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Disfluencies of 3- and 5-year old Spanish-speaking children

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Abstract

This study examined the disfluent speech of 32 normally fluent monolingual, Spanish-speaking children from Puerto Rico. The total frequencies and types of speech disfluencies were examined in 15 children (8 girls and 7 boys) aged 3;5–4;0 years ($M = 3.76$) and 17 children (8 girls and 9 boys) aged 5;0–5;5 years ($M = 5.18$). When examining the total frequencies of speech disfluencies, results revealed no main effects for age or gender as well as no interactions. Moreover, no differences were observed between the age groups in most of the disfluency types, including the rank orders of the types. Revisions, interjections, and single-syllable word repetitions were the most frequently observed speech disfluencies for both age groups. Broken words, blocks, and repetitions of more than one syllable were the least frequent. Overall, results revealed both similarities and differences when compared with the reported speech behaviors of English-speaking children.

Educational objectives: The reader will learn about and be able to describe: (1) the influence of age and gender on the total frequencies of speech disfluencies in 3- and 5-year old Spanish-speaking children from Puerto Rico; (2) the amount and type of difluencies in these young children; and (3) how the speech disfluencies of these Spanish-speaking children are similar to and different from those reported in the speech of English-speaking children.

Keywords: Stuttering; Disfluencies; Spanish-speaking; Preschoolers

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Over the years, much research has been completed examining the speech disfluencies of normally fluent young children. Many of these studies have been completed in an effort to better understand the expected behaviors of young children (e.g., Branscom, Hughes, & Oxtoby, 1955; Davis, 1939; DeJoy & Gregory, 1985; Egland, 1955; Haynes & Hood, 1977; Hubbard & Yairi, 1988; Wexler, 1982; Wexler & Mysak, 1982; Yairi, 1981; Yairi & Clifton, 1972; Yairi & Jennings, 1974). In addition, numerous reports have described disfluent behaviors in order to identify early stuttering and predict persistent stuttering (e.g., Ambrose & Yairi, 1999; Hubbard & Yairi, 1988; Johnson et al., 1959; Mansson, 2000; Meyers, 1986; Pellowski & Conture, 2002; Throneburg & Yairi, 2001; Yairi, 1997; Yairi & Ambrose, 1992; Yairi, Ambrose, & Niermann, 1993; Yairi & Lewis, 1984; Zebrowski, 1991). Although the descriptions of early speech disfluencies in young children have been extensive, these investigations almost exclusively have focused on understanding the speech of English-speaking children from Anglo-European cultures. Because stuttering is a fluency disorder observed across languages and cultures (see reviews in Bloodstein, 1995; Cooper & Cooper, 1998; Shapiro, 1999; Van Borsel, Maes, & Foulon, 2001; Van Riper, 1971), there is value in understanding the disfluent speech of young children from culturally and linguistically diverse backgrounds. Some investigations of fluency in populations other than English-speaking Anglo-European children have included studies of African Americans (Brutten & Miller, 1988; Conrad, C.A., 1985 as cited in Conrad & Seymour, 1998; Anderson, B., 1981 as cited in Cooper & Cooper, 1998; Leith & Mims, 1975; Robinson, Davis, & Crowe, 2000), Asians (Toyoda, 1959, as cited in Cooper & Cooper, 1998) and Hispanics (Almonte, Lecaros, Schwalm, & Salen, 1987; Bernstein-Ratner & Benítez, 1985; Carlo, 1996; Cordero, Rodríguez, & Guerrero, 1992; Dale, 1977; Leavitt, 1974). In addition, Watson and Anderson (2001) have described the disfluent speech of Spanish-speaking children who are 2 and 3 years of age. As discussed in that report, further study of Spanish-speaking youngsters is needed for a number of reasons (Watson & Anderson, 2001). Given the influence of linguistic and cultural behaviors, attitudes, and beliefs on fluency (Cooper & Cooper, 1998; Shames, 1989; Watson, 2001; Watson & Kayser, 1994), one must be cautious in generalizing findings describing English-speaking children to other linguistic and cultural groups. Also, by understanding expected behaviors in normally fluent Spanish-speaking children, we will be better able to differentiate more and less typical behaviors and identify stuttering in this population. Moreover, the need to provide accurate identification of disordered speech in Spanish-speaking youngsters continues to grow as the numbers of Hispanics in the United States increase (U.S. Bureau of Census, 2000). Lastly, through cross-linguistic studies of fluent and disfluent speech, our understanding of fluency development in all young children, including those children who speak English, should be enhanced.

Many studies examining the qualitative and quantitative features of disfluencies in English-speaking children have assessed the influence of gender and age on disfluent speech. Although there are discrepancies among researchers' interpretations and much variability in research reports, some patterns in the disfluent speech of English-speaking children have been identified. No significant differences have been reported in the total number of speech disfluencies or in most disfluency types exhibited by English-speaking boys and girls (Ambrose & Yairi, 1999; Haynes & Hood, 1977; Kools & Berryman, 1971; Ratusnik, Kiriluk, & Melnick-Ratusnik, 1979; Yairi, 1981, 1982; Yairi & Lewis, 1984). However, since gender roles reportedly differ across cultures (Lynch & Hanson, 1998; Watson & Kayser, 1994) and disorders of fluency are seen more often in males (Bloodstein, 1995), the relationship between gender and disfluent speech in Hispanic, Spanish-speaking boys and girls merits study.

While gender has not been found to influence speech disfluencies in nonstuttering English-speaking children, age has been reported to significantly affect the frequency and types of disfluencies of these youngsters. The frequency of speech disfluencies reportedly decreases after the age of 3 years (Ambrose & Yairi, 1999; DeJoy & Gregory, 1985; Wexler & Mysak, 1982; Yairi, 1997). Specifically, DeJoy and Gregory (1985) observed a significant decrease in speech disfluencies in boys between the ages of 3.5 and 5 years. Also, investigators have noted decreases with age in specific types of speech disfluencies, including whole and part word repetitions, phrase repetitions, incomplete phrases and revisions, and dysrythmic phonations (i.e., prolongations, broken words, and blocks) (Ambrose & Yairi, 1999; DeJoy & Gregory, 1985; Haynes & Hood, 1977; Wexler, 1982; Wexler & Mysak, 1982; Yairi, 1981). Some disfluency types, on the other hand, have been reported to increase with age, including grammatical pauses (DeJoy & Gregory, 1985) and interjections (Haynes & Hood, 1977). Moreover, variability in the amounts and types of disfluencies exhibited by young children has been reported by a number of investigators (e.g., DeJoy & Gregory, 1985; Haynes & Hood, 1977; Wexler & Mysak, 1982; Yairi, 1981, 1997). Whether or not similar patterns in the amount and types of speech disfluencies are observed in Spanish-speaking children as they get older is unknown.

Therefore, the purpose of this current study was to describe the speech disfluencies of 3- and 5-year-old normally fluent Spanish-speaking children from Puerto Rico. Specifically, the study was designed to examine the influence of gender and age on the speech disfluencies of these young children. The following research questions were asked: (1) Are there differences in the total frequency of speech disfluencies exhibited by Spanish-speaking boys and girls? (2) Does the total frequency of speech disfluencies decrease with age? (3) Is there an interaction between gender and age on the total frequency of speech disfluencies? and (4) Are there differences in the speech disfluency types exhibited by the 3- and 5-year-old Spanish-speaking children?

1. Method

1.1. Participants

Thirty-two children enrolled in six different Head Start centers in eastern Puerto Rico, the Fajardo educational district, participated in the study. The younger group included 15 children (8 girls and 7 boys) aged 3;5–4;0 years (M = 3.76). The older group included 17 children (8 girls and 9 boys) who were 5;0–5;5 years (M = 5.18). All children were monolingual Spanish-speakers (based on parent and teacher reports that only Spanish was spoken at home and school) and born and raised in Puerto Rico with Puerto Rican parents. All participants had normal cognitive, social and psychomotor development as determined by Head Start screenings and no history of or parental/teacher concern about fluency disorders. All children passed a pure tone bilateral hearing screening at 25 dB for 1000, 2000, and 4000 Hz. Speech and language skills were screened by the first author, a Puerto Rican native Spanish speaker. Since no formal articulation tests were available to assess sound production of Puerto Rican Spanish-speaking children, a criterion reference screening procedure was used to determine age-appropriate articulation. Using speech sound acquisition reports for Spanish-speaking children from Puerto Rico (Anderson & Smith, 1987), picture stimuli were presented to examine sound production in single words. All participants demonstrated adequate production of all phonemes expected for their age. Grammatical skills were examined using the *Screening Test of Spanish Grammar* (*STSG*) (Toronto, 1973). All children participating in the study scored at or above the 50th percentile based on the test's norms for Puerto Rican children. Voice was informally assessed while completing screening tasks and determined appropriate for the children's age and gender for all participants. An oral peripheral exam revealed normal structures and function to support speech. In addition to these screening procedures, all children passed the language subtest included in the Head Start developmental screening. Moreover, all parents and teachers reported normal speech and language skills for all participants.

1.2. Procedure

A spontaneous speech sample was elicited within 1 week of the speech, language, and hearing screening and was obtained during a free-play interactive activity. Since Hispanic children reportedly may need more time to respond to an adult (Guitiérrez-Clellén, 1995; Toronto, 1976), all interactions were conducted with the same Puerto Rican native Spanish-speaking researcher who screened the children. Free-play interaction has been observed to be appropriate for fluency analysis (DeJoy & Gregory, 1985; Hubbard & Yairi, 1988; Wexler & Mysak, 1982; Yairi & Ambrose, 1992). In addition, spontaneous speech sampling has been suggested as an appropriate sampling technique with Puerto Rican Spanish-speaking

children ages 2 through 6 years (Anderson & Smith, 1987; Toronto, 1976). Spontaneous speech was defined as "speech which is initiated by the child in response to questioning, or speech which the child himself initiates in the presence of the examiner" (Toronto, 1976, p. 153). Screening procedures and speech sampling activities were conducted in the same room at the Head Start center the child attended. Interactions lasted 30 min, were audio and video recorded using a Sony cassette recorder, model TCM-86V and a VHS Panasonic video camera, model AG-190, and included the same materials (e.g., play food and cooking utensils, play phones) with all children.

Elicited samples were transcribed verbatim by the Puerto Rican Spanish-speaking researcher while first listening to the audiotapes and then while viewing the video taped interaction. The first 50 syllables were omitted from analysis. Targeted sample sizes for analysis were between 500 and 800 syllables. Samples analyzed ranged from 286 to 517 words and 529 to 750 syllables.[1] Disfluencies were identified in each sample using adaptations of classification systems described by DeJoy (1975), DeJoy and Gregory (1985), Yairi (1981), and Campbell and Hill (1987). Disfluency types identified included: single-syllable word repetitions, multi-syllabic word repetitions, sound repetitions, repetitions of one syllable, repetitions of more than one syllable,[2] phrase repetitions, interjections, revisions, incomplete phrases, unfinished words, broken words, prolongations, blocks, grammatical pauses, and ungrammatical pauses. (See the addendum to this report for descriptions and examples.)

To determine inter-observer reliability, a Puerto Rican, bilingual (Spanish-English) ASHA certified speech–language pathologist reviewed 20% of the samples (four samples from the younger group and three samples from the older group). Average unit-by-unit agreement ratios for disfluency location and disfluency type were 85 and 86%, respectively. To determine intra-observer reliability, the Puerto Rican researcher reanalyzed 20% of the samples (four samples from the younger group and three samples from the older group). This researcher had extensive clinical and research experience in the analyses of disfluencies in the speech of children who do and do not stutter. Average unit-by-unit agreement ratios for disfluency location and disfluency type were 99 and 98%, respectively. Higher rates of intra-observer agreement when compared with inter-observer rates may have been influenced by the Puerto Rican researcher's familiarity with dialectical differences in Puerto Rican Spanish as well as her familiarity with the speaking situation.

[1] Two 3-year old children were not included in the study due to limited speech samples of less than 500 syllables.

[2] Repetitions of one and more than one syllable are not conventionally separated when examining the disfluencies of English-speaking children. However, given that there is a greater proportion of multi-syllabic words in Spanish (Hodson & Paden, 1991) and there were greater opportunities for repeating more than one syllable, it was decided to distinguish these two types of disfluencies in this investigation.

Table 1
Total proportions of disfluencies per 100 syllables by age and by gender

	Boys		Girls		Both	
	n	*M* (S.D.), range	*n*	*M* (S.D.), range	*n*	*M* (S.D.), range
Younger group (3;5–4;0 years)	7	5.21 (2.66), 1.60–8.93	8	5.48 (1.35), 3.86–7.47	15	5.36 (1.99), 1.60–8.93
Older group (5;0–5;5 years)	9	5.53 (1.83), 3.37–8.93	8	8.26 (5.88), 2.98–18.88	17	6.65 (4.09), 2.98–18.88

No significant group differences ($P > 0.01$).

2. Results

2.1. Total speech disfluencies

Total speech disfluencies per 100 syllables for each child were calculated by dividing the sum of all disfluency types by the total number of syllables and multiplying this number by 100. Means, standard deviations, and ranges of the total disfluencies per 100 syllables for boys and girls in the younger 3-year-old group and older 5-year-old group are presented in Table 1. Means of total disfluencies ranged from 5.21 for the younger boys to 8.26 for the older girls. Review of the numbers and percentages of children across the range of total speech disfluencies (see Table 2) revealed that 87.5 and 75% of all the boys and girls, respectively, exhibited from 3.0 to 8.99 total speech disfluencies per 100 syllables. Likewise, 80 and 82.4% of the younger and older children, respectively, exhibited from 3.0 to 8.99 total speech disfluencies. For all age and gender groups,

Table 2
Distribution of frequency of total disfluencies per 100 syllables for boys, girls and both in the younger and older groups

	Total disfluencies per 100 syllables									
	0–2.99		3.0–5.99		6.0–8.99		9.0–11.99		>12	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%
Younger group										
Boys	2	28.6	3	42.9	2	28.6	0	0	0	0
Girls	0	0	4	50.0	3	37.5	1	12.5	0	0
Both	2	13.3	7	46.7	5	33.3	1	6.7	0	0
Older group										
Boys	0	0	6	66.7	3	33.3	0	0	0	0
Girls	1	12.5	4	50.0	1	12.5	0	0	2	25.0
Both	1	5.9	10	58.8	4	23.5	0	0	2	11.8

the most common frequency range of total speech disfluencies was between 3.0 and 5.99.

To determine the influence of age and gender on the frequency of total speech disfluencies, a 2×2 factorial design with two levels of gender and two levels of age was used. Analyses of variance for independent measures revealed no statistically significant differences in the total speech disfluencies exhibited by the boys and girls ($F = 1.83$; df $= 1$; $P = 0.19$) or by the younger and older age groups ($F = 1.28$; df $= 1$; $P = 0.2674$). In addition, no interaction effect between age and gender was observed ($F = 1.14$; df $= 1$; $P = 0.2958$).

2.2. Speech disfluency types

Frequency of speech disfluency types per 100 syllables for each child was determined by dividing the sum of each disfluency type by the total number of syllables and multiplying that number by 100. Means, standard deviations, and ranges of these disfluency types for each age group are presented in Table 3. As indicated by the standard deviations and ranges, high amounts of variability were observed in the types of speech disfluencies within each age group. In order to determine if there were differences in the proportions of disfluency types exhibited by the two age groups, a series of one-way analyses of variance for independent measures were completed. These analyses revealed no statistically significant differences between the two age groups for any of the disfluency types (see Table 3). Review of the

Table 3
Disfluency types per 100 syllables for younger and older age groups

	Younger group		Older group		*F*	*P*
	M (S.D.)	Range	*M* (S.D.)	Range		
Single-syllable word repetition	1.07 (0.72)	0.27–2.27	1.50 (1.3)	0.13–4.86	1.24	0.274
Revision	0.75 (0.43)	0.13–1.60	0.95 (0.72)	0.14–3.37	0.90	0.349
Interjection	0.76 (0.47)	0.13–1.73	0.89 (0.55)	0.13–2.03	0.52	0.477
Ungrammatical pause	0.32 (0.25)	0–0.84	0.64 (0.72)	0–2.62	2.76	0.107
One syllable repetition	0.51 (0.40)	0–1.33	0.42 (0.27)	0–1.13	0.56	0.462
Phrase repetition	0.36 (0.34)	0–1.16	0.44 (0.42)	0–1.36	0.43	0.519
Grammatical pause	0.27 (0.20)	0–0.67	0.52 (0.44)	0–1.68	4.07	0.053
Incomplete phrase	0.37 (0.27)	0–0.84	0.29 (0.28)	0–1.19	0.69	0.412
Unfinished word	0.29 (0.24)	0–0.93	0.28 (0.47)	0–1.90	0.01	0.907
Multi-syllable word repetition	0.33 (0.31)	0–1.07	0.18 (0.12)	0–0.40	3.25	0.082
Prolongation	0.08 (0.15)	0–0.53	0.27 (0.27)	0–1.12	5.37	0.027
Sound repetition	0.14 (0.15)	0–0.40	0.17 (0.20)	0–1.10	0.23	0.633
Broken word	0.07 (0.09)	0–0.27	0.05 (0.11)	0–0.40	0.24	0.627
Block	0.05 (0.12)	0–0.40	0.05 (0.11)	0–0.40	0.01	0.907
More than one syllable repetition	0.01 (0.04)	0–0.15	0.03 (0.06)	0–0.16	0.72	0.402

rank orders of the disfluency types revealed that for both groups, single-syllable word repetitions, revisions, and interjections were the most frequent disfluency types. Broken words, blocks and repetitions of more than one syllable were the least frequent types for both groups.

3. Discussion

Comparisons of the disfluent speech in the Spanish-speaking children in this study and reports of English-speaking children must be made with caution. Differences in the subject inclusion criteria may affect the amounts and types of disfluencies observed. For example, when identifying English-speaking children who do not stutter, some investigators include criterion of less than three stuttering-like disfluencies (i.e., part-word repetitions, single-syllable word repetitions, and disrhythmic phonation) per 100 syllables (e.g., Ambrose & Yairi, 1999). When such criteria are used to identify normally fluent children, the resulting amounts and types of disfluencies are impacted (see Wingate, 2001). Since the purpose of the current study was to examine the frequency and types of disfluencies in these two age groups of Spanish-speaking children, no disfluency criteria beyond ruling out the presence of a stuttering problem through researcher observation and teacher and/or parent report were used to identify the participants in the study.

In addition to differences in subject selection, the samples analyzed in this study differ from those examined in some reported studies of English-speaking children. Specifically, in the present study, all utterances after the first 50 utterances were included; whereas in other investigations, shorter responses (e.g., isolated affirmatives and negatives, incomplete sentences) were omitted (Ambrose & Yairi, 1999; Haynes & Hood, 1977). The decision to include all utterances in this current study may have impacted the length of the children's response, which, along with complexity, has been shown to affect disfluencies in English-speaking children who do and do not stutter (e.g., Gaines, Runyan, & Meyers, 1991; Gordon, 1991; Gordon, Luper, & Peterson, 1986; Howell & Au-Yeung, 1995; Kadi-Hanifi & Howell, 1992; Logan & Conture, 1997; Logan & LaSalle, 1999; Melnick & Conture, 2000; Yaruss, 1999; Yaruss, Newman, & Flora, 1999). Although not the focus of this current investigation, the mean length of response (MLR) was determined for the two age groups. Utterances ranged from 1 to 21 words, with an average MLR of 2.99 (range = 2.06–4.32) in the younger group and from 1 to 24 words, with an average MLR of 3.57 (range = 2.94–5.57) in the older group. Although the difference in MLR was not statistically tested, it appeared not to be substantial. The similarity in the MLRs between the younger and older group may not necessarily reflect comparable linguistic abilities in the two groups, but rather possible cultural influences related to the sampling techniques and the interaction between the examiner and the child. Speech styles of Hispanic children vary according to interaction partner (Fantini as cited in Kayser, 1998).

Although the children in this current study had met with the examiner for speech, language, and hearing screenings prior to obtaining speech samples for analysis, the child's level of cultural awareness and experiences in interacting with unfamiliar adults may have impacted the interactions and subsequent samples obtained.

With these caveats in mind, comparisons with earlier reports of English-speaking children reveal both similarities and differences. The finding that there were no differences in the total speech disfluency frequencies in the Spanish-speaking boys and girls is consistent with reports of English-speaking, Anglo-European children (Ambrose & Yairi, 1999; Haynes & Hood, 1977; Kools & Berryman, 1971; Yairi, 1981, 1982; Yairi & Lewis, 1984) and African-American children (Brutten & Miller, 1988; Ratusnik et al., 1979). However, unlike reports of English-speaking children, there were no significant differences in the frequencies of total disfluencies between the 3- and 5-year-old Spanish-speaking children. The majority of the children in both groups (80 and 82.3%, respectively) exhibited between 3.0 and 8.99 disfluencies per 100 syllables. Moreover, comparisons of the younger and older groups revealed no statistically significant differences in the frequencies of the different disfluency types. These findings differ from the decreases in total disfluencies with an increase in chronological age that have been reported in English-speaking children (DeJoy & Gregory, 1985; Wexler, 1982; Wexler & Mysak, 1982; Yairi, 1997). In addition, many studies of English-speaking youngsters have suggested that there are significant decreases across age groups in the frequency of certain types of disfluencies while other types increase (Ambrose & Yairi, 1999; DeJoy & Gregory, 1985; Wexler, 1982; Wexler & Mysak, 1982). It is possible that the relationship between age and disfluency is different for Spanish- and English-speakers. However, other explanations for these disparate outcomes should be considered.

First, many of the English studies examined children with at least 18 months between the age groups and compared children younger than 3 years of age with older children (e.g., Wexler, 1982; Wexler & Mysak, 1982). It is possible that when including groups with a greater age range and with greater differences between age groups, the influence of age on the Spanish-speakers' disfluency types and amounts may be apparent. In fact, increases in the total amounts and certain types of disfluencies have been observed in 3-year-old Spanish-speaking children when compared with 2-year olds (Watson & Anderson, 2001). To better understand the relationship between age and disfluent speech in Spanish-speakers, behaviors in children across many years (e.g., from 2 years through 8 years) merit study.

Another possible explanation for no significant decreases with age deals with the great variability in the behavior of the Spanish-speaking children in both age groups. Similar to observations of English-speaking youngsters (e.g., Ambrose & Yairi, 1999) and those of younger Spanish-speaking children (Watson & Anderson, 2001), substantial differences across children in the total frequencies of disfluencies were noted in both age groups. Of particular interest were two

girls in the older group whose total frequencies (i.e., 14.2 and 18.9) per 100 syllables were markedly higher than the next highest total of 9.4 per 100 syllables. It may be that these girls were not "normally fluent" but actually exhibiting early stuttering. However, interestingly, neither the girls' teachers nor their parents considered them to have any speech or stuttering problems. Inclusion of parent report when identifying normally fluent children is not an uncommon practice (e.g., Ambrose & Yairi, 1999; Pellowski & Conture, 2002; Yairi, 1981; Zebrowski, 1991). Moreover, in English-speaking mothers, some disfluent behaviors are consistently identified as stuttered speech, whereas other behaviors are not (e.g., Zebrowski & Conture, 1989). It is possible that, for the cultural group examined in this study, there are different perceptions about speech disfluency and stuttering. Although the Hispanic culture is very heterogeneous (Kayser, 1998), some beliefs and perceptions about illnesses have been identified in this culture and differ from beliefs of English-speaking Anglo-European cultures (Kayser, 1998; Reyes, 1995; Zuniga, 1998). It is possible that the parents in this study did not perceive these increased prolongations and disfluency rates as less typical, suggesting a greater tolerance for higher frequencies of disfluent speech. On the other hand, it may be that the parents perceived their child's speech as less typical, but they did not acknowledge this problem. Given the importance of parent perception and the differences in values and beliefs across cultures, additional study is needed assessing the parents' perceptions of their Spanish-speaking children.

In addition to insights about the influence of age and gender, results of this investigation provide preliminary information about the frequency and types of speech disfluencies in young Spanish-speaking children. The means of total disfluencies per 100 syllables for these 3- and 5-year-olds were 5.36 and 6.65, respectively, which fell within the reported converted average frequency range of 5.22–6.96 per 100 syllables for English-speaking preschoolers (Yairi, 1997).[3] It is interesting to note, however, that only 13 of the 32 Spanish-speaking children (i.e., 40.6%) exhibited between 5.22 and 6.96 disfluencies per 100 syllables. Nineteen (9 in the younger group and 10 in the older group) of the 32 children had more or less speech disfluencies than the expected range for English-speaking preschoolers. This observation underscores the variability in the total disfluencies observed across the children, an observation often reported about the speech of English-speaking children (e.g., DeJoy & Gregory, 1985; Haynes & Hood, 1977; Wexler & Mysak, 1982; Yairi, 1981). Clinicians should be cautious in using averages and group data in making clinical decisions about what is appropriate or expected behaviors for an individual child, a caution expressed when examining younger Spanish-speaking children as well (see Watson & Anderson, 2001). In addition, this variability suggests that the consistency of

[3] This converted average frequency range reflects the conversion of the mean disfluencies per 100 words reported in Yaruss's (1999) review of studies of English-speaking children and is based on suggested conversion rates of dividing the words by 1.15 (Conture, 2001; Yaruss, 2000).

disfluent behaviors within children needs further study, including the incorporation of different elicitation contexts, different topics, and different partners (e.g., mothers, peers). Fluctuations in mood, topic and stuttering behaviors all have been identified as affecting spontaneous speech samples (e.g., Ambrose & Yairi, 1999).

In addition to the total frequencies, the types of disfluencies observed in both groups of Spanish-speaking children were similar to the reported behaviors of young English-speaking children (Ambrose & Yairi, 1999; Haynes & Hood, 1977; Johnson et al., 1959; Meyers, 1986; Wexler & Mysak, 1982; Yairi & Jennings, 1974; Zebrowski, 1991). Single-syllable word repetitions, interjections, and revisions were frequent in both groups of Spanish-speaking children, whereas broken words and blocks were infrequent.

In addition, for both the 3- and 5-year-old Spanish-speakers, syllable repetitions of more than one repeated unit was the least observed behavior, and not a typical behavior for these youngsters. Additional study is needed of a number of qualitative and quantitative features of the various disfluencies in Spanish, including the number of units repeated, disfluency length, and clustering of disfluencies. Such features have been examined in speech of English-speaking children (e.g., Davis, 1939; Hubbard & Yairi, 1988; Meyers, 1986; Logan & LaSalle, 1999; Zebrowski, 1991) and may serve to differentiate normally fluent Spanish-speaking children from those who stutter.

In addition, future study should examine multi-syllabic word repetitions, which, in this study, averaged 0.33 and 0.18 per 100 syllables in the younger and older groups, respectively. Due to the infrequency of multi-syllabic word repetitions in English, many studies combine this disfluency type with other types of disfluencies (e.g., Ambrose & Yairi, 1999; Wexler, 1982), making it difficult to compare the results of the current study with those of English-speaking children. Nevertheless, these frequencies seemed higher than what has been reported in English-speaking preschoolers (e.g., 0.01 by Yairi & Lewis, 1984 and 0.09 by Hubbard & Yairi, 1988). These increased rates may reflect the higher occurrence of multi-syllabic words in Spanish (Hodson & Paden, 1991), and, hence, additional opportunities for repeating such words.

Finally, this study provides some preliminary insights into the disfluent speech of young Spanish-speaking children from a specific group in Puerto Rico. One should be cautious in making generalizations to and comparisons with children from other economic groups, children from other Spanish-speaking groups (e.g., Mexican, Cuban, Central and South Americans), and children who are bilingual Spanish–English speakers. In an effort to negate the influence of English, this study focused on monolingual Spanish-speaking children. Although many studies have focused on similar populations (Kayser, 1998), the outcomes of studies that include only monolingual children cannot be generalized to bilingual English–Spanish speakers. Further systematic study of bilingual speakers is needed and generalizations from results of this present study should be limited to monolingual populations described in this investigation.

Appendix A. Types of disfluencies (*examples*)

Single-syllable word repetition	Repetition of whole one syllable word. (*La-la niña.*)
Multi-syllabic word repetition	Repetition of words of more than one syllable. (*La niña-niña es bonita.*)
Sound repetition	Repetition of a phoneme that does not stand alone as an intended syllable or word. (*La nina esta c-comiendo. Yo o-oigo todo.*)
Repetition of one syllable	Repetition of a syllable that includes the whole syllable or part of it. The nucleus (vowel) must be repeated. Repetitions of part of a monosyllabic word (consonant and vowel) are also considered repetition of one syllable. (*La ni-niña. La ti-tierra. Ma-más.*)
Repetition of more than one syllable	Repetitions of two or more syllables of a multi-syllabic word. (*La niña está comi–comien–comiendo*)
Phrase repetition	Repetition of two or more words, with no revision or modification of the content. (*La niña-la niña es bonita.*)
Interjection	Insertion of sounds, syllables, words, or phrases within an utterance. These insertions are not associated with the fluent or meaningful text and are not part of the intended message. (*La niña* (*hm*) *es bonita.*)
Revision	Modification in the content or grammatical form of an utterance. Revision also includes changes in the pronunciation of a word. (*La niña estaba-está comiendo.* [*estaba*:was] *La niña está go-comiendo.*. [pronunciation])
Incomplete phrase	Phrase in which the thought is not completed, and is not a repetition or revision. Incomplete phrase may occur at the end of an utterance or could be followed by an unrelated phrase or sentence, as indicated by the context. (*Yo estaba-la niña es bonita.* [*Yo estaba*: I was])

Unfinished word	A word that is not pronounced completely and is not followed by a repetition or a revision. (*La ni-*)
Broken word	Momentary cessation of phonation within words. (*La ni* ∼ *ña*.)
Prolongations	Audible prolongations of sounds within or at the end of words that are judged to be not intended. (*La n* → *iña*.)
Block	Audible tension at the onset of vowels or consonants. Intentional increases in loudness or articulatory movements for emphasis are not classified as blocks. (*La niña êstá comiendo*.)
Grammatical pause	Silent pauses of 1 s or longer in duration that occur within an utterance at grammatical junctions, such as immediately before coordination or subordinating conjunctions, before relative or interrogative pronouns, before adverbial clauses of time, manner, and place, when complete parenthetical references are made, and before articles or pronouns. (*La niña* ∼ *y el niño*. *La niña quiere* ∼ *que la ayudes a comer*. *La niña come mucho* ∼ *cuando quiere*. ∼ *Como estaba diciendo, la niña es bonita*. ∼ *La niña quiere que* ∼ *la ayudes a comer*.)
Ungrammatical pauses	Silent pauses of 1 s or longer in duration that occur at nongrammatical points in the flow of speech. (*La niña está* ∼ *comiendo*.)

References

Almonte, C., Lecaros, S., Schwalm, E., & Salen, A. (1987). Aspectos clínicos y priscopatológicos de la tartamudez precoz patológica [Clinical and psychopathological aspects of early pathological stuttering]. *Revista Chilena de Pediatría, 58*(6), 456–460.

Ambrose, N. G., & Yairi, E. (1999). Normative disfluency data for early childhood stuttering. *Journal of Speech, Language and Hearing Research, 42*, 895–909.

Anderson, R., & Smith, B. (1987). Phonological development of two-year-old monolingual Spanish speaking children. *Journal of Child Language, 14*(1), 57–58.

Bernstein-Ratner, N., & Benítez, M. (1985). Linguistic analysis of a bilingual stutterer. *Journal of Fluency Disorders, 10*, 211–219.

Bloodstein, O. (1995). *A handbook on stuttering* (5th ed.). San Diego: Singular Publishing Group.

Branscom, M., Hughes, J., & Oxtoby, E. (1955). Studies of nonfluency in the speech of preschool children. In W. Johnson & R. Leutenegger (Eds.), *Stuttering in children and adults* (pp. 157–180). Minneapolis: University of Minnesota Press.

Brutten, G. J., & Miller, R. (1988). The disfluencies of normally fluent black first graders. *Journal of Fluency Disorders, 13*, 291–299.

Campbell, J. H., & Hill, D. G. (1987). *Systematic disfluency analysis*. Poster session presented at the annual convention of the American Speech-Language-Hearing Association, New Orleans, LA.

Carlo, E. (1996). *Normal disfluency behaviors of Spanish-speaking Puerto Rican preschoolers*. Unpublished master's thesis, Texas Christian University, Fort Worth.

Conrad, C., & Seymour, C. (1998). Stuttering. In C. Seymour & E. H. Nober (Eds.), *Introduction to communication disorders: A multicultural approach* (pp. 165–184). Boston: Butterworth-Heinemann.

Conture, E. G. (2001). *Stuttering: Its nature, diagnosis, and treatment*. Boston: Allyn & Bacon.

Cooper, E., & Cooper, C. (1998). Multicultural considerations in the assessment and treatment of stuttering. In D. E. Battle (Ed.), *Communication disorders in multicultural populations* (2nd ed., pp. 247–274). Boston: Butterworth-Heinemann.

Cordero, J. A., Rodríguez, C. M., & Guerrero, J. L. (1992). La disfemia y su rehabilitación [Disphemia and its rehabilitation]. *Enfermaría Pediátrica, 163*, 61–66.

Dale, P. (1977). Factors related to dysfluent speech in bilingual Cuban-American adolescents. *Journal of Fluency Disorders, 2*, 311–314.

Davis, D. M. (1939). The relation of repetitions in the speech of young children to certain measures of language maturity and situational factors: Part I. *Journal of Speech Disorders, 4*, 303–318.

DeJoy, D. A. (1975). *An investigation of the frequency of nine individual types of disfluency and total disfluency in relationship to age and syntactic maturity in nonstuttering males, three and one half years of age and five years of age.* Unpublished doctoral dissertation, Northwestern University, Evanston, IL.

DeJoy, D. A., & Gregory, H. (1985). The relationship between age and frequency of disfluency in preschool children. *Journal of Fluency Disorders, 10*, 107–122.

Egland, G. O. (1955). Repetitions and prolongations in the speech of stuttering and nonstuttering children. In W. Johnson & R. Luetenegger (Eds.), *Stuttering in children and adults* (pp. 181–188). Minneapolis: University of Minnesota Press.

Gaines, N. D., Runyan, C. M., & Meyers, S. C. (1991). A comparison of young stutterers' fluent versus stuttered utterances on measures of length and complexity. *Journal of Speech and Hearing Research, 34*, 37–42.

Gordon, P. (1991). Language task effects: A comparison of stuttering and nonstuttering children. *Journal of Fluency Disorders, 16*, 275–287.

Gordon, P. A., Luper, H. L., & Peterson, H. A. (1986). The effects of syntactic complexity on the occurrence of disfluencies in 5-year-old nonstutterers. *Journal of Fluency Disorders, 11*, 151–164.

Guitiérrez-Clellén, V. F. (1995). Narrative development and disorders in Spanish-speaking children: Implications for the bilingual interventionist. In H. Kayser (Ed.), *Bilingual speech-language pathology: A Hispanic focus* (pp. 97–128). San Diego: Singular Publishing Group.

Haynes, W. O., & Hood, S. B. (1977). Language and disfluency variables in normal speaking children from discrete chronological age groups. *Journal of Fluency Disorders, 2*, 57–74.

Hodson, B. W., & Paden, E. P. (1991). *A phonological approach to remediation: Targeting intelligible speech* (2nd ed.). Austin: Pro-ed.

Howell, P., & Au-Yeung, J. (1995). Syntactic determinants of stuttering in the spontaneous speech of normally fluent and stuttering children. *Journal of Fluency Disorders, 20*, 317–330.

Hubbard, C., & Yairi, E. (1988). Clustering of disfluencies in the speech of stuttering and nonstuttering preschool children. *Journal of Speech and Hearing Research, 31*, 228–233.

Johnson, W., Boehmler, R. M., Dahlstrom, W. G., Darley, F. L., Goldstein, L. D., Kools, A., Jr., et al. (1959). *The onset of stuttering: Research findings and implications*. Minneapolis: University of Minnesota Press.

Kadi-Hanifi, L., & Howell, P. (1992). Syntactic analysis of the spontaneous speech of normally fluent and stuttering children. *Journal of Fluency Disorders, 17*, 151–170.

Kayser, H. (1998). Hispanic cultures. In D. E. Battle (Ed.), *Communication disorders in multicultural populations* (pp. 157–195). Boston: Butterworth-Heinemann.

Kools, J. A., & Berryman, J. D. (1971). Differences in disfluency behavior between male and female nonstuttering children. *Journal of Speech and Hearing Research, 14*, 125–130.

Leavitt, R. R. (1974). *The Puerto Ricans: Cultural change and language deviance*. Tucson: University of Arizona Press.

Leith, W. R., & Mims, H. A. (1975). Cultural influences in the development and treatment of stuttering: A preliminary report on the Black stutterer. *Journal of Speech and Hearing Disorders, 40*, 459–466.

Logan, K. J., & Conture, E. G. (1997). Temporal, grammatical, and phonological characteristics of conversational utterances produced by children who stutter. *Journal of Speech and Hearing Research, 40*, 107–210.

Logan, K. J., & LaSalle, L. (1999). Grammatical characteristics of children's conversational utterances that contain disfluency clusters. *Journal of Speech, Language and Hearing Research, 42*, 80–91.

Lynch, E., & Hanson, M. (1998). *Developing cross-cultural competence*, Baltimore, MD: Paul H. Brookes.

Mansson, H. (2000). Childhood stuttering: Incidence and development. *Journal of Fluency Disorders, 25*, 47–57.

Melnick, K. S., & Conture, E. G. (2000). Relationship of length and grammatical complexity to the (non)systematic speech errors and stuttering of children who stutter. *Journal of Fluency Disorders, 25*, 21–45.

Meyers, S. C. (1986). Qualitative and quantitative differences and patterns of variability in disfluencies emitted by preschool stutterers and nonstutterers during dyadic conversations. *Journal of Fluency Disorders, 11*, 293–306.

Pellowski, M. W., & Conture, E. G. (2002). Characteristics of speech disfluency and stuttering behaviors in 3- and 4-year-old children. *Journal of Speech, Language, and Hearing Research, 45*, 20–34.

Ratusnik, D. L., Kiriluk, E., & Melnick-Ratusnik, C. (1979). Relationship among race, social status, and sex of preschoolers' normal dysfluencies: a cross-cultural investigation. *Language, Speech, and Hearing Services in School, 10*, 162–170.

Reyes, B. (1995). Considerations in the assessment and treatment of neurogenic communication disorders in bilingual adults. In H. Kayser (Ed.), *Bilingual speech—Language pathology: An Hispanic focus* (pp. 153–182). San Diego: Singular.

Robinson, T. L., Davis, J. G., & Crowe, T. A. (2000). Disfluency in nonstuttering African American preschoolers during conversation and narrative discourse. *Contemporary Issues in Communication Sciences and Disorders, 27*, 164–171.

Shames, G. H. (1989). Stuttering: An RFP for a cultural perspective. *Journal of Fluency Disorders, 14*, 67–77.

Shapiro, D. (1999). *Stuttering intervention: A collaborative journey to fluency freedom*. Austin, TX: Pro-Ed.

Throneburg, R. N., & Yairi, E. (2001). Durational, proportionate, and absolute frequency characteristics of disfluencies: A longitudinal study regarding persistence and recovery. *Journal of Speech, Language, and Hearing Research, 44*, 38–51.

Toronto, A. S. (1973). *Screening test of Spanish grammar*. Illinois: Northwestern University.

Toronto, A. S. (1976). Developmental assessment of Spanish grammar. *Journal of Speech and Hearing Disorders, 41*, 150–171.

U.S. Bureau of the Census. (2000). *Statistical abstract of the United States*. (120th ed.). Washington, DC: U.S. Bureau of the Census.

Van Borsel, J., Maes, E., & Foulon, S. (2001). Stuttering and bilingualism: A review. *Journal of Fluency Disorders, 26*, 179–205.

Van Riper, C. (1971). *The nature of stuttering*. Englewood Cliffs, New Jersey: Prentice-Hall.

Watson, J. B. (2001). Enhancing cross-cultural competence in the assessment and treatment of stuttering. In H. Bosshardt, J. S. Yaruss, & H. Peters (Eds.), *Fluency disorders: Theory, research, treatment and self-help* (pp. 625–629). Nijmegen: Nijmegen University Press.

Watson, J. B., & Anderson, R. T. (2001). Disfluencies of 2- and 3-year-old Spanish-speaking children from Puerto Rico. *Contemporary Issues in Communication Sciences and Disorders, 28*, 140–150.
Watson, J. B., & Kayser, H. (1994). Assessment of bilingual/bicultural children and adults who stutter. *Seminars in Speech and Language, 15*(2), 149–164.
Wexler, K. (1982). Developmental disfluency behavior in 2-, 4-, and 6-year-old boys in neutral and stress situations. *Journal of Speech and Hearing Research, 25*, 229–234.
Wexler, K. B., & Mysak, E. D. (1982). Disfluency characteristics of 2-, 4-, and 6-year old males. *Journal of Fluency Disorders, 7*, 37–46.
Wingate, M. (2001). SLD is not stuttering. *Journal of Speech, Language, and Hearing Research, 44*, 381–383.
Yairi, E. (1997). Disfluency characteristics of childhood stuttering. In R. Curlee & G. Siegel (Eds.), *Nature and treatment of stuttering: New directions* (2nd ed., pp. 181–188). Boston: Allyn and Bacon.
Yairi, E. (1981). Disfluencies of normally speaking two-year-old children. *Journal of Speech and Hearing Research, 24*, 490–495.
Yairi, E. (1982). Longitudinal study of disfluencies in two-year-old children. *Journal of Speech and Hearing Research, 25*, 155–160.
Yairi, E., & Ambrose, N. (1992). A longitudinal study of stuttering children: A preliminary report. *Journal of Speech and Hearing Research, 35*, 755–760.
Yairi, E., Ambrose, N., & Niermann, R. (1993). The early months of stuttering: A developmental study. *Journal of Speech and Hearing Research, 36*, 521–528.
Yairi, E., & Clifton, N. F. (1972). Disfluent speech behavior of preschool children, high school seniors, and geriatric persons. *Journal of Speech and Hearing Research, 15*, 714–719.
Yairi, E., & Jennings, S. (1974). Relationship between the disfluent speech behavior of normal speaking preschool boys and their parents. *Journal of Speech and Hearing Research, 17*, 94–98.
Yairi, E., & Lewis, B. (1984). Disfluencies in the onset of stuttering. *Journal of Speech and Hearing Research, 27*, 154–159.
Yaruss, J. S. (1999). Utterance length, syntactic complexity, and childhood stuttering. *Journal of Speech, Language, and Hearing Research, 42*, 329–344.
Yaruss, J. S. (2000). Converting between word and syllable counts in children's conversational speech samples. *Journal of Fluency Disorders, 25*, 305–316.
Yaruss, J. S., Newman, R. M., & Flora, T. (1999). Language and disfluency in nonstuttering children's conversational speech. *Journal of Fluency Disorders, 24*, 185–207.
Zebrowski, P. (1991). Duration of speech disfluencies of beginning stutterers. *Journal of Speech and Hearing Research, 34*, 483–491.
Zebrowski, P., & Conture, E. (1989). Judgments of disfluency by mothers of stuttering and normally fluent children. *Journal of Speech and Hearing Research, 32*, 625–634.
Zuniga, M. E., (1998). Families with Latino roots. In E. W. Lynch & M. J. Hanson (Eds.), *Developing cross-cultural competence* (pp. 209–245). Baltimore: Paul H. Brookes.

CONTINUING EDUCATION

Disfluencies of 3- and 5-year old Spanish-speaking children

QUESTIONS

1. The purpose[s] of this study was [were] to:
   a. Identify the types of disfluencies in Spanish-speaking preschoolers who stutter
   b. Determine the prevalence of stuttering in Spanish-speaking children in Puerto Rico
   c. Compare the MLR in English and Spanish-speaking children

d. Examine the influence of age and gender on the disfluencies of normally developing Spanish-speaking children
e. All of the above

2. The children described in this study:
   a. Were monolingual, Spanish-speakers from Puerto Rico
   b. Represented two groups, aged 3 years and 5 years
   c. Were normally fluent
   d. Represented a lower socio-economic group
   e. All of the above
3. Results of this study indicated that the *total frequencies* of disfluencies in the speech of these Spanish-speaking children:
   a. Were greater for the younger group when compared with the older group
   b. Were similar to those frequencies reported in the speech of young English-speaking children
   c. Were greater for the boys than for the girls
   d. All of the above
   e. None of the above
4. Results of this study indicated that the most frequent *types* of disfluencies in the speech of 3- and 5-year-old Spanish-speaking children were:
   a. Similar to the types reportedly observed in the speech of English-speaking children
   b. Single-syllable word repetitions, interjections, and revisions
   c. Similar for both the younger and older age groups
   d. All of the above
   e. None of the above
5. One must be cautious when comparing the findings of this study with earlier reports of English-speaking children because:
   a. Criteria for subject selection may vary
   b. Samples analyzed may vary
   c. Mean length response may affect disfluent speech
   d. All of the above
   e. None of the above