

Prosody in L2 Acquisition

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1. Introduction

Prosodic structure, as it couples with information structure, is an integral component of the felicity of an utterance. A string of coherently arranged elements is uniquely flagged for discourse by its prosody (comprised of intonation, stress, and rhythm), separating peaks from valleys in the discourse topography. The placement of stress does carry meaning in that it indicates the scope of the focused information – an all-important feature of information structure.

The current study makes a cross-linguistic comparison of the nature of the prosody-focus relationship and how it manifests itself. The research question posed here is whether or not English and Spanish differ with regards to prosody for certain focus constructions, and if so, where evidence of this difference can be found. Once it has been established how things work in each language, we move on to a hypothesis and a number of predictions of what is expected to happen in a situation of adult second language acquisition.

The current study is of particular import to the area of acquisition due to the somewhat tacit nature of the acquisition process: there are no prosodic structure paradigms or prosody rules for learners to memorize, as are available for irregular verb tenses or plural formations, etc. Nonetheless, languages (rather, their speakers) capitalize on the existence of this communicative feature. The research presented here is advanced in the same vein: observing the production behavior of speakers who wield more than one system provides us with an opportunity to understand how language-specific constraints are manifested.

In order to answer the posed research question, it is first necessary to spell out the differences between English and Spanish, as detailed in section 1. The hypothesis and predictions of what is expected to happen in an acquisition situation are given in section 2. Section 3 details the method and experimental approach used to collect data; section 4 presents the results of the data analysis. The final section, section 5, is a discussion and conclusion of the research presented here.

2. Prosody and Focus: Rules Across Languages

This section begins with a discussion of how nuclear stress has been accounted for in the literature, and how subsequent instantiations of stress rules have brought research closer to detailing the nature of the relationship between syntax and stress. The discussion culminates in showing what the differences between Germanic and Romance languages are in terms of the computation of stress, followed by a discussion of where the evidence of difference can be observed.

2.1 Nuclear stress

The analysis adopted here has its origins in the Nuclear Stress Rule (henceforth NSR), as it appears in its post-Chomsky and Halle (1968) instantiations. The original version of the NSR stated

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that syntax determines stress. The original rule as presented in *The Sound Pattern of English* (1968: 17-18) is quoted below.

(1) The Nuclear Stress Rule (NSR):

Assign primary stress to a primary-stressed vowel in the context

V ... ----- ...]α where]α stands for a bracket with any label except N, A, or V.

We can then take α in (1) to be simply a variable ranging over all categories. The basic premise is that nuclear stress (henceforth NS) will fall on the rightmost constituent in contexts where the verb phrase has a complement (or adjunct).

Chomsky (1971) and Jackendoff (1972) refine commentary on the relationship between prosody and syntax with the *Focus Prosody Correspondence Principle* (cited in Zubizarreta & Vergnaud 2005: 525)

(2) Focus Prosody Correspondence Principle (FPCP)

The focused constituent must contain the intonational nucleus of the intonational phrase, where the intonational nucleus is identified as the syllable that bears main phrasal prominence. .

The rule in (1) and the principle in (2) work together to describe the prosody-syntax relationship: an application of the NSR gives us the phrase's most rhythmically prominent word, while the FPCP "mediates the relation between intonation and focus" (Zubizarreta 1998: 38). The NSR makes the correct prediction for transitive verbs, as shown in example (3). All the examples presented here are taken from the question and answer part of the experiment, as described in Section 3.¹

(3) Q: What happened?

A: A woman just gave me a dollar!

But what is to be said about verb phrases that only contain a predicate? It is here that Schmerling (1976) made a most important contribution in suggesting that the NS can fall on the subject in an "out-of-the-blue" context. Example (4) is of the unergative verb "to shake", and example (5) is of the unaccusative verb "to fall". In both examples, the NS falls on the subject.

(4) Q: Why did they scream?

A: The building just shook.

(5) Q: What was that noise?

A: A book just fell.

2.2 Zubizarreta: Rules for stress

The unergative example presented in 1.1 provides an illustrative lead-in to the discussion on how it is possible for two options to exist for main prominence (stress) placement in the case of this verb type. A specific discussion of this difference is couched within a broader explanation of how stress is computed for intransitive vs. transitive verbs in both English and Spanish, and this in turn is part of a larger analysis that attributes the difference in computation to metrical vs. syntactic trees.

The 'how' behind why these two options are possible is demonstrated with the distinction drawn between separate applications of the NSR made by Zubizarreta (1998) in her analysis of prosody and focus in Germanic and Romance languages.

Zubizarreta first reformulates the NSR, as given below, then uses this definition as a parting point to establish important syntactic distinctions that have crosslinguistic ramifications.

¹ In the interest of space, graphics of the sound files analyzed for this project are not given here. In the absence of visual representation of stress realization, stress (main prominence) will be represented by underlining the word or words that were stressed by the speaker.

(6) Revised NSR

S-NSR: Given two metrical sister-categories C_i and C_k , in which one is selectionally dependent on the other, assign main prominence to the dependent category if it is the lowest in the selectional ordering².

C-NSR: Given two metrical sister-categories C_i and C_k , assign main prominence to the category that is lowest in the asymmetric c-command ordering. (2005: 539)

In sum, S-NSR says that prominence is established in terms of *selectional ordering*, and C-NSR says that prominence established in terms of *asymmetric c-command*, where asymmetric c-command means whatever comes at the end: PP, AdvP, etc. Zubizarreta's fleshed-out analysis culminates in demonstrating that Germanic languages compute main prominence using both S-NSR and C-NSR, while Romance languages do so only in terms of C-NSR.

2.3 Prosody and focus in English

Main prominence can be computed by the most embedded argument for all verb types³. In the case of transitives, the most embedded argument is the object and the C-NSR applies, as the object is the one lower in asymmetric c-command. To illustrate this, I cite example (3) repeated here: "A woman just gave me a dollar!"

For intransitives, the mechanism is different since there is only one argument to be considered 'most embedded'. The S-NSR applies when the subject of an unaccusative receives NS: unaccusatives contain only one verbal head and the single nominal argument that they can select is the lowest constituent in the selectional chain.

Zubizarreta follows Hale and Keyser's (1993) structural analysis for verb types, which analyze unergatives as covert transitives, with a cognate object that can be syntactically incorporated into the verb. Unergatives are analyzed as having two verbal heads, each one selecting an argument. The lower verb selects the lowest constituent in the selectional chain.

A wide-focus construction is one in which the information being asserted qualifies as new within the status of the discourse structure. The data presented thus far in this study supports the idea that in English when the entire intransitive phrase is new information, the focused element that receives main prominence is at the left edge of the phrase. So stress falls on the argument (rather than the verb), which is positioned left most. An example (also taken from the data collected for the experiment presented here; see section V) for the intransitive unaccusative verb type is "My pet died". An example of the unergative type, where main prominence falls at the left edge, is "A baby cried".

In the following section, evidence from Spanish also shows that the prosody-focus alignment holds but its manifestation is different from that of English.

2.4 Prosody and focus in Spanish

Zubizarreta (1998) proposes the prosody-focus alignment of the S-NSR rule at work in English, which is claimed not to operate in Romance languages. It follows that Spanish and English share similar unmarked intonation patterns for transitive phrases. But in Spanish, for assertion/out-of-the-blue constructions the new information is always at the right edge of the phrase, regardless of the type of intransitive verb (examples (7) and (8) below are of an unergative, *bailar* (to dance) and an unaccusative, *romper* (to break), respectively). This is in line with Zubizarreta's proposal that in Spanish only the C-NSR operates: the lowest constituent in asymmetric c-command receives main prominence.

² Selectional ordering refers to the following process: "the functional category C(omp) selects the functional category T(ense), which in turn selects a verbal projection. The selectional ordering within the verbal projection is given by the lexicosyntactic structure of the verbal predicate." (Zubizarreta 1998: 52)

³ A reference to metrical and syntactic trees was made in the introductory paragraph of 2.3. While this is part of a broader analysis, for the current purposes of this work it is not necessary to include all the details of the entire analysis in order to understand the relationship between main prominence and embedding.

- (7) Q: ¿De qué te ríes?
 A: ¡Un pingüino está bailando! (Spanish)
 A penguin be-PRS-3SG dance-PROG
 “A penguin is dancing.”
- (8) Q: ¿Por qué está molesto tu papá? (Spanish)
 A: Se rompió la ventana.
 REFLBreak-PST-3SG the window
 “The window broke.”

In sum, while it is perfectly acceptable for NS to fall on the subject in wide-focus constructions in English, in Spanish you cannot get NS in a position non-adjacent to the phrase boundary for the same type of construction.

3. Hypothesis and Predictions for L2 Learners of English and Spanish

Now that it has been established that English and Spanish differ with regards to intonation for wide-focus constructions, an interesting question can be posed: will second language learners borrow the intonation pattern from their L1? The null hypothesis would be to assume that L1 transfer does not exist in the learner’s L2. I put forth the alternative hypothesis, namely that transfer does exist.

- (9) Hypothesis:
 L1 transfer effect can be observed with respect to prosody and focus alignment in the speech of L2 learners.
- (10) Predictions:
- L1 English/L2 Spanish speakers will stress the subject in Spanish in wide focus contexts for intransitives. Thus speakers are predicted to produce a stress pattern that is not expected in Spanish, but instead corresponds to what is produced in English for the relevant context.
 - L1 Spanish/L2 English speakers are expected to stress the verb in intransitive constructions in English, and by doing so speakers avoid placing stress on the subject in wide-focus contexts.
 - Both populations are expected to behave the same with regards to transitives because the stress pattern for transitives is assumed to be the same for both languages: the object or complement receives NS in wide-focus contexts. Since there is no difference between the treatment of this context in the two languages, no transfer takes place.

An experiment with multiple production tasks was designed in order to test these predictions, as described in section 3.

4. Method

4.1 Participants

Two populations participated in this bidirectional study: adults whose L1 is English and who are learning or have learned Spanish as adults, and adults whose L1 is Spanish⁴ and who are learning or have learned English as adults. All participants completed a fill-in-the-blank Cloze test (Cabrera, 2005) to assess proficiency in both languages. There are ten participants in the L1Eng/L2Span group, and ten participants in the L1Span/L2Eng participants.

Ages of participants in the former group range from 20 to 48, and five participants are considered high proficiency, two intermediate and five low proficiency (for the sake of reporting the results,

⁴ During this first stage of testing, L1 Spanish participants were limited to those who speak the Mexican variety of Spanish in an attempt to avoid possible confounding factors that might arise when analyzing data from more than one variety of Spanish. However, as testing continues, speakers of other varieties of Spanish will be solicited in order to see how results might differ across speech communities.

intermediates and lows were grouped together). Of the latter group, the participants' age ranges between 19 and 59, and five participants tested at the high proficiency level and five at the intermediate level.

4.2 Stimuli

A central concern of the current study is to empirically determine the intonation patterns associated with common sentence types in both Spanish and English. There are two separate yet related experiments: the question and answer (Q&A) experiment, as well as a narration experiment. The Q&A is controlled, not only in terms of the contexts (i.e. we are testing those contexts that allow us to test for intonation patterns thought to be associated with certain sentence types), but also in terms of relative length. The information structure categories that the Q&A pairs are designed to represent include the following: out-of-the-blue context/all new information (transitive, unaccusative, unergative), VP focus (all verb types), subject focus (all verb types), object focus (transitives), and contrastive focus.

The narration is open-ended, and allows us to see whether the staged Q&A patterns actually match what is used in a free narration where a storyline is implied (a series of drawings are the only context provided to the participant). The drawings used to prompt the narration part of the experiment were designed to allow participants to produce the "same" discourse contexts as captured by the Q&A, while capturing a broader information structure range.

4.3 Procedure

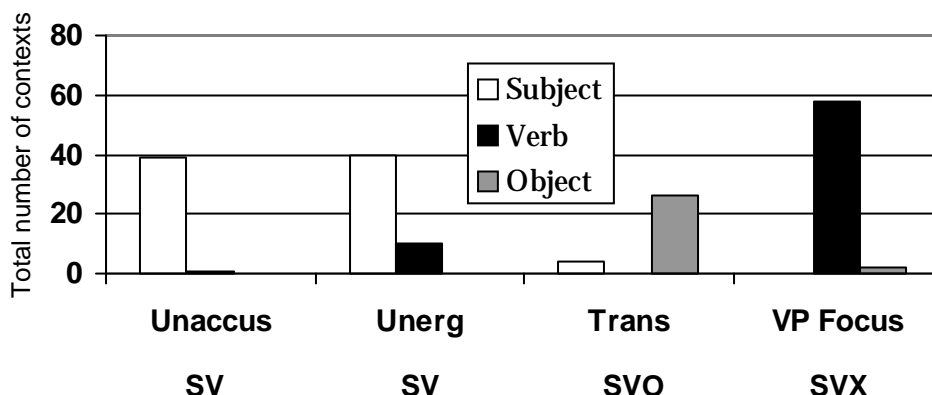
Participants in this study were asked to complete three separate tasks in both languages under study. Testing was done in two sessions, carried out one week apart, and the participant was always tested first in their L2. For the first part of the experiment the participant read the question and answer pairs. The pairs were presented on file cards, and while the participant was instructed not to look ahead, they were allowed to read the question silently beforehand if desired. For the second part of the experiment they constructed a brief narration based on a series of drawings. For the third part participants completed the Cloze test. Subjects received payment for participation in the experiment.

5. Results

5.1 Q&A results, quantitative and qualitative analysis for English

The figures presented in this section provide a quantitative analysis of stress placement for the Q&A part of the experiment for both populations. In Figure 1 (next page) we see that L1 speakers of English place nuclear stress on the subject in out-of-the blue contexts with unaccusative verbs in English; for example "A book just fell", and (see example 5). There is a preference for placing stress on the subject with unergative verbs as well; for example, "Madonna just walked by" (12). For transitive verbs there is a preference for stress to be placed sentence-finally on the object. For the VP focus category, stress consistently falls on the verb, as expected; for example "I'm married to an Italian" (13). The VP cases included in this category were all of transitive verbs with deaccented complements.

FIGURE 1 L1Eng Q&A English: Stress placement



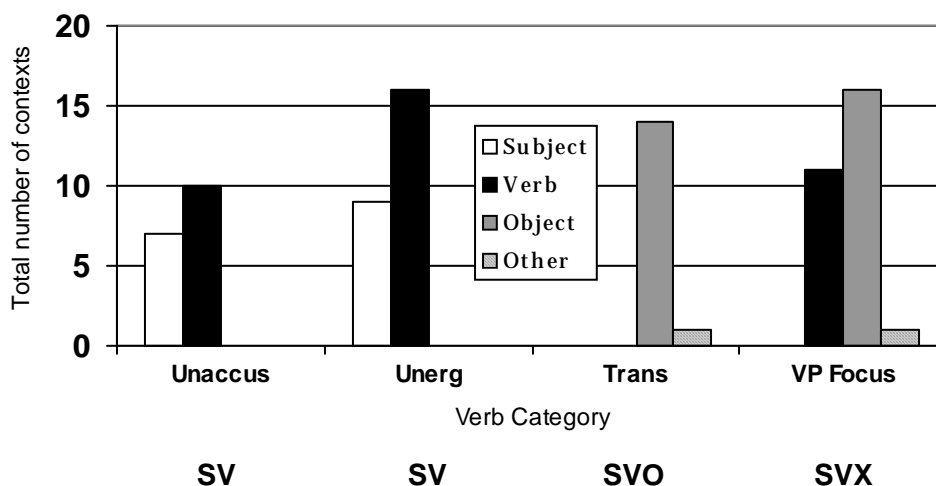
(12) L1Eng: Q: Why are you looking out the window?
A: Madonna just walked by!

(13) L1Eng: Q: Why do you study Italian?
A: I'm married to an Italian.

Now turning to the results of the L2English population, Figure 2 (next page) shows that participants are more likely to place stress sentence-finally on the verb in both unaccusative and unergative contexts; for example, “A book just fell”, and “Madonna just walked by”, respectively (15), (16). It should be noted that while this population’s behavior with regards to transitive verbs is not atypical, as one option in both English and Spanish is for the object to receive NS, it is of interest that there is no placement of NS on the subject (always opting for sentence-final stress). Even more interesting are the VP focus contexts, where L2 speakers show a tendency to override the deaccenting option available and instead go ahead with an unmarked sentence-final stress pattern; for example, “I’m married to an Italian” (17). (This is also of interest because they are not using this pattern for the minimal pair in their L1.)

At this point it seems safe to conclude that while some high proficiency speakers do acquire English-like stress patterns, even some high proficiency as well as intermediate proficiency L1 Spanish speakers do show a preference for placing stress sentence-finally in English. This would be in line with the stress-final placement in Spanish, where stress is not allowed to occur in a position non-adjacent to the intonational phrase boundary as part of the assertion (i.e. in non-contrastive, or wide-focus contexts).

FIGURE 2 L2Eng Q&A English



(15) L2Eng: Q: What was that noise?

A: A book just fell.

(16) L2Eng: Q: Why are you looking out the window?

A: Madonna just walked by!

(17) L2Eng: Q: Why do you study Italian?

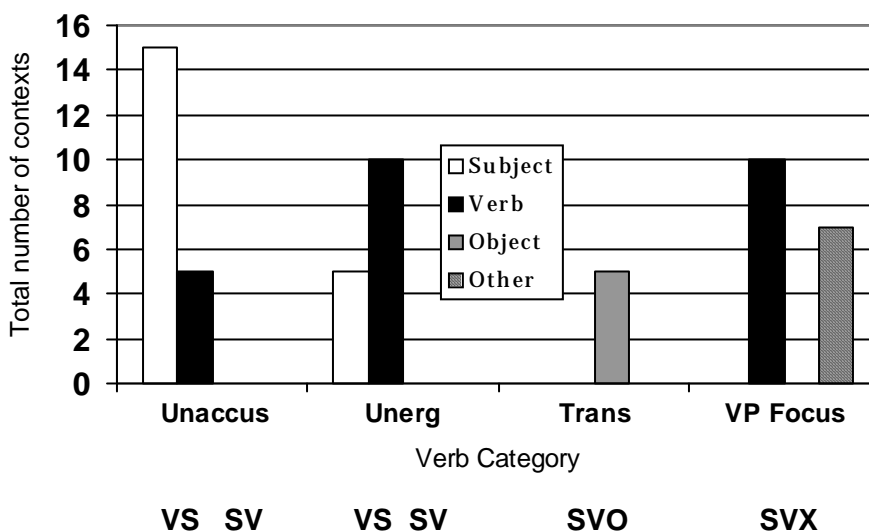
A: I'm married to an Italian.

5.2 Q&A results, quantitative and qualitative analysis for Spanish

Figure 3 (next page) gives a break-down of L1 Spanish behavior in Spanish. It is important to clarify one thing about stress placement for the intransitive class. The discourse-neutral order for unaccusatives is VS in Spanish, and for unergatives it tends to be SV. However, Figure 3 shows five instances of what could be thought of as unexpected stress patterns for these categories, but they are in fact expected. One context in each category was designed so that the expected order would be SV in unaccusatives and VS in unergatives. After clarifying that point, we see that stress is clearly sentence-final in Spanish. In the case of VP focus, the stress either fell on the verb, as expected, or was placed on the sentence-final adjective (also expected).

FIGURE 3

L1Span Q&A Spanish



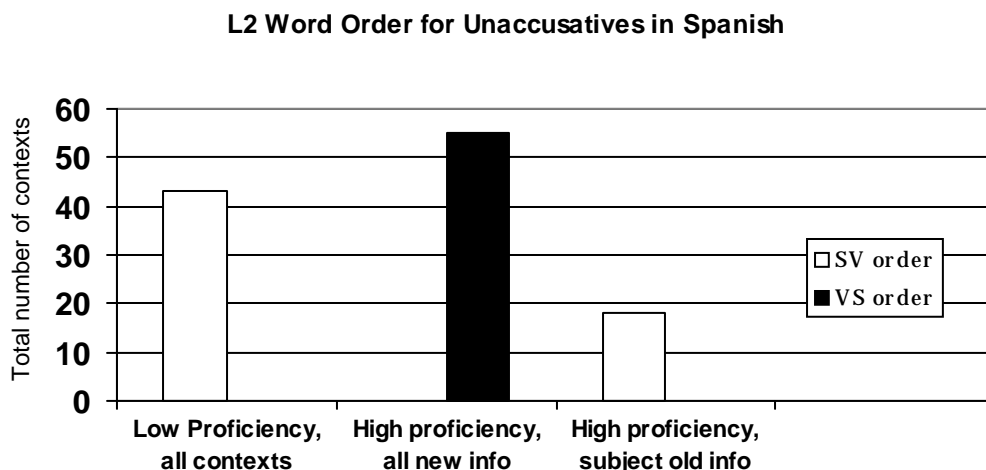
A chart for L2 Spanish speakers has not been included for the following reasons: 1) the behavior of the five highly proficient L2 speakers of Spanish was strikingly similar to that of the native speakers with regards to stress, 2) not all the data from the remaining five lower proficiency speakers was salvageable.

5.3 Narration, qualitative and quantitative analysis

In the case of L2 speakers of Spanish, the narrations are particularly of use when examining the acquisition of flexible word order in Spanish. Figure 4 (next page) might seem awkward as a means of representing word order, but it is meant to underscore the major differences between the two proficiency groups of this population. Low proficiency groups use SV for all unaccusative verbs, regardless of the informational status of the components. The subject received NS whenever it was the new information in a wide-focus context.

In the case of the highly proficient speakers, production is on par with that of native speakers: VS order is used when everything is new information or when the subject is being presented in to the discourse for the first time. However, the same speakers do use SV order with unaccusatives when the structure of the discourse solicits such an order (i.e. when the subject is old information and the predicate is the new information) – signaling that these speakers have fully acquired information structure in their L2 and make appropriate use of all the resources available to construct a coherent discourse. The stress patterns produced in each case also match that of native speakers: NS on subject in VS structure, NS on verb in SV structure.

FIGURE 4



As for the L1Span/L2Eng population, when they produce unaccusatives in English in out-of-the-blue contexts, they use the “there insertion” construction. (For example: “There is a shark in the water!”), where native speakers produce constructions such as, “A shark comes out of the water!” A possible conclusion is that these L2 speakers are avoiding a construction with a subject in initial position that is new information (and as such would receive NS), in an attempt to avoid a construction that would violate a constraint in their L1.

5.4 Word order and intonation correlation

Based on data from the L2 Spanish speaker population, there seems to be a correlation between native-like stress placement and word order acquisition. A clear tendency has been observed (Contreras, 1978; Suñer, 1982) for subjects of unaccusatives to appear postverbally when the subject is non-topic (see section 2.5; in the case of unergatives, the subject tends to be the topic of the phrase). Again, repeated observations of this phenomenon have firmly established this order as a tendency, but this is not a case of grammaticality. Perhaps for this very reason, flexible word order and the most common orders for verb types are not generally taught as part of the second-language curriculum (apparently a few textbooks do make mention of word order flexibility in Spanish (Montrul, 2005)). Instead, learners must glean this order from the context, perhaps making an abstraction based on the semantics of the verb type.

Whatever the specific nature of the learning process might be, the data presented here seem to indicate that for L2 speakers of Spanish, there is a correlation between the acquisition of stress patterns and word order. While it is my intuition that word order acquisition precedes that of intonation, a more complete analysis based on more robust data from a larger participant sample is necessary before the nature of this relationship can be determined with any accuracy.

6. Discussion

At first glance we can conclude that L2 speakers of English do attain complete acquisition but they rely more on syntax than on stress for communicative efficacy. As for the L2 speakers of Spanish, it would seem that complete acquisition is not obtained until sensitivity to appropriate word order is achieved, at which point syntax dictates appropriate stress application.

This work contributes to existing knowledge of intonation and information structure by providing more details as to the differences in contours across languages, as well as what happens when and if the two converge. It also contributes to knowledge in both languages as to the role of intonation and information structure. Continued work in this area will allow us to establish a continuum, ranging from

simultaneous bilingual speakers on one end to sequential L2 learners on the other. Looking at such factors as learning environment (the nature of the acquisition), patterns and frequency of use (activation levels), and tendency to combine or keep languages separate, will grant us a more complete perspective as to the relevant weights of the factors that contribute to language learning

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