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Research Article

The Disfluent Speech of Bilingual Spanish–English Children: Considerations for Differential Diagnosis of Stuttering

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Purpose: The primary purpose of this study was to describe the frequency and types of speech disfluencies that are produced by bilingual Spanish–English (SE) speaking children who do not stutter. The secondary purpose was to determine whether their disfluent speech is mediated by language dominance and/or language produced.
Method: Spanish and English narratives (a retell and a tell in each language) were elicited and analyzed relative to the frequency and types of speech disfluencies produced. These data were compared with the monolingual English-speaking guidelines for differential diagnosis of stuttering.
Results: The mean frequency of stuttering-like speech behaviors in the bilingual SE participants ranged from 3% to 22%, exceeding the monolingual English standard of 3 per 100 words. There was no significant frequency difference in stuttering-like or non-stuttering-like speech disfluency produced relative to the child's language dominance. There was a significant difference relative to the language the child was speaking; all children produced significantly more stuttering-like speech disfluencies in Spanish than in English.
Conclusion: Results demonstrate that the disfluent speech of bilingual SE children should be carefully considered relative to the complex nature of bilingualism.

Researchers and clinicians alike have long debated cross-linguistic issues that may distinguish bilingual children who do and do not stutter from their monolingual fluent and disfluent peers (e.g., Finn & Cordes, 1997; Roberts & Shenker, 2007; Van Borsel, Maes, & Foulon, 2001). The recurring theme continues to be the critical need for empirically based reports of the speech disfluencies produced by bilinguals in each of their two languages (for discussion, see Tetnowski, Richels, Shenker, Sisskin, & Wolk, 2012). At present, researchers' knowledge of the manifestation of stuttering in bilingual children is limited to an alarmingly low number of single-subject case studies (for review, see Coalson, Peña, & Byrd, 2013; Shenker, 2011). If the growth trends reported in the 2010 census continue, within the next 50 years, one in three U.S. residents will be Hispanic, and more than 60% of the population will speak both Spanish and English (U.S. Census Bureau, 2010). Thus, the bilingual population that may be in immediate need of clinical understanding is bilingual Spanish–English (SE) persons who stutter. Of further relevance to the differential diagnosis of stuttering in this unique clinical population is that bilingual SE speakers seem to produce mazes at higher rates than their monolingual peers (e.g., Bedore, Fiestas, Peña, & Nagy, 2006; Lennon, 1990; Lofranco, Peña, & Bedore, 2006; Poulisse, 1999; Rieger, 2003; Wiese, 1984).

Mazes have been defined as disruptions in the forward flow of speech that are characterized by the production of a string of words, initial parts, or unattached fragments of words that do not in and of themselves contribute to the message that the person is attempting to communicate (Loban, 1976). *Stuttering* has been defined as a disruption in the forward flow of speech that includes repetitions of sounds and syllables as well as audible and inaudible sound prolongations (Conture, 2001). The apparent overlap in the types of disfluencies that are considered to be mazes and those that are typically defined as instances of stuttering (see Tables 1 and 2), along with the reported high rate of maze production in bilingual SE speakers compared with monolinguals, raises the following question: Does bilingualism increase a bilingual SE child's risk for development/persistence of stuttering, or does bilingualism, perhaps, increase the risk for false positive identification of stuttering in the bilingual SE speaker? To be able to answer this question with reliability and validity, we first must increase the understanding of the typical speech disfluencies produced by bilingual SE

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Table 1. Identification and examples of the types of disfluencies considered to be mazes (Bedore et al., 2006).

Maze type	Description	Examples
Lexical revision	Correction of overt word choice errors, to add or delete lexical information	His (frog) dog also came along. (*La rana mayor*) *la rana bebé.*
Grammatical revision	Correction of overt grammatical errors	He was wearing the jar (in) on his head. *La rana* (*brincaron*) *brincó.*
Phonological revision	Correction of phonological errors	Squeak went the (saxolone) saxophone. *No le* (*agad*) *agradó mucho.*
Filled pause	Nonlinguistic vocalizations that occur at the beginning of utterances or between words	(Um) what is this? *La rana trató de* (*ah*) *tomar la leche.*
Repetition	Sound, part-word, whole-word, or phrase repetition	And (they) they were looking. *El búho* (*lo*) *lo persiguió.*

speakers who do not stutter. Therefore, the purpose of the present study was to analyze the speech disfluencies of bilingual SE children who do not stutter. Identification of what is typical will allow us to determine whether these disfluent speech behaviors are in fact comparable or distinct from what has been suggested as guidelines for differential diagnosis in monolingual English speakers. If the latter is proven to be the case, then recent suggestions of an increased risk for development and persistence of stuttering may need to be reconsidered (Howell, Davis, & Williams, 2009; cf. Packman, Onslow, Reilly, Attanasio, & Shenker, 2009).

Bilingualism as a Risk Factor for Stuttering

Howell et al. (2009) recently examined the referrals to a specialized fluency clinic of 317 children who stuttered (8–10 years of age) to determine whether bilingualism posed an increased risk to the development and/or persistence of stuttering. Within this pool of 317 children, they identified 15 bilingual children who stuttered who had not been exposed to English until they entered school at 5 years of age. They also identified 23 bilingual children who stuttered who used both their native language and English in the home prior to entering school ($n = 23$). Howell et al. compared the development, persistence, and recovery rates of these groups of children with a cohort of monolingual children who stuttered (exact number of monolingual participants not provided). They reported that proportionally more bilingual children appear to have risk of development and persistence of stuttering. Howell et al. also stated that the risk is greater for children who are exposed to two languages prior to entering school compared with children who are exposed only to one language prior to school entry. Upon consideration of these findings, they concluded, "if a child uses a language other than English in the home, deferring the time when they learn English reduces the chance of starting to stutter and aids the chances of recovery later in childhood" (p. 45). The efforts of Howell et al. are to be highly commended, as there is an established critical need for these bilingual data. Yet, as Packman et al. (2009) stated in response to Howell et al.'s suggestion, bilingualism is a gift; thus, any recommendation that would lead a parent to defer their child's exposure to another language must be supported by significant evidence (p. 248). Therefore, this recommendation by Howell et al. needs to be carefully considered with respect to at least a few critical confounding variables (for discussion of additional confounds, see Packman et al., 2009). Such consideration is of particular importance, as parents

Table 2. Identification, description, and examples of the types of speech disfluencies considered to be stuttering-like (SLD) versus non-stuttering-like (non-SLD; Ambrose & Yairi, 1999).

Speech disfluency	Description	Examples
SLD		
Monosyllabic word repetition	Repetition of a monosyllabic word	And (they) they were looking. *El búho* (*lo*) *lo persiguió.*
Sound repetition	Repetition of a sound within a word—typically occurs at the beginning of a word	The (d) dog started playing. (*S*) *se metió en la canasta.*
Syllable repetition	Repetition of a syllable within a word—typically occurs at the beginning of a word	Out of the (bu) bucket. *Se enojó* (*mu*) *mucho.*
Non-SLD		
Revision	Word usage or grammatical error correction	His (frog) dog also came along. (*La rana mayor*) *la rana bebé.*
Unfinished word	Abandoned or not completed word	His (fr) dog came along. *Fueron* (*a bus*) *a ver que era el sonido.*
Phrase repetition	Repetition of a phrase within an utterance	(A squeaky) a squeaky sound. (*Con las*) *con las avispas.*
Interjection	Filler words or nonlinguistic sounds used within an utterance	(Um) what is this? *La rana trató de* (*ah*) *tomar la leche.*
Polysyllabic word repetition	Repetition of a polysyllabic (more than one syllable) word	He was (playing) playing around. (*Para*) *para evitar la rana.*

of children who stutter and/or clinicians who read Howell et al.'s article may choose to limit exposure to another language until (what some have argued to be) the critical time period for second language learning has passed (Johnson & Newport, 1989).

Overlap Between Mazes and Stuttering-Like Speech Disfluencies

First, the tests and cutpoints used to characterize stuttering for the bilingual children in Howell et al.'s (2009) study were drawn from norms for monolingual English speakers; the authors reported use of norms for the Stuttering Severity Instrument for Children and Adults, Third Edition (Riley, 1994). There also was no identification of the specific types of speech disfluencies produced, leaving open the possibility that the types of speech disfluencies that were considered to be mazes and those that were considered to be stuttering-like were not carefully disentangled in the output of those bilingual children. The significant potential for this overlap between mazes and stuttering-like disfluencies is further highlighted in a study by Bedore et al. (2006). They explored maze production in terms of both type and amount in bilingual SE children (n = 22; mean age = 68.48 months) compared with functionally monolingual children (n = 22 English speaking, mean age = 69.86 months; n = 22 Spanish speaking, mean age = 69.18 months). The bilingual children produced repetitions more frequently than any other maze type. They also produced higher rates of repetitions than the monolinguals. These repetitions included repetitions of phrases; repetitions of multisyllabic words; and—of particular note to stuttering—repetitions of sounds, syllables, and monosyllabic words. Repetitions of phrases are considered to be non-stuttering-like, and controversy exists regarding whether monosyllabic word repetitions should be categorized as stuttering-like (e.g., Brocklehurst, 2013; Einarsdóttir & Ingham, 2005; Howell, 2013; Wingate, 2001; cf. Ambrose & Yairi, 1999). However, repetitions of parts of words, such as sounds and syllables, are commonly considered to be indicative of stuttering (for review, see Yairi & Seery, 2011). Perhaps this atypically high rate of production of sound and syllable repetitions that appears to comprise the majority of the mazes produced by bilingual SE speakers contributes to this (potential mis-) perception of an increased risk of stuttering in this population.

Disfluent Speech Analyses in Each Language

Another critical consideration is that Howell et al. (2009) completed their speech disfluency analyses in English samples only. The language sample of a monolingual English speaker cannot be considered equivalent to the English output of a bilingual speaker whose native and/or second language is English. In fact, bilinguals who speak a variety of language pairs have been shown to produce more mazes in their second language than they do in their native language (Lennon, 1990; Poulisse, 1999; Rieger, 2003; Wiese, 1984). They also produce higher rates of mazes than monolinguals (e.g., Poulisse, 1999; Wiese, 1984). Researchers (e.g., Bedore et al., 2006; Karniol, 1992; Poulisse, 1999) have argued that this increased rate of maze production in bilinguals compared with monolinguals and the higher rate of maze production in their second compared with their native language may reflect the uncertainty bilinguals have regarding the language they are speaking. Researchers have also argued, however, that as bilinguals progress in their proficiency and use of both languages, they have access to more possibilities with respect to their output. This increase in the number of potential options can also lead to linguistic uncertainty. Regardless as to whether they have limited or exceptional knowledge of both languages, the critical take-away message is that the language knowledge of bilinguals is not limited to one language; rather, it is spread across two. Bilingual speakers may know some of the same words in both languages, but there is not a one-to-one correspondence between what they know in one language to what they know in the other language (Peña, Bedore, & Zlatic-Giunta, 2002). Therefore, Howell et al.'s completion of disfluent speech analyses in only one language does not account for the likelihood of variations in maze production across the two languages spoken by their participants. That being said, without having any point of reference for what is considered to be typical speech disfluencies in the bilingual population and how those typical speech disfluencies compare with what has been documented in the monolingual literature, it is difficult, if not impossible, to determine what is atypical. Hence, there is a need for the present study.

Bilingualism Is Not Categorical

Yet another factor that is important to consider when taking into account the findings reported by Howell et al. (2009) is that bilingualism is measured on a continuum (Valdés & Figueroa, 1994). In other words, bilingualism is not a categorical measurement; rather, there are degrees of bilingualism. The vast majority of investigations of bilinguals in the stuttering literature have been markedly limited in the manner in which bilingualism is defined (for review, see Coalson et al., 2013). Labeling all children who speak two languages as "bilingual" does not allow for consideration of the continuous nature of bilingualism and how performance on language tasks fluctuates depending on language dominance and proficiency (for review, see Grosjean, 1998, 2004). In addition, although there is no one standard measure of bilingualism, both the child's exposure to the language and the child's actual use of that language have been documented as critical factors to consider when determining his or her level of bilingualism (Gutiérrez-Clellen & Kreiter, 2003). Information regarding these factors was not provided by Howell et al.

Language Dominance

To date, there have been conflicting data regarding the production of stuttering-like speech disfluencies depending on the language dominance of the speaker. Given that the participants in these studies were either adolescents or older, we offer summaries of these studies with caution given to consideration of expected changes in language proficiency and use across the two languages over time (Grosjean, 1998). We also acknowledge that the linguistic output of these participants may have been mitigated by negative social emotional consequences of persistent stuttering (Craig, Blumgart, & Tran, 2009). Nevertheless, these data, at least, provide a starting point for the role of dominance in the manifestation of stuttering in bilinguals. For example, Jankelowitz and Bortz (1996) reported that the English–Afrikaans bilingual man in their study (age = 63 years) produced more stuttering-like speech disfluencies in his less dominant language of Afrikaans. Similarly, Lim, Lincoln, Chan, and Onslow (2008; total $N = 30$; age range = 12–44 years) reported increased stuttering in the less dominant language for the Mandarin–English bilinguals ($n = 4$) and also for the English–Mandarin bilinguals ($n = 15$), with similar amounts of stuttering reported between the Mandarin and English output for the balanced bilinguals ($n = 11$). By comparison, Jayaram (1983) examined the speech output of Kannada–English bilinguals ($n = 10$; age range = 19–32 years) who were considered to be more proficient in Kannada. Jayaram reported that these bilingual speakers produced significantly more stuttering-like speech disfluencies in Kannada than in English. Of particular relevance to the present study, Dale (1977) analyzed the speech disfluency of four bilingual SE adolescents (mean age = 13 years) who were reportedly equally proficient in both English and Spanish. He stated that all four participants stuttered in Spanish only; no stuttering was observed in English. In contrast, Bernstein Ratner and Benitez (1985) reported that the SE bilingual man (age = 50 years) they observed (who was similar to Dale's, 1977, participants in that he was considered to be a balanced bilingual) stuttered more severely in English. More recently, Ardila, Ramos, and Barrocas (2011) reported that the English dominant adult bilingual SE speaker (age = 27 years) whom they observed stuttered more in Spanish than in English.

Grammatical Considerations

In addition to dominance, research has demonstrated that stuttering varies depending on the grammatical structure of the language being spoken (e.g., Jankelowitz & Bortz, 1996; Jayaram, 1983; Lim et al., 2008; Nwokah, 1988). The stuttering-like speech disfluencies produced across the specific languages (other than English) that were spoken by the children in Howell et al.'s (2009) study were not analyzed. Collection of comparable data across the two languages that the bilingual child speaks would afford exploration as to whether the language being spoken (regardless of dominance) uniquely impacts stuttered speech. Specific to bilinguals who speak Spanish and English, Bernstein Ratner and Benitez (1985) analyzed the stuttering-like speech disfluencies produced in the Spanish versus English output of the bilingual adult they observed. They reported that their participant's stuttering occurred more frequently on verbs than nouns in his Spanish compared with his English output. Likewise, Ardila et al. (2011) reported significantly more stuttering in Spanish than in English on adjectives, adverbs, and conjunctions. This difference in stuttering loci has been attributed to the pro-drop form that is characteristic of Spanish. The pronouns are often omitted because the context of the sentence and the inflected verb form provide enough information to allow for identification of the subject (Anderson & Centeno, 2007).

Maze production has also been shown to fluctuate depending on the language the child is speaking. Bedore et al. (2006) reported that the typically fluent bilingual SE children in their study produced more grammatical revisions in Spanish than they did in English. They argued that this difference was likely related to the morphological distinctions between these two languages. For example, word order is significantly more restricted in English than Spanish, and the gender plus plural variations in Spanish do not exist in English. These differences result in patterns of mazes that are unique to the language that is being spoken. Thus, it cannot be assumed that the manifestations of stuttered speech and/or maze production will be similar across the two languages that the bilingual speaks. This further illustrates the need for documentation of typical disfluent speech in bilingual SE speakers.

Increased Risk for False Positive Identification

One final overarching consideration is that the concern for false positive identification in bilingual SE speakers is not unique to the present study's focus on stuttering. The following quote underscores the magnitude of this risk: "There are great individual differences within and between the two languages of bilingual children and current assessment instruments are not designed to differentiate differences from true disabilities in these children" (Gutierrez-Clellen & Simon-Cereijido, 2010, p. 49). Although review of the data at the national level does not specify diagnosis of communication disorders by group, statewide data suggest that culturally and linguistically diverse children appear to be either over- or underrepresented in the population of children who have learning disabilities (Artiles & Trent, 2000, as cited in Klingner & Artiles, 2006). Further, it has also been reported that those children who are lacking proficiency in both their first and second languages are the ones who appear to be overrepresented (Artiles, Rueda, Salazar, & Higareda, 2005).

Purpose of the Present Study

In summary, stuttering and maze production appear to fluctuate depending on the number of languages the person speaks, the person's ability to speak the language, and the nature of the language the person is speaking. However, to better understand whether bilinguals present with a higher risk for development/persistence of stuttering than their monolingual peers, we must first increase the understanding of the types and related frequency of speech disfluencies produced by bilingual children who do not stutter. To achieve this, we compared the fluency of our bilingual SE participants' output with the established monolingual English-speaking guidelines for differential diagnosis of stuttering, as, again, no guidelines currently exist with respect to the identification of stuttering in bilingual SE speakers. Use of monolingual speech disfluency criteria allowed us to explore whether the types and amount of speech disfluencies produced by these bilingual SE children differ markedly. We also used a more detailed analysis of the language dominance of our participants such that any variations and the relative impact on speech fluency could be more carefully considered. In addition, we collected language samples in English and Spanish in a contextual manner that allowed for a valid comparison of the influence of the language being spoken on the child's speech fluency. Specifically, we asked the following questions:

1. How does the frequency and types of stuttering-like and non-stuttering-like speech disfluencies produced by bilingual SE children who do not stutter compare with the monolingual guidelines for differential diagnosis of stuttering?
2. Does the frequency and/or types of speech disfluencies (i.e., non-stuttering-like or stuttering-like speech disfluencies) produced by bilingual SE children differ depending on language dominance (i.e., balanced, Spanish dominant, or English dominant)?
3. Does the frequency and/or types of speech disfluencies (i.e., non-stuttering-like or stuttering-like speech disfluencies) produced by bilingual SE children differ depending on the language produced (i.e., English vs. Spanish)?

Method

Participants

The participants for the current study were 18 Mexican American kindergarteners (nine boys, nine girls; age = 5;6–6;7 [years;months]) who were recruited from school districts in central Texas that enroll large numbers of bilingual students. These children were determined to be typically fluent (not a child who stutters) for the following key reasons: (a) they had no present or prior history of parent or teacher concern with regards to the child's speech fluency; (b) the bilingual SE doctoral students who administered the speech-language testing and collected the speech samples in both languages (and who were native Spanish speakers with comparable proficiency in Spanish and English; Van Borsel & Pereira, 2005) reported no concerns regarding atypical speech disfluency; and (c) the three authors along with an additional bilingual SE doctoral student (who is also American Speech-Language-Hearing Association [ASHA] certified and a speech-language pathologist [SLP] who was blind to the purposes of the present study) analyzed the recordings of the narrative samples that were produced in English and in Spanish by each child; none of the four noted any concerns regarding atypical speech fluency. Specific to the author team, the three authors together have expertise in stuttering and communication disorders in bilingual SE speakers. The first author is ASHA certified, a licensed SLP, and a professor who specializes in stuttering. The second author is ASHA certified, a licensed SLP, and a professor who specializes in bilingual language development and disorders. The third author is ASHA-certified and a licensed SLP who works with bilingual SE children with communication disorders. The first author learned Spanish as a second language with formal acquisition extending through doctoral studies. The second and third authors are native Spanish speakers. Each author's Spanish and English language competence supports reliable identification in both languages (for review, see Van Borsel & Pereira, 2005).

Language Dominance

To establish the children's level of exposure to Spanish and English, participants' parents and teachers completed questionnaires about their patterns of language input and output (Gutiérrez-Clellen & Kreiter, 2003; Restrepo, 1998). Children's parents rated their current levels of language input and output on an hour-by-hour basis (Gutiérrez-Clellen & Kreiter, 2003). Parents also provided information about their children's history of exposure to both languages at home and school from birth. Teachers provided information on the children's classroom language use. To be eligible to participate in the study, children had to have had at least 20% input and output in each language when they were in prekindergarten. When the children were tested (in kindergarten), their use of English and Spanish spanned the full range from predominant Spanish use to predominant English use.

To establish their level of language ability, all of the children completed the experimental version of the Bilingual English Spanish Assessment (BESA; Peña, Gutierrez-Clellen, Iglesias, Goldstein, & Bedore, 2014),[1] a standardized measure of language ability for bilingual SE children that is composed of both semantic and morphosyntactic subtests. All participants performed within normal limits on the BESA, indicating that they presented with typically developing language skills.

From our determination of the children's level of exposure and level of ability in Spanish and English, our participant pool comprised 18 children with typically developing language skills matched for age and gender across three groups separated by dominance. Six of these children (three boys, three girls; mean age = 70.2 months) were Spanish dominant (using Spanish 61%–80% of time), six children (three boys, three girls; mean age = 70.0 months) were balanced bilinguals (using Spanish and English 40%–60% of the time), and six children (three boys, three girls;

[1]Access to BESA prior to publication was made available by the second author, who is a contributing author of BESA.

mean age = 71.5 months) were English dominant (using English 61%–80% of the time).

Data Collection

Narrative output has been established as being more likely to elicit disfluent speech in monolingual English-speaking children who do and do not stutter (Byrd, Logan, & Gillam, 2012) and maze production in the English and Spanish output of bilingual children (Bedore et al., 2006). Narrative samples have also been shown to be congruent when produced in Spanish compared with English in bilingual SE speakers (Fiestas & Peña, 2004). Additionally, narratives have been proven to elicit longer utterances in young elementary school children (Leadholm & Miller, 1995). Thus, for the present study, Spanish and English narratives were elicited for each of the 18 participants on different days within a 4-week time window using one of four wordless picture books: *A Boy, a Dog, and a Frog* (Mayer, 1967); *Frog, Where Are You?* (Mayer, 1969); *Frog on His Own* (Mayer, 1973); and *Frog Goes to Dinner* (Mayer, 1974). Two narratives (a retell and a tell) were collected in each language (both Spanish and English) at the children's schools in a quiet room. To elicit the narrative, the children first looked at a book while the examiners told a story, and then the children retold the story while looking through the book again. Story models were based on the protocols designed by Miller and Iglesias (2008). After the retell, the children told a second story without a model. The order of retell followed by tell was consistent across all participants to facilitate participant understanding of the output required as well as comparable sample lengths across tasks. However, the use of English versus Spanish was counterbalanced across participants. Code-switching was allowed, but examiners continued prompting in the language in which the children had begun telling the story (for more information about the sampling procedures, see Bedore, Peña, Ho, & Gillam, 2010). All samples were recorded using a digital audio recorder (Sony MS-515 or ICD-P320) with an external microphone (ECM 115) and then were transcribed using Sony Digital Voice Editor Version 2.4.04.

Transcription

Narratives were transcribed using Systematic Analysis of Language Transcripts (SALT; Miller & Iglesias, 2008). The entirety of each narrative was transcribed for analysis by the third author, who is a bilingual ASHA-certified, state-licensed SLP whose competence in both English and Spanish as well disfluency analysis would support reliable transcription (Van Borsel & Pereira, 2005). Utterances were segmented into communication units following the guidelines for spoken narrative production outlined by Loban (1976). Words were coded according to the SALT guidelines for analysis of English and Spanish transcripts.

Mean length of utterance in words (MLU_w) was selected over a morpheme-based analysis because the two measures are very highly correlated with one another, and MLU_w has been argued by many researchers (e.g., Parker & Brorson, 2005; Thordardottir & Weismer, 1998) to be an easier, more reliable utterance-level analysis, particularly when comparing across languages. Additionally, MLU_w is recommended when analyzing Spanish narrative samples (Gutiérrez-Clellen & Simon-Cereijido, 2010). Further, words as opposed to syllables were selected as the basic coding level to allow for direct comparison with other studies that have examined the disfluent speech of bilingual SE speakers (e.g., Ardila et al., 2011; Bernstein Ratner & Benitez, 1985; Carias & Ingram, 2006). Use of words also allowed for analysis of number of total words (NTW), number of different words (NDW), and the type token ratios—analyses that would not have been available had we completed a morpheme-based analysis. Samples were checked for reliability and were coded for speech disfluencies using SALT, as described below.

Reliability of transcription. To ensure transcription reliability, all transcripts were retranscribed by the third author. In addition, the first author reviewed all audio samples and related transcriptions from each child to confirm accuracy; any discrepancies found in either the third author's retranscription or the first author's review of the transcripts were resolved through additional review and discussion among all three authors.

Disfluency coding. To address the questions of interest, we coded stuttering-like and non-stuttering-like speech disfluencies, as they have been categorized in monolingual English speakers (see Table 2 for description and related examples). Thus, the speech disfluencies considered to be stuttering-like in nature were sound repetitions, syllable repetitions, monosyllabic word repetitions, and inaudible and audible sound prolongations. Non-stuttering-like speech disfluencies included phrase repetitions, interjections, and revisions (Ambrose & Yairi, 1999).

To code the speech disfluency types, the third author labeled the disfluent words within the transcript as a speech disfluency that is considered by Ambrose and Yairi's (1999) guidelines to be either stuttering-like or non-stuttering-like. The disfluent words were then labeled as one of the specific types of speech disfluencies that fall within these two broad categories (e.g., sound repetition, phrase repetition). The identification of the speech disfluencies as a stuttering-like or non-stuttering-like disfluency as well as the identification of the specific type of speech disfluency within those two categories were completed using the SALT coding conventions.

Reliability of speech disfluency identification. Any discrepancy in the speech disfluency identification was listened to again by all three authors. Through group discussion, discrepancies were resolved to yield 100% agreement on all speech disfluency types identified both at the broad category level (i.e., stuttering-like vs. non-stuttering-like) and at the narrow level of specific type of speech disfluency produced (e.g., sound repetition, revision).

Considerations of timing and tension. Ambrose and Yairi's (1999) guidelines were employed to allow for category and type identification. In addition, for purposes of understanding how the speech disfluencies produced by these children may uniquely differ from monolingual English-speaking children who stutter, we also completed our speech disfluency analyses, with careful consideration given to the timing and tension of the productions (Guitar, 2013; Yairi & Seery, 2011).

For consideration of timing, the rhythmicity of the repetitions was considered to be typical if the iterations occurred one after the other with no difference in the duration and if there were no rapid bursts of iterations within the repetition set. Given that tension and rhythm influence each other, in addition to durational differences in the iterations produced, we also listened for pitch changes within the iteration, as that type of audible change is indicative of a change in tension. If the pitch of each iteration was comparable, with no audible stress change unique to the iterations within the repetition set, then the tension was considered to be typical.

There were no monosyllabic word or syllabic part-word or sound repetitions produced by this cohort of children wherein the rate of iteration to iteration significantly differed. There also were no rapid bursts of iterations within the repetition sets produced by these children. In addition, there were no iterations wherein the duration of each production differed and/or the pitch from iteration to iteration differed.

Reliability of repetition identification. To ensure reliability of the identification of atypical versus typical repetitions, the first author independently listened to, coded, and then relistened to and coded these repetitions, yielding 100% intrarater reliability. The third author also independently listened to and coded the repetitions. The third author's description of each repetition as being typical was consistent with that of the first author's, yielding 100% interrater reliability.

Results

To review, the purpose of the present study was to explore in typically fluent bilingual SE children the frequency and types of speech disfluencies that are currently considered to be "stuttering-like" and "non-stuttering-like." The initial analysis was completed to ensure that the results reported were not confounded by any atypical production differences between the children's English and Spanish samples. The next set of analyses focused on the key questions of the present study, with the first one being the frequency and types of speech disfluency produced, and the second one being whether the production of those speech disfluencies differed depending on language dominance and/or language produced.

Language Sample Characteristics

See Table 3 for the detailed language sample characteristics. To examine the language samples that we were comparing for distinct speech disfluency behaviors, we completed a multivariate analysis of variance with four dependent and two independent variables. The four dependent variables were (a) MLUw, (b) NTW, (c) NDW, and (d) number of utterances (NU). The two independent variables were the child's language proficiency (i.e., balanced bilingual, SE dominant, or English–Spanish dominant) and the language produced in the sample (i.e., Spanish or English). Specific to the child's language proficiency, no significant difference was found for any of the four sample measures: MLUw, $F(2, 30) = 0.529$, $p = .595$, $\eta_p^2 = .034$; NTW, $F(2, 30) = 0.682$, $p = .514$, $\eta_p^2 = .043$; NDW, $F(2, 30) = 0.660$, $p = .524$, $\eta_p^2 = .042$; and NU, $F(2, 30) = 0.264$, $p = .769$, $\eta_p^2 = .017$. Similarly, relative to the language the child produced, no significant differences were found in MLUw, $F(1, 30) = 0.947$, $p = .338$, $\eta_p^2 = .031$; NTW, $F(1, 30) = 2.427$, $p = .130$, $\eta_p^2 = .075$; NDW, $F(1, 30) = 1.662$, $p = .207$, $\eta_p^2 = .052$; and NU, $F(1, 30) = 1.856$, $p = .183$, $\eta_p^2 = .058$. In addition, there was no significant interaction between language dominance and the language produced for MLUw, $F(2, 30) = 0.230$, $p = .796$, $\eta_p^2 = .015$; NTW, $F(2, 30) = 1.003$, $p = .379$, $\eta_p^2 = .063$; NDW, $F(2, 30) = 0.315$, $p = .732$, $\eta_p^2 = .021$; and NU, $F(2, 30) = 1.390$, $p = .265$, $\eta_p^2 = .085$. If we had used conversational samples instead of the retell–tell narrative tasks, we would have likely seen significant differences in these production-based measures (Fiestas & Peña, 2004). Using the narrative task allowed us to elicit samples that did not significantly differ in form. As a result, we were better able to determine how speech disfluencies might fluctuate across these two languages for these children with varying degrees of proficiency.

Frequency and Types of Stuttering- and Non-Stuttering-Like Speech Disfluencies

The purpose of the first question was to identify the frequency and types of stuttering-like and non-stuttering-like speech disfluencies produced by these bilingual SE speakers (on the basis of classifications informed by monolingual English children who stutter, as—at present—no bilingual SE differential diagnosis guidelines exist).

Frequency. The frequency of production of the speech behaviors that would typically be considered to be stuttering-like in monolinguals was higher than the standard 3 per 100 words across the majority of the participants ($n = 14$), with the mean percentage of stuttering-like speech disfluencies for these individuals ranging from 3% to as high as 22%. In addition, the frequency of total (i.e., non-stuttering-like plus stuttering-like) speech disfluencies per 100 words produced by these children was greater than 10 per 100 words for 13 of the 18 participants in at least one of their language samples. See Table 4 for the percentage of stuttering-like speech disfluencies, the percentage of non-stuttering-like speech disfluencies, and the percentage of total speech disfluencies produced by each of the participants in the present study.

Recall that we selected words versus syllables to allow for comparison with the frequency differences reported in past bilingual SE stuttering research. However, given that in the monolingual literature it has been argued that the use of words versus syllables can inflate the speech disfluency frequencies, we randomly selected four of the 18 participants

Table 3. Sample (i.e., English vs. Spanish) characteristics for the balanced bilingual (BB), bilingual Spanish dominant (BSD), and bilingual English dominant (BED) children.

	BB		BSD		BED	
Characteristic	**English**	**Spanish**	**English**	**Spanish**	**English**	**Spanish**
MLUw	5.41	4.76	4.975	4.39	4.545	4.535
NU	64	46.5	57.5	34.5	43.5	50.5
NTW	357.5	226	308.5	172.5	211	232.5
NDW	93	78.5	80	57	75	72.5

Note. MLUw = mean length of utterance in words; NU = number of utterances; NTW = number of total words; NDW = number of different words.

to determine whether there was potential frequency inflation. Results from this analysis did not reveal any significant differences in the percentage of stuttered words in English versus the percentage of stuttered syllables in English, $t(6) = -0.474$, $p = .652$. Similarly, there were no differences in the percentage of stuttered words in Spanish versus the percentage of stuttered syllables in Spanish, $t(6) = 0.304$, $p = .771$. This lack of difference does not mean that the potential for inflation when using words versus syllables does not exist. Rather, it simply indicates that for the samples used in the present study, the differences in syllable versus word length did not mediate a frequency difference.

Types. Specific to the types of stuttering-like speech disfluencies produced, 16 of the 18 participants produced monosyllabic word repetitions in both of their conversational samples. Of the remaining two participants, one produced monosyllabic repetitions in Spanish but did not produce that particular type of repetition in English; in contrast, the other participant demonstrated the opposite pattern. Twelve of the 18 participants produced sound repetitions in either their English or Spanish sample. Only one participant produced sound repetitions in both samples. The remaining five participants did not produce sound repetitions in either language.

Production of a cluster, that is, two or more stuttering-like speech disfluencies immediately adjacent to one another, was demonstrated only once by two of the 18 participants. One of these two participants produced the clustering behavior

Table 4. Mean percentage of production of SLD and non-SLD in the English versus Spanish samples of the BB, BSD, and BED children.

		SLD		Non-SLD		Total disfluencies	
Participant	**Dominance**	**English**	**Spanish**	**English**	**Spanish**	**English**	**Spanish**
1	BB	2.33	8.53	6.69	5.21	9.01	13.74
2	BB	1.41	3.93	3.80	17.90	5.20	21.83
3	BB	0.26	1.12	2.62	3.37	2.88	4.49
4	BB	1.97	4.39	2.36	8.29	4.33	12.68
5	BB	3.04	10.14	7.46	30.43	10.50	40.58
6	BB	0.00	8.46	6.45	7.35	6.45	15.81
M		1.50	6.10	4.90	12.09	6.40	18.19
SD		1.19	3.47	2.24	10.30	2.89	12.31
7	BSD	4.19	5.58	2.09	4.65	6.28	10.23
8	BSD	5.22	4.15	8.96	10.49	14.18	14.63
9	BSD	1.66	4.38	3.65	2.92	5.32	7.30
10	BSD	5.74	9.55	10.43	13.64	16.17	23.18
11	BSD	0.00	5.26	0.00	0.00	0.00	5.26
12	BSD	1.80	0.00	11.38	8.63	13.17	8.63
M		3.10	4.82	6.09	6.72	9.19	11.54
SD		2.28	3.07	4.78	5.09	6.28	6.52
13	BED	4.26	7.07	9.93	9.00	14.18	16.08
14	BED	2.34	3.86	3.04	7.07	5.37	10.93
15	BED	7.41	21.93	6.17	7.89	13.58	29.82
16	BED	0.40	1.07	3.21	6.79	3.61	7.86
17	BED	4.69	4.11	3.13	6.85	7.81	10.96
18	BED	1.35	0.43	2.70	2.56	4.05	2.99
M		3.41	6.41	4.70	6.70	8.10	13.11
SD		2.56	7.97	2.86	2.19	4.71	9.25
Grand *M*		2.67	5.78	5.23	8.50	7.90	14.28
SD		2.15	5.05	3.31	6.86	4.69	9.53

of a monosyllabic word repetition and a syllable repetition in English. The other participant produced a cluster of a monosyllabic word repetition and a sound repetition in Spanish.

Regarding the production of specific types of non-stuttering-like speech disfluencies, 17 of the 18 participants produced revisions in both of their speech samples; one participant produced revisions only in Spanish. The production of interjections was the next most commonly occurring type of non-stuttering-like speech disfluency. Seventeen participants produced interjections in both samples. One child produced interjections in Spanish only. Phrase repetitions were produced by 15 participants in both samples. One participant produced phrase repetitions in only one of his two samples. Two participants did not produce any phrase repetitions in either sample. Unfinished words were produced by 14 participants in both samples and by one participant in one sample; the remaining three participants did not produce an unfinished word in either sample. Finally, the production of a polysyllabic word repetition was documented only in the Spanish speech samples of five of the 18 participants. The remaining 13 participants did not produce a polysyllabic word repetition in either language. See Table 5 for the mean percentage of production of the specific types of speech disfluencies across participants.

Another factor that we measured relative to the types produced was the number of iterations. Iterations are defined as the number of times the person repeats the sound, syllable, or word. Across the 18 participants, the mean number of iterations for sound repetitions was 5 (range = 4–8). The mean number of iterations for syllable repetitions was also 5 (range = 3–9). The mean number of iterations for the monosyllabic repetitions was 6 (range = 4–10). The rhythm and stress of these iterations were comparable across productions and, as previously described, were not atypical in nature.

Influence of Language Dominance and/or Language Produced

In addition to identifying the types and frequencies of the disfluent speech behavior produced by these bilingual SE children, we also wanted to explore whether the child's language dominance and/or the language the child produced uniquely impacted the child's speech fluency (see Table 4). To determine whether the frequency per 100 words of the stuttering-like and non-stuttering-like speech disfluencies produced (dependent variables) differed relative to the child's language dominance and/or the language the child was speaking, a multivariate analysis of variance was completed.

Language dominance. No difference was found specific to language dominance for frequency of stuttering-like speech disfluencies, $F(2, 30) = 0.265$, $p = .769$, $\eta_p^2 = .017$; frequency of non-stuttering-like speech disfluencies per 100 words, $F(2, 30) = 0.882$, $p = .424$, $\eta_p^2 = .056$; or for frequency of total speech disfluencies per 100 words, $F(2, 30) = 0.228$, $p = .798$, $\eta_p^2 = .015$. That is, the six children who were considered to be balanced bilinguals, the six children who were considered to be English dominant, and the remaining six children who were considered to be Spanish dominant produced comparable rates of stuttering-like, non-stuttering-like, and total speech disfluencies.

Language produced. In contrast to language dominance, there was a significant difference relative to the language of the sample. The bilingual children in the present study produced a significantly higher percentage of stuttering-like speech disfluencies in their Spanish compared with their English samples, $F(1, 30) = 5.307$, $p = .028$, $\eta_p^2 = .150$. They also produced a significantly higher percentage of total speech disfluencies in their Spanish than their English samples, $F(1, 30) = 6.294$, $p = .018$, $\eta_p^2 = .173$. No significant differences were found in the children's production of

Table 5. Mean percentage of production of the specific types of SLD speech disfluencies and non-SLD speech disfluencies that were produced in the English versus Spanish samples of the children separated into groups related to dominance (i.e., BB, BSD, and BED).

	BB		BSD		BED	
Type	**English**	**Spanish**	**English**	**Spanish**	**English**	**Spanish**
SLD						
MSWR	1.43	4.725	3.005	4.62	2.785	5.615
SDR	0.07	1.15	0.04	0.075	0.52	0.685
SYLR	0	0.16	0.055	0.12	0	0.115
MSWR-SDR	0	0	0	0	0.105	0
MSWR-SYLR	0	0.06	0	0	0	0
Non-SLD						
REV	1.805	3.85	1.605	2.385	1.5	2.89
UW	0.275	1.865	0.3	1.055	0.715	1.84
INT	1.895	4.98	2.795	1.95	1.735	0.965
PR	0.555	1.115	1.385	1.335	0.75	1.015
PSWR	0	0.285	0	0	0	0.13

Note. MSWR = monosyllabic word repetition; SDR = sound repetition; SYLR = syllable repetition; MSWR-SDR = monosyllabic word repetition and sound repetition cluster; MSWR-SYLR = monosyllabic word repetition and syllable repetition cluster; REV = revisions; UW = unfinished words; INT = interjections; PR = phrase repetitions; PSWR = polysyllabic word repetitions.

non-stuttering-like speech disfluencies in their Spanish compared with their English samples, $F(1, 30) = 3.354$, $p = .077$, $\eta_p^2 = .101$.

Language dominance by language produced. No significant interactions were found between language dominance and the language of the sample for frequency of stuttering-like speech disfluencies, $F(2, 30) = 0.381$, $p = .686$, $\eta_p^2 = .025$; frequency of non-stuttering-like speech disfluencies produced, $F(2, 30) = 1.248$, $p = .302$, $\eta_p^2 = .077$; or frequency of total speech disfluencies produced, $F(2, 30) = 1.220$, $p = .309$, $\eta_p^2 = .075$.

Discussion

Researchers have suggested recently that bilingualism is a factor that may contribute to the development/persistence of stuttering (Howell et al., 2009; cf. Packman et al., 2009). However, at present, researchers do not have a sufficient understanding of the disfluent speech of bilingual children who do not stutter. Thus, it is difficult to determine whether a bilingual child is in fact at risk for stuttering or if, perhaps, as a group, bilingual children produce higher levels of typical speech disfluency than their monolingual peers. In the present study, we examined the disfluent speech of bilingual SE children who do not stutter to determine what differences (if any) exist relative to their speech production compared with what has been established in monolingual English speakers. Results are later discussed with implications related to future development of guidelines for identification of stuttering in bilingual SE children.

Frequency and Types of Speech Disfluencies Produced

The bilingual SE children who participated in the present study were all typically fluent speakers, yet they all produced an overall frequency of stuttering-like speech disfluencies per total words that is considered to be indicative of stuttering in monolingual English speakers (Ambrose & Yairi, 1999). Regarding the frequency data, the percentage of stuttering-like speech disfluencies per 100 words as well as the total speech disfluencies produced per 100 words exceeded the monolingual guidelines for what would be indicative of stuttering for the majority of these bilingual SE participants. This high frequency of disfluent speech behavior may be inherent to the processing involved in the production of spoken language in bilinguals. Bedore et al. (2006) noted that, unlike the monolingual child, bilingual children are learning and using two separate languages. One could argue that though they have access to two different languages, they have not had similar practice in one language compared with monolinguals. Also, as they progress in their knowledge and use of both languages, one could argue that they have more choices from which to select their output. Thus, in either case, these bilingual speakers may be more likely to experience an increased level of linguistic uncertainty that could overtly result in an increased production of disfluent speech. Findings from the present study lend support to this assumption. Therefore, clinicians should expect to see higher rates of speech disfluencies in the output of typically fluent bilingual speakers. Clinicians should also be aware that use of monolingual English-speaking frequency guidelines in their analysis of the disfluent speech of bilingual SE speakers would likely lead to a false positive identification of stuttering.

Monosyllabic word repetitions. Interestingly, the clinical utility of categorizing speech disfluency into stuttering-like versus non-stuttering-like speech disfluencies is not without debate in the monolingual stuttering literature (e.g., Brocklehurst, 2013; Einarsdóttir & Ingham, 2005; Howell, 2013; Wingate, 2001). To that end, the bilingual child may be the ideal case for determining whether such categories are warranted. In fact, if the language skills of children who stutter are not impaired (see Nippold, 2012), then why would there be a higher risk for stuttering in speakers of more than one language? Furthermore, if language were the issue, we should expect to see the same types of speech disfluencies produced to the same degree across languages, particularly for those persons who are considered to be typically fluent. However, such a distinct pattern has not been observed; rather, there is overlap in the monolingual literature. There is also overlap in the bilingual literature as indicated in the present study.

Of particular clinical relevance to these high frequencies of stuttering-like speech disfluencies per total words is that the production of monosyllabic word repetitions was the driving force behind the frequency being higher than 3% for the majority of the participants. Monosyllabic word repetitions are a type of speech disfluency that has been included in the category of what is considered to be a stuttering-like disfluency as well as the category of what is considered to be a maze (Ambrose & Yairi, 1999; Bedore et al., 2006). Monosyllabic words are among the most frequently occurring words in the Spanish language output even though there are relatively few of them (Navarro, 1968). Monosyllabic words are also more likely to be function words in Spanish and are more likely to be produced at the beginning of phrases or utterances—arguably the location of greatest uncertainty. Future research regarding loci considerations specific to frequency and types of speech disfluencies produced by typically fluent bilingual SE speakers is warranted. However, preliminary data suggest that when completing disfluent speech analyses of bilingual SE children, clinicians should take caution when interpreting this particular type of speech disfluency as an instance of stuttering.

Inaudible/audible sound prolongations. Although monosyllabic word repetitions were produced to a high degree, there was one specific type of stuttering-like speech disfluency that was not produced by any of these bilingual SE speakers; none of the children in the present study produced inaudible or audible prolongations. This finding supports the classic notion of this type of speech disfluency as a harbinger of stuttering (Conture, 2001). That is, the lack of production of this particular type of speech disfluency by bilingual SE children who do not stutter may be of significant clinical relevance. Further, cluster production occurred only once in the speech output of two participants, suggesting that the production of two or more speech disfluencies together may also be more characteristic of stuttered speech than typical speech disfluency in bilingual SE speakers. Thus, these preliminary data suggest that the prolonging of sounds and/or fixed articulatory gesturing as well as the clustered production of speech disfluencies that are indicative of stuttering in monolingual English speakers may also be indicative of stuttering in bilingual SE speakers.

Iterations and atypical timing/tension. That being said, there are at least two other behaviors that have been identified as key differentiating behaviors in monolingual English speakers that do not appear to be discriminating in bilingual SE speakers: (a) number of iterations and (b) atypical timing and tension. A mean number of iterations of 3 or higher is considered to be indicative of stuttering in monolingual English speakers (e.g., Pellowski & Conture, 2002). Recall that the mean number of iterations produced in the present study was 4–6, depending on the speech disfluency type that was repeated. Also, recall that there was no atypical rhythm or tension across the production of these iterations. Perhaps, for the bilingual SE typically fluent population, the rhythm and stress of the iterations, as opposed to the number produced, are the critical factors to consider. Clinicians should be cautious when calculating the mean number of iterations in bilingual SE speakers, as that number may be markedly higher than what has been reported as being atypical in monolingual English speakers. Clinicians should also take into account the timing and tension of those iterations, as that may prove to be more discriminating.

Individual variability. The present study reported on group trends; however, as with all spoken output analyses, individual variability exists. For example, upon review of Table 4, it is clear that the large majority of participants were in fact more disfluent in Spanish. However, there were a few participants who produced more speech disfluencies (both non-stuttering-like and stuttering-like disfluencies) in English than in Spanish. There were also participants for whom the difference in their disfluent speech production between their Spanish versus English output was proportionally larger than for others. Thus, as is the case with respect to monolingual guidelines, clinicians must be cautious when making any decisions regarding whether a bilingual child stutters solely on the basis of frequency and types of speech disfluencies produced.

Influence of Dominance

The data related to dominance and speech disfluency frequency in bilingual persons who stutter have been inconsistent across the literature. Some researchers have reported more stuttering in the less dominant language (e.g., Ardila et al., 2011; Jankelowitz & Bortz, 1996; Lim et al., 2008), whereas others have reported more stuttering in the dominant language (e.g., Jayaram, 1983). Yet, there are still others who report differing patterns in those persons who are considered to be balanced bilinguals (e.g., Bernstein Ratner & Benitez, 1985). Present results suggest that bilingual SE children who do not stutter produce a significantly higher frequency of speech disfluencies in Spanish than in English regardless of their language dominance. Thus, clinicians need to be aware that sampling the client's more dominant language only or, perhaps, what is the common language spoken between the clinician and client would not be the appropriate diagnostic choice, as present data suggest there is a need to sample both languages the clients speaks.

Our findings specific to dominance do not discount that dominance may play a distinct role in the speech fluency of persons who stutter; rather, our data suggest that the predicted patterns relative to the disfluent speech of children who do not stutter may not be differentially influenced by dominance. On the other hand, the conflicting reports related to dominance in the stuttering literature may be because dominance may not be as critical to typical speech disfluency and/or stuttering as is the nature of the language being spoken. For example, in the case study by Jayaram (1983), there was more stuttering in Kannada than in English, the more dominant language of the participant. In contrast, in the study by Jankelowitz and Bortz (1996), there was more stuttering in Kannada again, but this was considered to be the less dominant language for these participants. Additionally, recall that the most recent case study of an adult bilingual SE speaker indicated that the speaker's dominant language was English, but the speaker stuttered more in Spanish. Ardila et al. (2011) suggested that this finding lends support to the notion that dominance plays a role. However, as an alternative, we propose that the speaker may have stuttered more in Spanish because of the increased linguistic and/or motoric complexity of that language compared with English. This certainly could be argued with respect to the case studies specific to stuttering in Kannada versus English. Additional support for this possibility is also found in the preliminary results from the present study related to the influence of the language produced.

Influence of Language Produced

Regardless of the child's dominant language, the children produced significantly more stuttering-like speech disfluencies when they were speaking Spanish than when they were speaking English. The production of non-stuttering-like speech disfluencies approached significance (in the same direction) but failed to yield significant differences. Specifically, of the 18 participants, only two participants presented with a lower frequency of stuttering-like speech disfluencies per 100 words in their Spanish compared with their English sample. Further, the frequency of those stuttering-like speech disfluencies in the Spanish samples was higher than the standard diagnostic guideline of 3 stuttering-like speech disfluencies per 100 words (Ambrose & Yairi, 1999) for 14 of the 18 participants, with the individual mean percentage of stuttering-like speech disfluency in these 14 Spanish samples ranging from 3% to 22%. By comparison, seven of the English samples were produced with greater than 3 stuttering-like speech disfluencies per 100 words. In addition, seven of the 18 participants presented with more than 3 stuttering-like speech disfluencies per 100 words in both their English and Spanish samples. There are, at least, a few key considerations as to why these bilingual children produced more speech disfluencies in their Spanish than in their English language sample regardless of dominance.

First, in Spanish there are more morphosyntactic elements to revise than in English. The speaker must choose the form with the appropriate level of definiteness, gender, and number (*el* [the masculine singular], *la* [the feminine singular], *un* [a masculine singular], *una* [a feminine singular], *los* [the masculine plural], *las* [the feminine plural], *unos* [the masculine plural], *unas* [the feminine plural]). By comparison, in English, the speaker needs to be concerned only about definiteness (i.e., "a" vs. "the"). Thus, the production of more speech disfluencies in Spanish than in English may be related to the fact that Spanish has more grammatical and syntactic restrictions (Bedore et al., 2006; Watson, Byrd, & Carlo, 2011).

Another example of language-based differences in disfluent speech is highlighted by Bernstein Ratner and Benitez (1985) in their documentation of an SE balanced bilingual who produced a higher amount of stuttering-like speech disfluencies when producing verbs than nouns in Spanish but did not produce a higher amount between these two word types when speaking English. Bernstein Ratner and Benitez argued that the common use of pro-drops in the Spanish language contributes to nouns being less frequent than verbs. That consideration, coupled with the fact that there tends to be a relatively equal production of nouns and verbs in English, provides language-based support for why there was a difference in speech disfluency frequency relative to word types between these two languages. In sum, present data lend further support to the need for clinicians to complete disfluent speech analyses in both of the languages the person speaks, as the production of speech disfluencies appears to uniquely vary depending on the language produced. Sampling in both languages will allow the clinician to identify all types of speech disfluencies produced by the child and whether production of specific types varies with respect to the child's language dominance. Additionally, sampling in both languages will provide insight regarding whether the production of specific types is influenced by the linguistic and/or motoric demands of the language being produced.

Additional Considerations Regarding Differential Diagnosis

Parental concern. Parent concern has been demonstrated to be a reliable resource for need for further evaluation (Glascoe, 1997). Specific to concern regarding stuttering, the frequency percentage needed to elicit parental concern may be significantly higher for parents of bilingual children as they may be more accustomed to hearing mazes in their child's speech. It is also possible that the presence of timing and tension differences is the main contributor to parental concern across parents of monolingual and bilingual children. In the present study, there were high rates of speech disfluencies produced, but all were produced without atypical tension or rhythm. At present, the key contributors to parental concern in the monolingual child who stutters have yet to be confirmed. Perhaps, with additional research, we may find that tense, arrhythmic speech is more concerning than is a high frequency of disfluent speech for the parents of bilingual as well as the parents of monolingual children.

Children versus adults. In the present study, we are reporting on a cohort of young bilingual SE children with typical fluency. We must consider that not only will the bilingual SE child who stutters differ but, also, that any differences noted may be exclusive to children. That is, with the bilingual typically fluent SE adult, the course of development of their two languages including the possibility of language loss in one or both of their languages (Grosjean, 1998, 2004) could lead to differences in speech disfluency at later ages from what we have seen in these younger children. Further, for the adult bilingual SE who stutters, these developmental differences in language use/loss, coupled with the affective factors that are characteristic of persistent stuttering (e.g., Craig et al., 2009), will undoubtedly present considerations that are distinct from those that we ultimately identify to be indicative of stuttering in young bilingual SE children.

Narrative versus structured conversation task. Research with monolingual English-speaking children who do and do not stutter suggests that speech disfluency is higher in narrative than in conversational speaking (Byrd et al., 2012). Byrd et al. (2012) also reported that the production of stuttering-like speech disfluencies, in particular, was higher in narratives than in conversations for all children. The authors suggested that rather than solely eliciting conversational samples, as has been the standard practice, clinicians should also elicit narrative samples. Perhaps bilingual SE children will show the same trend as monolingual English-speaking children. Future research should explore whether the disfluent speech of bilingual SE children differs in narrative versus conversational output, as this will allow for a better understanding of the type(s) of language sampling task(s) that would prove to be the most beneficial to use when analyzing the disfluent speech of these children.

Conclusion

Results from the present study suggest that bilingual SE children who do not stutter produce a higher frequency of stuttering-like speech disfluencies than would be expected in the output of monolingual English-speaking children who do not stutter. Our data corpus is not large enough to allow for a suggested cutoff score for bilingual SE speakers. However, clinicians should be aware that there is sufficient evidence to suggest that the speech disfluency frequency guidelines for monolingual English speakers appear to be too low for what might be indicative of stuttering in bilingual SE speakers. The evidence from the present study also lends additional support to the need as clinicians to take caution when interpreting the production of monosyllabic word repetitions, as this type of speech disfluency can inflate the speech disfluency frequencies to nearly five times the current standard used for English-speaking monolinguals. Present findings further suggest that production of this type of speech disfluency should not be included in the stuttering frequency calculations unless they are produced with atypical timing and tension. To that end, results reveal the need to explore the potential clinical use of prolongations (both audible and inaudible) as well as the rhythm and rate of iterations in diagnosing bilingual children who stutter, as these behaviors, in particular, may prove to be the most reliable differentiators. Last, but not least, our findings suggest that the speech disfluencies of bilingual SE children should be carefully considered relative to the complex nature of bilingualism. Specifically, the typically fluent bilingual SE child's disfluent speech appears to be mediated by the language being spoken, not by language dominance, as our participants produced more speech disfluencies in their Spanish than in their English output regardless of dominance. Perhaps, of greatest clinical relevance, the data presented here demonstrate that their disfluent output is not comparable with monolingual English speakers. Thus, any clinical use of monolingual English guidelines to determine factors such as diagnosis, prevalence, risk, and so forth are strongly cautioned against until researchers have additional evidence to support the reliability and validity of such application.

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