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Patterns of stuttering in a Spanish/English bilingual: A case report

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Abstract
Stuttering patterns may differ when comparing two languages. In bilinguals, specific patterns of stuttering in each one of the languages may potentially be found. This study reports on the case of a 27-year-old Spanish/English simultaneous bilingual whose dominant language is English. Speech and language testing was performed in both languages (language repetition, language understanding, vocabulary, reading, verbal fluency, spontaneous speech and conversational speech). Some differences in the stuttering distribution were found: stuttering in adjectives, adverbs and conjunctions occurred at least twice as much in Spanish as in English; stuttering was also more frequent in verbs in Spanish. Some hypotheses are presented to explain the differences in stuttering severity in both languages. It seems that when comparing stuttering in two different languages in the same subject, it is possible to find similarities in the stuttering pattern, suggesting general stuttering laws; but also differences, associated not only with language-specific idiosyncrasies but also with the individual's bilingualism characteristics.

Keywords: *stuttering, bilingualism, Spanish characteristics, stuttering in Spanish/English bilinguals*

Introduction

About half of the world population is bilingual (Grosjean, 1982; Siguan, 2001), although the exact percentage depends upon the definition of bilingualism that is used. In the United States, there are over 40 million bilinguals (~15% of the population) (U.S. Census Bureau, Statistical Abstract of the United States, 2008); 75% of these bilinguals are Spanish/English bilinguals. If stuttering affects ~1% of the general population (American Psychiatric Association [APA], 1994; Ardila, Bateman, Niño, Pulido, Rivera, & Vanegas, 1994; Mansson, 2000) it may be calculated that in the country there are ~3 million people presenting with stuttering. In consequence, it can be assumed that in the United States there are ~450,000 bilingual stutterers, and close to 350,000 of them are Spanish/English bilinguals.

Stuttering occurs in all languages and ethnic groups (Andrews, Craig, Feyer, Hoddinott, Howie, & Neilson, 1983; Zimmermann, Liljeblad, Frank, & Cleeland, 1983), although prevalence might differ (Perello, 1995), because linguistic variables may affect stuttering.

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Brown (1945) identified four basic speech/language factors that determined whether words will be spoken dysfluently by adults who stutter. These factors are: (1) word class (content words are more prone to stuttering than function words); (2) word length (long words are more difficult); (3) sentence position (words that appear in early positions are more likely to be stuttered) and (4) phone the word starts with (words starting with consonants are more difficult than those that start with vowels). Other speech/language factors, such as utterance rate have also been correlated with stuttering frequency (Howell, Au-Yeung, & Pilgrim, 1999). Due to linguistic differences across languages (i.e. differences in word-length, stress patterns, phonological characteristics, etc.), specific stuttering characteristics may differ when comparing two languages (Dworzynski, Howell, & Natke, 2003; Dworzynski & Howell, 2004). In bilinguals, specific patterns of stuttering in each one of the languages may potentially be found. Certainly, a bilingual stutterer may represent a potential model to compare stuttering in two different languages.

There is a general belief among researchers in the area that stuttering is more prevalent in bilinguals than in monolinguals (Van Borsel, Maes, & Foulon, 2001). Travis, Johnson, and Shover (1937) suggest that a direct relationship between bilingualism and stuttering may exist. For 26% of the bilingual stutterers in their study, the age of onset of stuttering coincided with the introduction of a second language. Several authors seem to support that bilingualism is directly at the origin of the fluency disorder. Pichon and Borel-Maisonny (1964) state that stuttering could be ascribed to bilingualism in an important percentage of stutterers, and, hence, bilingualism may be regarded as a 'risk factor' for stuttering. Other authors (e.g. Karniol, 1992) have presented a similar point of view. Supposedly, using two languages may represent an excessive linguistic demand for some children. Noteworthy, certain dysfluencies can be considered 'normal' when speaking a second language. In a recent study, Howell, Davis, and Williams (2009), using a clinical referral sample of 317 children aged 8–12 who stuttered collected in South-East England between 1999–2007, found that 69 of the subjects were bilingual (21.8%); 38 children used a language other than English primarily or exclusively in the home and 36 of these (94.7%) bilinguals who stuttered did so in both their languages. The authors concluded that certainly there is an increased chance of stuttering onset for bilingual children. Furthermore, bilingual children not only have an increased risk of stuttering but also a lower chance of recovery from stuttering than monolingual speakers.

Few studies have analysed stuttering specifically in Spanish/English bilinguals. Cabrera and Bernstein Ratner (2000) studied a 5-year-old Spanish/English bilingual boy, and reported an association between code-switching events and the occurrence of fluency failures. Dale (1977) studied four Cuban-American male adolescents, all of whom were born in the United States but spoke only Spanish at home. All four subjects were quite proficient in Spanish and English, but none of them exhibited dysfluent speech while speaking English. While conversing in Spanish, however, varying degrees of dysfluency were observed. Bernstein Ratner and Benitez (1985) described a 50-year-old adult male bilingual stutterer who had spoken Spanish and English since learning to speak and used both languages almost equally. Some general observations in this case were: (1) it was harder for this subject to initiate sentences or clauses in Spanish than in English; (2) conjunction and clause initial dysfluencies were twice as frequent in Spanish as in English; (3) initial noun phrases and verb phrases were associated with stuttering in English, but not in Spanish and (4) There was a tendency for dysfluency to appear on vowel-initiated words both in English and Spanish; nonetheless, Spanish vowels were represented almost twice as often. The authors suggested that differences in the loci of dysfluencies between English & Spanish were associated mainly with differences between English & Spanish sentence structure.

Across different studies Howell and colleagues (Au-Yeung, Gomez, & Howell, 2003; Howell, 2004; Howell & Au-Yeung, 2007) have analysed the linguistic characteristics of stuttering in Spanish-speakers. Au-Yeung et al. (2003) selected 46 Spanish-speakers divided into five age groups. The authors were interested in pinpointing if the developmental change in loci of dysfluency from mainly function words to mainly content words, observed for English speakers who stutter, also occurs for comparable Spanish speakers who stutter. It was found that the rate of dysfluency on function words was higher than that on content words, particularly in the youngest speakers. Function word dysfluency rate dropped off and content word dysfluency rate increased across age groups. Howell (2004) observed that the correlation between word type and stress does not apply to the same extent in Spanish as in English; in Spanish it was found that both phonetic and metrical factors are important and independent determinants of stuttering in adults who stutter: non-stressed content words had higher stuttering rates than non-stressed function words. In English it is difficult to dissociate the influence of syllabic and metrical factors, given that content words tend to weigh highly on indexes of phonetic complexity and stress is also carried almost exclusively on these word types. Howell and Au-Yeung (2007) analysed if the phonetic complexity affected stuttering rate for Spanish speakers. The analysis was performed using Jakielski's (1998) Index of Phonetic Complexity (IPC) scheme in which each word is given an IPC score based on the number of complex attributes it includes for each of eight factors. Stuttering on function words for Spanish did not correlate with IPC score for any age group. This mirrors the finding for English that stuttering on these words is not affected by phonetic complexity. The IPC scores of content words correlated positively with stuttering rate for 6–11-year-old and adult speakers. Evidence was obtained that the factors found to be important determinants of stuttering on content words in English for speakers aged 12 and above also affected Spanish speakers.

It has been demonstrated that diverse phonetic/articulatory idiosyncrasies may affect stuttering. Dworzynski et al. (2003) analysed the linguistic factors affecting stuttering in German speakers. In adults, both word type (content/function) and word length increased stuttering rate significantly. It was also found that when word difficulty (based on a combined measure of all Brown's factors) increased, stuttering rate rose. With children, only the word-length factor was significant, and stuttering rate was not governed to the same extent by overall word difficulty. Significant correlations between stuttering rate and phonetic complexity score were found for content words for children over the age of 6 years and adults (Dworzynski & Howell, 2004).

Although there is not a clear explanation for this association between stuttering and bilingualism, it can be conjectured that using two languages represents an additional linguistic burden for bilingual children. Lebrun and Paradis (1984) consider that the input of linguistically mixed utterances might trigger the development of stuttering in bilingual children with a predisposition to stuttering, and, hence, stuttering may be more apparent in bilingual than in monolingual children. Indeed, a diversity of factors may contribute to the apparently increased stuttering frequency reported in bilinguals, such as the characteristics of the two languages (i.e. similarities and differences between both languages), the type of bilingualism (simultaneous, successive, etc.), the mastery of the two languages, etc. For instance, it is evident that language mastery plays a significant role in bilingual stuttering: it has been observed that language ability in a second language influences the frequency, distribution and nature of dysfluencies; and stutterers stutter less in their more dominant language than in the language with lower proficiency (Jankelowitz & Bortz, 1996; Lim, Lincoln, Chan, & Onslow, 2008). Van Borsel et al. (2001) have suggested that a major investigation topic in the area is whether or not prevalence of stuttering in bilinguals is affected by the similarities of the languages involved (i.e. the functional distance between both languages); unfortunately, available data do not provide a clear answer to this question.

There are three possibilities for stuttering patterns in bilinguals: (1) stuttering occurs in one language but not the other; (2) Stuttering occurs in both languages with similar speech behaviour patterns in each one and (3) Stuttering occurs in both languages but varies from one language to another (Nwokah, 1988). Although similar patterns and distributions of stuttering with different degrees of stuttering severity in each language do occur in bilingual stutterers, it is more common to find that both the severity and distribution of dysfluencies differ from one language to another (Van Borsel et al., 2001).

The purpose of this study was to analyse the pattern of stuttering in a Spanish/English bilingual. Although both Spanish and English are Indo-European languages with diverse similarities and commonalities, from a phonetic/articulatory point of view several significant differences can be found between Spanish and English. Some of them are: (1) more types of words carry stress in Spanish than English. As a matter of fact, Spanish presents a rather clear accentual structure; every word has an accent that is clearly salient; (2) Spanish is a syllabic language; each word is composed of one or several syllables usually formed around one vowel (or diphthong), that are easily distinguished; (3) the number of phonemes is lower in Spanish than in English (~23 phonemes vs. ~34 phonemes); this difference is mainly due to the increased amount of English vowels, but Spanish includes a significantly larger amount of diphthongs; conversely, Spanish words are on average longer in number of phonemes and syllables than English words. As stress (Natke, Sandriesen, van Ark, Pietrowsky, and Kalveram, 2004; Wingate, 2002), phonetic structure (Howell, Au-Yeung, & Sackin, 1999) and word-length (Brown, 1945) are three known determinants of stuttering, the participation of these factors could lead to different frequency and patterns of stuttering in these two languages. In addition, English is a stress-timed language (syllables may last different amounts of time, but there is a given amount of time between two consecutive stressed syllables, and that time is roughly a constant), while Spanish is a syllable-timed language and every syllable takes up roughly the same amount of time when pronounced (Abercrombie, 1965). This last difference clearly may also affect speech fluency. Because of these differences in the syllabic characteristics between Spanish and English, we emphasised the analysis of the percentage of stuttered words. Furthermore, it has been suggested that speaking rate may be faster in Spanish than in English (Miranda & Valencia, 1997), and it is known that utterance rate correlates with stuttering frequency (Howell et al., 1999).

This study hypothesised that similarities and differences in stuttering patterns would be found, suggesting general stuttering laws as well as language-dependent stuttering idiosyncrasies. Information about the patterns of stuttering in Spanish and English is limited; extending this information can be particularly valuable in further understanding linguistic variables affecting stuttering.

Method

Case report

The subject is a 27-year-old, right-handed male. He is a second generation Cuban-American. His mother and father immigrated to the United States at 8 and 10 years of age, respectively. English was the dominant language spoken in the home. However, the subject was exposed to Spanish for at least 8 hours per day until age 5 while under the care of his grandparents, who only spoke Spanish. The majority of the subject's schooling was received in English, although he studied Spanish grammar and literature for 2 years in high school. The subject does not speak any other languages.

The subject's mother noted the onset of stuttering at ~6–7 years of age. The subject's father and paternal grandfather and great-grandfather were also dysfluent. The subject received speech therapy for ~30 minutes per week while in elementary school. He also was evaluated and attended about three sessions at a private practice prior to entering junior high school. The subject then received speech therapy once per week for ~4 months when he was 18 years old. In each of these instances, therapy was provided only in English. The type of stuttering therapy received was easy onset therapy. Additionally, the subject has engaged in several years of self-study to control the severity of his stuttering. The result of this self-study has been the inclusion of stuttering modification and cognitive behaviour therapy techniques to the subject's repertoire.

The subject and his family have observed a gradual decrease in the severity of his stuttering in both English and Spanish. However, the subject is aware that he exhibits a greater number of dysfluencies in Spanish than in English. The subject currently speaks Spanish ~10% of the time.

Testing procedure

The following tests were administered in a single session:

(1) *Spontaneous speech test 1*: description of a picture (Plate # 1 from the Boston Diagnostic Aphasia Examination; Goodglass & Kaplan, 1983);
(2) *Spontaneous speech test 2*: reporting something (e.g. the content of two university courses that he is currently taking);
(3) *Reading*: English and Spanish texts with a similar topic (literature analysis) and similar level of difficulty, each one containing 646 words;
(4) *Boston Naming Test*: English and Spanish (Kaplan, Goodglass, & Weintraub, 1978, 1996);
(5) *Verbal fluency in two condition*: (a) Category/Semantic (to tell as many as possible words in 1 minute; two categories were used: animals, fruits); (b) letter/phonological (to tell as many words beginning with the letters F, A, S and M as possible in 1 minute);
(6) *Language repetition*: taken from the Multilingual Aphasia Examination English and Spanish versions (Benton & Hamsher, 1976; Rey & Benton, 1991);
(7) *Peabody Picture Vocabulary Test*: English and Spanish versions (Dunn & Dunn, 2007; Dunn, Padilla, Lugo, & Dunn, 1986). This test was administered to have some additional information about the subject's bilingualism level. Because of the characteristics of the test, no oral answer is required: and
(8) *Vocabulary sub-test from the WAIS-III* English and Spanish (Wechsler, 1997; 1999) version.

Order of administration was randomly selected, but Spanish and English were given in an alternating way. The order of administration was:

(1) Boston Naming Test: English,
(2) Repetition Spanish,
(3) Spontaneous Speech 1 English,
(4) Vocabulary Spanish,
(5) Peabody Vocabulary Test English,
(6) Reading Spanish,
(7) Vocabulary English,
(8) Spontaneous Speech 1 Spanish,
(9) Repetition English,
(10) Verbal fluency Spanish,

(11) Reading English,
(12) Spontaneous speech 2 Spanish,
(13) Verbal fluency English,
(14) Boston Naming Test Spanish,
(15) Spontaneous Speech 2 English and
(16) Peabody Vocabulary Test Spanish.

Once the formal testing was completed, an informal conversation both in Spanish and in English was conducted ('Conversation' condition); the topic of this informal conversation was the participant's experience with stuttering. This closing conversation was also recorded and used as additional data for analysis. The Spontaneous Speech and Conversation conditions were transcribed by a bilingual Spanish/English assistant. Transcriptions were double checked by the authors. Any discrepancies found were discussed and then resolved by the first two authors in conjunction. Transcriptions were then entered into a spreadsheet with utterances separated into Terminable Units. (A T-Unit is equivalent to a sentence with all of its subordinate clauses. Coordinated clauses are separated into different T-units; see Gutiérrez-Clellen, Restrepo, Bedore, Peña, & Anderson, 2000.) Each T-unit was then coded by two graduate assistants (one for English and one for Spanish) for number of words, number of clauses, grammatical category of each word, grammatical category of stuttered words, number of stuttering events, type of stuttering event, number of fillers and whether stuttering/filler occurred in the beginning of sentences or clauses. Counted as stuttering events were phonemic prolongations, phonemic repetitions, part-word and whole-word repetitions. Each repetition type was counted only once regardless of the number of repetitions. Blocks were not observed and fillers were not counted as stuttering events, but rather analysed as an associated speech abnormality (see Table I).

Coding for Spanish transcriptions was checked by the first author and for English transcriptions by the second author, and discrepancies were resolved by the two authors in conjunction.

Table I. General characteristics of the 'spontaneous speech' and 'conversation' conditions.

	Spontaneous speech 1		Spontaneous speech 2		Conversation		All conditions	
	Eng	Span	Eng	Span	Eng	Span	Eng	Span
Total number of words	91	59	289	87	872	282	1252	428
Total number of T-units	7	7	25	6	67	30	99	43
Mean length of T-units (in words)	13	8.43	11.56	14.5	13	9.72	12.6	9.95
Index of complexity (mean # clauses per unit)	1.86	1.29	2.08	1.66	2.3	1.83	2.21	1.67
Total number of fillers	11	8	50	27	70	57	131	92
Fillers per T-unit	1.86	1.14	2	3.86	1.04	1.97	1.32	2.14
Total number of stuttering moments	4	9	44	15	115	61	163	85
% of stuttered words	4	15	15	17	13	21	13	20
Stuttering moments per T-unit	.57	1.28	1.76	2.5	1.72	2.03	1.64	1.97
% phonemic prolongations	11.1	0	2.27	0	1.74	6.55	2	6
% phonemic repetitions	0	0	0	6.67	.87	4.92	.6	5
% part-word repetition	25	0	11.36	20	12.2	16.4	13	15
% part-word 1 syllable	100	0	40	100	92.9	100	76	100
% whole-word repetition	75	88.89	86.36	80	85.2	72.1	65	75
% whole-word 1 syllable	100	100	100	91.67	100	79	100	83

Note: Eng = English; Span = Spanish.

Results

Table II presents the general results in the different formal tests that were administered. In all the tests, scores were higher in English than in Spanish. Excepting Verbal–letter condition, scores can be considered as normal. No question, English was the dominant language and Spanish the non-dominant language. His score on the Boston Naming Test–Spanish, was 34/60, usually considered as normal in bilinguals' non-dominant language (Rosselli, Ardila, Santisi, Arecco, Salvatierra, & Conde, 2002). Dysfluencies were absent or minimal in all these tests, excepting WAIS-III Vocabulary. Furthermore, in reading, no stuttering episode was observed either in English or Spanish.

Table I presents the characteristics of the two spontaneous speech and conversation conditions. As observed, the amount of speech produced was notoriously higher in English than in Spanish: while the total number of words in these three conditions was 1252 in English, it was only 428 in Spanish; that is, he used almost three-times more words in English than in Spanish; overall speech rate was higher in English than in Spanish: ~ 104 words/minute in English and 42 words per minute in Spanish; this difference was related with the introduction of longer pauses in Spanish than in English. Language complexity was higher in English than in Spanish, according to the Mean Length of Terminable Units (T-units, Gutiérrez-Clellen et al., 2000)

Table II. General results in the different tests.

	Score	Raw score	Scaled score	Dysfluencies	Standard score
Boston Naming Test					
Spanish	34/60			3	
English	58/60			0	
Peabody					
Spanish		117 (125)			na
English		216 (228)			114
Language repetition					
Spanish	8 (percentile ~50)			2	
English	14 (percentile ~95)			0	
Vocabulary (WAIS-III)					
Spanish			9	17	
English			16	9	
Verbal fluency (semantic)					
Spanish					
Animals	19			0	
Fruits	9			0	
English					
Animals	29			0	
Fruits	10			0	
Verbal fluency (letter)					
Spanish					
F	5			0	
A	3			0	
S	5			0	
M	3			0	
English					
F	5			0	
A	2			0	
S	7			0	
M	4			0	

and the Index of Sentence Complexity (mean # of clauses per T-unit). Stuttering was more evident in Spanish than in English: the number of stuttering moments per T-unit was between .57–1.76 in English, whereas in Spanish it was between 1.28–2.50. Fillers per T-unit were 1.32 in English and 2.14 in Spanish. Dysfluency types were very similar in English and Spanish, with the greatest percentage being whole-word repetition (65% in English and 75% in Spanish) followed by part-word repetitions (13% in English and 15% in Spanish). Phonemic prolongations and repetitions were more frequent in Spanish than in English (11 vs. 2.6%).

Figure 1 presents the percentage of words stuttered in English and Spanish, and the stuttering moments per T-unit in English and Spanish. It is observed that, according to Percentage of Words Stuttered, stuttering in English was observed in ~13% of the words (4%, 15% and 13% in the three conditions); while in Spanish it was found in ~20% of the words (15%, 17% and 21%); that is, stuttering in Spanish was ~1.54-times more frequent than in English. According to Stuttering Moments per T-Unit, stuttering in English averaged 1.64 (.57, 1.76 and 1.72); while in Spanish they averaged 1.97 (1.28, 2.50 and 2.03); that means that Stuttering Moments per T-Unit were 20% more frequent in Spanish than in English.

Table III shows the percentage of stuttering by grammatical category. Several general conclusions can be drawn: (1) stuttering in nouns was most infrequent; it was absent in English and

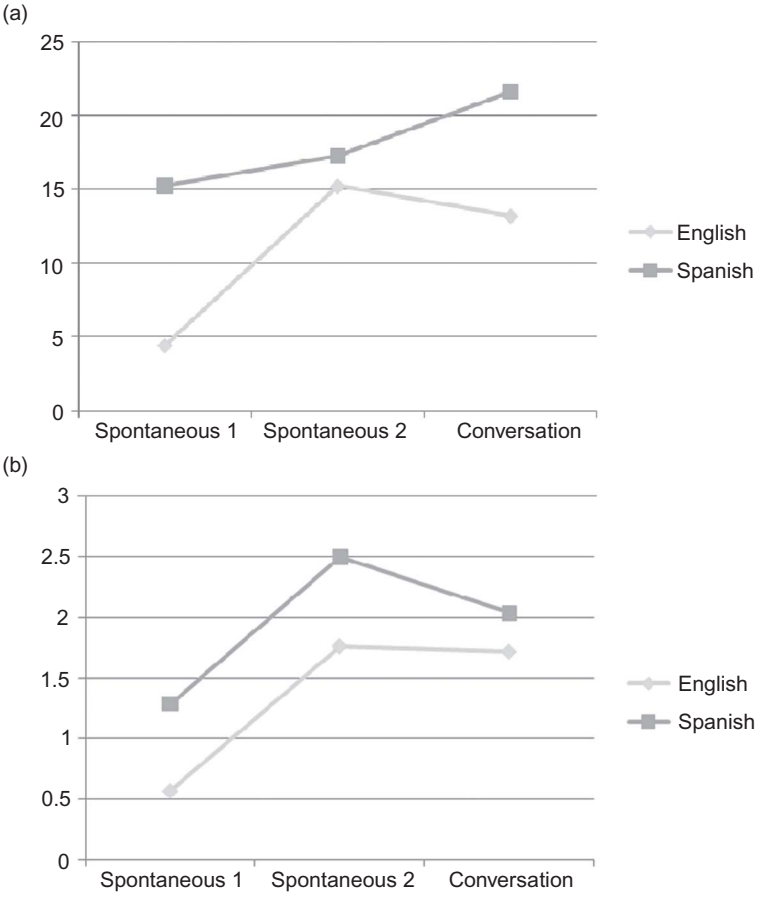

Figure 1. Percentage of stuttered words (a) and stuttering moments per T-units (b) in English and Spanish.

Table III. Percentage of stuttering by grammatical category (each spontaneous condition separate and all three conditions combined).

	Spontaneous speech 1		Spontaneous speech 2		Conversation		Combined	
	Eng	Span	Eng	Span	Eng	Span	Eng	Span
Nouns	0	0	0	0	0	2	0	1.15
Verbs	7.69	0	9.8	18.2	7.84	18	8.29	15.71
Auxiliaries (plus aux verbs)	14.3	0	8.33	50	28.9	25	23.94	16.7
Adjectives	0	0	5.26	33.3	5.08	11.1	4.82	17.24
Adverbs	0	0	7.14	25	5.97	35.7	6.18	34.37
Conjunctions	0	50	11.5	25	7.69	14.7	8.25	17.5
Pronouns	0	20	12.8	0	15.9	18.8	14.65	18.9
Prepositions	6.67	33.3	29.2	15.8	13.4	15.2	10.61	17.24
Determiners (articles/demonstratives)	6.67	30	34.8	22.2	8.77	33.3	14.73	29.03
Others (quantifiers, infinitival to, negative)	0	6.67	16.7	0	28	46.7	25.86	52.63

observed in only 1.15% of Spanish nouns; (2) Stuttering in adjectives, adverbs and conjunctions occurred at least twice as often in Spanish as in English; (3) in a less consistent way, stuttering was observed in verbs more frequently in Spanish than in English; (4) in general, stuttering in both languages was more frequent in function (i.e. prepositions, pronouns, auxiliary verbs, conjunctions, determiners, quantifiers, particles and infinitival 'to') than in content (i.e. nouns, verbs, adjectives and adverbs) words. This difference was statistically significant for English ($\chi^2 = 24.11$; $df = 1$; $p = .001$) but not for Spanish ($\chi^2 = 1.32$; $df = 1$; $p =$ ns).

All subsequent analyses were done using the 'conversation condition' because this was the condition where most stuttering occurred (Table IV).

To pinpoint the effect of vowel vs. consonant initiated words, word-length and phonetic complexity, the initial segment of the 'conversation' condition (208 words in English and 210 words in Spanish) was selected. Table V presents the association between stuttering and

Table IV. Percentage of stuttering at the beginning of a sentence or clause in both languages ('conversation' conditions).

	T-units	Stuttered moments	Stuttering beginning	Percentage
English	67 (872 words)	79	21	26.6
Spanish	30 (282 words)	48	17	35.4

Table V. Percentage of stuttering in vowel and consonant initiated words in both languages ('conversation' conditions).

	Vowel initiated			Consonant initiated		
	Total	Stuttered	Percentage	Total	Stuttered	Percentage
English	55	6	10.91	153	13	8.50
Spanish	92	16	17.39	118	16	13.56

Table VI. Association between word-length and stuttering ('conversation' conditions).

	English			Spanish		
	Total	Stuttered	Percentage	Total	Stuttered	Percentage
1-phoneme	16	1	6.25	14	3	21.43
2-phoneme	57	9	15.79	63	15	23.81
3-phoneme	56	7	12.5	34	4	11.76
4-phoneme	29	1	3.45	35	2	5.71
5-phoneme	15	0	0	25	5	20.00
6-phoneme	15	1	6.67	19	2	10.53
6 < phoneme	20	0	0	20	1	5.00
Total	208	19		210	32	

vowel and consonant initiated words in both languages. For both languages, stuttering was more frequent (by ~25–30%) in vowel initiated words than in consonant initiated words. However, this difference was not statistically significant for English ($\chi^2 = .27$; $df = 1$; $p = \text{ns}$) or Spanish ($\chi^2 = .20$; $df = 1$; $p = \text{ns}$). Distribution was similar in English and Spanish.

The association between word-length and stuttering was further analysed (Table VI). In English, the majority of the stuttered words (17/19 = 89.5%) contain one-to-three phonemes; in Spanish one-to-three phoneme words represent 68.8% (22/32) of stuttered words.

Finally, the IPC was calculated following the procedure described by Dworzynski and Howell (2004) and Howell and Au-Yeung (2007). Two logistic regression analyses were performed to assess whether IPC significantly predicted the stuttering of a word in Spanish and in English. Table VII presents the summary of this analysis both for English and for Spanish and Figure 2 illustrates the association between phonetic complexity and stuttering ('conversation' condition). Results showed that IPC was not significant for English and marginally significant for Spanish. Nonetheless, the prediction was in a negative direction: The higher the IPC, the lower the stuttering probability.

Discussion

Although the patient was a simultaneous Spanish/English bilingual, with English as a dominant language, it was evident that stuttering was more frequent in Spanish than in English. Several explanations could be proposed for this observation: (1) stuttering in general is more severe in the less dominant language (Jankelowitz & Bortz, 1996; Lim et al., 2008); in our case, Spanish was the native language but currently English was clearly the dominant one; (2) The subject received therapy in English and, hence, his control of stuttering in English was more efficient

Table VII. Logistic regression analysis using IPC as the independent variable and stuttering as the dependent variable for Spanish and English.

	Variables in the equation					
	B	*SE*	Wald	*df*	Sign.	Exp(B)
Spanish	−.267	.132	4.098	1	.043	.765
English	−.263	.153	2.953	1	.086	.769

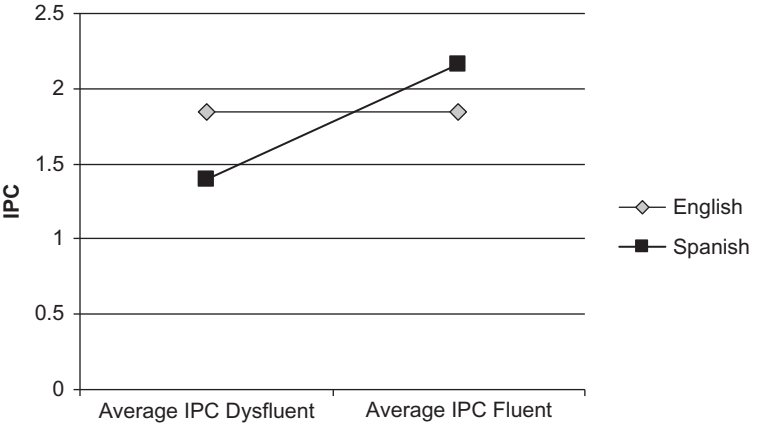

Figure 2. Association between phonetic complexity and stuttering ('conversation' condition).

than in Spanish and (3) Because of a diversity of linguistic reasons (e.g. stress characteristics, word length, speech rate, etc.) stuttering probability in Spanish is higher than in English.

Although there are no comparative epidemiological studies of stuttering in Spanish and English, the prevalence of self-reported stuttering in Spanish seems too high (2% according to Ardila et al., 1994), compared with the usually accepted prevalence of stuttering in English (.8–1% according to the DSM-IV; APA, 1994). Interestingly, in the four Cuban-American male adolescents studied by Dale (1977), all of them proficient in Spanish and English, none exhibited dysfluent speech when speaking English, while varying degrees of dysfluency were observed in Spanish. By the same token, in the balanced bilingual described by Bernstein Ratner and Benitez (1985), it was found that not only was it harder for this subject to initiate sentences or clauses in Spanish than in English, but also the conjunction and clause initial dysfluencies were twice as frequent in Spanish as in English; and, in general, stuttering appeared more severe in Spanish than in English. It has been suggested that stuttering prevalence varies across different languages (e.g. Perello, 1995); for instance, it may be lower in tonal languages. It could be suggested that, because of some linguistic reasons, Spanish represents a language with a high prevalence of stuttering. It is not simple, however, to pinpoint which are the specific linguistic reasons that make Spanish a language with an increased prevalence of stuttering; nonetheless, it could be speculated that the evident syllabic structure, making Spanish an overtly syllable-timed language (Berg, 1991), may increase the likelihood of dysfluencies. However, only comparative studies of stuttering in different types of languages can clarify the linguistic reason accounting for the different distribution of stuttering across languages.

These three explanations (i.e. stuttering in general is more severe in the less dominant language; subject's control of stuttering in English was more efficient than in Spanish; stuttering probability in Spanish is higher than in English) are not contradictory, and all of them may have contributed to the disproportionately higher frequency of stuttering in Spanish.

Similarities and differences in the stuttering pattern in both languages were observed. For both languages stuttering was observed specially in 'spontaneous speech' and 'conversation' conditions; it was lower in the WAIS-III Vocabulary sub-test (i.e. defining words); it was absent in English and minimal in Spanish in naming (Boston Naming Test); and it was absent in both languages during the verbal fluency tests and reading conditions.

In general, stuttering in both languages was more frequent in function than in content words, but more so in English; stuttering in adjectives, adverbs and conjunctions occurred at least twice as often in Spanish than in English; these differences are congruent with the suggestion that there are differences in the loci of dysfluencies between English and Spanish due to their specific linguistic characteristics proposed by Bernstein Ratner and Benitez (1985). These authors also found a different distribution of stuttering in different grammatical categories; for instance, they reported that stuttering in conjunctions in Spanish was twice as frequent as in English, exactly coincidental with our results.

For both languages, stuttering was more frequent in vowel-initiated words than in consonant-initiated words, although stuttering in vowel-initiated words was slightly higher in Spanish than in English. Also, stuttering was more likely in longer words in Spanish than in English; in English, stuttering was observed mostly in short (one-to-three phonemes) words. Although the percentage of stuttering in shorter words was smaller in Spanish, this is still a high percentage, especially considering that Spanish has fewer short words than English. It is likely that this bias towards shorter words is due to the higher occurrence of stuttering in function words in both languages.

We found that there is no significant association between IPC and stuttering probability. The stuttered language sample that we used for this analysis was composed almost exclusively by function words. This finding is congruent with Howell and Au-Yeung's (2007) report that stuttering on function words for Spanish does not correlate with IPC score in children and is also similar to the observation for English that stuttering in function words is not affected by phonetic complexity.

Noteworthy, whether in English or Spanish, our case study does not support the four basic speech/language factors proposed by Brown (1945) to determine whether words will be spoken dysfluently by individuals who stutter. We found that function words were more prone to stuttering than content words; stuttering was observed especially in short words; in only ~30% of the cases (26.6% in English and 35.4% in Spanish) stuttering was observed at the beginning of a sentence or clause (although our subject used a significant amount of fillers in the beginning of sentences that potentially may have helped him avoid stuttering) and stuttering was more frequent in vowel- than consonant-initiated words.

In conclusion, when comparing stuttering in two different languages in the very same subject, it is possible to find similarities in the stuttering pattern, suggesting general stuttering laws; but also differences, associated not only with the linguistic idiosyncrasies of each one of the languages, but also with the individual's mastery of each language and bilingualism characteristics.

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