The phonetics, phrasing, and pragmatics of spontaneous speech intonation in Mexican Spanish

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1. Introduction

- Numerous recent studies have been dedicated to the phonetics, phonology and pragmatics of Spanish declaratives in lab (i.e. scripted) speech.
- Face’s (2003) study represents an initial step in accounting for the differences between lab speech and spontaneous speech in Spanish.
  - Study finds distinct trends occurring in spontaneous speech vs. lab speech.
  - Study’s value can also be found in its proposals for future research, such as exploring the relationship between intonation and pragmatic meaning in spontaneous speech, and developing a phonological analysis of the patterns found in spontaneous speech.
- Rao (forthcoming) uses the proposals of Face (2003) and Prieto (2004) in order to investigate the spontaneous speech intonation of Madrid Spanish declaratives by exploring the manifestations of the phonetic features detailed in Face (2003) and a constraint on phonological phrasing from Prieto (2004), based on pragmatic meaning conveyed.
- The present study aims to extend on the findings of Rao (forthcoming) by exploring the relationship between intonation and pragmatic meaning in the spontaneous speech declaratives of Mexican Spanish by examining the phonetics and phrasing of speech acts belonging to five pragmatic categories created by Searle (1977).

2. Previous relevant studies

2.1 Spontaneous speech

- Face (2003)- compares downstepping, final lowering, fundamental frequency (F0) rises through stressed syllables/deaccenting, and F0 peak alignment in spontaneous speech vs. lab speech in Spanish.
- Hidalgo Navarra (1998, 2001)- describes how tonal rises and falls serve particular pragmatic functions, such as emphasizing words, giving orders and expressing humor, among others. These studies also indicate that pragmatic categories of interrogatives are differentiated based on tonal rises or falls.
- Hirschberg et al (2004)- investigate downstepped contours in conveying discourse topic structure and in signaling new vs. given information in English in lab speech and spontaneous speech. Downstepped contours were found to occur more in read speech, but they do signal the ending of a topic and are used to present given information in both speech styles.
• Hansson (2003) - examines the distribution and phonetic realization of prosodic phrase boundaries in spontaneous speech in Swedish via production and perceptual experiments.
• Payà (2003) - looks at the prosody of parenthetical insertions in Catalan spontaneous speech. The pitch contour of these structures is found to be related to formality and discourse typology (narrative vs. dialogue).

2.2 Phrasing

• Prosodic phonology framework (Selkirk 1984, Selkirk 1986, Nespor and Vogel 1986) posits the following hierarchy.

• Prosodic Hierarchy

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>IP</td>
<td>Intonational Phrase (Major Phrase)</td>
</tr>
<tr>
<td>PPh</td>
<td>Phonological Phrase (Minor Phrase)</td>
</tr>
<tr>
<td>PW</td>
<td>Prosodic Word</td>
</tr>
<tr>
<td>F</td>
<td>Foot</td>
</tr>
<tr>
<td>σ</td>
<td>Syllable</td>
</tr>
</tbody>
</table>

• Prieto (2004) examines patterns of phonological phrasing in Peninsular Spanish. While making reference to the hierarchy shown in (1) and using the Optimality Theory (OT) (McCarthy and Prince 1993) approach to phonology, this study considers the rankings of a series of size and eurythmic constraints that interact to determine the phonological phrasing of Spanish declaratives in slow, normal, and rapid speech. Of particular importance to this study is the constraint MIN-N-PHP (rapid speech), which minimizes PPhs per IP in fast speech and also posits that PPhs do not exceed 4 PWs.


3. Methodology

• Five pragmatic categories of speech acts examined (Searle 1977):
  o Representatives- subjective assertions or beliefs about the world.
  o Directives- used to get the hearer to perform an action.
  o Commissives- promises.
  o Expressives- reveal an inner state of a speaker that does not convey anything new about the world (i.e. apologies, congratulatory remarks).
  o Declarations- signal changes in a state of affairs.
Spontaneous speech declarative data collection was inspired by a methodology used by Hualde (2002), in which a native speaker linguist produces intonation patterns they envision for certain contexts, in a laboratory setting. Face (2003) mentions that although this may appear to be a contrived way to collect data, it is an effective way of producing isolated examples of spontaneous speech.

A native speaker linguist (and ex-attendee of acting school) of the Mexico City dialect of Spanish was provided with three situations for each of the five pragmatic categories mentioned and asked to produce appropriate sentences for each context. For example, for the ‘representatives’ category, the speaker was asked to give her opinion about the war in Iraq, and she said:

- Bueno, definitivamente no estoy de acuerdo con la guerra, pienso que está hecha solo por intereses económicos más que humanitarios y lo mismo es que Estados Unidos siempre hace una guerra para tener más dinero y para tener abuso de poder en otros lugares (‘Well, I definitely don’t agree with the war, I think it’s more for economic rather than humanitarian interests, and it’s always the same in that the United States creates war in order to have more money and to abuse power in other places.’)

The recordings were played back to the speaker to make sure that she perceived them as characteristic of her natural spontaneous speech. Later, a perceptual test was realized using another native speaker of this dialect in which she listened to the utterances and marked the most emphasized items (this was useful for PPh analysis).

The traits investigated across all pragmatic categories were those detailed in Face (2003): downstepping, final lowering, F0 rises through stressed syllables/deaccenting and F0 peak alignment. Also, PPh length was accounted for, in order to detect a connection between such length differences and pragmatic meaning, as well as to evaluate Prieto’s (2004) constraint dealing with PPh length in rapid speech.

Data collection and analysis was done using the Speech Analyzer© software package.
4. Results
4.1 Downstepping

- An analysis of F0 contours for the five pragmatic categories reveals that downstepping occurs between pauses or hesitations in all pragmatic categories, but at different frequencies, as shown in Table 1.

<table>
<thead>
<tr>
<th>Pragmatic Category</th>
<th>Frequency (%) of Downstep</th>
</tr>
</thead>
<tbody>
<tr>
<td>Representatives</td>
<td>66</td>
</tr>
<tr>
<td>Directives</td>
<td>40</td>
</tr>
<tr>
<td>Commissives</td>
<td>30</td>
</tr>
<tr>
<td>Expressives</td>
<td>17</td>
</tr>
<tr>
<td>Declarations</td>
<td>33</td>
</tr>
</tbody>
</table>

Table 1: Frequency of downstep between pauses/hesitations according to pragmatic category.

Downstepped contours occurring in a representative and a directive are shown in Figures 1 and 2:

Figure 1: Downstepping in a ‘representative’; ...lo mismo es que Estados Unidos siempre hace una guerra... (‘...and it’s always the same in that the US always makes war...’

...lo mismo es que Estados Unidos...
Figure 2: Downstepping in the ‘directive’; Javier tienes que estudiar, estás descuidando demasiado la escuela (‘Javier you have to study, you are being way too careless about school’).

4.2 Final lowering

- Occurs in 2/3 cases of representatives, commissives, and declarations. Examples are illustrated in Figures 3 and 4.
Figure 3: The completion of a representative with an immeasurable final peak: …abuso de poder en otros lugares. (‘…abuse of power in other places’).
4.3 F0 rises through stressed syllables/deaccenting

- Table 2 shows the percentage of stressable words that do not have an F0 rise through the accented syllable (deaccented).

<table>
<thead>
<tr>
<th>Pragmatic Category</th>
<th>% of deaccented words</th>
</tr>
</thead>
<tbody>
<tr>
<td>Representatives</td>
<td>17</td>
</tr>
<tr>
<td>Directives</td>
<td>15</td>
</tr>
<tr>
<td>Commissives</td>
<td>18</td>
</tr>
<tr>
<td>Expressives</td>
<td>17</td>
</tr>
<tr>
<td>Declarations</td>
<td>7</td>
</tr>
</tbody>
</table>

Table 2: Percentage of deaccentuation according to pragmatic category.
4.4 F0 peak alignment

- Out 113/311 (36%) total PWs displayed F0 peak alignment within the tonic syllable. Table 3 shows the percentage of F0 peaks aligned with tonic syllables in each pragmatic context.

<table>
<thead>
<tr>
<th>Pragmatic Category</th>
<th>% of F0 peaks aligning with tonic syllables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Representatives</td>
<td>22</td>
</tr>
<tr>
<td>Directives</td>
<td>36</td>
</tr>
<tr>
<td>Commissives</td>
<td>30</td>
</tr>
<tr>
<td>Expressives</td>
<td>54</td>
</tr>
<tr>
<td>Declarations</td>
<td>49</td>
</tr>
</tbody>
</table>

Table 3: Percentage of peaks aligning with tonic syllables according to pragmatic category.

Figure 5: F0 peak alignment with the tonic syllable of the word crimen ('crime') in the representative utterance el nivel de crimen es bastante alto en la ciudad de México. ('The crime rate is quite high in Mexico City').
Figure 6: F0 peak alignment with the tonic syllable in the commissive utterance *Te aseguro que voy a ir a tu fiesta* (‘I assure you that I’m going to your party’).
4.5 Phonological phrasing

- Table 4 shows the quantities of PPhs of varying lengths based on pragmatic category, in terms of the number of PWs/PPh.

<table>
<thead>
<tr>
<th>Pragmatic Category</th>
<th>1 PW</th>
<th>2 PWs</th>
<th>3 PWs</th>
</tr>
</thead>
<tbody>
<tr>
<td>Representatives</td>
<td>9</td>
<td>21</td>
<td>9</td>
</tr>
<tr>
<td>Directives</td>
<td>11</td>
<td>11</td>
<td>2</td>
</tr>
<tr>
<td>Commissives</td>
<td>17</td>
<td>22</td>
<td>3</td>
</tr>
<tr>
<td>Expressives</td>
<td>20</td>
<td>12</td>
<td>0</td>
</tr>
<tr>
<td>Declarations</td>
<td>16</td>
<td>19</td>
<td>2</td>
</tr>
</tbody>
</table>

Table 4: Total numbers of PPhs of various lengths, ranging from 1 PW-3PW according to pragmatic category.

5. Discussion

5.1 Downstepping

- Face (2003) mentions that although downstepping is characteristic of declaratives in lab speech, it does not occur in all examples of spontaneous speech examined in his study. He goes on to mention that it is unclear what the pragmatic difference is between a spontaneous utterance employing downstepping and that which does not.

- Rao (forthcoming) finds that downstepping occurs in representatives and expressives in Madrid Spanish. Pragmatically speaking, it appears that downstepping is used in expressions that reveal the speakers feelings about a certain topic with a low level of emotion (representatives), as well as when referring to old information (expressives).

- The data in the present study show that this phenomenon can occur in all five pragmatic situations, with representatives and directives showing the highest frequency. Pragmatically speaking, across all categories, it appears that downstepping is used in expressions that reveal the speakers feelings about a certain topic with a low level of emotion (representatives), as well as when referring to old information, which was often cued by the use of sé (‘I know’). When examining directives, it appears that downstepping can also serve a command or implied command function, meaning the speaker is trying to get the hearer to perform an action (based on known information as well).
5.2 Final lowering

- Face (2003) notes that final lowering is not as common in spontaneous speech as it is in lab speech. It only seems to occur when information is repeated or predictable.

- Rao (forthcoming) shows that only representatives show final lowering. Therefore, the results suggest that the expression of opinions with a low emotional load can lead to final lowering.

- In the present study, final lowering occurs in representatives, commissives, and declarations. Overall, this drop in F0 appears to be a strategy used to indicate the conclusion of an idea (similar to the function of the steep falling declarative-final *tonema* of Navarro-Tomás 1948). In most cases when final lowering of F0 is not present, it appears that the utterance could have been continued, or there was hesitation or uncertainty of an idea.

5.3 F0 rises though stressed syllables/deaccenting

- Face (2003) mentions that there are a few cases in lab speech where a stressed syllable does not contain an F0 rise. However, in spontaneous speech it is more common to find stressed syllables that do not have this rise (deaccented). His study finds that 30% of accentable words in pre-nuclear position don’t have a pitch accent. The study leaves open the questions of how frequent deaccented words are and what types of words are deaccented.

- The results for frequency of deaccented words in Rao (forthcoming) are consistent with Face’s (2003) results (around 30%) for four of the five pragmatic categories examined. Deaccented words tend to be noun-phrases when modified by prepositional phrases, quantifiers, prepositions, demonstrative adjectives, and infinitival complements.

- In the present study, deaccenting ranges from 7-18% of words of different pragmatic categories, which is less than the previous two studies. Deaccented words tend to be those of secondary communicative importance, for example, forms of *estar* (‘to be’) + adjective or gerund, and forms of the verb *ir* (‘to go’). The majority of deaccented words appear in the final phrase of an idea (where final lowering is often present), which suggests a connection between this phenomenon and the conclusion of an idea.
5.4 F0 peak alignment

- Face (2001, 2002a, 2002b), Hualde (2002) and Nibert (2000), among others, have shown that in cases of focus in lab speech declaratives, the F0 peak is realized in the tonic syllable, as opposed to the post-tonic (‘early alignment’), which is the pattern for broad focus declaratives. However, Face (2003) suggests that pragmatic conditions other than focus may be responsible for F0 alignment in the stressed syllable in spontaneous speech, such as signaling a speaker’s attitude or emphasizing a change of subject.

- In Rao (forthcoming), expressives show a high number of F0 peaks aligning with the tonic syllable, due to a high level of emotion (excited or lamentful). It appears overall that this strategy is used when emphasizing an item as highly prominent in discourse.

- In the present study expressives show the highest frequency of F0 peaks aligning with the tonic syllable, due to more emotion and representatives show the lowest frequency due to the least emotion. A perceptual test realized using another native speaker of this dialect shows that 84% of examples of early alignment were perceived as being emphasized or focused (with about 3/4 of these occurring in PPh final position and the other 1/4 in initial PPh position). Therefore, early alignment is a cue to phrase boundaries, and used to focalize or highlight elements in discourse. Also, oxytonic F0 peaks align with tonic syllables in all contexts, as found for lab speech by Face (2002a), Hualde (2002), among others.

5.5 Phonological phrasing

- Prieto (2004) proposes that in rapid speech, there is a constraint on PPh length, with the maximum PWs/PPh being 4.

- Rao (forthcoming) finds 2 PWs/PPh is the most common length across pragmatic conditions, but that emotional load correlates pragmatically with PPh length (representatives average 3 PW/PPh while expressives average 1 PW/PPh). Overall it shows that 4 PWs/PPh is possible, but uncommon.

- The present study exhibits a maximum of 3 PWs/PPh, with 2 PW/PPh being the most common overall length. Overall, the most emotional utterances, expressives, are the only category in which 1 PW/PPh is the most frequent length, which is similar evidence to that of Rao (forthcoming). Also, all words appearing in their own PPhs were perceived as focused, which validates Face (2002b), who claims that individual phrasing of words is a focusing device. Interestingly, there are examples of function words (such as *para*) that are normally unstressed that are associated with pitch peaks and are phrased individually, as a result of hesitations. Overall the very idea of *spontaneous* speech often entails a lack of scripting or practiced speech, meaning that when speakers are thinking of what to say, or what
spontaneously comes out of their mouth, there are bound to be hesitations and pauses between stretches of thoughts which ultimately yield shorter phrase lengths.

6. Conclusion

- This study has shown that the phonetics/phrasing of intonation in spontaneous speech can vary according to the pragmatic meaning conveyed. The emotional load of a speech act, old/repeated information and emphasis/communicative importance appear to be factors that affect F0 contours in the categories included in the study. Also, when comparing the results for Mexican Spanish to those of Peninsular Spanish, it is revealed that dialectal variation is an important variable to consider in future studies of spontaneous speech intonation in Spanish.

- Future work is needed in the area of spontaneous speech in Spanish:
  - Examine more speakers, more dialects, more complex interactions.
  - Look at a wider range of pragmatic contexts.
  - Work toward a phonological analysis of spontaneous speech.
  - Examine the role of duration, intensity, etc in marking stress.
Selected References


Appendix

Examples from each pragmatic category:

Representatives

Bueno, definitivamente no estoy de acuerdo con la guerra, pienso que está hecha solo por intereses económicos más que humanitarios y lo mismo es que Estados Unidos siempre hace una guerra para tener más dinero y para tener abuso de poder en otros lugares.

‘Well, I definitely don’t agree with the war, I think it’s more for economic rather than humanitarian interests, and the United States always does this, creates war in order to have more money and to abuse power in other places.’

Directives

Javier tienes que estudiar, estás descuidando demasiado la escuela. Deberías enfocarte más a tus estudios y menos a las fiestas.

‘You have to study, you are being way too careless about school. You should focus more on your studies and less on parties.’

Commissives

Sí, sí recibí tu e-mail diciéndome del dinero y sé, pero mira, no depende de mí realmente mi cheque está retrasado y en cuanto llegue, en cuanto llegue mi cheque yo te aseguro que te lo pago inmediatamente, es lo primero que voy a hacer.

‘Yes, yes I received your email telling me about the money and I know, but look, it’s not about me, really, my check is late and as soon as it arrives, as soon as my check arrives, I assure you I’ll pay you back right way, it’s the first think I’m going to do.’

Expressives

Lo siento mucho, creo que tenemos pendiente un desayuno pero mira la verdad es que me fui a la biblioteca y me olvidé del tiempo, estaba muy entretenida leyendo y se me olvidó, discúlpame.

‘I’m really sorry, I think we were supposed to go to breakfast but the truth is that I went to the library and I lost track of the time, the books I was really entertained by the reading, and I forgot, I apologize.

Directives

Juanito, mira lo pensé muy seriamente y nosotros no podemos seguir viviendo juntos, así es que te voy a pedir que dejes el departamento, te conviene más tú puedes encontrar algo más barato y yo puedo seguir pagando la renta sola.

‘Juanito, look I thought seriously about it and we can’t keep living together so I’m going to ask that you leave the apartment, it’ll be more convenient for you to find something cheaper and I can keep paying the rent on my own.’