Prominence Shifts in English and Spanish Parallel Constructions

Jeffrey Klassen
McGill University
1085 Doctor Penfield Avenue
Montreal, QC

Michael Wagner
McGill University

Heather Goad
McGill University

Annie Tremblay
University of Kansas
1541 Lilac Lane
Lawrence, KS

Contact: jeffrey.klassen@mail.mcgill.ca

Abstract

Certain information theoretical distinctions that are encoded by prosody in English are encoded by word order in Spanish (Bolinger, 1954), a fact often related to the freer word order in Spanish (Lambrecht, 1994; Büring, 2010). This study reports on a production experiment that compares whether and how the two languages mark focus in cases of parallelism, where a change in word order is not an option in Spanish. Prior studies have claimed that Spanish marks focus prosodically only if the focus involved is 'contrastive' or 'corrective' (Zubizarreta, 1998), whereas English marks all types of focus prosodically. Our production results are compatible with this claim, but we offer another interpretation of the results: That the focus operator involved in prosodic focus marking in Spanish necessarily has to take scope over the entire root clause (speech act), while in English it can take scope over a broader range of constituents.

1 Focus-Driven Shifts in Sentential Prominence

The pattern of prosodic prominence of utterances in which all encoded information is new and no constituent is construed as being contrastive is often viewed as the 'default' prosodic pattern. In English, the typical default prosodic pattern for most sentences involves a pitch accent on the last constituent (Chomsky and Halle, 1968; Cinque, 1993), and in Spanish this is even more likely to be the case (Ladd, 1990; Zubizarreta, 1998; Ladd, 2008; Büring, 2010). Examples of the default stress pattern in each language are illustrated in examples (1) and (2).

(1) A: What kept you up last night?
B: [A woman was SINGING]$_F$

(2) A: ¿Que te mantenía despierto anoche?
B: [Alguna mujer CANTÓ]$_F$

The final stressed syllable of the final sentential constituent is likely to be perceived as the most prominent syllable of the sentence, often referred to as its 'nuclear stress'. Sometimes, the main prominence is placed on a constituent other the one which would be expected to carry it by default. Such 'prominence shifts' encode what information is contextually given and what information is 'focused' or 'contrastive'. An example is given in (3):

(3) A: Who was singing last night in the street?
B: [A WOMAN]$_F$ was singing.

Contextually motivated shifts in sentential prominence are argued by Rooth (1992) to reflect the alternatives to an utterance that are relevant in the current context. In Rooth's theory, every constituent comes with a set of alternatives, its 'focus semantic value,' in addition to its regular denotation. When there is an antecedent for focus marking, prominence falls on those constituents that are substituted in the antecedent, and is shifted away from constituents that are the same. In the present case, the question serves as the antecedent, and the relevant alternatives to B's utterance are all of the form *x was singing*. Hence prominence is shifted away from from the predicate and placed on the subject by leaving the VP unaccented and/or by boosting the prominence on the subject (Breen et al., 2010).

It has long been noted that the marking of focus differs between English and

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Spanish (Bolinger, 1954), and more generally between Germanic and Romance languages (Vallduví, 1993; Lambrecht, 1994). One difference between focus-marking in English and Spanish is that Spanish makes use of certain word orders to mark focus that are not allowed in English. As has been described by many researchers (Bolinger, 1954; Lambrecht, 1994; Zubizarreta, 1998; Lozano, 2006; Büring, 2010; Hualde et al., 2012; Domínguez, 2013, i.a.), given or topical constituents are often placed earlier in an utterance, and new or focused constituents are often placed in the more prominent, sentence-final position. Under this view, a leftward shift in prominence, as was seen in English in (3), is not permitted, or at least not preferred when an alternative syntactic strategy is available:

(4) *Spanish*

A: ¿Quién cantó anoche en la calle?
"Who sang last night in the street?"

B: #[Alguna MUJER]$_F$ cantó
a woman sang

B′: Cantó [alguna MUJER]$_F$
sang a woman
"A woman sang."

Sometimes, however, prominence does shift even in Spanish. One instance are corrective utterances (Zubizarreta, 1998):

(5) A: Algun hombre cantó anoche en la calle.
"A man sang in the street last night."

B: No, [alguna MUJER]$_F$ cantó.
no a woman sang

B′: #No, cantó [alguna MUJER]$_F$.
no sang a woman
"No, a WOMAN sang."

One conclusion often drawn is that Spanish marks focus prosodically only in corrective utterances, while in English, focus is marked prosodically in a greater range of circumstances (Zubizarreta, 1998; Ladd, 2008). In fact, Zubizarreta (1998), López (2009), Büring (2010), and others have claimed that syntactic ways to mark focus trade off with prosodic means of focus marking, a claim that is used to explain the prosodic differences between English and Spanish.

The evidence in the literature for this interaction between focus type and prosodic marking has mostly been based on impressionistic observations. The only experimental study that we know of that directly compared English and Spanish with respect to their prosodic marking of different types of focus is Cruttenden (2006). Cruttenden looked at 10 different dialogues in a range of typologically different languages. Although Cruttenden does not identify the types of focus in each of the dialogues, two of the dialogues arguably do involve a corrective response (dialogue 5 and dialogue 7), of which one example is the following:

(6) a. A: I did all the work.
B: You mean your SISTER did all the work.

b. A: Yo hizo todo el trabajo.
I did all the work

B: Lo que quieres decir es que tu
it that want say is that your
hermana hizo todo el TRABAJO.
sister did all the work

Cruttenden found that in contrast to English, where 7 out of 7 speakers shifted prominence to *sister* in (6), 0 out of the 4 Spanish speakers shifted prominence to *hermana*, all instead re-accenting *trabajo*.[1] For the second corrective dialogue (not shown), again 0 out of 4 of the Spanish speakers showed a prominence shift.

Cruttenden's results therefore seem to contradict commonly held assumptions that Spanish shifts prominence for corrective focus. However, Cruttenden's experiment is based on a few isolated sentences (for example, only 2 dialogues that one could plausibly call 'corrective' per speaker), with few speakers (only four speakers in Spanish). A more detailed comparison of focus marking in English and Spanish is clearly needed, with a larger sampling of participants and more carefully controlled stimuli.

2 Prominence Shifts Under Parallelism

In constructions involving series of parallel linguistic constructions, contrastive intonation is necessary in English (Chomsky, 1971):

(7) John is neither EASY to please, nor EA-

[1]There are inconsistencies in Cruttenden's reporting of the results. The table of results (p.319) reports 1 out of 4 Spanish speakers shifting prominence in (6), whereas within the text (p.324) it is reported that "all four Spanish speakers re-accented *trabajo*." Additionally, the table of results reports that 7 out of 7 speakers re-accented *work* in the English dialogue, while it is clear within the text that this must be a mistake, and instead it must be that 7 out of 7 English speakers accented *sister* and de-accented *work*.

GER to please, nor CERTAIN to please, nor INCLINED to please, nor HAPPY to please, ...

Rooth (1992) analyzes this type of prosodic marking of contrast as an anaphoric phenomenon, similar to the use of pronouns. Prominence shifts like those observed in (7) require an appropriate antecedent. He introduces the presuppositional focus operator $\sim$. The operator $\sim$ introduces the presupposition that there is an antecedent similar to the constituent that $\sim$ attaches to (the 'scope' of $\sim$). The antecedent has to be identical, except that any F-marked constituent contained in the scope of $\sim$ (its 'focus', or 'foci' if there are multiple) has to be non-identical at least in one alternative. Under this theory, the focus structure for (7) is analyzed as follows:

(8) John is neither $\sim$[EASY$_F$ to please], nor $\sim$[EAGER$_F$ to please], nor $\sim$[CERTAIN$_F$ to please], nor $\sim$[INCLINED$_F$ to please], nor $\sim$[HAPPY$_F$ to please], ...

Usually, the antecedent for prosodic focus marking precedes the anaphor, as in (3), where the question in the context serves as the antecedent for the answer. But in cases of parallelism as in (8), a prominence shift is possible even in the first occurrence of the parallel structure, in which case prosodic focus marking is *cataphoric* rather than *anaphoric*. Put simply, the first instance of focus marking in (8) leaves the listener hanging: It sets up a contrast that requires an *post*cedent that has not been realized yet. A listener might use this information and expect a parallel structure to be imminent. Another way of thinking about cataphora is that the listener has to accommodate a prior (unmentioned) antecedent, to which all instances of the parallel structure are anaphoric (Williams, 1997). The exact conditions governing cataphoric prominence shifts are not yet known: Authors such as Rooth (1992) have provided the intuition that a shift in prominence within the first parallel constituent (e.g. *easy* in (8)) is optional English, which would make sense because it requires a level of foresight when planning the utterance that may not always be possible. Cataphoric focus marking requires a greater amount of look-ahead, and therefore its optionality might be due to limits on production planning.

The intuition sometimes reported for Romance languages is that there is no shift in prominence in cases of parallelism (Ladd, 1990; Ladd, 2008; Bocci, 2013). Vander Klok et al. (2014) provide experimental evidence that this is correct at least for French—note that French, unlike Spanish, does not employ the focus-driven changes in word order seen in (4).

The case of parallelism is particularly interesting because it provides an opportunity to constrain the scope of $\sim$ in order to observe how its scope affects prosodic focus marking. We use this method in the present study to test whether Spanish marks corrective focus differently from other types of focus. Consider the three cases of parallelism in English below:

(9) a. Move $\sim$[angel$_F$ number two] to $\sim$[donkey$_F$ number two].
b. $\sim$[Click angel$_F$ number two]. Then $\sim$[click donkey$_F$ number two].
c. $\sim$[Don't click angel$_F$ number two.] $\sim$[Click donkey$_F$ number two].

One characterization of the relevant differences between the three cases is that only the last example in (9-c) is 'corrective,' while the other two cases are merely 'contrastive'. Uses of focus can more generally be distinguished by their pragmatic function, and focus is often classified into different 'types of focus' along those lines. However, there is another way to characterize the distinctions in (9): They differ in the scope of $\sim$; that is, they differ in the the attachment height of $\sim$ (Vander Klok et al., 2014). Since each of the two parallel constituents has to serve as an antecedent for the focus marking of the other, the scope of $\sim$ is constrained and cannot be so wide that both parallel constituents fall within the constituent that $\sim$ attaches to. This means that in (9-a), the scope of $\sim$ cannot be wider than the NPs, and each focus operator has to attach to a separate individual-denoting NP within a single clause. In (9-b) and (9-c), $\sim$ cannot span both sentences, but $\sim$ can attach to nodes bigger than the individual NPs, that denote entire propositions. In the last example in (9-c), $\sim$ can attach to constituents that correspond to separate imperative speech acts.

If Spanish marks only *corrective* focus prosodically, we would expect focus marking only to be possible in the Spanish equivalent of (9-c). In this case, we could also characterize Spanish as restricting the scope of $\sim$ to constituents that de-

note entire speech acts (in an alternative terminology, we could refer to such constituents as "root clauses," where the root corresponds to a syntactic node used in a particular speech act). We refer to this as the "Corrective" or "Speech act scope" hypothesis:

(10) Spanish: Corrective Hypothesis
(or: Speech act scope) – see (9) for translation

a. Ponga el ángel número dos en el burro número dos.
b. Haga clic en el ángel número dos. Después haga clic en el burro número dos.
c. No $\sim$[haga clic en el ángel$_F$ número dos.] $\sim$[Haga clic en el burro$_F$ número dos.]

Another possibility, however, is that Spanish also allows for a prominence shift in cases like (10-b), where $\sim$ can scope over constituents that denote propositions. Under this view, Spanish restricts $\sim$ to clausal scope. This is compatible with the claim that certain Romance languages do not allow multiple focus operators within a single clause (Calabrese, 1987; Stoyanova, 2008; Bocci, 2013). Then, English and Spanish should pattern similarly with respect to (10-b) and (10-c), shifting prominence where the two focus operators involved are in separate clauses. In (10-a), where two focus operators within a single clause are necessary in order to mark parallelism, prosodic focus marking should still be impossible in Spanish. This so-called "Propositional Scope" hypothesis therefore generates different predictions from the "Speech Act Scope" or "Corrective" hypothesis, the predictions of which which are illustrated in (10).

By comparing the realization of the three sentence types in (9) and (10), we can gain novel insights into the grammatical underpinnings of the differences and provide the first systematic experimental evidence of these claimed differences. At the same time, this comparison will serve as a test for the more basic claim, assumed by many previous authors, that Spanish reliably marks corrective focus as in (10-c) but not does not mark parallelism in cases like (10-b).

3 Materials

We designed our materials to test focus at three different levels with respect to the syntactic scope of the focus operator involved: Two parallel DPs within a single clause ("sub-clausal," as in (9-a) and (10-a)), two parallel clauses ("clausal," as in (9-b) and (10-b)), and two parallel speech acts, where the second corrects the first ("super-clausal," as in (9-c) and (10-c)). Within each type of parallelism, we controlled whether the first, the second, or both constituents were contrasted. For example, when the first constituent was contrasted, the head nouns would be in focus (e.g. Move [angel]$_F$ number two to [donkey]$_F$ number two). When the second was contrasted, the number modifiers would be in focus (e.g. Move angel [number two]$_F$ to angel [number three]$_F$). Finally, when both contrasted, the phrase contained two foci, on both the head noun and the modifier (e.g Move [angel]$_F$ [number two]$_F$ to [donkey]$_F$ [number three]$_F$). This resulted in a total of 9 conditions. An example set of 9 stimuli is summarized in Table 1 for English and in Table 2 for Spanish. We created 72 object-number combinations for each language (each with 2 objects $*$ 2 numbers), each with 9 variants (according to the 9 conditions; i.e. 72 $*$ 9 items per language).

The experiment was run in a Latin square design, where each participant only saw one condition from each object-number combination, but an equal number of 8 trials from each condition across the experiment. The items were presented in random order. The objects were chosen to be relatively high frequency nouns referring to concrete, easily illustratable objects like animals, articles of clothing and food items. They consisted of only disyllabic trochees in both Spanish and English. The numbers two, three and six (*dos*, *tres* and *seis*) were used because they are monosyllabic in both languages. Number modifiers ("number two", "number three") were used because they are postnominal in both English and Spanish.[2]

[2]Many previous studies of prosodic focus make use of noun-adjective combinations (Swerts et al., 2002; Hamlaoui et al., 2012), which somewhat limits crosslinguistic comparisons between Germanic and Romance languages: Germanic adjectives usually precede the noun while in Romance, the opposite is true. Using a modifier that is postnominal in both languages allowed us to control for potential effects of the syntax on prominence. Vander Klok et al. (2014), however, report experimental evidence suggesting that whether an adjectival modifier is prenominal or postnominal does not alter whether a prominence shift with an NP is possible or not.

	Sub-clausal Scope
Head Noun	Move angel number two to donkey number two.
Modifier	Move angel number two to angel number three.
Both	Move angel number two to donkey number three.
	Clausal Scope
Head Noun	Click angel number two. Then click donkey number two.
Modifier	Click angel number two. Then click angel number three.
Both	Click angel number two. Then click donkey number three.
	Super-clausal Scope
Head Noun	Don't click angel number two. Click donkey number two.
Modifier	Don't click angel number two. Click angel number three.
Both	Don't click angel number two. Click donkey number three.

Table 1: English production task conditions

	Sub-clausal Scope
Head Noun	Ponga el ángel número dos en el burro número dos.
Modifier	Ponga el ángel número dos en el ángel número tres.
Both	Ponga el ángel número dos en el burro número tres.
	Clausal Scope
Head Noun	Haga clic en el ángel número dos. Después haga clic en el burro número dos.
Modifier	Haga clic en el ángel número dos. Después haga clic en el ángel número tres.
Both	Haga clic en el ángel número dos. Después haga clic en el burro número tres.
	Super-clausal Scope
Head Noun	No haga clic en el ángel número dos. Haga clic en el burro número dos.
Modifier	No haga clic en el ángel número dos. Haga clic en el ángel número tres.
Both	No haga clic en el ángel número dos. Haga clic en el burro número tres.

Table 2: Spanish production task conditions

4 Research Questions and Predictions

Our first research question was whether the two languages mark focus prosodically in the final constituent (which we will call "NP2"), and if this would occur in all types of contexts. The Speech Act Scope hypothesis (and Corrective hypothesis) predict that prominence shifts in Spanish should occur only within the Super-clausal condition, while a Propositional Scope approach would predict prominence in Spanish to be shifted in both the Clausal and Super-clausal conditions. A second research question relates to the marking of cataphoric (anticipatory) focus in English and Spanish (within "NP1"), in order to see whether speakers of English or Spanish would ever shift prominence in anticipation of the upcoming constituent. We predicted prominence shifts to be less frequent in NP1 than in NP2 because of its optional nature (possibly due to limits in look-ahead when planning an utterance).

5 Procedures

Participants were recorded with the use of a digital head-mounted microphone. The participant sat in front of one computer screen and the experimenter sat at a second screen that was turned away from the participant at a perpendicular angle. The participant was required to instruct the experimenter to move or click images on the screen based on different symbols that appeared with the images. The experimenter performed the instructions on their own screen. Before the experimental trials, the participants practiced each type of instruction by running through a block of 9 practice trials. The practice block was repeated as needed to ensure that the participant gave the correct instruction corresponding to the symbol on the screen. The three types of instructions were "Move," which was indicated with an arrow (Figure 1), "Click...then, click," which was indicated with two green squares and an arrow (Figure 2), and "Don't click...click," which was indicated with a red square and a green square (Figure 3).

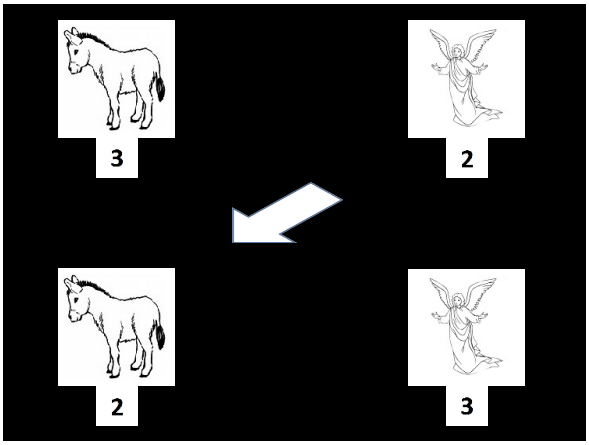

Figure 1: Visual Array – "Move angel number two to donkey number two."

The participant was told that the experimenter could not see the instructive symbols so that they would think that the verbal instructions were the only information available to the experimenter. In reality, both screens were completely synchronized, and the experimenter performed the moves

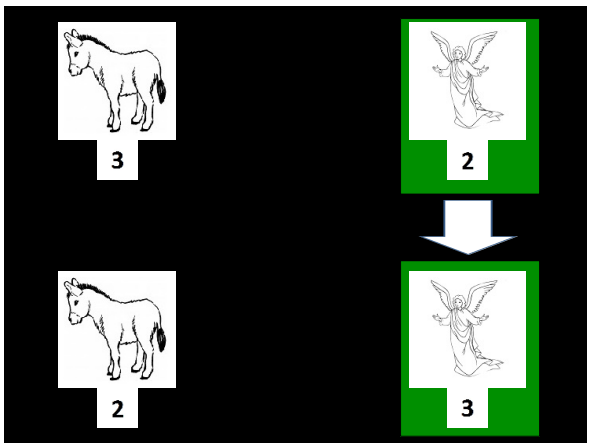

Figure 2: Visual Array – "Click angel number two. Then, click angel number three."

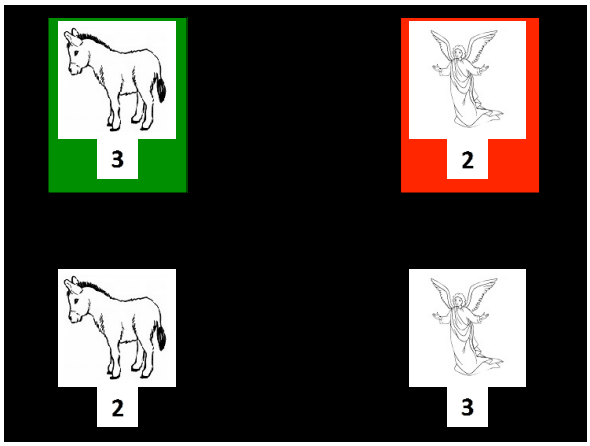

Figure 3: Visual Array – "Don't click angel number two. Click donkey number three."

as instructed, simply pretending to not know each move. During the experiment, each visual array was presented for 4 seconds before the appearance of the symbols in order for the participant to have enough time to activate the name of the objects on the screen. Once the symbols appeared, the recording began: The participant formed their utterance based on the symbols, and the experimenter gave verbal confirmation to continue once they had carried out the move.

6 Participants

Two groups of participants were recruited: a group of 16 North American English native speakers (10 female, born in USA and Canada[3]) and a group of 17 native speakers of Spanish (14 female) from Latin American countries.[4] Of the 17 Spanish speakers, 9 were born in Colombia, 3 were born in Mexico, 2 were born in Venezuela, and 1 each was born in Chile, Cuba, and the Dominican Republic.

Because they were concurrently participating in a second language study, all participants were Spanish-English bilingual to a limited extent: Both native speaker groups scored at an intermediate level of proficiency in their second language. In addition, participants were not excluded if they had knowledge of a third language (most commonly, French), but such participants were included in the study only if their third language was reported to be less dominant and less proficient than both Spanish and English.[5]

7 Data Analysis

Data were coded for prominence impressionistically by two trained annotators. A research assistant whose native language was English coded the English data and the first author, who is also an English native speaker, coded the Spanish data. For each recorded item, the annotator listened and noted whether the main stress of the phrase had been shifted leftward to the head noun (prominence shift) or if it remained in the default rightmost position (no prominence shift). Acoustic measures were extracted and the prominence annotations were validated by measuring the correlation between the annotations and the acoustic measures by means of a logistic regression: Items marked as "prominence shift" consistently showed a larger difference in prominence between the head noun and the modifier (relative prominence). In NP1, pitch and duration predicted prominence, and in NP2, intensity and duration were the significant predictors. Both languages were pooled together in the regression, and language did not lead to a significant interaction when included in the model (and therefore was excluded). The results

[3] One native English speaker was born in the United Kingdom but moved to the US at a young age and spoke with a North American accent.

[4] Argentinean Spanish speakers were excluded since the dialect is known to differ greatly from other dialects of the Americas, particularly with respect to information structural components (Gabriel, 2010).

[5] Language status was determined by means of a language background questionnaire that asked participants to report their proficiency in each language they knew, and asked about the amount of exposure they received from each language throughout all stages of infancy to late adolescence. All participants lived in an English-speaking country at the time of the study. All Spanish native speakers had arrived in the English-speaking country during adulthood (mean age of arrival: 26.18 years).

of these models are shown in Table 3.

It must be acknowledged that using impressionistic annotations from a single rater in each language is less than ideal, as is using non-native speakers to annotate their non-native language. It is therefore clear that additional analyses (a second annotator in English in order to establish inter-rater reliability, use of two Spanish native speakers for Spanish) are indeed necessary. In addition to this, the annotators could not be completely blind to the initial conditions because the sentence types were apparent upon listening. In future analyses, we will employ annotators who are blind to the experimental hypotheses.

	NP1	**NP2**
	Coeff (SE)	Coeff (SE)
(Intercept)	$-3.65\ (0.24)^{***}$	$-1.46\ (0.18)^{***}$
Intensity	$0.14\ (0.08)$	$0.15\ (0.05)^{**}$
Pitch	$0.34\ (0.09)^{***}$	$-0.04\ (0.05)$
Duration	$0.55\ (0.11)^{***}$	$0.39\ (0.06)^{***}$

$^{***}p < 0.001, ^{**}p < 0.01, ^{*}p < 0.05$

Table 3: Acoustic Predictors of Annotations

Despite the issues arising from employing impressionistic prominence annotations, we do not directly report on the raw acoustic measures because it is often the case that with acoustic prominence, several acoustic variables work together in a dependent fashion. For example, Breen et al. (2010) showed that relative intensity, duration and pitch worked additively to determine whether prominence had been perceived to have been shifted: One, two or all three cues may be present, but it is difficult to predict the exact mixtures required. The percept of relative prominence has been argued to be more robust than acoustic measures, and in general leads to high inter-annotator reliability (Klassen and Wagner, 2016).

Finally, given the results of the logistic regression in Table 3, it could very well be the case that cataphoric focus is marked using different combinations of cues in relation to those used in focus marking for the second constituent, as argued for example in (Rooth, 2015); this would need to be investigated in further research.

8 Results

8.1 Anaphoric Focus

We first look at the prosodic realization of the second constituent, that is, the case of anaphoric (as opposed to cataphoric) focus marking. As seen in Figure 4, English speakers shifted stress to the head noun of NP2 in the Head Noun condition in 92-93% of the trials, whereas they rarely shifted prominence in cases where the modifier was not given (Both and Modifier conditions). Scope was not a significant factor in determining prominence shift in English.

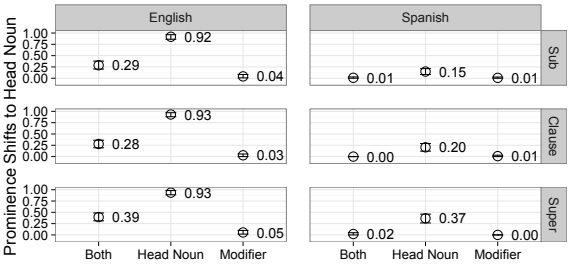

Figure 4: Prominence annotations for NP2 (Anaphoric focus)

	Coeff (SE)
(Intercept)	$-1.46\ (0.11)^{***}$
scope1 (Super vs. other)	$0.52\ (0.15)^{***}$
scope2 (Clause vs. Sub)	$-0.23\ (0.21)$
language	$2.26\ (0.22)^{***}$
scope1:language	$-0.61\ (0.29)^{*}$
scope2:language	$0.34\ (0.42)$

$^{***}p < 0.001, ^{**}p < 0.01, ^{*}p < 0.05$

Table 4: Generalized linear mixed model - Anaphoric Focus. Formula: Annotation $\sim$ scope $*$ language $+$ (1|participant) $+$ (0+scope|participant) + (0+scope|item)

Overall, Spanish speakers shifted prominence less frequently than what was seen for English speakers. As seen in Figure 4, Spanish speakers shifted prominence to the head noun within the Head Noun condition in only 20-37% of the trials, depending on the level of scope of the focus operator.

We tested for the significance of the observed differences using a logistic mixed-effects regression, outlined in Table 4. Our model included Scope and Language and their interaction as fixed effects, and random effects for by-item and by-participant differences. The random effects included slopes for the two fixed effects and their interaction. The three-level factor Scope was coded using Helmert Coding: The first contrast compared Super-scope vs. the two other scopes and the second contrast compared clausal scope vs.

sub-clausal scope. Helmert Coding was the type of coding best suited to our theoretical question: There was no true control condition with respect to Scope; the first comparison (Super vs. other) directly tested the Corrective/Speech Act Scope hypothesis while the second (Clausal versus Sub) tested the Propositional Scope hypothesis.

The results show a main effect of Language: A prominence shift was generally more likely in English than in Spanish. It also showed a main effect of Scope: Super-clausal scope (i.e., in our stimuli, corrective focus) was more likely to cause a prominence shift than other types of scope. Crucially, there was also a significant interaction between Language and Scope, showing that the difference between super-clausal and other types of scope observed in Spanish differed significantly from that difference in English. To our knowledge, this is the first experimental demonstration that indeed, the difference between corrective focus and other types of focus is important in determining prominence shifts in Spanish, but not in English.

8.2 Cataphoric Focus

When looking at prosodic focus marking in the first constituent, we see that the rate of prominence shifts in NP1 is much lower compared to that in NP2. However, as seen in Figure 5, English native speakers do, to some degree, shift prominence to the head noun in cataphoric focus contexts, while Spanish native speakers almost never do.

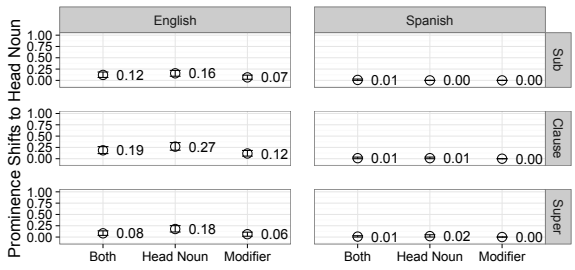

Figure 5: Prominence annotations for NP1 (Cataphoric focus)

The difference in the rate of cataphoric prominence shifts between the English and Spanish experiments is characterized by a significant main effect of test language in the model shown in Table 5. Scope was not a significant predictor.

9 Discussion and Conclusion

With respect to anaphoric focus, Spanish speakers shift prominence leftwards with greater frequency

	Coeff (SE)
(Intercept)	$-3.89\ (0.31)^{***}$
scope1 (Super vs. other)	$-0.19\ (0.56)$
scope2 (Clause vs. Sub)	$-0.42\ (0.67)$
language	$3.40\ (0.57)^{***}$
scope1:language	$-1.07\ (0.90)$
scope2:language	$-0.01\ (1.29)$

$^{***}p < 0.001, {}^{**}p < 0.01, {}^{*}p < 0.05$

Table 5: Generalized linear mixed model - Cataphoric Focus. Formula: Annotation $\sim$ scope $*$ language $+$ (1|participant) $+$ (0+scope|participant) + (0+scope|item)

in the Super-clausal scope condition, where the focus operator took wide scope over the speech act, than in the other two conditions with narrower scope. This is compatible with the idea that in Spanish, only corrective focus is marked prosodically. It is also compatible with the idea that in Spanish, $\sim$ necessarily takes scope over constituents that correspond to entire speech acts (the 'root' level). This pattern of results cannot be explained by the Propositional Scope hypothesis—if this was the correct explanation, then the case in which both operators attach to constituents denoting propositions should allow for prominence shifts in Spanish.

We found the rate of cataphoric focus marking to be fairly low in English, and essentially at floor in Spanish. A future study would need to find the cause of the optionality in English. It could be that cataphoric focus marking requires greater look-ahead, although it would be difficult to see how one could increase look-ahead in an experimental setting: Our participants already had plenty of time to plan their utterances. One idea could be to use written instructions instead of symbols, because in such a case the majority of the sentence (besides the prosodic realization) would already be planned out for the speaker. Another method that might encourage a higher degree of cataphoric focus marking in an experimental setting would be to create a situation in which the task is time-sensitive and the speaker is required to increase the response time of the listener: Perhaps in such a case, cataphoric focus would be employed more frequently, in order to help the listener anticipate the final game instruction and respond with greater speed.

An unexpected result is that the rate of promi-

nence shift in Spanish for corrective focus was only 37% — fairly low in comparison to English. We have suggested that the source of the difference between English and Spanish could be explained by the scope of $\sim$. However, this could function in two different ways: Either Spanish allows only very wide (root-level) scope for $\sim$, or only wide-scope $\sim$ shows prosodic effects (see (Vander Klok et al., 2014) for a related proposal for French).

Under the view that $\sim$ can only attach to root-level nodes, one possible way to explain the low rate of Spanish prominence shifts is that our stimuli were in fact ambiguous between two different kinds of structures: The first structure involves a single speech act with two sub-commands, which we separate here with a comma. In this case, the utterance includes what is sometimes called 'contrastive negation' (McCawley, 1991) or 'replacive negation' (Jacobs, 1991). The second possible structure involves two independent speech acts:

(11) a. Don't click angel number two, click donkey number two.
b. Don't click angel number two. Click donkey number two.

If Spanish speakers only shifted prominence in one of these two structures, it would shed further light on the precise conditions governing prosodic focus marking in Spanish. We have not yet tried to test whether there is any evidence in our data for such a distinction (for example, the two structures might differ with respect to the boundary tones separating the two commands).

Another possibility is that $\sim$ can attach at all levels in Spanish, but only has prosodic effects attached at the root level. Our parallelism manipulation sets an upper bound for the scope of $\sim$ (it cannot attach to a node that includes both legs of the parallelism, since then there is no appropriate antecedent anymore). It also sets a lower bound (it cannot attach lower than the node that contains the F-marked constituent). But, as was pointed out to us by a reviewer, it is still compatible with several attachment sites (provided that lower scope is possible at all in Spanish). Our corrective condition is compatible with adjoining the $\sim$ operators at the NP level, since their presupposition is fulfilled for this contrast between smaller constituents as well:

(12) a. Narrow Scope: Don't click $\sim$[angel$_F$ number two], click $\sim$[donkey$_F$ number two].
b. Wide Scope: Don't $\sim$[click angel$_F$ number two], $\sim$[click donkey$_F$ number two].

Note that in English, either wide or narrow attachment of $\sim$ would lead to a prominence shift, but based on this hypothesis, only giving widest scope to $\sim$ would lead to a prominence shift in the second leg of the parallelism in Spanish. Variation in the scope of $\sim$ could therefore explain the lower accentuation rate in Spanish compared to English.

Understanding the relatively low rate of corrective focus marking in Spanish might prove crucial in order to further differentiate the different interpretations of the observed patterns. What our results clearly show is that corrective focus is indeed different from other types of focus in Spanish in terms of its prosodic realization. Furthermore, we maintain that corrective focus can be described in syntactic terms: corrective focus involves root-level scope of $\sim$, as was argued in Vander Klok et al. (2014).

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