Sociolinguistic Variation in the Prosody of Buenos Aires Spanish According to the Theory of Phonology as Human Behavior

Claudia Enbe and Yishai Tobin
Ben-Gurion University of the Negev

1. Introduction

The goals of this study are to compare and contrast the intonation patterns of Buenos Aires Spanish (BAS) and to determine the degree of variation between speakers according to the sociolinguistic variables of age and gender. This study deals with the prosodic patterns of three basic sentence types — declarative, wh-questions and exclamatory — of BAS as spoken by men, women and children of different age groups.

The classic norms of Spanish prosody — established by Navarro Tomás (1944/1974) — were later supported experimentally for Ibero-Spanish and various Latin American dialects (Quilis 1993, Sosa 1999, Beckman et al. 2002) including for BAS in particular (Toledo 2000, Colantoni & Gurlekian 2002, 2004, Enbe 2003, Barjam 2004) but these studies did not consider the sociolinguistic parameters of age and gender as variables of prosodic variation. To the best of our knowledge, the first time these variables were analyzed for BAS was in Enbe et al. (2006). The data were elicited by a repetition task and analyzed using the notation of the Autosegmental-Metrical Theory (AM; Pierrehumbert 1980), the ToBI system (Tones and Break Indices; Beckman & Ayers 1993/1997, Beckman et al. 2002), and the adaptation of the latter for Argentinian Spanish (*ToBI ampliado* 'wider ToBI' (ToBI-A; Gurlekian et al. 2001, 2004). The results of the present study have been analyzed according to the Theory of Phonology as Human Behavior (PHB; Diver 1979, 1995, Davis 1987, Tobin 1997, 2000).

2. The Theory of Phonology as Human Behavior (PHB)

The theory of PHB was developed by William Diver (1979) and his students of the Columbia School (CS). These linguists define language as a symbolic tool whose structure is shaped both by its communicative function and by the characteristics of its users (Contini-Morava & Sussman Goldberg 1995, Contini-Morava & Tobin 2000, Contini-Morava et al. 2005, Huffman 2001, Reid et al. 2002, Tobin 1990, 1993, 1994/1995, 2000). In the CS framework, grammatical analyses account for the distribution of linguistic forms as an interaction between hypothesized linguistic meanings and contextual, pragmatic and functional factors such as inference, ease of processing, and iconicity. Phonological analyses explain the syntagmatic and paradigmatic distribution of phonological units within signals, also drawing on both communicative function and human physiological and psychological characteristics.

The CS approach in general and the theory of PHB in particular may be viewed as part of the historical development of a larger twentieth-century structural, functional and cognitive linguistics and phonology beginning with Ferdinand de Saussure (1916/1959) followed by the functional, communication-oriented Prague School (PS; Tobin 1988a, b, 2001, 2005). The "communication factor" inherent in the PS was then supplemented by the "human factor" embodied in the concepts of "asymmetry" and "economy of effort in phonological change" developed by André Martinet (1955), the founder of the French School of Functional Linguistics.

It was Diver (1979, 1995), however, who has shown that a more complete theory of phonology has to take both the communication factor and the human factor into account together. Diver maintains that

---

there is a constant struggle between our need for maximum communication and our desire for minimum effort. The communication factor (requiring a large number of phonemes demanding a great deal of effort) will be in conflict with the human factor (striving for minimal effort) resulting in a trade-off between the two. According to the theory of PHB, language in general — and phonology in particular — can be seen as a synergetic mini-max struggle: the desire to create maximum communication with minimal effort.

3. Experimental design

3.1. Participants

The participants for this study were 132 native speakers of BAS divided into 3 age groups: a) children (5-8 years); b) adults (18-50 years) and c) adults (51-78 years), with 22 males/ 22 females per group. The subjects were native, monolingual, middle-class speakers of BAS living in the Buenos Aires area. They had been diagnosed with normal hearing and have no physiological disorders of the vocal folds nor of the vocal tract. Adolescents (9-17) were not included in our study because of hormonal changes affecting fundamental frequency (F0).

3.2. Material

The corpus was composed of the following three sentences: (a) declarative: *El agua hierve* 'The water is boiling.'; (b) wh-question: *¿Dónde vive el nene?* 'Where does the boy live?' and (c) exclamatory: *¡Gol!* 'Goal!'. The sentences contained only voiced consonants and vowels in order to generate an uninterrupted fundamental frequency contour. The target sentences were examined and verified by a board of eight experts (four speech pathologists, two linguists and two language teachers) who listened to the sentences and classified the utterances as typical BAS declarative, wh-question and exclamatory sentences.

3.3. Procedure

The current study is part of a larger research project (Enbe 2003, Enbe et al. 2004, 2006) which originally compared and contrasted the prosodic patterns of two populations: one with typical or normal speech versus one with atypical or pathological speech. Therefore we chose sentences with a controlled prosodic pattern and similar content words using a repetition task that would help us to compare and contrast the utterances for these two diverse populations. We felt that this repetition task has advantages over the other elicitation tasks (e.g. reading aloud, spontaneous speech) previously used in intonation studies . First, children of 5-6 years do not necessarily read at all and children of 7-8 years may not read fluently. Second, our larger research project also included speakers of BAS with various speech disorders (e.g. stuttering, dysarthria, neurological disorders) for which the elicitation tasks of spontaneous speech and reading aloud were not suitable. We also avoided the use of other elicitation tasks such as picture naming, word identification, word production, and fragment completion which are frequently employed in the clinic because speakers with pathological speech may associate these tasks with their therapy. These other elicitation tasks are also related to complex cerebral activity that did not suit part of the atypical population of our original study. We would also like to point out that we are aware that, in sociolinguistic studies, the closest approximation of spontaneous speech is preferred. However the current study dealing with the specific sociolinguistic variables of gender and age was not included in our original research question – we were more interested in the normal versus pathological aspects of prosody in BAS – but developed rather as an outcome of the data that we collected for our typical speakers at the initial stage of our research.We are also aware that the use of the repetition task may present additional problems for the sociolinguistic and psycholinguistic aspects of our study as concerns context, pragmatics and the priming effect, among others factors, and accordingly the data must be interpreted with caution. However, given that the sociolinguistic variables of gender and age in prosody in general and in BAS in particular have not been adequately researched previously, we view

the present research as an important first step and suggest the use of other elicitation methodology or methodologies for future sociolinguistic studies of prosody.

The target sentences of our study were recorded by a 30-year-old female native speaker of BAS who is also a speech language pathologist. The subjects listened to the recorded data and were asked to repeat the sentences. Each speaker heard the recorded target sentence once in order to avoid him/her becoming accustomed to the intonation pattern. In the very few cases where the speaker confused the words of the sample sentence, the task was repeated. The speaker was requested to produce each utterance using his own "natural" (or habitual) prosodic patterns for each of the specific grammatical sentence (declarative, interrogative or exclamatory). In addition, a pilot study had demonstrated that speech professionals (speech pathologists, musicians and teachers), who have received specialized training in language and musical skills, do not imitate the prosodic patterns in repetition tasks but rather produce their own habitual prosodic patterns, so we anticipated a similar behavior from naive speakers. The same speech professionals were used to evaluate the recorded data presented in the research and judged all the sentences to be typical of BAS prosody.

The utterances were recorded in a partially-isolated acoustic room, using AKG acoustics D50S dynamic vocal microphone on a Mini-disc Sony MZ-R37. Waveforms were digitized and stored on a hard disc with a quantization rate 16 bits using a sampling frequency of 44 kHz. Acoustic analysis was performed with the "Anagraf" speech program (Gurlekian 1997) and each utterance was labelled according to the principles of AM-Theory (Pierrehumbert 1980), following the guidelines of ToBI (Beckman and Ayers 1993/1997) within "ToBI-A" (a wide ToBI system proposed for Argentinian Spanish; Gurlekian et al. 2001, 2004). The sentences were labelled using four descriptive tiers (a) orthographic; (b) tonal; (c) phonemic; and (d) breaks. The phonemic transcription was performed in the Argentinian Spanish SAMPA adaptation (Gurlekian et al. 2001). We used the ERB scale (Equivalent Rectangular Bandwidth) for the fundamental frequency values (Gurlekian et al. 2001, 2004). The results were interpreted within the framework of the theory of PHB which attempts to explain linguistic phenomenal in general and phonologic and prosodic features, in particular according to the axiom of "maximum communication with minimum effort."

Regarding the phonetic and prosodic transcriptions of the utterances both, in the Argentinian Spanish ToBI and the AM Theory, pitch accents are determined by a perceptual and spectrographic analysis of the fundamental frequency (F0). We located the intonational prominences of the sentence perceptually (in Spanish these prominences coincide with the stressed syllable of the content words) and then, by means of speech analysis, we placed a high (H*) or a low (L*) tone of the F0 on the appropriate syllables. This tonal mark is directly dependent on the tone placed on the syllable/syllables that appear just before the stressed syllable and/or at the tone of the juncture. We would like to further point out that the Argentinian ToBI version differs from the Spanish ToBI system in that the sentence is labeled describing the number of syllables before and after the pitch accents and by using the psychoacoustic ERB scale to describe the fundamental frequency. In the following Table 1, we present an example of tonal labeling.

ToBI –A label	Labeling
nH*	7H*
nH*+Lm	7H*+5L1

Table 1. The Argentinian ToBI labeling, *ToBI ampliado (*ToBI-A; 'wider ToBI').

"n" indicates the ERB level (1-12) and "m" indicates the number of orthographic syllables (0, 1, 2, 3…) to the left or right of the tonal accent. For example, 7H*+5L1 represents a high tonal accent with ERB level seven, and falls to five ERBs one syllable later (Gurlekian et al. 2001, 2004).[1]

---

[1] Concerning the transcription of intonational phrasing, one anonymous reader claimed that "two prosodic words are typically phrased into one intonational phrase, not two". Navarro Tomás (1944/1974) and Canellada & Madsen (1987), among others, point out which grammatical categories in the sentence are joined together by speakers (e.g., 'adjective and noun', or 'verb and complement'). D'Imperio et al. (2005) and Frota et al. (2007) found that in Spanish declarative sentences with different syntactic structures, two adult female speakers separated the Subject (S) from the Predicate (by producing the verb (V) and object (O) together and thus by separating the S and VO into

4. Results and discussion

4.1. Declarative sentences

Studies of the prosody of Spanish declarative sentences (e.g. Navarro Tomás 1944/1974, Quilis 1993, Prieto et al. 1995, Sosa 1999, Hualde 2000, Beckman et al. 2002, Barjam 2004) have not considered the sociolinguistic parameters of age and gender as variables of prosodic variation. Quilis (1993) and Díaz-Campos & McGory (2002) refer to diferent prosodic patterns found in males and females discussing them as particular cases rather than analyzing their data according to the variables of age and gender.

In this study — as in our previous study using a smaller population of typical and atypical BAS speakers (Enbe et al. 2006) — we found variations in prosody correlating with gender and age. Our results are based on the two fundamental tonal patterns for declarative sentences originally presented in Navarro Tomás (1944/1974). In both types, the tonal contour is divided according to syntactic and semantic norms and the highest pitch accent — called HiF0 (highest F0) — is placed in the first part of the sentence:

(1) **Type 1**: "rising-falling contour (subject)/falling contour (predicate)" (L% HiF0 L-/ L*L-L%) which is the easiest of all prosodic patterns to produce and provides the most basic contrasts. According to Bolinger (1989:11) this "rising/falling" pattern is found in the infant cry as the earliest form of vocalization and was later conventionalized as the most basic intonation pattern in the languages of the world. Therefore we refer to it as the unmarked pattern. Figure1 presents the declarative sentence *El agua hierve* 'the water is boiling') using the unmarked type-1 pattern (divided into two melodic groups separated by tonal change) by a 19-year-old male speaker.
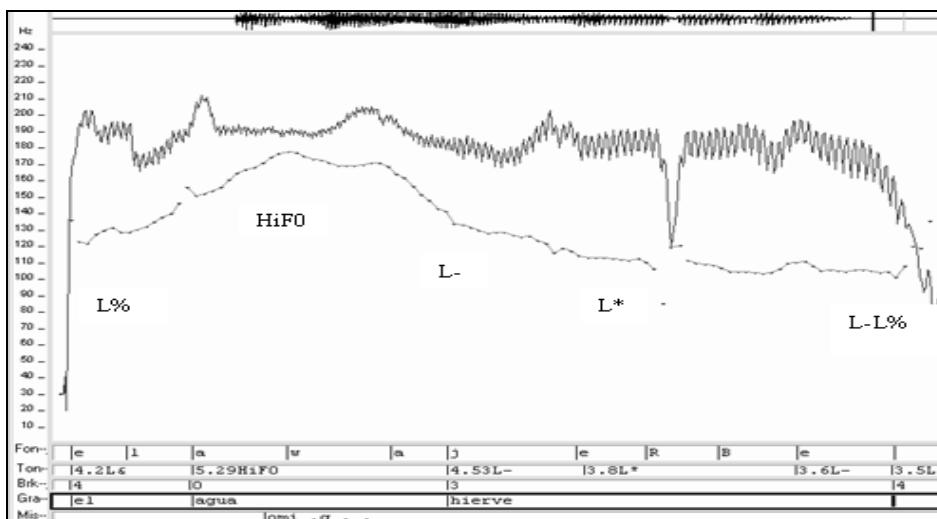

Figure 1. Male (19 years old): Declarative Sentence: *El agua hierve* 'the water is boiling'. Classic Type 1.

(2) **Type 2**: "high-rising contour (subject)/falling contour (predicate)" (L% HiF0 H-/L*L-L%) which is used to show a clearer contrast between both parts of the sentence (Navarro Tomás, 1944/1974). Type 2 requires more effort than type 1 and we therefore refer to it as the marked form. Figure 2 shows the declarative sentence *El agua hierve* uttered by a 21-year-old female speaker using the marked pattern type 2 (the contour pattern is divided into two melodic groups separated by tonal change).

---

different melodic groups. They also found that this (S)(VO) division was retained despite differences in the length of each separate syntactic category. In our study, we divided the sentences into melodic groups for Subjects and Verbs (S)(V) which we also perceived as two separate melodic groups 'in the speakers' production' of declarative sentences.
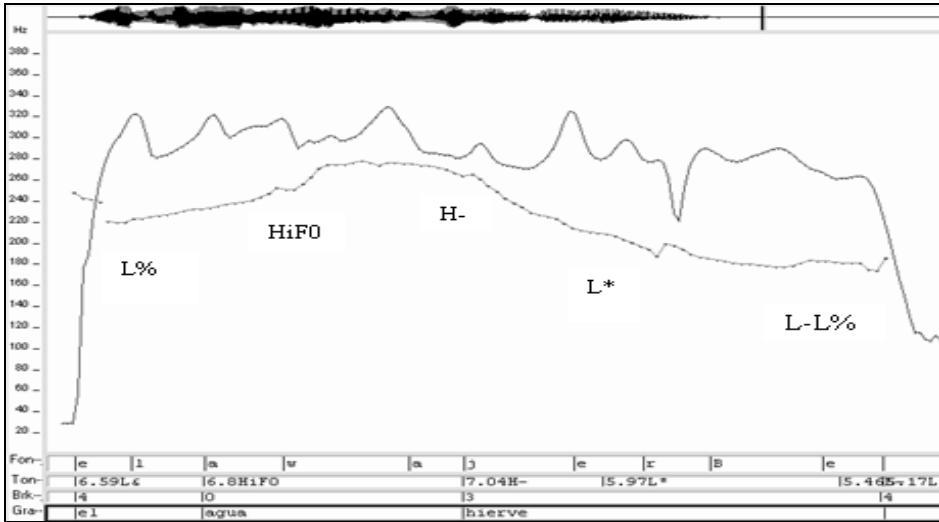
Figure 2. Female (21 years old): Declarative Sentence: *El agua hierve*. Classic Type 2.

In addition to these two kinds of patterns, we found that minority of BAS speakers (12% of females and 30% of males) produced different patterns which we will refer to as "other patterns" that have been described elsewhere in the literature for other dialects. These involve the first pitch accent having a low rather than high tone (cf. Figure 3 *El agua hierve* uttered by a 7-year-old male) or the high pitch accent falling on the verb (cf. Figure 4 *El agua hierve* uttered by a 36-year-old male). In Figure 3, it may be possible to assign a L*+H pitch accent. However this would mean that there is only one melodic group, whereas we (as well as other native BAS speakers) heard two distinct melodic groups when analyzing the data.
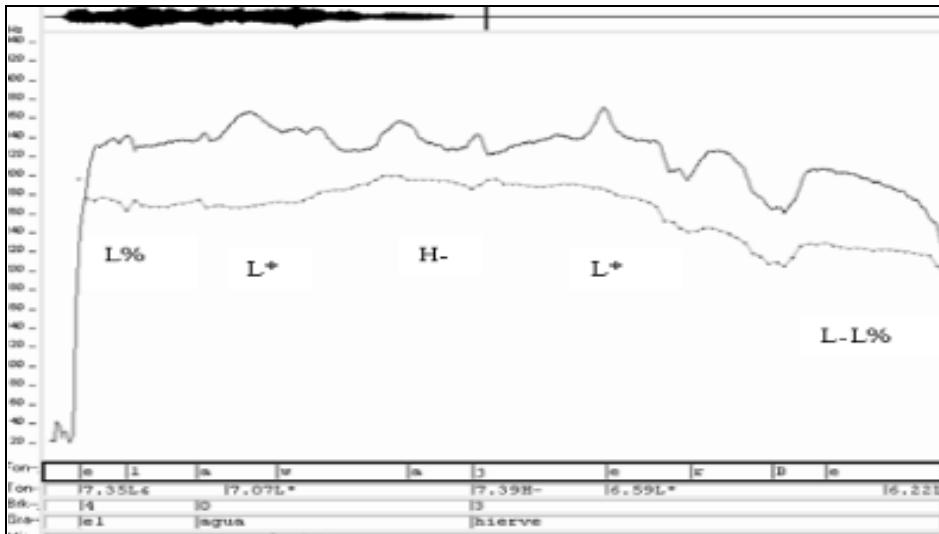

Figure 3. Male (7 years old): Declarative Sentence *El agua hierve*.
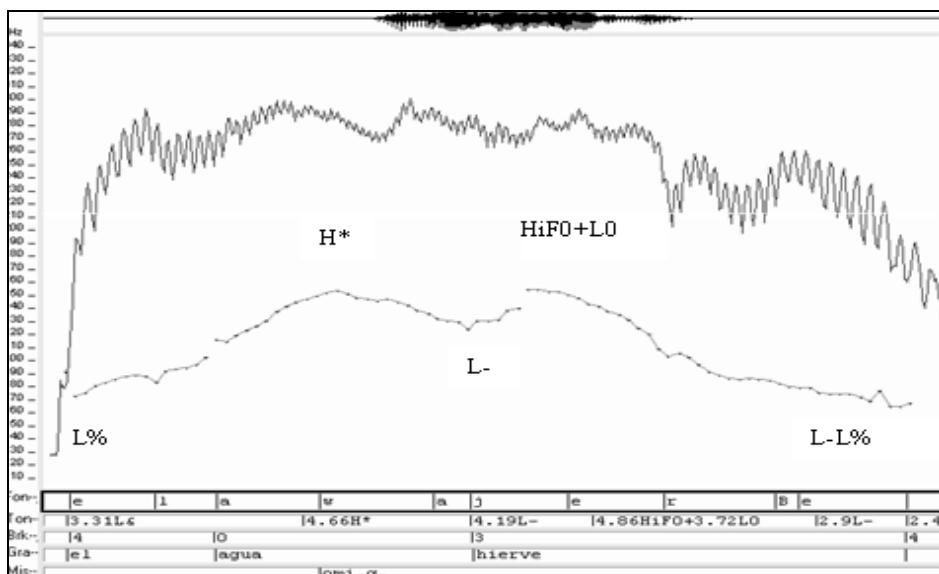The first pitch accent bears a low tone.

Figure 4. Male (36 years old): Declarative Sentence *El agua hierve*.
The high pitch accent falls on the verb.

Based on the declarative sentence *El agua hierve*, the data of the present study show the following distribution according to gender:

(1) The majority of **females** prefer the marked contour pattern Type 2 (64%) over the unmarked Type 1 (21%) and other patterns (15%);

(2) **Males** have an almost equal and random distribution of Type 1 (34%), Type 2 (32%) and other patterns (34%).

However, we also found different prosodic pattern preferences according to age in the following ways (see Table 2):

Males: (a) 19% of boys, 36% of men (51-78) and 45% of men (18-50) prefer the unmarked Type 1; (b) 18% of men (18-50), 32% of men (51-78) and 45% of boys prefer the marked pattern Type 2; and (c) 32% of men (51-78) and 36% of boys and men (18-50) prefer other patterns.

Females: (a) 54% of girls, 54% of women (18-50) and 82% of women (51-78) prefer the marked pattern Type 2; (b) 14% of women (51-78) and girls, and 36% of women (18-50) have the unmarked Type-1 pattern and (c) 4% of women (51-78); 10% of women (18-50) and 32% of girls use other patterns.

Participants		Declarative sentences					
		Type1		Type2		Other patterns	
		Tokens	%	Tokens	%	Tokens	%
Males	5-8	4	19%	10	45%	8	36%
	18-50	10	45%	4	19%	8	36%
	51-78	8	36%	7	32%	7	32%
Females	5-8	3	14%	12	54%	7	32%
	18-50	8	36%	12	54%	2	10%
	51-78	3	14%	18	82%	1	4%

Table 2. Declarative sentences: contour pattern distribution according to gender and age.

The results presented in Table 2 for declarative sentences show clear-cut differences in the prefered tonal contour pattern correlating with age and gender: the majority of females of all ages (54%-82%) prefer the marked Type-2 pattern, a preference that increases with age, while males show a less systematic variation: boys (45%), like females, prefer the marked Type-2 pattern and adult males (18-78) prefer the unmarked Type-1 pattern (36%-45%) more than the marked Type-2 (19%-32%) and

other patterns (32%-36%). This less systematic distribution of the marked/unmarked patterns with male speakers increases with age. In this study, we have concentrated only on the classic marked and unmarked patterns described for Spanish. The "other patterns" which appear in the table consist of the use of bitonal H+L* (high-low) or H* (high) pitch accents on the verb, and/or the use of L* (low) pitch accent on the subject, among other variations that differ from the classic patterns. We will not deal with these other patterns in this study.

Our findings for BAS support the gender differences previously found in sociolinguistic research across languages for Western societies (Labov 1990, Foley 1997, Cheshire 2002, among others), and for Spanish in particular (Cameron 2000 and Silva-Corvalán 2001). These studies have demonstrated that women favor the more conservative and prestigious (referred to as "correct") forms in segmental phonology as well as on other linguistic levels. Quilis (1993) found that females prefer to use what we refer to as the marked prosodic patterns which provide greater communicative contrasts in intonation as opposed to the more monotonic prosodic patterns found in males. It appears then that women prefer more marked forms than men. This preference for more marked forms may be viewed in alternative ways: unmarked forms are generally more frequent and considered to be the norm or standard. Marked forms have been perceived in the above sociolinguistic studies of segmental phonology and other areas as being more specialized, conservative or prestigious. Thus, this may also be the case in our study of BAS intonation as well. However, by the same token, the preference for marked forms may also be viewed as being innovative precisely because the unmarked form is usually the more frequent and common of the two. In the present study, we found that females prefer the classic marked prosodic pattern of declarative sentences which not only implies more effort on the part of the speaker to contrast both parts of the sentence, but also provides more clear-cut prosodic distinctions which facilitates perception on the part of the hearer. This particular preference for marked prosodic contours by BAS women therefore may lead to the conclusion that they are more conservative in their speech (in the sense of "more correct" as Silva Corvalan found) and use more prestigious prosodic patterns than men. This preference for marked forms may be viewed in two alternative ways: (1) as either a deviation from the unmarked prosodic patten prefered by males or (2) as an innovation which might demonstrate that women are more sensitive to pragmatic situational contexts.

4.2. Wh–questions

The literature on Spanish prosody (beginning with Navarro Tomás 1944/1974, followed by Alcoba & Murillo 1998, Canellada & Khulmann-Madsen 1987, Quilis 1993, Sosa 2003, Barjam 2004) has shown a basic similarity between declaratives and wh-interrogatives. Specifically, the high tone falls on the first part of the sentence followed by a falling tonal contour. However, none of these studies, which use different dialects, methodologies and elicitation techniques, classifies the prosodic patterns according to the criteria of age and gender. In a preliminary study involving 18 native speakers equally matched for gender in three age groups, Enbe et al. (2006) found both similarities and differences vis-à-vis the classical prosodic patterns of wh-questions for native-speakers of BAS correlating with these variables. For all age and gender groups, we found that BAS speakers prefer to: (a) place the highest pitch accent on the wh-word (as with the classical pattern), but in contrast to the classical pattern, (b) there is also a tendency to place a high pitch accent on the verb and on the subject, and (c) end the sentence with a rising terminal contour after a high pitch accent.

The data from the present study, using the sentence *¿Dónde vive el nene?* 'Where does the boy live?', with a larger number of participants (132 speakers), support our previous results and indicate that BAS wh-questions: (1) have a different tonal contour than declarative sentences and (2) have a wider range of variability among speakers than the unmarked declarative sentences as concerns the variables of gender and age. We relate these differences to the fact that wh-questions are more complex and marked than declarative sentences semantically, syntactically and pragmatically for the following reasons: (a) wh-questions have an obligatory interrogative marker or 'wh-word' that always takes the highest pitch accent and (b) there is a change in word order (Wh-word+V+S) compared to the unmarked S-V of declaratives.

The results of BAS wh-questions according to gender show that the majority of females (72%) and males (65%) prefer the classic high pitch accent on the wh-word while 28% of females and 35% of

males use other patterns, which include the presence of the high pitch accent on the verb (*vive* 'lives') or on the noun (*nene* 'boy')). Figure 5 represents the classic pattern with the high pitch accent on the wh-word (64-year-old man) and Figures 6-7 represent other patterns found in BAS, including the presence of the high pitch accent on the verb (*vive* 'lives'; Figure 6, 21-year-old male) or on the noun (*nene* 'boy'; Figure 7, 5-year-old female).
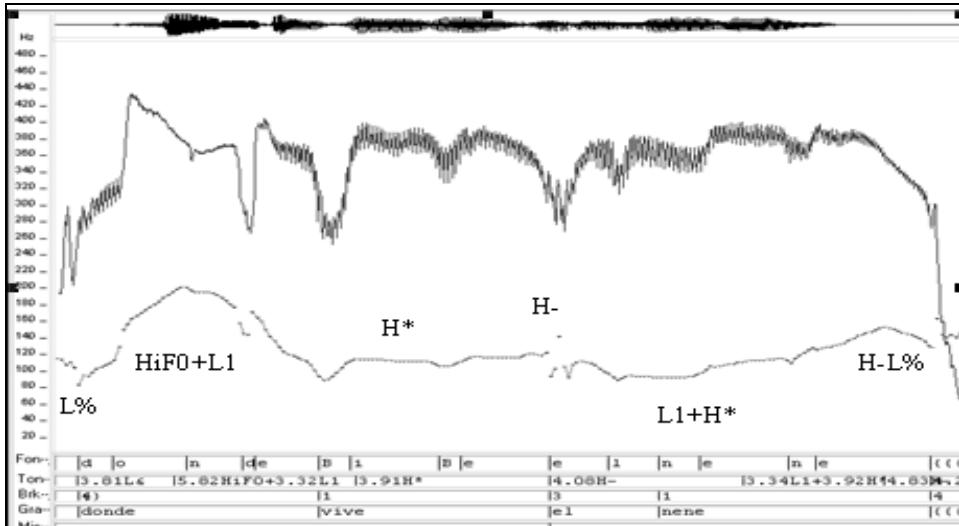

Figure 5. Male (64 years old). Wh-question *¿Dónde vive el nene?* 'Where does the boy live?'.
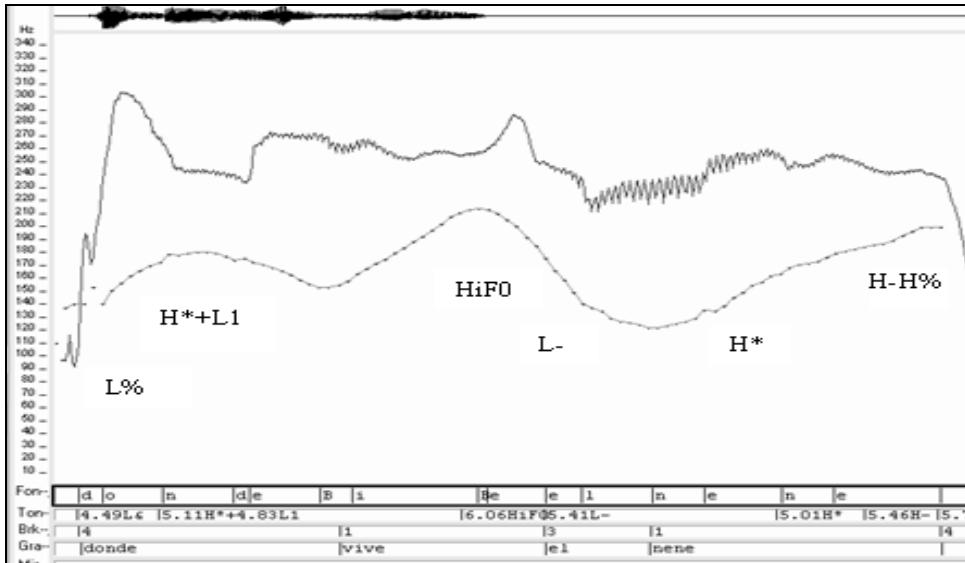The highest pitch accent is on the wh-word.

Figure 6. Male (21 years old). Wh-question *¿Dónde vive el nene?*. The high pitch accent is on the verb.

Figure 7. Female (5 years old). Wh-question *¿Dónde vive el nene?*.
The highest pitch accent is on the subject.

BAS speakers also have different pitch accent preferences according to gender and age in the following ways (see Table 3 below):

Males: (a) 45% of younger men (18-50) and the majority (73%) of men (51-78) and of boys (77%) place the highest pitch accent on the wh-word; (b) 23% of boys, 27% of men (51-78) and the smaller majority (55%) of younger men (18-50) prefer other patterns.

Females: (a) The majority of females of all ages (54% of younger women (18-50), 77% of girls and 86% of older women (51-78) place the highest pitch accent on the wh-word; (b) 14% of older women (51-78), 23% of girls and 46% of younger women (18-50) produce the highest pitch accent on the verb or noun.

Participants		Wh-questions			
		HiF0 in Wh-word		Other Patterns	
		Tokens	%	Tokens	%
Males	5-8	17	77%	5	23%
	18-50	10	45%	12	55%
	51-78	16	73%	6	27%
Females	5-8	17	77%	5	23%
	18-50	12	54%	10	46%
	51-78	19	86%	3	14%

Table 3. Wh-questions: pitch accent distribution according to gender and age.

Table 3 indicates that the majority of the youngest and oldest speakers of both genders (73%-86%) have the strongest preference for the classical pattern, where the highest pitch accent falls on the wh-word, while the adults (18-50) of both genders (45%-55%) have a more random distribution of patterns.

4.2.1. BAS wh-questions terminal contour

Research on classic Spanish wh-question intonation (Navarro Tomás 1944/1974, Canellada & Khulmann-Madsen 1987, Quilis 1993, Alcoba & Murillo 1998, Barjam 2004) employing different methodologies and elicitation techniques have found a very strong to exclusive preference for the

unmarked falling contour pattern. However, Navarro Tomás (1944/1974), Quilis (1993) and Sosa (2003) describe at least three different terminal contour patterns based on sociolinguistic and pragmatic contexts:

(1) **Falling terminal contour** ('unmarked'): the wh-word receives the highest pitch accent and the old information appears with a falling tonal contour similar to that of the declarative sentences (L-L%);

(2) **Rising terminal contour** ('polite'): the terminal contour rises after the last low pitch accent (H-H%). This high terminal contour implies insecurity over the truth of what was asked (Sosa 2003). Navarro Tomás (1944/1974:111) describes this pattern as "suave y cortés" ('soft and polite');

(3) **Rising-falling terminal contour** ('emphatic'): the terminal contour rises and falls after the last low pitch accent (H-L%). The high-falling terminal contour expresses surprise or amazement according to the pragmatic situation or context (Navarro Tomás 1921:186).

Navarro Tomás labels contour patterns (2) and (3) pragmatically as being polite and emphatic based on his subjective interpretations. To our knowledge, these pragmatic labels have been discussed in the subsequent literature, but have not been rejected or replaced. Quilis (1993) also describes another prosodic contour as being emphatic, where after the high pitch accent in the wh-word, the tonal contour maintains the high tonal pattern until the last pitch accent where the tonal line falls in a similar way to the unmarked classical form. Escandell-Vidal (1998:170-171) considers the classical "polite" terminal contour as the "canonical" or unmarked tonal contour of interrogative sentences. She calls it a "falling-rising contour" and claims that it represents "an interpretation of a 'desirable' thought, that is, a representation of a thought that would be relevant to someone if true" (p. 198). She further claims that this prosodic contour may acquire different meanings according to context precisely because it is "neutral" or "unmarked". In our study, we use the standard classification of "unmarked" for the classic falling terminal contour in interrogatives similar to the way it is used for declarative sentences. Escandell-Vidal (1998) neither includes the methodology nor describes the population used in her study. We have generally found that the more marked prosodic patterns are usually associated with more marked pragmatic functions that we view as a function of language iconicity. It should be noted that in the majority of all of the above studies, as well as in our own, the data have not been taken from natural conversation that would provide the situational contexts directly signaling either politeness or emphatic conditions. Further research using natural or spontaneous language data is necessary to verify the "politeness" or the "emphaticness"/"emphasis" of these prosodic patterns and to discover whether the use of one pattern over another may be socially conditioned.

Furthermore, because there is no agreement in the AM theory literature concerning the kind of relationship - that is whether it is reciprocal or not - between the last pitch accent and the terminal contour for Spanish wh-questions (Sosa 2003, Barjam 2004), we will analyze the tonal movement of the BAS terminal contour in wh-questions according to age and gender, independently of the last pitch accent of the sentence. We have found the following age and gender differences for the classic terminal contours in our BAS data (see Table 4):

Males: 32% of older men, 59% of younger men and 64% of boys have the "polite" rising terminal contour; 27% of both boys and younger men and 68% of older men show a classic "emphatic" pattern; and 9% of boys and 14% of younger men produce the unmarked falling terminal contour.

Females: 77% of girls, 68% of older and younger women have the "polite" rising terminal contour (H-H%); 14% of younger women, 23% of girls and 27% of older women produce the classic "emphatic" wh-question; and 5% and 18% of older and younger women respectively show the unmarked falling terminal contour.

Therefore, for the most part, our BAS results presented in Table 4 differ from the classic Spanish data in the following ways:

(1) On average, 71% of females and 52% of males prefer the marked rising "polite" terminal contour;

(2) On average, 21% of females and 40% of males prefer the marked rising-falling "emphatic" terminal contour;

(3) On average, only 8% of both females and males produce the classic "unmarked" falling terminal pattern.

Participants		Wh-Questions terminal contour					
		Falling "unmarked"		Rising "polite"		Rising – Falling "emphatic"	
		Tokens	%	Tokens	%	Tokens	%
Males	5-8	2	9%	14	64%	6	27%
	18-50	3	14%	13	59%	6	27%
	51-78	0	0%	7	32%	15	68%
Females	5-8	0	0%	17	77%	5	23%
	18-50	4	18%	15	68%	3	14%
	51-78	1	5%	15	68%	6	27%

Table 4. Wh-questions: terminal contour distribution according to gender and age.

One possible reason for the dissimilarity could be the different methodologies and elicitation techniques used in these studies (reading-aloud, spontaneous speech and repetition tasks). Another could be dialectal differences and other characteristics of BAS previously discussed (see also Colantoni and Gurlekian 2004). Whatever these differences may be, we can observe that speakers of BAS prefer to invest more effort to produce more clearly marked communication differences in their wh-questions than they did with their declarative sentences. We may very well have a pattern here which is worthy of further research with a larger sample population focusing on specific elicitation tasks and/or employing additional elicitation techniques for a larger corpus of more diverse and complex data as well.

4.3. Exclamatory Sentences

The classic studies of Spanish exclamatory sentences are few and only provide minimal descriptions of this kind of sentence (Navarro Tomás 1944/1974, Canellada & Khulmann-Madsen 1987; Quilis 1993). They refer to at least three different patterns of exclamatory sentences depending on the pragmatic and emotional state of the speaker but do not include the variables of age and gender. In previous research, we found an exclusive preference for the unmarked falling tonal contour for all age and gender groups (Enbe et al. 2006).

We based the present study on the two most relevant exclamatory contour patterns described by Navarro Tomás (1944/1974):

(1) **The falling exclamatory** ("*exclamativa descendente*"; L% HiF0 L-L%): the tonal contour starts with a low tone, rises on the first tonic syllable to the highest pitch accent and then falls until the end of the sentence (this pattern is similar to the classic unmarked pattern in declaratives and wh-questions);

(2) **The rising exclamatory** ("*exclamativa ascendente*"; L% HiF0 H-H%): the tonal contour starts on low tone and rises to a high pitch accent and a high terminal contour.

The results of the BAS data involving the simple exclamatory sentence *¡Gol!* 'Goal!' show that the vast majority of speakers (86%-100%), regardless of age and gender, prefer the classic unmarked falling contour with the high pitch accent on the vowel of the word preceding a falling terminal contour (see Figure 8 which represents the sentence *¡Gol!* 'Goal!' uttered by a 62-years-old male). Only a minority of speaker of both genders (5% of boys and adult males (51-78) and 14% of girls) have a different pattern not discussed in the literature with a high boundary tone after a low phrase accent (L-H%). Figure 9 represents the sentence *¡Gol!* 'Goal!' uttered by a 68-years-old male).
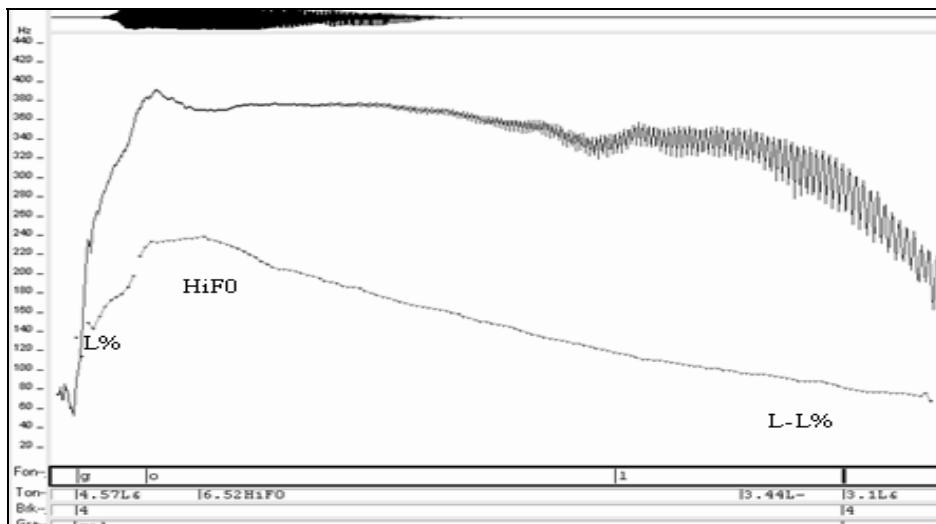
Figure 8. Male (62 years old). Exclamatory sentence *¡Gol!* 'Goal!'.
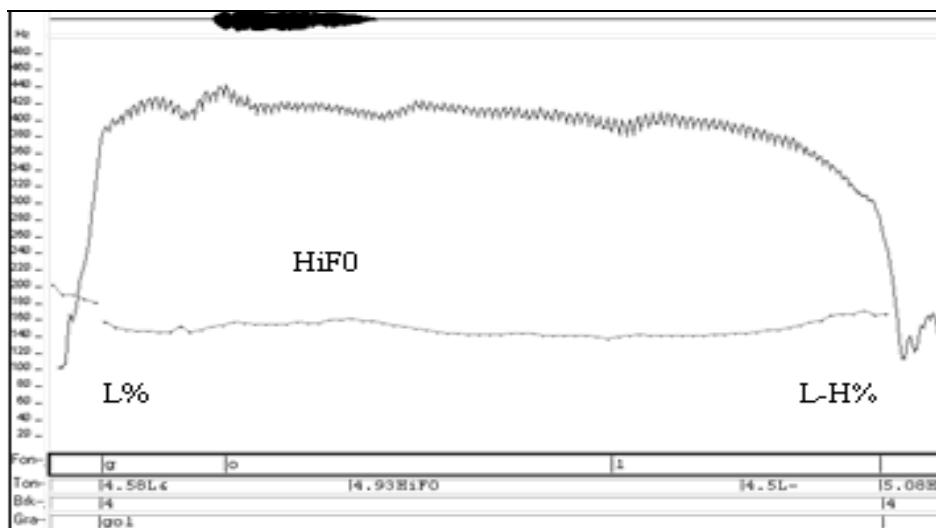The classic "unmarked" contour pattern.

Figure 9. Male (68 years old). Exclamatory sentence *¡Gol!*. Different terminal contour than the classic pattern: a low phrase accent and high boundary tone (L-H%).

This strong preference for the classic falling contour for a marked exclamatory sentence may be related to our use of a one-word sentence. However, we also hypothesize that the preference for the unmarked exclamatory contour pattern probably exists because it is the easiest to produce and the one which Bolinger (1989) refers to as the most natural pattern, acquired at the earliest age and the most universal and frequent across languages.[2]

---

[2] It was pointed out to us by an anonymous reviewer that the use of the monosyllabic exclamation *¡Gol!* may be problematic: the word itself may have a somewhat fixed/lexicalized contour because of its use in sports, by announcers and fans alike (the majority of which are stereotypically male), with an unusually long falling contour that can take up an entire breath group. Therefore, the results obtained for the word *¡Gol!* may be more limited in their generalizations as opposed to other more generic exclamatory utterances.

5. Analysis of the data according to the Theory of Phonology as Human Behavior (PHB)

The Theory of PHB can explain the use of the most basic, easiest to produce, unmarked high-falling tonal contours in traditional Spanish employing the fundamental axiom underlying the theory that language represents a compromise between striving to achieve maximum communication with minimal effort (Tobin 1990, Enbe et al. 2006). However, in our BAS data, we have found preferences for the more difficult, complex, marked high prosodic contours both in simple unmarked declarative sentences (subject-verb) as well as in the more complex marked wh-questions (wh-word-verb-subject). Acoustically and perceptually, these marked tonal contours produce more clear-cut prosodic contrasts, but they also require more effort on the part of the encoder. Only in the exclamatory sentence which is marked pragmatically — but was syntactically and semantically the most simple sentence in the corpus — did the majority of our BAS speakers (86%-100%) prefer to exert minimal effort using the unmarked prosodic contour.

Our BAS data reveal that the unmarked **declarative sentences** show the greatest variation for gender and age. First, the majority of all females favor the classic marked Type-2 pattern with the oldest women show the strongest preference. With the more difficult marked Type-2 pattern, more effort is invested in order to produce clearer contrasts which is why we have also considered this pattern to be more prestigious. This preference for a marked form provides further prosodic evidence for the sociolinguistic studies of Western societies showing that women favor more conservative, "correct" and prestigious forms than men (Labov 1990, Foley 1997, Cameron 2000, Silva-Corvalán 2001, Chesire 2002). Second, males are less systematic in their use of prosodic patterns: all male adults (18-78) favor the unmarked contour and other patterns – as shown in previous sociolinguistic studies of Western societies — while male children (like females) show a stronger preference for the marked declarative pattern. The speakers who prefer the unmarked Type-1 pattern invest minimum effort to produce the fundamental communication contrasts, while speakers choose more complex patterns to create alternative kinds of contrasts.

With the **wh-questions** — the more difficult marked sentence type — the differences are stronger for age than for gender. All children, women of all ages, and adult males (51-78) prefer the classic high pitch accent in the wh-word. They invest the most effort to produce the strongest clear cut prosodic contrasts associated with this marked sentence type. Adult males (18-50) favor other patterns of varying degrees of difficulty over the classic marked pattern. These results indicate - like those of Cameron (2000) - that young adult males and females deviate the most from the classic marked speech patterns using nonstandard (i.e. not the classic patterns) or innovative strategies.

The **exclamatory** sentences — which in our study are shorter than the other two sentence types — require more effort than the unmarked declarative but less effort than the marked wh-question. The vast majority of speakers of all ages and both genders follow the classic unmarked falling pattern for the exclamatory sentence. However, there are very minor differences in gender and age for this marked sentence type: 5% of boys and adult males (51-78) and 14% of girls prefer a different pattern.

6. Conclusions

The data from BAS show an inverse relationship between the difficulty of the sentence and the range of prosodic variation attested correlating with gender and age among speakers. The most simple declarative sentence shows the largest degree of prosodic variation for both gender and age. In the most difficult, complex and highly marked wh-questions, the differences in gender appear to be neutralized but variation exists with the variable of age (males and females 18-50 strongly prefer non-classic patterns). In the marked but less difficult to produce exclamatory sentence, the majority of all speakers followed the classical unmarked pattern with minor differences for both gender and age.

Our study of the prosodic patterns of BAS, which has focused on the variables of gender and age, indicates that: (1) females of all ages consistently prefer the marked prestigious prosodic forms; (2) male children tend to follow female speakers; (3) adult males have more random prosodic patterns; and

(4) adults (18-50) of both genders differ the most in their choice of prosodic patterns for declaratives and wh-questions.

References

Alcoba, Santiago & Julio Murillo. 1998. Intonation in Spanish. In D. Hirst and A. Di Cristo (eds.), *Intonation Systems. A Survey of Twenty Languages.* Cambridge : Cambridge University Press.152-166.

Barjam, John P. 2004. *The Intonational Phonology of Porteño Spanish*. M.A. Thesis, University of California, Los Angeles.

Beckman, Mary & Gayle Ayers Elam. 1997. Guidelines for ToBI labelling. http://ling.ohiostate.edu/phonetics/E_ToBI . vers.3.1997. The Ohio State University Research Foundation. 1st version 1993.

Beckman, Mary, Manuel Díaz-Campos, Julia McGory & Terrel Morgan. 2002. Intonation across Spanish, in the Tones and Break Indices Framework. *Probus* 14: 9-36.

Bolinger, Dwight. 1989. *Intonation and its Uses. Melody Grammar and Discourse*. California, Stanford University Press.

Canellada, Maria J. & John Kuhlman Madsen. 1987. *Pronunciación del Español,* Madrid: Castalia.

Cameron, Richard. 2000. Language change or changing selves?: direct quotation strategies in the Spanish of San Juan, Puerto Rico. *Diachronica* 17: 249-292.

Chesire, Jenny. 2002. Sex and gender in variationist research. In J.K. Chambers, P. Trudgill and N. Schiling-Estes (eds.), *The Handbook of Language Variation and Change.* Oxford: Blackwell. 423-443.

Colantoni, Laura & Jorge Gurlekian. 2002. Modeling intonation for synthesis: pitch accents and contour patterns in Argentine Spanish. Paper presented at the First Conference on Laboratory Approaches to Spanish Phonology. University of Minnesota, Minneapolis: Minnesota. September 6-7.

----------. 2004. Convergence and intonation: historical evidence from Buenos Aires Spanish. *Bilingualism: Language and Cognition*. 7 (2): 107-119.

Contini-Morava, Ellen & Barbara Sussman-Goldberg (eds.) 1995. *Meaning as Explanation*: *Advances in Linguistic Sign Theory*. Berlin/New York: Mouton de Gruyter.

Contini-Morava, Ellen, Robert Kirsner & Betsy Rodriguez-Bachiller (eds.) 2004. *Cognitive and Communicative Approaches to Linguistic Analysis*. Amsterdam /Philadelphia: John Benjamins.

Contini-Morava, Ellen & Yishai Tobin (eds.) 2000. *Between Grammar and Lexicon*. Amsterdam /Philadelpia: John Benjamins.

Davis, Joseph. 1987. A combinatory phonology of Italian. *Columbia University Working Papers in Linguistics* 8: 3-100.

Díaz-Campos, Manuel & Julia McGory. 2002. La Entonación en el Español de América: un Estudio Acerca de Ocho Dialectos Hispanoamericanos. *Boletín de Lingüística* 18: 3-26. Universidad Central de Venezuela.

D'Imperio, Mariapaola, Gorka Elordieta, Sónia Frota, Pilar Prieto & Marina Vigário. 2005. Intonational phrasing in Romance: The role of syntactic and prosodic structure. In S. Frota , M.Vigario and M.J. Freitas (eds.), *Prosodies*. Berlin and New York: Mouton de Gruyter.

Diver, William. 1979. Phonology as Human Behavior. In: D. Aaronson and R. Reiber (eds.), *Psycholinguistic Research: Implications and Applications*. Hillsdale: Lawrence Erlbaum. 163-181.

----------. 1995. Theory. In E. Contini-Morava and B. Sussman-Goldberg (eds.), *Meaning as Explanation: Advances in Linguistic Sign Theory*. Berlin/New York: Mouton-De Gruyter. 45-113.

Enbe, Claudia. 2003. *Description of the Suprasegmental Features: Intonation and Rhythm in Normal and Pathological Speech of Buenos Aires Spanish according to the Theory of Phonology as Human Behavior*. MA Thesis. Ben-Gurion University of the Negev. Israel.

Enbe, Claudia, Jorge Gurlekian & Yishai Tobin. 2004. Suprasegmental features in Normal and Pathological Speech of Buenos Aires Spanish according to the Theory of Phonology as Human Behavior. Paper presented at the Eighth International Columbia School Conference on the Interaction of Linguistic Form and Meaning with Human Behavior, New York, February 14-15.

----------. 2006. A laboratory analysis of suprasegmental features in normal and pathological speech of Buenos Aires Spanish according to the Theory of Phonology as Human Behavior. In M. Diaz-Campos (ed.), *Proceedings of the Second Laboratory Approaches to Spanish Phonetics and Phonology*. Somerville, MA: Cascadilla Press. 83-105.

Escandell-Vidal, Victoria. 1998. Intonation and procedural encoding: the case of Spanish interrogatives. In V.Rouchota and A. Jucker (eds.), *Current Issues in Relevance Theory*. Amsterdam/Philadelphia: John Benjamins.169-203.

Foley, William. 1997. *Anthropological Linguistics: An introduction*, Oxford: Basil Blackwell. Chapter 15, 286-306.

Frota, Sónia, Mariapaola D'Imperio, Gorka Elordieta, Pilar Prieto & Marina Vigário. 2007. In P. Prieto, J. Mascaró and M. J. Solé (eds.), *Segmental and Prosodic Issues in Romance Phonology*. Amsterdam/Philadelphia: John Benjamins.131-153.

Gurlekian, Jorge. 1997. El Laboratorio de Audición y Habla en el LIS. In: M. Guirao (ed.), *Procesos Sensoriales y Cognitivos*. Buenos Aires: Dunken. 55-81.

Gurlekian, Jorge, Laura Colantoni & Humberto Torres. 2001. El Alfabeto Fonético Sampa y el Diseño de Corpora Fonéticamente Balanceados. *Fonoaudiológica* 47(3): 58-69.

Gurlekian, Jorge, Hernán Rodríguez, Laura Colantoni, & Humberto Torres. 2001. Development of a Prosodic Database for an Argentine Spanish Text To Speech System. Paper presented at the IRCS Workshop on Linguistic Databases. University of Pennsylvania, Philadelphia, USA.

Gurlekian, Jorge, Humberto Torres & Laura Colantoni. 2004. Modelos de entonación analítico y fonético fonológico aplicados a una base de datos del español de Buenos Aires, *Estudios de Fonética Experimental* 13: 275-302.

Hualde, Jose I. 2000. Intonation in Spanish and the other Ibero-Romance languages: Overview and status questions. In C. Wiltshire and J. Camps (eds.), *Romance Phonology and Variation: Selected papers from LSRL* 30. Amsterdam/Philadelphia: Benjamins. 101-115.

Huffman, Alan. 2001. The Linguistics of William Diver and the Columbia School. *WORD* 52(1): 29-68.

Labov, William. 1990. The intersection of sex and social class in the course of linguistic change. *Language Variation and Change* 2: 205-54.

Martinet, André. 1955. *Economie des Changements Phonétiques*. Berne: Editions A. Francke.

Navarro Tomás, Tomás, 1921. *Manual de Pronunciación Española*. Madrid: Publicaciones de la Revista de Filología Española.

----------. 1974. *Manual de Entonación Española*. Madrid: Guadarrama,(1st. version 1944)

Pierrehumbert, Janet. 1980. *The Phonology and Phonetics of English Intonation*. Ph. D. thesis. MIT.

Prieto, Pilar, Jan Van Santen & Julia Hirschberg. 1995. Tonal alignment patterns in Spanish. *Journal of Phonetics* 23: 429-451.

Quilis, Antonio. 1993. *Tratado de Fonología y Fonética Españolas*. Madrid, Gredos.

Reid Wallis, Ricardo Otheguy & Nancy Stern (eds.), *Signal, Meaning, and Message*: *Perspectives on Sign-Based Linguistics*. Amsterdam/Philadelphia: John Benjamins.

Saussure, Ferdinand de. 1959 [1916]. *Cours de linguistique générale /A Course in General Linguistics*. Paris: Payo/ New York: Philosophical Library.

Silva Corvalán, Carmen. 2001. *Sociolinguística y Pragmática del Español*. Washington: Georgetown University Press. 85-127.

Sosa, Juan M. 1999. *La Entonación del Español*. Madrid: Cátedra.

----------. 2003. Wh-questions in Spanish: Meanings and Configuration Variability. *Catalan Journal of Linguistics* 2: 229-247.

Tobin, Yishai. (ed.) 1988a. *The Prague School and Its Legacy in Linguistics, Literature, Semiotics, Folkore and the Arts*. Amsterdam/Philadelphia: John Benjamins.

Tobin, Yishai. 1988b. Two quantitative approaches to phonology: A contrastive analysis. In H. Blume. (Ed.), *Beiträge zur quantitativen Linguistik: Gedachtniskolloquium für Eberhard Zwirner*. Tübingen: Gunter Narr Verlag. 71-112.

----------. 1990. *Semiotics and Linguistics*. London/New York: Longman.

----------. 1993. *Aspect in the English Verb: Process and Result in Language*. London/New York: Longman.

----------. 1994/ 1995. *Invariance, Markedness and Distinctive Feature Analysis: A Contrastive Study of Sign Systems in English and Hebrew*. Amsterdam/Philadelphia: John Benjamins (hardcover) / Ben-Gurion University Press (paperback).

----------. 1997. *Phonology as Human Behavior: Theoretical Implications and Clinical Applications*. Durham, NC/London: Duke University Press.

----------. 2000. Comparing and contrasting Optimality Theory with the Theory of Phonology as Human Behavior. *The Linguistic Review* 17(2-4): 291-301.

----------. 2001. Phonetics versus phonology: The Prague school and beyond. In C. Kreider (ed.), *Phonology: Critical Concepts*. London/New York: Routledge. 48-68.

----------. 2005. Structuralist phonology: Prague school. In K. Brown (Editor-in-Chief), *Encyclopedia of Language and Linguistics*. 2nd *Edition*. Oxford: Elsevier. (12) 170-177.

Toledo, Guillermo. 2000. Taxonomía tonal en español. *Language Design* 3: 1-20.

Selected Proceedings of the 3rd Conference on Laboratory Approaches to Spanish Phonology

edited by Laura Colantoni and Jeffrey Steele

Cascadilla Proceedings Project   Somerville, MA   2008

Web access and citation information

This entire proceedings can also be viewed on the web at www.lingref.com. Each paper has a unique document # which can be added to citations to facilitate access. The document # should not replace the full citation.

This paper can be cited as:

Enbe, Claudia and Yishai Tobin. 2008. Sociolinguistic Variation in the Prosody of Buenos Aires Spanish According to the Theory of Phonology as Human Behavior. In *Selected Proceedings of the 3rd Conference on Laboratory Approaches to Spanish Phonology*, ed. Laura Colantoni and Jeffrey Steele, 140-154. Somerville, MA: Cascadilla Proceedings Project.

or:

Enbe, Claudia and Yishai Tobin. 2008. Sociolinguistic Variation in the Prosody of Buenos Aires Spanish According to the Theory of Phonology as Human Behavior. In *Selected Proceedings of the 3rd Conference on Laboratory Approaches to Spanish Phonology*, ed. Laura Colantoni and Jeffrey Steele, 140-154. Somerville, MA: Cascadilla Proceedings Project. www.lingref.com, document #1720.