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Intonational convergence in Bulgarian Judeo-Spanish spontaneous speech

Abstract The present contribution investigates the intonation of the Sofian variety of Judeo-Spanish (JUSPA). Based on a corpus of narrative interviews recorded by four mature female JUSPA-Bulgarian bilinguals and four same-aged monolingually raised speakers of Sofian Bulgarian, it is shown that the Bulgarian of both speaker groups is characterized by higher F0 maxima, a wider pitch range and a more variable pitch as compared to the JUSPA data produced by the bilinguals. Likewise, the Bulgarian data present shorter pauses and longer Intonational Phrases (IPs). This suggests that the bilinguals feel insecure when speaking JUSPA, their original L1, which has been increasingly replaced by the surrounding language, Bulgarian. An autosegmental-metrical analysis of the corpus reveals that they use the same inventory of pitch accents and boundary tones in both of their languages and that differences between the data sets refer to the frequencies of use of the very same targets, but not to different tonal repertoires. We interpret this finding as an instance of prosodic convergence but at the same time attribute it to L1 attrition under the influence of the individuals' dominant language.

Keywords: intonation, Judeo-Spanish, Bulgarian, convergence, first language attrition

1. Introduction

Judeo-Spanish (henceforth JUSPA) refers to the varieties of Spanish spoken by the Sephardic Jews in their new areas of settlement (mostly in the former Ottoman Empire and North Africa) after their expulsion from Spain in 1492. From the 15th century onwards, it developed independently from other Spanish varieties, entering in contact with the respective surrounding languages, among them Greek, Turkish, Serbian, and Bulgarian. The Bulgarian variety of JUSPA addressed in this paper is still spoken by a rather small group of about 250–300 native speakers, the youngest of whom were born in the 1960s. All speakers are at least bilingual and dominant in Bulgarian (henceforth BULG). The use of JUSPA is nowadays restricted to informal communication within the community (Schelling 2005; Studemund-Halévy & Fischer 2013). The most important area of interaction in JUSPA is the *Club ladino*, founded in Sofia in 1998, where the speakers meet on a regular basis to practice their language.

Apart from some remarks included in general descriptions (see Hetzer 2001, among others), the literature on JUSPA phonology is rather sparse and mainly focuses on the varieties spoken outside Bulgaria, e.g. in Morocco (Bradley 2015) and Turkey (Bradley & Delforge 2006; Hualde 2013; Romero 2013); see Bradley (2021, to appear) for an overview. The only comprehensive study on Bulgarian JUSPA phonetics and phonology is Kănčev's (1975) dissertation, which resembles the studies mentioned so far regarding the focus on segmental features. Regarding prosodic properties such as intonation, Hualde and Şaul (2011) argue that the main F0 contours of the variety of JUSPA spoken in İstanbul do not differ substantially from those of Peninsular Spanish; according to Hualde and Şaul (2011), transfer of F0 contours from JUSPA to Turkish is a typical feature of bilingual Turkish-JUSPA language use.

Recent studies have shown that bilingual speakers of BULG and JUSPA transfer the feature of vowel raising from the majority language (BULG) to the Spanish diaspora variety (Gabriel & Kireva 2014a; Fischer et al. 2014), though to different degrees depending on the variety of BULG they acquired in early childhood (Gabriel & Grünke 2018). As pointed out by Andreeva et al. (2013: 346), the raising of the BULG unstressed vowels /ɔ/ and /a/ to [u] and [ə], respectively, comes along with durational reduction, a feature which has a direct impact on the overall durational characteristics of the language, i.e. on global speech rhythm. Regarding the classical dichotomy of stress-timed vs. syllable-timed languages, BULG is characterized as occupying an intermediate position between the two poles of the continuum, i.e. BULG has been shown to be 'more stress-timed', exhibiting a greater variability of vocalic intervals, than, e.g., Castilian Spanish (Dimitrova 1998). This also holds true for the variety of JUSPA spoken in the Bulgarian capital Sofia, investigated by Gabriel and Kireva (2014a), Fischer et al. (2014), and Gabriel and Grünke (2018). The durational reduction of unstressed vowels is directly mirrored in global speech rhythm, i.e. the two languages spoken by the bilinguals, JUSPA and BULG, are situated between monolingual Sofian BULG and Castilian Spanish with respect to the variability of vocalic intervals in the speech signal (Fischer et al. 2014: 99). Gabriel & Kireva (2014a) consequently argue that Sofian JUSPA has strongly converged with BULG at the rhythmic level, thereby conceiving the term of convergence as a bidirectional type of cross-linguistic influence (see Höder 2014).

Regarding the intonation of Sofian JUSPA, Andreeva et al. (2017) showed that mature bilingual speakers (ages: 79–88) use the same repertoire of pitch accents in the reading pronunciation of both of their languages. In the pre-nuclear area, for instance, the majority of rising pitch accents present early peak alignment (L+H*) in both JUSPA and BULG (for Sofian BULG speakers of the same age also see Dimitrova et al. 2018: 711). With regard to this feature, Sofian JUSPA crucially differs from the overwhelming majority of present-day varieties of Mainstream Spanish (including the Castilian dialect), which show a predominant use of late peak alignment (i.e. L+<H*) in pre-nuclear positon in declarative sentences (see Estebas-Vilaplana/Prieto 2010: 19 for Castilian and Hualde & Prieto 2015 for an overview across dialects). At the same time, Sofian JUSPA patterns with other Spanish contact varieties such as Buenos Aires Spanish (Gabriel et al. 2010; 2013; Gabriel & Kireva 2014b) or Andean Spanish (O'Rourke 2004) that presumably have adopted the alignment properties of pre-nuclear rising pitch accents from the respective contact languages (Italian, Quechua).

On the basis of a rating experiment with 95 raters (native speakers of Sofian BULG), Andreeva et al. (2017) also showed that the BULG data produced by the very same bilingual speakers of Sofian BULG and JUSPA that are analyzed in the present paper was not perceived as being different from the speech of same-aged monolingual speakers of the BULG variety spoken in the capital.[1] The authors interpreted this finding as a signal of prosodic convergence of the bilinguals' languages. Note that they used the notion of convergence in a broader sense, i.e. as a (unidirectional or bidirectional) mechanism of contact-induced change that increases the similarities between two given languages (Myers-Scotton 2002).

In the present paper, we concentrate on the intonational properties of both of the languages spoken by mature BULG-JUSPA bilinguals who have been living in Sofia for more than 50 years. Our aim is to examine whether JUSPA and BULG have converged at the intonational level to the same extent in spontaneous speech as was recently shown by Andreeva et al. (2017) for read speech.

The paper is organized as follows: In Section 2, we briefly outline the methodology adopted in our analysis, before presenting the results (Section 3) and discussing them in the context of contact-induced language change (Section 4), along with some concluding remarks.

1 For effects of the speakers' age on the use of pitch accent types in Sofian Bulgarian see Dimitrova et al. (2018).

Tab. 1: Duration of the analyzed material for each speaker (in seconds)

	SP1	SP2	SP3	SP4	*Total*
BULG_m	151.39	169.51	169.14	154.77	644.81
BULG_b	160.74	74.62	82.09	148.26	465.71
JUSPA	176.84	179.72	184.85	198.06	739.47

2. Methodology

To answer the question of whether convergence with BULG shows up in JUSPA spontaneous speech to the same extent as was found by Andreeva et al. (2017) in their read data, we created a corpus consisting of extracts from narrative interviews conducted in both JUSPA and BULG. The interviews were semi-focused in that all speakers were asked to retell their life story and family history and to speak freely about their daily lives and their (past and present-day) use of JUSPA. The recordings with the JUSPA-BULG bilinguals were made in Sofia in September 2011 (four female speakers, aged 80–88); the control group consisting of four female BULG monolinguals of the same age (79–86) was recorded in Sofia in September/October 2016. The bilingual speakers were recorded in JUSPA and BULG (henceforth BULG_b), the monolinguals in BULG only (henceforth BULG_m). For the present study, we analyzed extracts of these recordings; the net amount of speaking time for each speaker, excluding all pauses, is given in Tab. 1. The bilinguals were born in different Bulgarian towns: Кюстендил (Kjustendil), Пазарджик (Pazardžik), Казанлък (Kazanlăk), and Карнобат (Karnobat). They are native speakers of JUSPA who used this language on a regular basis in family situations during childhood. BULG became their dominant language when they moved to Sofia for study purposes between 1947 and 1950. Regarding their pronunciation in BULG, all subjects display the features typical of the capital. As already mentioned, the results obtained from an accent rating test performed by 95 raters (all of them born and living in Sofia) show that the bilinguals are not perceived as different from the monolinguals (Andreeva et al. 2017). Two of the monolingual speakers have been living in Sofia throughout their lives; the other two were born in Шумен (Šumen) and Кюстендил (Kjustendil), but all of them grew up and currently live in the capital. All subjects are female, hold an academic degree and were mature speakers (aged 79–88) at the time of data collection.

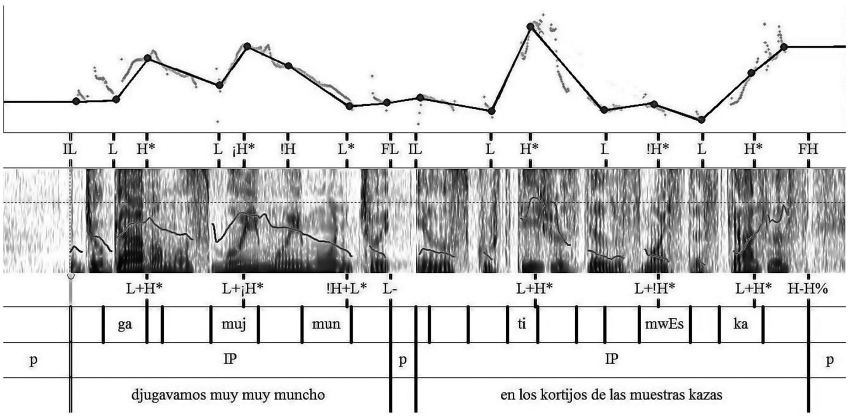

Fig. 1: Labeling of data (JUSPA, from top to bottom): Stylized pitch contour; labeling of tonal landmarks; raw pitch contour; ToBI labeling of pitch accents, phrasal accents and boundary tones; syllable boundaries and SAMPA transcription of prominent syllables; intonation phrases (IP) and pauses (p); orthographic transcription.

Syllable and intonation phrase (IP) boundaries were marked and prominent syllables were labeled manually using Praat (Boersma & Weenink 2017); for an example of the labeling of the data see Fig. 1.

According to Ladd (1996), F0 values can be attributed to two partially related but distinct characteristics of a speaker's performance: (a) pitch level, i.e. the overall height of the speaker's voice, and (b) pitch span, i.e. the range of frequencies covered by the speaker. In order to extract F0 values, we used Praat scripts. Irregular voiced stretches of speech caused by laryngealization were excluded from further analyses. The following long-term distributional (LTD) measures were calculated per IP: mean and median F0 values (in Hz) for level, and minimum and maximum F0 for span (in Hz). Pitch range measurements were calculated in semitones by means of the formula 39.863 * log10(maximum/minimum) (Reetz 1999). The measure describing the variation of the F0 distribution is the standard deviation (SD; in Hz). Additionally, the mean duration of the IPs and of the pauses was measured.

In a first step, we provide a phonetic description of the F0 contours, following the method proposed by Patterson (2000) and Mennen et al. (2012). This approach distinguishes between tonal landmarks (local F0 maxima and minima) associated with prominent or non-prominent syllables and between initial and non-initial peaks. Every tonal landmark was identified auditorily and visually. Local maxima (H) and minima (L) were labeled with a star (H* and L*), if they aligned with a stressed syllable. They were labeled H and L if they aligned with an unstressed syllable. The beginning and the final landmarks were labeled separately: the phrase-initial/final lows F0 were labeled as IL/FL and phrase-initial/final highs as IH/FH. The top section of Fig. 1, above, shows an example of the F0 stylization process.

In a second step, we labeled the relevant F0 movements according to the ToBI labeling conventions (Silverman et al. 1992), based on the repertoires of pitch accents and boundary tones proposed in recent work on Spanish and Bulgarian intonation (see Hualde and Prieto (2015) for a cross-varietal perspective on Spanish; Andreeva (2007), Andreeva et al. (2016; 2017), Dimitrova and Jun (2015) for the Sofian variety of Bulgarian). An example for the ToBI labeling is provided in Fig. 1, above. It needs to be pointed out in this context that the present study is based on a limited data set, which, as a consequence of the type of text analyzed here (narrative interviews), almost exclusively consists of declarative sentences of different degrees of complexity. We thus do not aim to elaborate a full-fledged 'tonal grammar' of Sofian JUSPA, which would include the unmarked tonal realizations of both pre-nuclear accents and nuclear configurations (nuclear pitch accent plus following boundary tone) of all sentences types including pragmatically different types of declaratives, interrogatives, imperatives and vocatives.[2] Consequently, we do not claim that our ToBI labeling represents underlying (phonological) categories; the annotation used in the second step of our analysis rather represents a systematization of the tonal landmarks (as defined in the first step) according to the ToBI labels proposed in the literature.

For statistic validation, we used the software JMP 13 to perform Linear mixed models (LMMs). We calculated two different models: one comparing BULG_m and BULG_b and one comparing BULG_b and JUSPA with the respective measure as dependent variable, SPEAKER as random factor, and DATA

2 Such full descriptions of the intonational systems of ten varieties of Spanish are given in Prieto and Roseano (2010). The analyses presented in the individual chapters of that volume draw on sub-corpora built up according to identical methodology: the data were collected using a so-called discourse completion task (see Vanrell et al. 2018), an inductive method which consists in presenting the subjects with an everyday situation and asking them to react verbally in a natural way. A complete description of JUSPA intonation along these lines is still a desideratum for future research.

Tab. 2: Measures by data set.

Parameter	BULG_m	BULG_b	JUSPA
mean (Hz)	178.43	180.88	172.71
median (Hz)	174.21	176.72	169.95
minimum (Hz)	124.99	124.26	118.43
maximum (Hz)	257.61	258.04	237.94
pitch range (semitones)	12.53	12.94	12.19
SD (Hz)	32.31	31.61	28.54
mean IP duration (ms)	1157.65	1241.87	1123.87
mean pause duration (ms)	626.03	647.85	823.11

SET (BULG_m vs. BULG_b; BULG_b vs. JUSPA) as fixed factor. For frequency counts of the pitch accents realized by the different groups we used χ^2 tests. The confidence level was set at $\alpha=0.05$.

3. Results

Mean values for each of the F0 and durational measures by data set are presented in Tab. 2.

A systematic comparison of the LTD measures of F0 showed no significant differences in the realizations from the BULG_m and BULG_b data sets. On the other hand, the comparison between BULG_b und JUSPA showed that the bilingual speakers realized higher standard deviation (F [1, 1379] = 13.2965, $p<0.001$), higher F0 maximum values (F [1, 1377] = 21.9648, $p<0.001$), and wider pitch range (F [1, 1378] = 12.4306, $p<0.001$) when speaking Bulgarian; see Fig. 2 below. This trend holds true for all speakers except for Sp1, who presents the inverse picture for pitch range and standard deviation; see Fig. 3, below.

Our statistical analyses for the duration measurements showed that the bilingual speakers produce longer IPs (F [1, 1331] = 13.3538, $p<0.001$) and shorter pauses (F [1, 1154] = 7.0495, $p<0.01$) in the BULG_b data set than in the JUSPA data set; see Fig. 4, below.

Regarding the distribution of pitch accents, our analysis revealed that the same repertoire of six pitch accents, i.e. L*, H*, H+L*, L*+H, L+<H*, and L+H*, was used in each of the three data sets (BULG_m, BULG_b, and JUSPA). Note that essentially the same inventory of pitch accents was found in read data produced by the same speakers (see Andreeva et al. 2017: 172). A schematized representation of these pitch accents is given in Fig. 5.

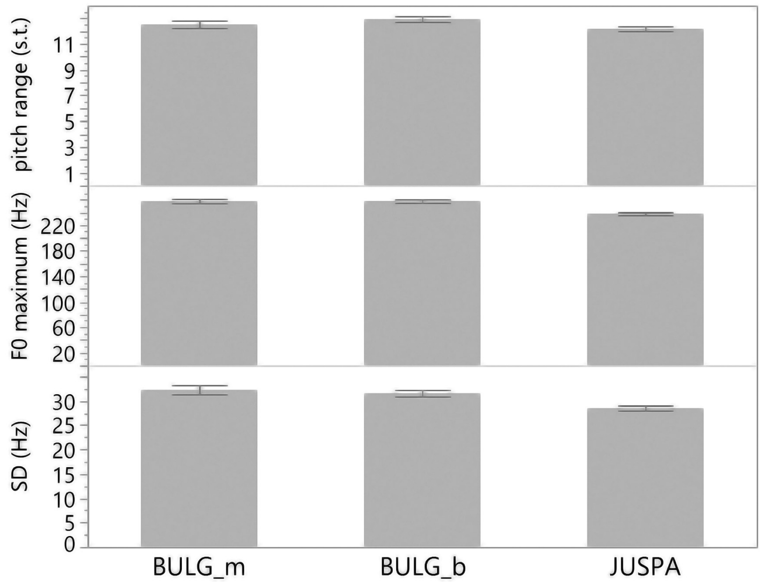

Fig. 2: Pitch range (semitones), maximum F0 values (Hz) and standard deviation (Hz) in the three data sets (from left to right: BULG_m, BULG_b and JUSPA).

Concerning the realization of nuclear pitch accents, we found that both the bilingual and the monolingual speakers use predominantly H*, but also L* and L+H*. However, for the bilingual group, we found slightly more monotonal L*, and for the monolingual group – more bitonal rising pitch accents of the L+H* type, in which the F0 peak is reached at the end of the stressed syllable. In pre-nuclear position, both groups of speakers use again mostly H* pitch accents and to a lesser extent L+H* and L*; see Tab. 3, below.

As far as boundary tones are concerned, our analysis revealed that the same repertoire is used in the three data sets (%H, H-%, L-H%, H-L%, L-%, H-, LH-, HL-, L-). Significant differences were found in the relative frequency of the different boundary tones between JUSPA and BULG_m [$\chi^2(8, N = 1174) = 123.818, p < 0.001$], JUSPA and BULG_b [$\chi^2(8, N = 1024) = 63.477, p < 0.001$], and between BULG_m and BULG_b [$\chi^2(8, N = 962) = 83.452, p < 0.001$]; see Tab. 4, below.

The bilingual speakers use predominantly H-L% and H-% when speaking BULG_b, and L-%, H-L%, H-% and H- when speaking JUSPA. The monolingual speakers also show a preference for H-L% and H-%, but frequently use

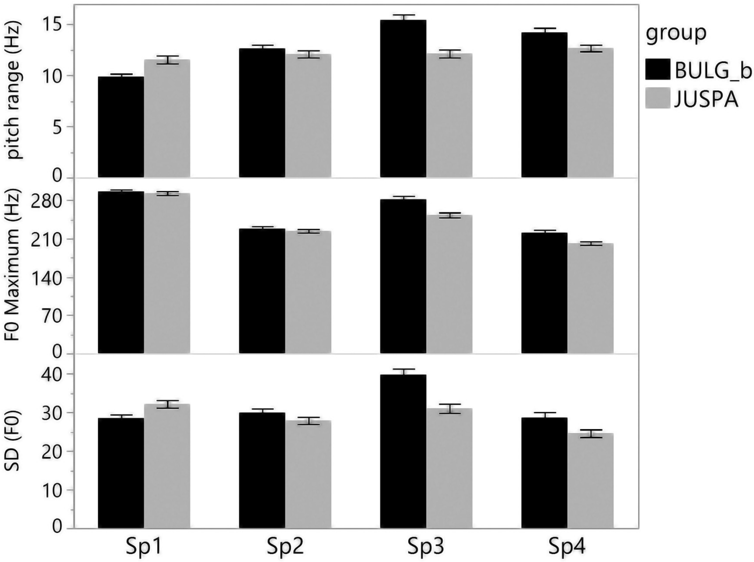

Fig. 3: Pitch range (semitones), maximum F0 values (Hz) and standard deviation (Hz) for the individual bilingual speakers.

HL-, H-, and L-%, as well. It should also be noted that when speaking BULG, the intonation of the two groups of speakers is not typically going down to the bottom of the speaker's range at the end of an IP. When speaking JUSPA, however, the bilingual speakers reached the lower part of their range in 32 % of the IPs. This is in accord with the longer pauses found in our durational analysis and might be caused by planning difficulties.

Since the differences between JUSPA, BULG_b and BULG_m apply to the different frequencies of the same tonal categories and not to different repertoires, they might be explained with respect to the metrical structures of the prosodic words in Bulgarian and Spanish. We consequently looked at the distribution of pitch accents according to stress patterns. Tab. 5, below, summarizes the stress patterns in the three data sets, JUSPA, BULG_b and BULG_m, according to the position of the stressed syllable in the prosodic word. It can be seen that the most frequent pattern in both JUSPA and BULG is stress on the penultimate syllable, for both the pre-nuclear (upper panel) and nuclear position (lower panel). The second most frequent pattern in JUSPA is stress on the last syllable, whereas in BULG either stress on the last or on the antepenultimate syllable is

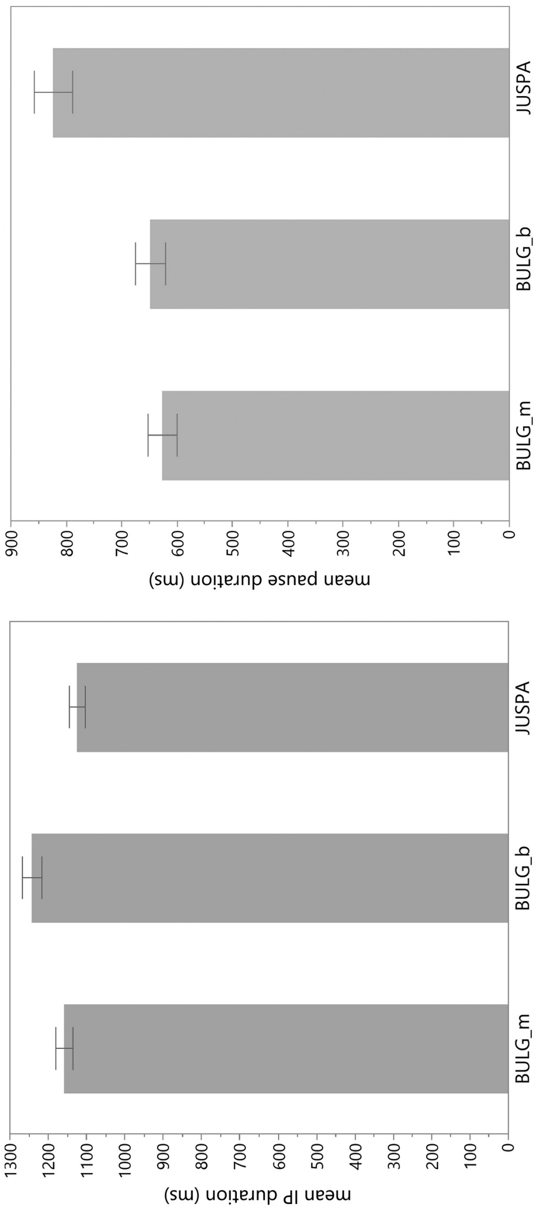

Fig. 4: IP duration (left panel) and pause duration (right panel) for BULG_m, BULG_b and JUSPA.

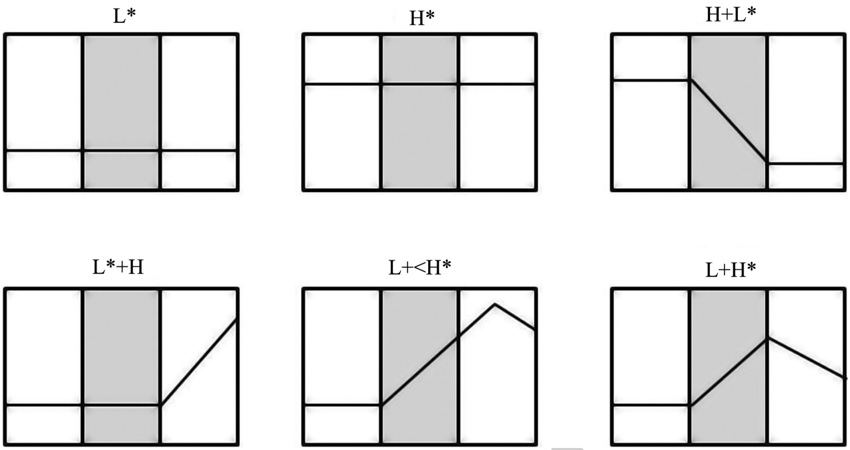

Fig. 5: Schematized representation of the pitch accents used in the three data sets. The areas shaded in gray represent the position of the metrically strong syllable.

Tab. 3: Distribution of pitch accents in the three data sets (in %).

	H*	H+L*	L*	L*+H	L+H*	L+<H*
			nuclear pitch accents			
BULG_m	40	5	22	0	32	1
BULG_b	44	3	26	1	23	3
JUSPA	42	2	29	0	25	2
			pre-nuclear pitch accents			
BULG_m	68	3	12	2	14	1
BULG_b	63	1	10	5	15	5
JUSPA	67	1	8	0	19	5

second most frequent. While in JUSPA there are only a few words with stress on the antepenultimate and 4th-to-last syllable and no words with stress on the 5th, 6th and 7th-to-last syllable, the BULG data exhibit some occurrences of words stressed on these syllables.

The following two graphs represent the frequencies of occurrence of stress patterns per number of syllables within the prosodic word across the three data sets (see Fig. 6 for stress patterns in pre-nuclear position and Fig. 7 for stress patterns in nuclear position).

Tab. 4: Distribution of boundary tones in the three data sets (in %).

boundary tones	BULG_m	BULG_b	JUSPA
%H	6	5	1
H-%	17	22	18
L-H%	3	7	5
H-L%	19	30	22
L-%	10	2	26
H-	15	7	12
LH-	4	7	1
HL-	22	8	9
L-	4	2	6

Tab. 5: Distribution of stress patterns (in %) in the three data sets (based on prosodic word division). Words with ultimate stress include monosyllables.

	ultimate	penultimate	antepenultimate	4th-to-last	5th-to-last	6th-to-last	7th-to-last
	pre-nuclear position						
BULG_m	34	46	15	5	-	-	-
BULG_b	18	51	26	5	-	-	-
JUSPA	30	65	4	1	-	-	-
	nuclear position						
BULG_m	22	42	25	7	2	1	1
BULG_b	23	40	30	4	5	-	-
JUSPA	29	63	8	-	-	-	-

As can be seen in Figs. 6 and 7, the most frequent stress pattern for prosodic words consisting of two or three syllables is penultimate stress for both languages and across all data sets, independent of the position in the IP (i.e. pre-nuclear or nuclear position). Regarding prosodic words of more than three syllables, this pattern only holds true for the JUSPA data set. In Bulgarian, however, the most frequent stress pattern in this condition is antepenultimate stress. For prosodic words of more than two syllables, the second most frequent pattern in Bulgarian is antepenultimate stress, in contrast to JUSPA, where this is ultimate stress.

Our analysis reveals significant differences between the three data sets concerning the use of pre-nuclear pitch accents in words with stress on

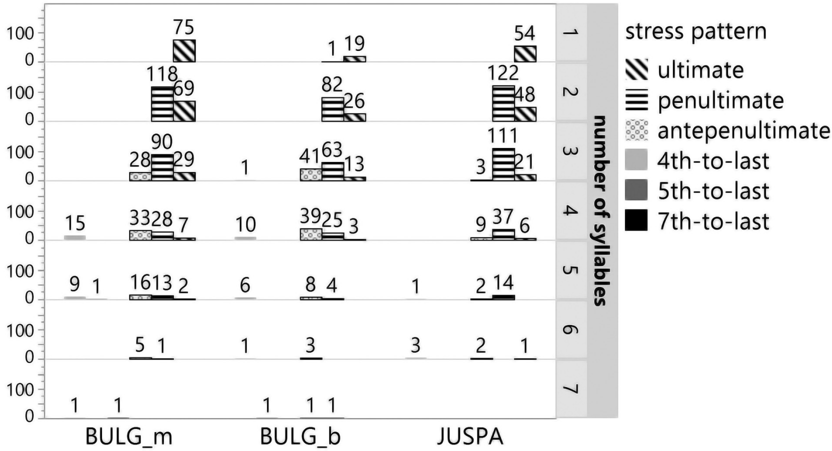

Fig. 6: Stress patterns per number of syllables within the prosodic word across the three data sets (pre-nuclear position); absolute numbers.

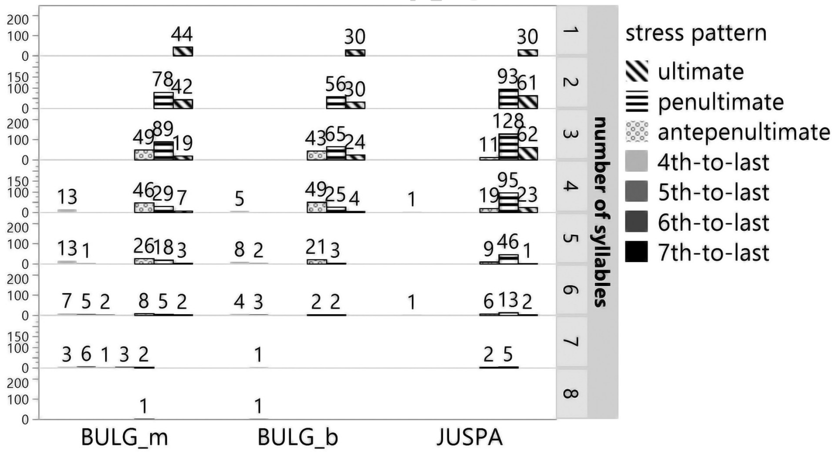

Fig. 7: Stress patterns per number of syllables within the prosodic word across the three data sets (nuclear position); absolute numbers.

the last and penultimate syllable. The comparison between BULG_m and JUSPA shows that when stress is on the last syllable, there are more L* accents in the BULG_m data set and more L+H* in the JUSPA data set [χ^2 (4, N = 312) = 12.294, $p < 0.05$]. When stress is on the penultimate syllable, there are more L+<H* accents in JUSPA [χ^2 (5, N = 531) = 15.632, $p < 0.01$]. When the comparison was carried out between BULG_b and JUSPA, it turned out that when stress is on the last syllable the bilingual speakers produce more L+H* accents in JUSPA [χ^2 (5, N = 191) = 13.621, $p < 0.05$]. By contrast, more L*+H pitch accents were produced on the penultimate syllable when they spoke BULG(_b) [χ^2 (5, N = 457) = 20.069, $p < 0.01$]. Finally, the comparison between the two Bulgarian data sets, i.e. BULG_m and BULG_b, shows more L*+H and L+<H* for the bilingual group with items stressed on the last [χ^2 (5, N = 243) = 12.165, $p < 0.05$] and on the penultimate syllable [χ^2 (5, N = 426) = 15.826, $p < 0.01$].

However, as shown in Tab. 3, above, the amounts of L*+H and L+<H* only come up to 1 % and 6 %, respectively. This suggests that these differences are of limited relevance here. Hence, only the difference between BULG_b and JUSPA and the one between BULG_m and JUSPA in words stressed on the last syllable seem to be substantial. The three data sets do not differ essentially in the other prosodic structures, including the most frequent pattern in both languages, i.e. stress on the penultimate syllable.

Concerning the nuclear accents in prosodic structures with stress on the last syllable, significant differences were found between BULG_m and JUSPA (more L+H* realized by the monolingual speakers) [χ^2 (4, N = 295) = 26.981, $p < 0.001$], as well as BULG_b and BULG_m (again more L+H* realized by the monolingual speakers) [χ^2 (4, N = 205) = 14.452, $p < 0.01$]. In words stressed on the penultimate syllable, BULG_m and JUSPA also show significant differences (more L+<H* in the JUSPA data) [χ^2 (4, N = 599) = 11.851, $p < 0.05$]. No differences were found between BULG_b and JUSPA.

As already stated, the difference found between BULG_m and JUSPA with respect to the most frequent prosodic structure, namely stress on the penultimate syllable, is a minor one because of the few realizations of L+<H*. It is important, though, to point out that the monolingual speakers realize more nuclear L+H* than the bilinguals in words stressed on the last syllable. In Tab. 6, we summarize the results described so far. Significant differences are highlighted in bold; the negligible ones are set in brackets.

Tab. 6: Comparisons between the three data sets (based on prosodic word division).

stress position	pre-nuclear accents	nuclear accents
ultimate	(BULG_m more L* than JUSPA) **JUSPA more L+H* than BULG_m** **JUSPA more L+H* than in BULG_b**	**BULG_m more L+H* than JUSPA** **BULG_m more L+H* than BULG_b**
penultimate	(JUSPA more L+<H* than BULG_m) **BULG_b more L*+H than JUSPA** (BULG_b more L*+H than BULG_m) (BULG_b more L+<H* than BULG_m)	(JUSPA more L+<H*)

4. Discussion and concluding remarks

Based on a corpus of spontaneous speech (narrative interviews conducted in JUSPA and BULG, respectively), we have shown that the bilingual speakers use considerably lower F0 maxima, a narrower pitch range and generally less variable pitch when they speak JUSPA as compared to the two Bulgarian data sets (BULG_b and BULG_m). Additionally, the JUSPA data show the longest pauses and the shortest IPs. Furthermore, when speaking JUSPA the bilinguals typically go down to the bottom of their range at the end of approximately one third of the IPs. These results indicate that the speakers feel some insecurity when speaking their original mother tongue, which has been increasingly replaced by the surrounding language, Bulgarian, in the course of the decades.

In contrast to these differences between JUSPA and BULG, the bilinguals use the same inventory of pitch accents and boundary tones in both of their languages (JUSPA and BULG_b), which, in turn, does not differ from the repertoire of tonal units used by the monolingual speakers (BULG_m). Regarding the occurrences of pre-nuclear L+H* placed on words bearing ultimate stress, the bilinguals produce more instances of this accent type when speaking JUSPA (see Section 3). We found no considerable differences with respect to the occurrences of nuclear accents. As already pointed out in Section 3, the fact that the bilingual speakers use the same pitch accent types, i.e. L*, H*, H+L*, L*+H, L+<H*, and L+H*, in both of their languages, holds true not only for the spontaneous data analyzed in the present paper but also for the read data produced by the same speakers analyzed in Andreeva et al. (2017).[3] This finding strongly

3 The only difference between the spontaneous and read data sets refers to the fact that in the former the amount of H* (JUSPA: 67 %, BULG_b: 63 %) is higher than in the

suggests that convergence, conceived as a mechanism of linguistic change that increases the similarities between two languages, operates at different linguistic levels: The Spanish diaspora variety (JUSPA) seems to have converged towards the surrounding language (BULG) not only with regard to durational properties (raising of unstressed vowels and global speech rhythm; see Gabriel & Kireva 2014; Fischer et al. 2014, and Section 1) but also at the level of intonation, in both read and spontaneous speech. This view is underpinned by the fact that this phenomenon is also apparent with respect to stress assignment: Unlike mainstream Spanish, where comparative constructions such as *más fuerte* 'stronger' are produced with a stress on the adjective, i.e. *más FUERte*, our bilinguals largely follow the Bulgarian model in assigning stress to the comparative particle (see BULG *силен* (*SIlen*) 'strong', *по-силен* (*PO-silen*) 'stronger'), which yields productions such as *MAS fuerte*. Again, this phenomenon not only shows up in the read materials analyzed by Andreeva et al. (2017: 175) but also in the spontaneous data, where examples like *MAS bueno*, *MAS fuerte* or *MAS interesante* alternate with comparative structures that follow the Spanish stress pattern.

It should be noted, in this context, that the striking prosodic parallels between Sofian JUSPA and the surrounding language might also be attributed to first language attrition (see Schmid 2011 for an overview) under the influence of the individuals' dominant language (in this case: BULG). Such an interpretation is plausible since our speakers ceased to use their L1 on a daily basis when they left their families and moved to the capital to enroll for their university studies. However, since no earlier recordings of the same speakers are at our disposal, it is hardly possible to decide whether they (directly) acquired a diaspora variety of Spanish whose prosody was already strongly influenced by BULG from the very beginning, or whether their original L1 (JUSPA) was still prosodically different from BULG at the time of acquisition and has changed under the influence of BULG due to language attrition.

It has been shown in the literature that the use of F0 differs according to speech style (for Spanish see, e.g., Face 2003) and that listeners are generally able to identify speech as either being read or produced spontaneously (Dellwo et al. 2015). However, both the differences in production (e.g. the amount of downstepped or non-realized pitch accents, see Face 2003) and the subtle cues raters rely on when classifying speech samples as read or spontaneous

latter (JUSPA: 42 %, BULG_b: 47), while the distribution is reversed for L+H* (spontaneous data JUSPA: 19 %; BULG_b: 15 % vs. read data JUSPA: 47 %; BULG_b: 18 %); see Andreeva et al. (2017: 173).

(e.g. articulation rate; Dellwo et al. 2015) do not affect the overall repertoire of underlying pitch accents that belong to the prosodic system of the language under study. This view is also underpinned by the fact that the inventory of pitch accents identified for both JUSPA and BULG in the present study does not differ from the one established by Andreeva et al. (2017) for read speech. The fact that the repertoire is also the same across data sets (JUSPA, BULG_m, BULG_b) rather strengthens the view of instability of intonation in situations of language contact and bilingualism.

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