%	y=4 18%	y=7 32%
	b [[numerosos]$_{H\text{-}}$ [niños y niñeras]$_{H\text{-}}$ [leales]$_{L\text{-}}$]$_{L\%}$	y=5 23%	y=12 55%	y=7 32%	y=10 45%
	c [[numerosos]$_{H\text{-}}$ [niños y niñeras leales]$_{L\text{-}}$]$_{L\%}$	y=21 **95%**	y=6 27%	y=6 27%	y=6 27%
	d [[numerosos niños y niñeras]$_{H\text{-}}$ [leales]$_{L\text{-}}$]$_{L\%}$	y=14 64%	y=9 41%	y=13 59%	y=8 36%
	e [[numerosos niños y niñeras leales]$_{L\text{-}}$]$_{L\%}$	y=19 **86%**	y=6 27%	y=13 59%	y=10 45%

=20

The shadings in table (11b) show that the interpretation of tunes 'a' through 'd' by advanced learners all closely approximate native listener assessments. As for tune 'e,' a similar conclusion can be drawn after a closer look at the actual percentages. The advanced group strongly accepts meaning A, while the native listeners show a tendency in the direction of its acceptance. For the tune 'e'-meaning B correspondence, the advanced group rating is 33%, just shy of a medium shading or, in other words, almost in the range of uncertainty. Similarly, native listeners are not clear on the rejection or acceptance of meaning B for this tune. Recall that the earlier assumption about a preference for symmetry in the modification of conjunct structures predicts an acceptance of both meanings A and B for tune 'e.' However, without the presence of a medial H- phrase accent to elucidate syntactic structure, advanced L2 learners of Spanish, similar to native listeners, find it challenging to interpret its meaning.

The results in table (11c) from the intermediate learners show that their responses also approximate native listener judgments, albeit to a lesser degree than the advanced learners. Like the advanced learners, the intermediates reveal native-like intuitions regarding a narrow scope of modification for both APs, represented by the strong acceptance of meaning A for both tunes 'a' and 'e.' As regards the interpretation of tunes 'b' through 'd' involving a wide scope of modification for both APs, the intermediate learners show less competence. While they accurately accept meaning B for tunes 'b' and 'c,' they miss the mark on 6 of the other 10 correspondences for tunes 'b' through 'd,' resulting in many medium shadings (i.e., uncertainty), especially as regards the asymmetrical meanings C and D.

The accurate interpretation of the tunes in minimal group 2 requires additional knowledge of Spanish grammar beyond the components required by the tunes in minimal group 1. The text for minimal group 2 contains not one but two APs, and these APs co-occur with two coordinated NPs, one AP appearing in absolute prenominal position and the other in absolute postnominal position. This type of overall structure is unattested in the learners' L1 English grammar. Nevertheless, the partially accurate responses from the intermediate learners imply a restructuring process of the L2 interlanguage grammar to accommodate such syntax and its interplay with intermediate phrasing. While intermediate learners show competency when each AP modifies its local NP only (meaning A), the option of a non-local or wide scope of modification for both APs (meaning B) seems to be emerging in their L2 interlanguage. At the same time, however, some level of uncertainty and inaccuracy persists regarding the limits of a wide-scoped modification (meanings C and D, for instance). Regardless, the responses of the advanced L2 learners indicate that, at a later stage of development, learners of L2 Spanish with L1 English can possess a native-like L2 grammar that accommodates the complexities of these utterances.

Turning now to the results in table (11d) for the beginning learners, their responses approximate native listener judgments to a much lesser degree than do the intermediate learners' responses. Similar to the other three groups, the beginners strongly accept meaning A for both tunes 'a' and 'e.' However, they also inaccurately assign meaning A to tune 'c.' Meaning A, is, in fact, the only interpretation accepted by the beginners. These L2 learners either reject or show uncertainty regarding all of the other meanings and tune-meaning correspondences, as indicated by the light and medium shadings, respectively.

As was claimed for minimal group 1, the L2 beginners' composite results for minimal group 2 point to L1 transfer as a strategy for approaching this even more complex L2 input. Recall that it was argued that due to L1 transfer, beginners demonstrate partial success (indicated by the dark shading) in interpreting both meanings A and B in minimal group 1, where only one AP with either a narrow or wide scope of modification, respectively, is involved. Together with the learners' prior L2 knowledge of word order (i.e., NPs in Spanish are head-initial), the L1 English grammar can accommodate the AP modification and intermediate phrasing options presented by these tunes (refer to the examples from English offered earlier). When presented with the L2 input from minimal group 2, the beginners display some level of competence as regards the tune-meaning correspondences *not unlike* their L1 grammar, specifically, the interpretation where *one* AP *locally* modifies its adjacent NP (i.e., meaning A). The remaining tune-meaning correspondences all involve options not instantiated in the L1, specifically, a *wide-scoped* modification for one or both of the *two* co-occurring APs. The L1 grammar cannot accommodate the presence of two co-occurring APs, one prenominal and the other postnominal, not to mention the possible AP modification and intermediate phrasing options that these introduce. It is precisely with these tune-meaning correspondences (those involving tunes 'b,' 'c,' and 'd' matched with meanings B, C, and D) that the beginner responses reflect a clear lack of competence in the L2. (Recall that intermediate learners are challenged by these same correspondences.) L1 transfer accounts for this disparity in the beginners' results. Their L2 responses display accuracy where the L1 and L2 grammars converge. Concurrently, their responses display inaccuracy where the L1 and L2 grammars diverge. If L1 transfer is not deemed possible and the true beginners' initial state is UG, there is little way to account for: 1) the knowledge that these learners already display regarding complex utterances in Spanish with no prior instruction nor abundant positive evidence from previous L2 input, 2) the fact that this knowledge coincides with the L1, and 3) the fact that there is inaccuracy

where the L2 diverges from the L1.

Additionally, a comparison of the beginner results with those of the other three groups reveals a clear and gradual restructuring of L2 interlanguage grammar towards a more restrictive and native-like state. Starting with each beginner table (labeled 'd') and moving backwards alphabetically through the other tables, such restructuring is represented visually through a gradual increase of dark and light shading (indicating certainty) and a gradual decrease of medium shading (indicating uncertainty), increasingly in accordance with native listener responses. These data support nicely the Full Access Hypothesis, in which a native-like attainment of the L2 is deemed possible, albeit not guaranteed.

4. Conclusion

The three research questions explored in this study have been the following: 1) do true beginners perceive disambiguating H- phrase accents in Spanish intonation contours, despite limited experience with the language?; 2) do the beginners' assessments regarding the meaning of these utterances conform to the pattern observed for intermediate and advanced learners, where interpretations are less restrictive the earlier the stage of L2 acquisition?; and 3) do the beginner responses show evidence of L1 transfer?

First, the perception test results indicate that beginning learners do indeed perceive and interpret an utterance-medial H- phrase accent, but only in limited cases. Beginners accurately accept various tune-meaning correspondences accepted also by native listeners, and the utterances involved vary only in terms of the absence versus presence or the placement of H-. Had these learners not perceived and attended to H- phrase accents in the aural L2 input, their responses would have shown a medium shading exclusively, indicating chance. Thus, the Full Access without Transfer Hypothesis, which predicts an absence of knowledge or uncertainty, is not supported by the true beginner responses.

Second, the beginners' assessments of meaning do indeed conform to the emerging continuum suggested in Nibert (2005): their responses are less restrictive than those of intermediate learners, which in turn are less restrictive than those of advanced learners, which are native-like. In other words, the gradual development or restructuring of L2 interlanguage grammar toward a more restrictive and native-like state is clearly observable in the composite results from the three groups of L2 learners. Said restructuring involves various components of the grammar, including intermediate phrasing marked by a H- phrase accent, syntax (i.e., word order, and the modification of two coordinated NPs by one or two APs), and the intonation-syntax interface.

Third, the true beginners' responses do indeed show evidence of L1 transfer. The beginners make various accurate assessments regarding the meaning of complex utterances in the L2, and these responses occur where the L1 English grammar and the L2 Spanish grammar converge (i.e., *one* AP *locally* modifies its adjacent NP). When L2 utterances containing structures not instantiated in the L1 are involved (i.e., two APs co-occur with two coordinated NPs, and each AP has a wide scope of modification, modifying both the local and non-local NP), the beginners' responses are inaccurate, as are some responses from the intermediate learners for these same utterances, albeit to a much lesser degree. L1 transfer accounts for these composite patterns of response. If L1 transfer is not deemed possible and the true beginners' initial state is UG, there is little way to account for the sophisticated beginner knowledge already displayed, given no previous instruction about intermediate phrasing choices marked by a H- phrase accent in Spanish intonation and assuming an absence of abundant positive evidence from previous L2 input. Thus, the results from this study lend substantial support to the view that the initial state of L2 acquisition is the L1 grammar. In sum, within generative theory, and within the perspective that L2 acquisition is constrained by Universal Grammar (UG), the cumulative results obtained from the three groups of L2 learners strongly support the Full Transfer Full Access Hypothesis, where the initial state of L2 acquisition is the learner's L1 grammar, there is full access to UG for the subsequent restructuring of L2 interlanguage, and a native-like level of attainment in the L2 is deemed a possible, albeit not assured, outcome.

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