AN INVESTIGATION OF SPEECH DISFLUENCIES OF BILNGUAL URDU-ENGLISH

By

Aasia Kabani

A Master's Thesis submitted to the Department of

Communication Sciences and Disorders, in partial fulfillment of the reqiurements of degree of

MASTER OF ARTS

Chair of Committee: Kia N. Johnson, Ph.D., CCC-SLP

Committee Member: Farzan Irani, Ph.D., CCC-SLP

Committee Member: Katerina Ntourou, Ph.D., CCC-SLP

University of Houston
May 2020

DEDICATION

This thesis is dedicated to my parents, Sajjad and Shabana Kabani for their love and support. I dedicate this thesis to my husband, Humer Ali, my best friend and my number one fan. Love you so much Gopi. Lastly, I dedicate this thesis to my brothers, Fahd and Umar Kabani, for all the support and laughs. I am so grateful for you all.

ACKNOWLEDGMENTS

I would like to thank Dr. Kia Johnson for all that you have done. For guiding, supporting and being an amazing mentor for me, not only during this study but throughout my graduate school years. Thank you for always believing in me, push me, and encouraging me to strive for the best and giving me all the opportunities to shine. I would not have been able to accomplish all that I have without you. Thank you Dr. Johnson, I will forever be grateful.

Thank you Dr. Farzan Irani and Dr. Katerina Ntourou for all the time you put in and for all the collaboration during this process. Your knowledge and expertise has been priceless and I appreciate all you did for this study.

A special thank you to the University of Houston Stuttering Research Laboratory graduate researchers, Daniela Castro Alvarez and Yousrah Wasim – for help running participant visits alongside me, coding and transcribing data. Your time and efforts will always be appreciated.

ABSTRACT

Bilingual Urdu-English (UE) children who do not stutter (CWNS) are known to exceed the diagnostic criteria for developmental stuttering based on monolingual English speakers during their developmental age. Because of this, this population is at a great risk of being misdiagnosed as children who stutter (CWS). The purpose of this current study is to examine the frequency and types of speech disfluencies in school-age bilingual Urdu-English (UE) children who do not stutter (CWNS) during narrative and conversational language samples. This study compared the frequency and types of speech disfluencies of Urdu-English (UE) CWNS to those of Spanish-English (SE) CWNS from Rincon, Johnson, and Byrd (2020) during narrative and conversational language samples. The current study was an expansion of Naqvi (2019) to include a larger sample of Urdu-English speaking children and address other limitations identified in this previous study. Participants included bilingual Urdu-English children (6 CWNS) ranging from 5 years to 7 years and 11 months that were recruited from the greater Houston, Texas area. Findings indicated that the current diagnostic criteria for developmental stuttering, which is based on Monolingual English Speakers, are not appropriate for bilingual Urdu-English CWNS. Findings suggests that across both U-E CWNS and S-E CWNS both met the diagnostic stuttering criteria of 3% stutter-like disfluencies per total number of words spoken for 2 of the 4 samples, in both narrative. Secondly, UE-CWNS presented with stuttering-like disfluencies that are based on repetition including sound syllable repetition and whole word repetition, as well as audible sound prolongation. Lastly, U-E CWNS and S-E CWNS both exhibited comparable types of speech disfluencies.

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Introduction

Childhood stuttering is a fluency disorder that impacts approximately 1% of the school-age population in the United States (Scott, 2012). Approximately, 5% of children go through a period of stuttering in the span of their preschool years. And while most recover, 1% persist (Scott, 2012). A major component in determining the presence or absence of childhood stuttering involves assessing the frequency of sutter like disluencies as well as notating the types of speech disfluencies being exhibited (Scott, 2012). These data are traditionally analyzed against evidence-based criteria created from monolingual English-speaking children who do and do not stutter (Byrd, Bedore, & Ramos 2015). However, Byrd, Bedore and Ramos (2015) , Rincon, Johnson, & Byrd (2020) , Naqvi (2019) and Choo & Smith (2020) are a few of many studies that suggest that this use of this criteria with may have negative implications for use in determining the presence or absence of stuttering in bilingual children.

Defining Stuttering

Fluency is the production of speech which includes the smoothness, continuity, effort and rate (American Speech-Language-Hearing Association, 2020). The most common fluency disorder, stuttering, is a break in the natural flow of speech which is represented by sound prolongations, repetitions, blocks, revisions and interjections. All of which can affect the manner of speech. In addition, physical tension, negative reactions, avoidance of specific sounds or words, and secondary behaviors are present (ASHA, 1993; Yaruss, 1998; Yaruss, 2004).

The speech disfluencies presented in stuttering are categorized into two types: 1. Stuttering-like disfluencies (SLD) and 2. Nonstuttering-like disfluencies (nSLD) (Ingham & Riley, 1998; Johnson, 1961; Sawyer & Yairi, 2006; Yaruss, 1997). Types of SLDs include monosyllabic whole-word repetitions (e.g. cat-cat-cat), sound/syllable repetitions (e.g., “co-co-co-cookie”), audible sound prolongations (e.g., “coooooookie”), and inaudible sound prolongations (e.g., “I want a …. cookie”). Types of nSLDs include

revisions (e.g. “I need... I mean I want a cookie”), phrase repetitions (e.g. “I want I want to go to the store”) and interjections (e.g. “umm”, “like”).

In considering a diagnosis of stuttering, a considerable amount of weight is placed on the frequency of speech disfluencies – especially stuttering-like disfluencies – presented by the individual. The criteria often used is based on monolingual English-speaking children and indicates that – for children who stutter - the frequency of total speech disfluencies (i.e., stuttering-like disfluencies + nonstuttering-like disfluencies) traditionally should exceed 10% of words spoken and the frequency of stuttering-like disfluencies exceed 3% (Scott, 2012; Ambrose & Yairi, 1999). However, reports based on bilingual Spanish- English (SE) speakers who do not stutter have suggested that bilingual children with normal speech fluency exhibit more disfluencies than monolingual individuals their age and surpass the frequency criteria of 3% of stuttering-like disfluencies (Byrd, Watson, Bedore, & Mullis, 2015; Byrd, Bedore, & Ramos, 2015). This places bilingual Spanish-English children at high risk of being misdiagnosed with stuttering in comparison to their monolingual English-speaking counterparts (Byrd, Watson, Bedore, & Mullis, 2015). The variation of stuttering has been monitored across various locations, context and conversational partners (Johnson et al., 2009). However few studies have examined stuttering across languages within a bilingual child (Ramos, 2015).

Bilingualism and Stuttering

There is a growing body of research focused on bilingualism and stuttering (Byrd, Watson, Bedore, & Mullis, 2015). Most of what has been published recently centers around bilingualism and stuttering in Spanish-English (SE) speaking children and are relatively low in sample size.

Spanish-English Studies. A study by Taliancich-Klinger, Byrd, and Bedore (2013) reported disfluent speech for a bilingual SE female at age of 6 years and 1 month with confirmed stuttering. Parents reported the child’s language input and output as well and conducting speech and language assessments to identify the child’s language skills in both English and Spanish. The results illustrated mixed language dominance. Overall, the participant demonstrated more nonSLDs (non-stutter like

disfluencies) than SLDs (stutter like disfluencies) in both Spanish and English and presented more disfluent in both Spanish and English when the participant made a longer mean length of utterance (MLU). As a result, because the authors believe that language and stuttering specific aspects play a big role to the fluency breakdowns in bilingual SE CWS, the researchers stated the need for further and continued research on bilingual SE CWS in order to establish an appropriate diagnostic criteria and guideline for bilingual population (Taliancich-Klinger, Byrd, & Bedore, 2013).

Byrd, Bedore, and Ramos (2015) conducted a study examining the frequency and type of speech disfluencies produced by bilingual SE children who do not stutter. In this research study, Byrd and colleagues analyzed tell-retell narratives in both Spanish and English elicited from 18 kindergarten children using one of four wordless picture books from the *Frog, Where are You?* book series. The authors reported the frequency of stuttering-like disfluencies (i.e., monosyllabic word repetitions, sound repetitions, and syllable repetitions) to range from 3% to 22%, which exceeds the diagnostic criteria or standard of 3% stuttering-like disfluencies to determine the presence of stuttering (Byrd et al., 2015). Byrd et al, (2015) also report no significant difference in the frequency of speech disfluencies depending on language dominance. However, they did report a greater frequency of stuttering-like disfluencies by their participants in Spanish in comparison to English. Clinical application of the findings recommended use of this data when developing a process to accurately identify stuttering in this population.

Another study by Byrd and colleagues (Byrd, Watson, Bedore, & Mullis, 2015) sought to investigate the ability of bilingual SE speaking speech-language pathologists to accurately identify stuttering in SE children. Participants, 14 SE speaking SLPS, listened to narrative retell samples in Spanish and English provided by 2 SE children – one who had a diagnosis of stuttering and one who did not – using books from the *Frog Where Are You?* book series. Results from this study indicated that while 10 of the 14 SLP participants correctly identified the sample of a child with diagnosed stuttering as the child who stutters, 12 of the 14 participants inaccurately identified the nonstuttering child as the child who stuttered. The authors went on to report that the findings were not influenced by the participants' length of clinical experience or confidence and training on the topic.

Another recent study by Rincon et al. (2020) investigated speech disfluencies in Spanish-English CWS and CWNS. The purpose of this study was to examine the speech disfluency, frequency and type of bilingual SE CWS to SE CWNS during narrative samples elicited in Spanish and English to provide further diagnostic information for this population. Speech disfluencies were compared between 3 bilingual children who stuttered and 3 bilingual children who did not stutter. Narrative speech samples were elicited from each participant in both languages. Findings indicated both groups to have a high frequency of speech disfluencies including a percentage of stuttering-like disfluencies that exceeded 3% regardless of language or sample type. However, differences in the types of disfluencies were reported. Specifically, while both groups presented with a high frequency of whole-word and part-word repetitions, the children who stuttered were more likely to also present with audible and inaudible sound-prolongations which was not the case with the children who did not stutter (Rincon et al., 2020). This study has been expanded to also include the addition of play-based conversational sample (i.e. dialogue) from the same group of children (Johnson, Byrd, & Rincon, in preparation).

All in all, based on research by Taliancich-Klinger, Byrd, & Bedore (2013), Byrd, Bedore, & Ramos (2015), and Rincon et al. (2020), we see consisant results of increase in freuencies and stutter like disfluenies in bingual Spanish English children who do not stutter.

Urdu-English Studies. While Spanish and English have often been the foci of these studies, other languages have also been examined – albeit limited – to include Urdu. An exploratory study was conducted by Naqvi and Johnson (2019) with the purpose of investigating the frequency and type of speech disfluencies in 3 bilingual Urdu-English speaking kindergarten children. In this study, very similar to methodology used in Rincon et al. (2020), participants provided narrative and play-based conversational in both Urdu and English. Findings from that relatively small exploratory study were similar to what has been reported on the speech disfluencies of Spanish-English speaking children (e.g., Rincon et al., 2020; Byrd et al., 2015).

Specifically, Naqvi and Johnson (2019) hypothesized that bilingual Urdu-English (U-E) children who do not stutter (CWNS) would exhibit a frequency of (1) overall speech disfluencies (i.e., stuttering-

like disfluencies and nonstuttering-like disfluencies) and (2) stuttering-like disfluencies that would exceed the diagnostic criteria commonly used to diagnose stuttering in children (i.e., 10% total disfluencies for words spoken and 3% stuttering-like disfluencies of total words spoken in sample) regardless of the speech sample type (narrative; conversation) or language (Urdu; English). It was also hypothesized, that of the stuttering-like disfluencies displayed, U-E CWNS would only exhibit sound/syllable repetitions and whole-word repetitions.

For the methodology of Naqvi and Johnson (2019), 3 participants between the ages of 5 and 7 provided two narrative samples – one sample in Urdu and one sample in English – as well as two play-based conversational samples – one sample in Urdu and one sample in English. Each sample for the three participants were coded for disfluencies in order to determine the percentage of total disfluencies per sample, percentage of stuttering-like disfluencies per sample, as well as a tabulation of disfluencies by type. A parent/guardian of each participant also completed an adapted version of the Bilingual Input-Output Survey to measure the child's overall input and output in Urdu and English to confirm that each participant met the study requirements.

These findings are similar to what has been reported in studies speech disfluencies of Spanish-English speaking children. Specifically, two of the three bilingual U-E participants met or exceeded the diagnostic criteria of 10% total speech disfluencies in the narrative samples of both languages, but none in the conversational samples. The same two participants of the three also met or exceeded the diagnostic criteria of 3% stuttering-like disfluencies in the narrative samples of both languages, but not in the conversational samples. The third participant was more inconsistent by meeting or exceeding this 3% criteria in the Urdu conversational sample and the English narrative sample only. Findings from Naqvi are also consistent with Rincon et al (2020) in that of the stuttering-like disfluencies presented by the U-E CWNS participants, all were sound/syllable repetitions and monosyllabic whole-word repetitions. Although the sample size is extremely small in number, Naqvi (2019) interprets findings to suggest that an increased risk for a misdiagnosis of stuttering in bilingual children who do not stutter extends beyond just bilingual Spanish-English speakers to other languages spoken with English. Despite interesting

findings, Naqvi (2019) did present with some limitations. Of the limitations, the most notable limitation was sample size. The method of screening speech and language skills to determine inclusion/exclusion procedures was also mentioned as a limitation.

Taken together, findings from these studies will be useful in improving the diagnosis of stuttering in bilingual children and decrease the likelihood of an erroneous diagnosis of stuttering. While each of these studies have investigated the characteristics of speech disfluencies in a specific bilingual population, none - to the author's knowledge - have compared the speech disfluencies of one bilingual population (i.e., Spanish-English speaking children) to those of another bilingual population (i.e., Urdu-English speaking children). These types of cross cultural empirical investigations are necessary to understand to role of bilingualism in fluency and how best to assess bilingual children for stuttering. Long-term, these can also help determine whether the amount of disfluencies in bilinguals are language dependent or just a consequence of learning a second language and eventually predicting recovery vs persistence. By looking into different languages, and cross cultural similarity and differences, one can learn the langauge speech patterns and how frequncies of both SLDs and nSLDs are present in languages.

Bilingualism in the United States

Cultural diversity in the United States has substantially grown in the last decade (Zeigler & Camarota, 2018). There are over 67 million residents in the United States (US) that speak a language other than English in the home (Zeigler & Camarota, 2018). According to the 2015 Census Bureau, the percentage of bilingual speakers has doubled over time, from 10% bilingual to 20% (Grosjean, 2018). While Spanish is the most common language spoken in the United States (US) besides English, Urdu has also grown substantially from 2010 to 2017 (Grosjean, 2018). Specifically, US residents who are bilingual in Urdu and English rose by 23% since 2010 (CIS).

Within the US, Texas ranks second among states having a large population (36%) of speakers who speak a language other than English at home (Zeigler & Camarota, 2018). Houston also ranks as the fourth largest city to have on average 50% of residents who speak another language at home than English

with Urdu ranked as one of the most spoken (Scamman, 2017; Zeigler & Camarota, 2018). These data suggest continued growth in bilingualism in the US to include bilingual Urdu-English speakers.

The Urdu Language

In 2004, Shackle reported there to be approximately 100 million Urdu speaking individuals around the world (Shackle, 2004). Urdu is the national language of Pakistan and is also spoken in Bangladesh India, Nepal, Middle East and other countries around the world. Urdu originates from a poetic background and is similarly written to Arabic scriptures (Shackle, 2004).

The language includes formal and informal verb forms (formal verbs are used with elders and/or an individual with an importance stance. Informal verbs used in more casual conversations, with friends for example) as well as masculine or feminine gender noun. While English is written from left to right, Urdu is written from right to left. The language has 39 basic letters and 13 extra characters, like the Arabic letters. In Arabic, there are 28 consonantal phonemes (in which two are semi-vowels). Arabic has six vowel phonemes, which include three long vowels and three short vowels. Overall, Arabic sounds are uvular Pharyngeal and pharyngealized (Shackle, 2004).

Unlike in English, which has 5 vowels, Urdu has 3 short vowels sounds and 7 long vowel sounds (Shackle, 2004). The short vowels are represented through diacritics placed either above or below the letters, as presented in the Arabic language. In Urdu, the diacritics are often omitted which results in the need to use context clues to accurately identify the intended sound when reading in Urdu (Shackle, 2004). Long vowels are written using letters combined with diacritics.

Relative to syntax, there are vast differences between Urdu and English, both having distinct and unique grammatical structure, properties and rules. Based on the demographics of ASHA (ASHA 2019), it is safe to assume that most speech-language pathologists have little or no knowledge of the Urdu language nor clinical implications of the language for bilingual children. It is important for speech-language pathologists to be familiar with the presentation of normal speech disfluencies in bilingual children including bilingual Urdu-English speaking children in order to properly identify stuttering.

Purpose

Thus, the purpose of the current study is to examine the frequency and types of speech disfluencies in school-age bilingual Urdu-English (UE) children who do not stutter (CWNS) during narrative and conversational language samples. This study will also informally compare the frequency and types of speech disfluencies of UE CWNS to those of Spanish-English (SE) CWNS from Rincon et al. (2020) during narrative an samples. The current study expands Naqvi (2019) to include a larger sample of Urdu-English speaking children and address other limitations identified in this previous study.

The following research questions were posed:

1. What is the frequency of SLD and nSLD in he speech of bilingual U-E CWNS during in Urdu and English conversational and narrative samples?
1. What type of disfluencies are predominant in the speech of U-E bilingual children in English and Urdu conversational and narrative samples?

It was hypothesized that – like bilingual Spanish-English speaking children, U-E CWNS will have an increased frequceny for both SLD and nSLDs exceeding the diagnostic criteria for total speech disfluencies and stuttering-like disfluencies in both languages. It was also hypothesized that U-E CWNS will exhibit more monosyllabic whole-word and part-word repetitions that audible for SLDs and all types of NSLDs as S-E CWNS in Rincon (2020).

Methods

Participants

Participants consisted of 6 bilingual UE typically developing children (4 males and 2 females) between the ages of 5;0 (years; months) to 7;11 (M = 95 months SD = 32.72). Based on parent report, all 6 participants were identified as Asian. Participants were paid volunteers recruited from the Houston metropolitan area by means local area speech-language pathologists, friends, family, and social media as well as the distribution of fliers to Mosques. This study was approved by the University of Houston

Committee for Protection of Human Subjects Parental consent was obtained for each participant and also included assent from the children.

Based on parent report, none of the 6 participants were reported to have a current or previous diagnosis of stuttering. Additionally, none of the participants were reported to have any other speech, language, or hearing problems with the exception of one participant who was reported to be receiving speech therapy for a speech sound production disorder.

From an initial sample of 7 participants, 1 was excluded from data analyses due to age being higher than the recruiting age. This resulted in 6 participants for the current study (Table 6). To address the third research question and hypothesis comparing speech disfluencies of the current U-E participants to S-E participants, extant data from 6 participants were selected from Rincon et al, (2020) who matched closely to the current participants in gender and age. Those 6 S-E participants were also between the ages of 5;0 (years; months) to 7;11 (M = 78.00 SD = 9.67). For this study, we looked at 3 S-E CWNS and 3 S-E CWS.

Establishing Bilingual Eligibility

As with Naqvi (2019), to determine the participants level of bilingualism, at least for the current study, and determine their exposure to the Urdu and English language, a parent(s) of each participant completed an adapted version of the *Bilingual Input-Output Survey (BIOS;* (Peña, Gutierrez-Clellen, Iglesias, Goldstein, & Bedore, 2014). The BIOS is a parent-report questionnaire initially created to determine a child's exposure to Spanish and English on a day-to-day basis. Although the BIOS was created for use with Spanish and English, the questionnaire simply elicits a daily report of the participant's percentage of language input and output across two languages. This questionnaire has been used in other studies involving bilingual Spanish-English children (Byrd, Bedore, & Ramos, 2015; Taliancich-Klinger & Byrd, 2013; Rincon et al., 2020).

As with other similar studies (Naqvi, 2019; Byrd, Bedore, & Ramos, 2015; Taliancich-Klinger & Byrd, 2013; Rincon et al (2020), participants for the current study needed to have at least 20% input and

output in both Urdu and English to be eligible. Based on parent-report on the BIOS, all participants had at least 20% input and output in Urdu and English.

Speech, Language, and Hearing Screening

For the current study, the *Alberta Language and Development Questionnaire* (ALDeQ; Paradis, Emmerzael, & Duncan, 2010) was used to screen each child's speech and language skills. The ALDeQ is a parent-report questionnaire to gather information on the child's speech and language development in their first language and whether the parent identifies areas of concern. The ALDeQ has been used in other studies in instances where formal speech and language tools are not available (Paradis, 2016). The ALDeQ consists of 4 sections: Early Milestones, Current fist language abilities, Behavior patterns, Activities preferences and Family history. The ALDeQ questionnaire is given as an interview. The ALDeQ was selected because, to the author's knowledge, there are no valid and reliable standardized screening or assessment tool available to assess the speech and language skills of bilingual Urdu-English speakers as well as no accessible tool to formally assess the speech and language skills of monolingual Urdu speaking children. Based on parent-report, there were no concerns with speech and language development in either language for any of the participants. All participants also passed a binaural pure tone hearing screening and had no other speech, language, and related problems.

Talker Group Classification

Participants were classified as a CWNS if there was (a) no parental concern for stuttering (b) listener perception of normal speeh fluency in both langauges by the graduate student reseracher (c) and listener perception of normal speech fluncey in English by a board certified speech-lanaguage pathologist with expertise in stuttering.

Procedures

Methodology for this study was adapted from Naqvi (2019) and Rincon et al. (2020). Data was collected from each participant during a 1.5 hour visit at either the University of Houston Sugar Land campus or the University of Houston main campus. The location was selected by the parent based on

convenience. Data was collected by 2 graduate student clinicians, both of whom were bilingual native Urdu speakers. However, for each visit, one of the two student clinicians were designated as the Urdu *only* speaker while the other was designated as the English *only* speaker during the duration of the research visit. This was done to lead each participant into believing that each student clinician only spoke English or Urdu thus increasing the likelihood of obtaining an adequate size sample in both languages. One of two student clinicians administered the ALDeQ to the parent/guardian of the participant, while the other student clinician screened hearing.

Speech Samples

Four counterbalanced speech samples were obtained per participant: (1) Narrative sample in English, (2) Narrative sample in Urdu; (3) Conversational sample in English; (4) Conversational sample in Urdu. The langauge the gradute student clinician would speak for the session was selected at random. The same graduate clinician that obtained the narrative sample in Urdu, is the same graduate student that obtained the conversational sample in Urdu. This was done so that the child believed that each clinician only spoke Urdu or English, hence, reducing the changes of the participant speaking to the clinician in the language they preferred.

Narrative speech samples. A narrative sample in English and in Urdu, separately, was elicited from each participant through a tell-retell method using a wordless picture from the *Frog Where Are You?* book series. Two book from the series – *Frog Where are you*– were translated by the graduate student clinician who is a Native speaker of Urdu (with assistance with graduate student's Urdu native speech parent) and used to elicit narrative samples in Urdu. A different book from the series – Frog Where Are You? - was used to elicit narrative samples in English. For both languages, the story was read aloud by the clinician while viewing the pictures from the story. Both Frog Where Are You books were contunterbalanced to rule out any differences that can arise from one book to the other. After the clinician read the story while viewing the pictures with the participants, the child was then instructed to retell the

story while reviewing the pictures. Each of the four narrative samples were approximately 20 - 30 minutes in length yielding samples that ranged from 250-300 words total (M = 277.3, SD = 35.206).

Conversational speech samples. A conversational sample in English and in Urdu, separately, was elicited from each participant through informal play with age-appropriate stimuli (e.g., Legos, race cars, Playdoh). One of the student clinicians engaged in conversation with the participant to elicit a sample. The student clinician guided the conversation with abstract topics (e.g., activities from school, upcoming family, or family celebrations).

Dependent Measures and Data Preparation

Speech disfluencies. The following dependent measures were used for preliminary data analyses: (1) total disfluencies (stuttering-like + nonstuttering-like disfluencies)/number of words spoken (TDs), (2) stuttering-like disfluencies/number of words spoken (SLDs), and (3) ratio of stuttering-like disfluencies to total disfluencies (SLDs/TDs).

Data coding. Each speech sample was coded by a graduate student clinician for stuttering-like and nonstuttering-like speech disfluencies through use of video recordings of each sample. Live disfluency counts were taken during each session when collecting samples. For each sample, disfluency counts were recoded by video recordings of each sample session. The graduate student clinicians have been formally trained in tabulating speech disfluencies. Langauge samples were not transribed, but should be considered in the future studies and furture coding.

Reliability. Intra- and inter-judge measurement reliability were obtained for total disfluencies (stuttering-like + nonstuttering-like disfluencies) in Urdu and English in all 4 samples using 2 randomly selected participants. The interrater relaiblity was conducted by both graduate student researchers recoding the speech sample coded by the other graduate student reasreacher. The intrarater reliability was conducted by the same graduate student researcher who recoded their own videos of speech samples. Intra- and interjudge reliability percentages for the two speech disfluency measures were assessed through

use of the following reliability index (e.g., Johnson, Walden, Conture, & Karrass, 2010): (A+B/[A+B]+[C+D])× 100, where A = number of words judged stuttered on both occasions, B = number of words judged nonstuttered on both occasions, C = number of words judged stuttered on one occasion, and D = number of words judged nonstuttered on one occasion. The interrater reliability for total speech disfluencies was 99% in Urdu and 72% in English. All codings were coded and recoded between the year span of the samples being collected. The intra-rater reliability was 86% in Urdu and 86% in English. The author – a second year graduate student with previous formal education and training on fluency disorders – served as one coder and a first-year graduate student with training on speech disfluency served as the second coder. Due to the small sample size of the study, a MANOVA was not conducted. Descrptive data was used in this study.

Results

To review, this study sought to answer the following research questions:

1. What is the frequency of SLD and nSLD in the speech of bilingual U-E CWNS during in Urdu and English conversational and narrative samples?
2. What type of disfluencies are predominant in the speech of U-E bilingual children in English and Urdu conversational and narrative samples?

This study hypothesized that, like bilingual Spanish-English speaking children, U-E CWNS will have an increased frequceny for both SLD and nSLDs exceeding the diagnostic criteria for total speech disfluencies and stuttering-like disfluencies in both languages. It was also hypothesized that U-E CWNS will exhibit more monosyllabic whole-word and part-word repetitions than audible for SLDs and all types of NSLDs as S-E CWNS in Rincon (2020).

Frequency of Speech Disfluencies in U-E Children

Due to the low sample size of the study, results are reported by participant.

U-E participant 1: 7-year-old female. During the narrative Urdu sample, participant 1 presented with: 11% of TDs, 8.3% of SLDs, and 75.8% of SLDs/TDs. During the narrative in English, the participant presented with: 7% of TDs, 3% of SLDs, -and 42.9% SLDs/TDs. During the conversational Urdu sample, she presented with: 5.3% of TDs, 1.3% of SLDs, and 25% SLDs/TDs. During the conversational English sample, she presented with: 7.3% of TDs, .3% of SLDs, and 4.5% of SLDs/TDs. Overall, the percentage of total speech disfluencies (TD) exceeded the criteria in Urdu during the narrative samples only. Additionally, the percentage of stuttering-like disfluencies met or exceeded the criteria in both languages during the narrative samples (Table 7).

U-E participant 2: 6-year-old male. During his narrative Urdu sample, participant 2 presented with: 10.1% of TDs, 6.1% of SLDs, and 60.9% of SLDs/TDs. During the narrative English sample, he presented with: 10.2% of TDs, 6.1% of SLDs, and 60% of SLDs/TDs. During the conversational Urdu sample, he presented with: 2.6% of TDs, 1.7% of SLDs, and 50% SLDs/TDs. During the conversational English sample, he presented with: 3% of TDs, .7% of SLDs, and 22.2% SLDs/TDs. Overall, the percentage of TDs and SLDs met or exceeded the criteria during the narrative samples in both languages only (Table 8).

UE participant 3: 5-year-old male. During the narrative Urdu sample, participant 3 presented with: 2.1% of TDs, .4% of SLDs, and 20% SLDs/TDs. During the narrative English sample, he presented with: 7.1% of TDs, 5% of SLDs, and 70% of SLDs/TDs. During the conversational Urdu sample, he presented with: 4.6% of TDs, 3.1% of SLDs, and 66.7% of SLDs/TDs. During the conversational English sample, he presented with: 5% of TDs, 2.7% of SLDs, and 53.3% of SLDs/TDs. Overall, the only percentage that exceeded the criteria was the percentage of SLDs during the English narrative sample (Table 9).

UE participant 4: 6-year-old female. During the narrative Urdu sample, participant 4 presented with: 2% TDs, .7% of SLDs, and 33.3% of SLDs/TDs. During the narrative English sample, she

presented with: 2.3% of TDs, 1.3% of SLDs, and SLDs/TDs of 57.1%. During the conversational Urdu sample, she presented: 1.3% of TDs, .3 % of SLDs, and 25% of SLDs/TDs. During the conversational English sample, the participant presented with: 1% of TDs, 0% of SLDs, 1% of nonSLDs, and 0% of SLDs/TDs. Overall, participant 4 did not meet or exceed the criteria in either language (Table 10).

UE participant-_5: 7-year-old male. During the narrative Urdu sample, participant 5 presented with 7.7% of TDs, 2% of SLDs, and 26.1% of SLDs/TDs. During the narrative English sample, she presented: 6% of TDs, 2% of SLDs, and 33.3% of SLDs/TDs. During conversational Urdu sample, he presented with: 5.7% of TDs, 1% of SLDs, and 17.6% of SLDs/TDs. During conversational English sample, she presented with: 7% of TDs, 1.3% of SLDs, and 19% of SLDs/TDs. Overall, participant 5 did not meet or exceed the criteria in either language (Table 11).

UE child participant: 6-year-old male. During the narrative Urdu sample, participant 6 presented with: 1.7% of TDs, .7% of SLDs, and 40% of SLDs/TDs. During the narrative English sample, he presented with: 1.7% of TDs, .3% of SLDs, and 20% of SLDs/TDs. During the conversational Urdu sample, the participant presented with: .7% of TDs, 0% of SLDs, and 0% SLDs/TDs. Lastly, during the conversational English sample, he presented: 3.3% of TDs, .3% of SLDs, and 1% of SLDs/TDs. Overall, participant 6 did not meet or exceed the criteria in either language (Table 12).

Based on the results related to frequency of speech disfluencies, two of the 6 participants exceeded the criteria of total disfluencies (10%) or stuttering-like disfluencies (3%). This suggests that, in general – but based on a small sample size - bilingual Urdu-English speaking children with typically developing speech do not meet the diagnostic criteria based on monolingual English-speaking children.

Types of Speech Disfluencies Exhibited by U-E Children

The following results address the second hypothesis that U-E CWNS would exhibit more monosyllabic whole-word and part-word repetitions than audible and inaudible sound prolongations. (Table 5). Due to the low sample size of the study, results are reported by participant.

U-E participant 1: 7-year-old female. During her narrative Urdu sample, she presented with 9 SSRs, 16 WWRs, 2 PRs, 1 INT, and 5 REVs. During the narrative English sample, she presented with, 2 SSRs, 6 WWRs, 1 ASP, 7 PRs, 2 INTs, 3 REVs. During the Urdu conversation she presented 1 SSR, 3 WWRs and 12 INTs. Lastly, during the English conversation she presented 1 SSR, 1 PR, 16 INTs, and 4 REVs (Table 13).

U-E participant 2: 6-year-old male. During his narrative Urdu sample, she presented with 5 SSRs, 9 WWRs, 1 PR, 5 INJs and 3 REVs. During the narrative English sample, he presented 8 SSRs, 7 WWRs, 5 PRs, 4 INT and 1 REV. During his English conversational sample, he presented 4 SSRs, 4 WWRs, 3 INTs, and 4 REVs. Lastly, during Urdu conversational sample he presented with 2 SSRs, 2 WWRs, 1 PRs, and 2 REVs (Table 14).

U-E participant 3: 5-year-old male. During the narrative Urdu sample, he presented 1 SSR, 3 INTs, and 1 REV. During the narrative English sample, he presented 4 SSRs, 3 WWRs, 1 INT, and 2 REVs. During the Urdu conversational sample, he presented 5 SSRs, 1 WWRs, and 3 INTs. Lastly, during the English conversational sample, he presented, 1 PR, 1 INT, and 1 REV (Table 15).

U-E participant 4: 6-year-old female. During the Urdu narrative sample, she presented 1 SSRs, 1 WWR, 3 INT, and 1 REV. During the English narrative sample, she presented 2 SSRs, 2 WWRs and 3 INTs. During the Urdu conversational sample, she presented 2 SSRs, 1 WWRs, and 2 INTs. Lastly, during the English conversational sample, she presented, 1 PR, 1 INT, and 1 REV (Table 16).

U-E participant 5: 7-year-old male. During the Urdu narrative sample, he presented 2 SSRs, 4 WWRs, 16 INTs, and 1 REV. During the English narrative sample, he presented 6 WWRs, and 9 INTs. During the Urdu conversational sample, he presented, 3 WWRs, 4 PRs, 10 INTs, and 3 REVs. Lastly, during the English conversational sample, he presented 4 WWRs, 14 INTs, and 3 REVs (Table 17).

U-E participant 6: 6-year-old male. During the narrative Urdu sample, he presented 1 SSR, 1 WWR, and 3 INT. During the English narrative sample, he presented, 1 WWRs 2 INTs, and 2 REVs.

During the Urdu conversational sample, he presented 1 INT and 1 REV. During the English conversational sample, he presented 1 SSR, 1 PR, 4 INTs, and 4 REVs (Table 18).

Based on the results related to the types of speech disfluencies, all participants exhibited more monosyllabic whole-word and part-word repetitions than audible and inaudible sound prolongations which is in line with the second hypothesis (Table 5).

Discussion

This exploratory study investigated the frequency and types of speech disfluencies in school-age bilingual Urdu-English (UE) children who do not stutter (CWNS) during narrative and conversational language samples. The present study sought to answer the following research questions:

1. What is the frequency of SLD and nSLD in the speech of bilingual U-E CWNS during in Urdu and English conversational and narrative samples?
2. What type of disfluencies are predominant in the speech of U-E bilingual children in English and Urdu conversational and narrative samples?

Both research questions will be discussed below.

1. What is the frequency of SLD and nSLD in the speech of bilingual U-E CWNS during in Urdu and English conversational and narrative samples?

Based on a small sample size, not all the particpants met the diagnostic stuttering criteria of 10% total speech disfluencies per total number of words spoken in either of the 4 samples (Table 1 & 3). The averages of the samples are the following: Urdu narrative 5.8 %, English narrative 5.7%, Urdu conversation 3.4%, English conversation 4.4%; none met the 10% creiteria of total speech disfluencies. On average, however, the participants in this study met the diagnostic stuttering criteria of 3% stutter-like disfluencies per total number of words spoken for at least 2 (narrative samples) of the 4 speech samples (Table 2 & 4). The average for the Urdu narrative sample was 3.03% and the average for English

narrative sample of 3%; both meeting the creiteria of 3% stutter like disfluencies. As of now, the criteria diagnoses stuttering at 10% in total disfluencies and 3% in stutter-like disfluencies per 100 words (Byrd et al., 2015). If participants from the current study were held to these diagnostic criteria that are normative data based on monolingual English speaking children, then the participants in this study whos frequency exceed the 3% criteria of stutter like disfluencies in the narrative samples could potentially be misdiagnosed. Where in fact, the participants are showing a profile that appears to be similar to other bilingual children who do not stutter which include increased frequency in stutter like disfluencies.

In addition, based on reports from Byrd, Watson, Bedore, & Mullis, (2015) and Byrd, Bedore, & Ramos, (2015), research on bilingual Spanish- English (SE) speakers who do not stutter have suggested that bilingual children with normal speech fluency exhibit an increased of frequency of disfluencies than monolingual individuals their age and surpass the frequency criteria of 3% of stuttering-like disfluencies. All in all, with 3 of the 6 bilingual Urdu-English participants meeting the frequency of 3% stutter like disfluencies in both narrative samples, we see that the bilingual population has a higher chance of being misdiagnosed.

2. What type of disfluencies are predominant in the speech of U-E bilingual children in English and Urdu conversational and narrative samples?

To address the second research question, during this study, SLDs presented by U-E CWNS included sound/syllable repetitions, whole-word repetitions and one audible sound prolongation. All nSLDs were presented in both samples; phrase repititons, revisions and interjections. In contrast with Rincon et al. (2020), Spanish-English CWNS presented with the similar SLDs consisting of whole-word and sound/syllable repetitions in both English and Spanish, presenting in narrative samples. This study reported sound/syllable repetitions and whole-word repetitions to be present in both bilingual SE CWS and SE CWNS and to have audible and inaudible sound prolongations presented in SE CWS. Hence, Rincon et al. (2020) noted that SE CWS presented with a higher frequency of audible and inaudible sound prolongations compared to SE CWNS.

Thus, with the comparison with Rincon et al (2020), and the progression of the severity of stuttering, the findings from the current study support the hypothesis that U-E CWNS will exhibit more whole-word and sound/syllable repetitions than audible and inaudible sound prolongations. With future investigating of U-E CWS, researchers can see whether SLDs such as audible and inaudible sound prolongations are present in UE CWS who display a greater severity in stuttering.

Caveats

Small Sample Size

Due to the exploratory nature of this study, collecting a big sample size was difficult. A sample size of (n=6) U-E CWNS was investigated. Future expansion to this study will need to include a larger sample size that includes bilingual U-E CWNS and bilingual U-E CWS. In addition, future studies should also continue and expand on assessing more bilingual CWS and CWNS, comparing type of disfluencies, as well as finding or formaualting Urdu language and speech assessments that can address the particpant's language and speech proficiency.

Reliability in Coding

The first coder was a second year graduate student researcher who coded data in both Urdu and English. Our second coder who was a first year graduate student did not have formal course instruction in fluency disorders. However given that the student spoke both Urdu and English, it was difficult to find a graduate student who spoke Urdu and took part in the formal fluency course. The first year graduate researcher was taught the foundations of fluency, how to take disfluency counts and information regarding the type of disfluencies. After the graduate student researcher was trained, she became appropriate for this role and was able to successfully code fluency research in both Urdu and English. In future research, gathering relaibity for all particpants will be important to make the date more reliable and accurate.

Lack of Language Assessment that is appropriate for Urdu-English Speaking children

In this current study, there was a lack of having Urdu language and speech assessments. In Rincon et al. (2020), the study included a formal language assessment tool for Spanish and English to minimize the chance that the disfluencies presented were a result of deficits in Spanish or English. However, in this current study, it was not possible to find a formal assessment tool to assess the participants language and that was appropriate for bilingual Urdu-English speaking children as well.

As a result of a not having the availability of an Urdu language assessment, the Albert Language and Development Questionnaire was used to determine whether there was a parent-based concern with a child's speech and/or language skills and development. The ALDeQ questionnaire screens the child's speech and language skills in their first language based on parent report and have been used in other studies in instances where formal speech and language tools are not available (Paradis, 2016).

Conclusion

This study supplies evidence that bilingual Urdu-English (UE) speaking children- similar to – Spanish-English (SE) children- exhibit speech disfluencies that are similar in frequency and can meet or exceed the diagnostic criteria that is used when assessing children who stutter. Future studies need to collect data from bilingual UE CWS is needed to assess types of disfluencies present and to assess the frequency of audible sound prolongation and inaudible sound prolongation. Findings also mimic Spanish-English data, where Urdu English children who do not stutter also presented with stutter-like disfluencies that are based on repetition (SSR and WWR) and ASP. These exploratory findings suggest that bilingual U-E who do not stutter are at great risk of being misdiagnosed for stuttering. All in all, findings from this study gives motivation to continue researching with larger samples and find a more appropriate method to assess participants for the exclusion/inclusion criteria.

Tables

Table 1. Total Disfluencies per Spoken Words for U-E CWNS

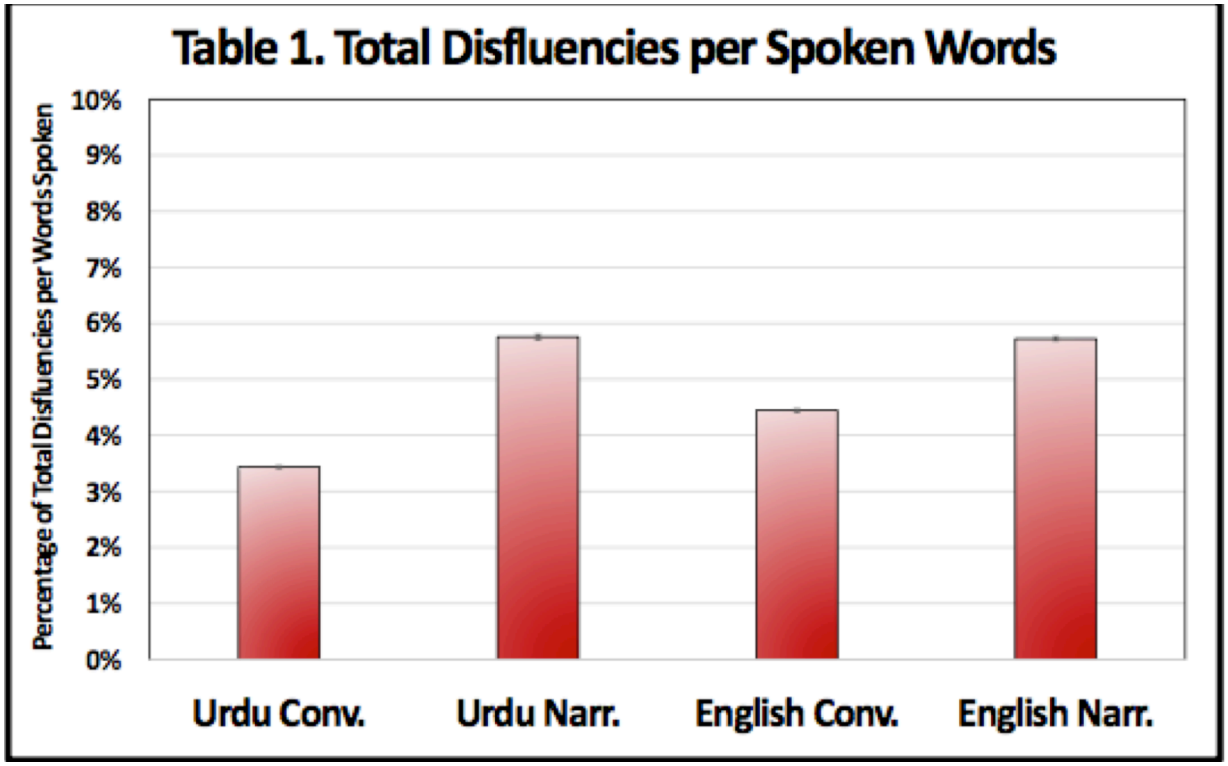

Table 2. SLDs per Spoken Words in U-E CWNS

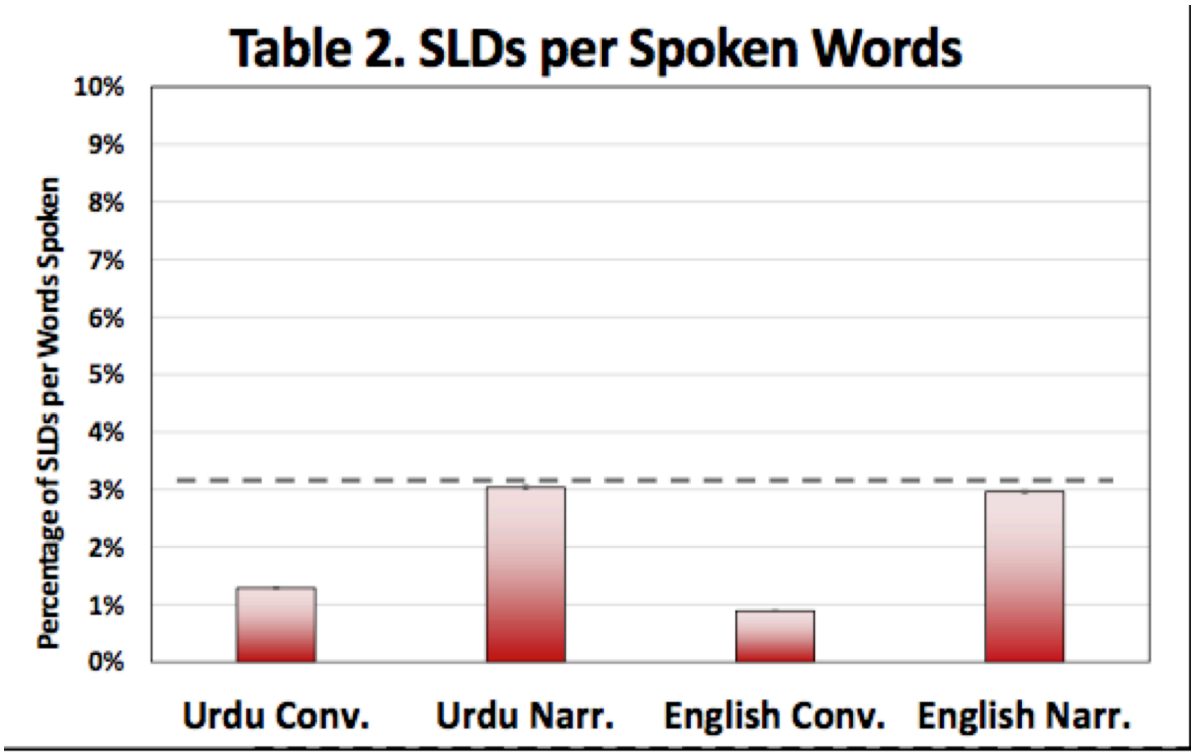

Table 3. Total Disfluencies per Spoken Words

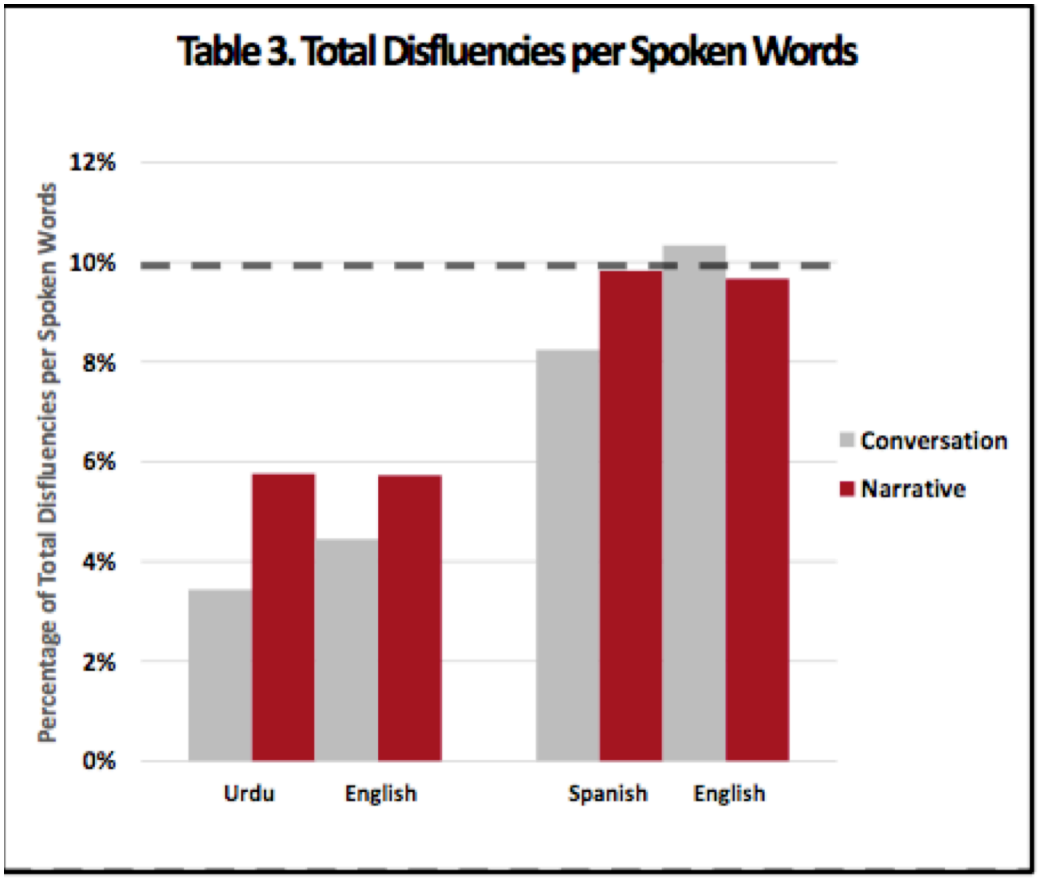

Table 4. Stuttering-Like Disfluencies per Spoken Words

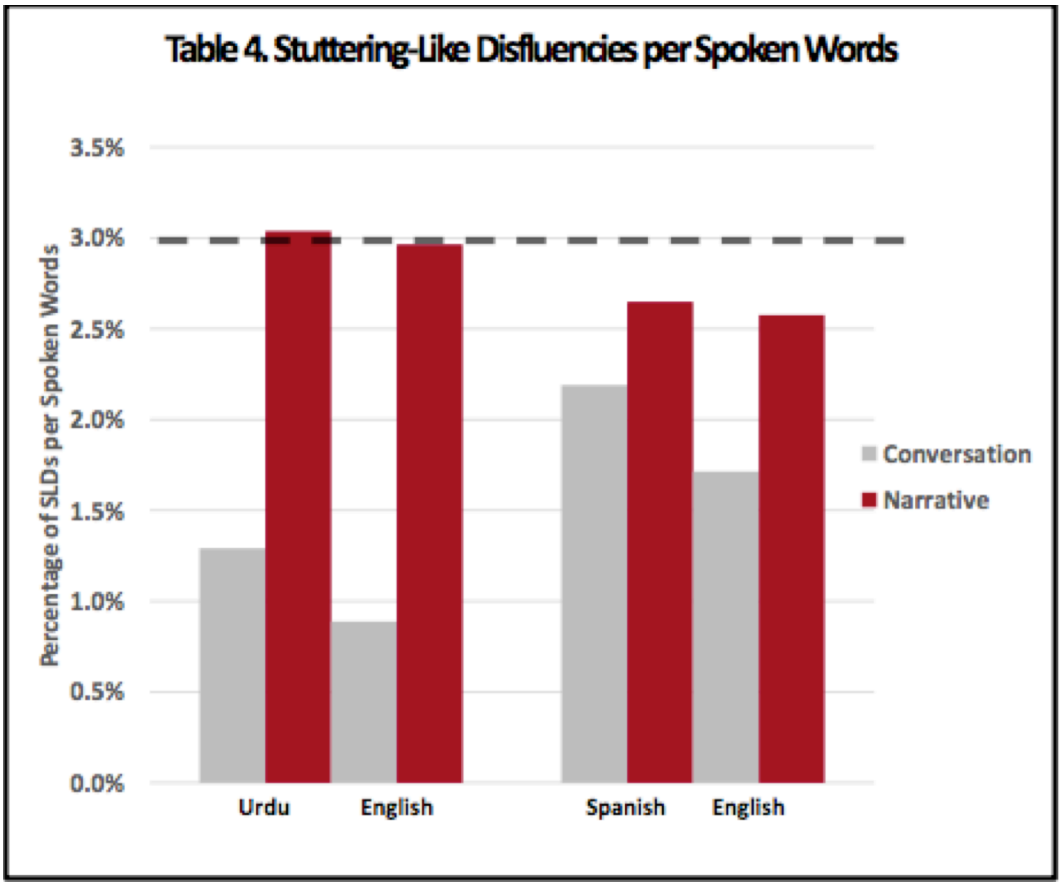

Table 5. Urdu-English: Average Disfluencies by Type.

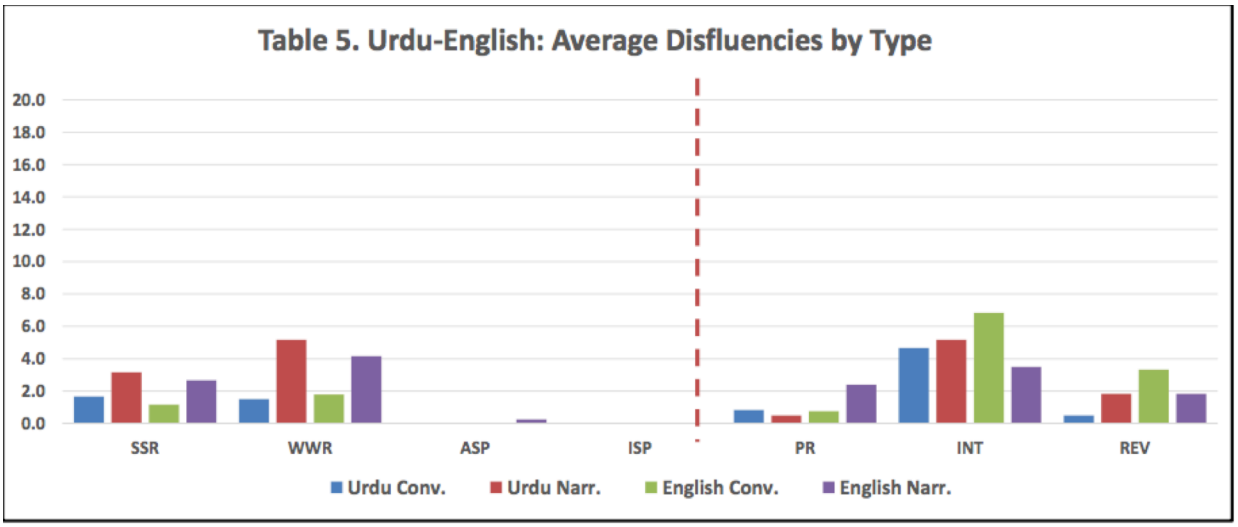

Table 5: Stuttering-like disfluencies (SLD): SR=sound syllable repetitions, WWR=whole word repetitions. Nonstuttering-like disfluencies (nSLD): ASP= audible sound prolongations, ISP=inaudible sound prolongations, PR=phrase repetitions, INT=interjections, REV=revisions

Table 6. Participants Demographic Information

ID	Age (years, months)	Gender	BIOS (Participants met 40% - 60% input and output in both Urdu, English)	Narrative Samples Average Word Length	Conversation Samples Words Length	Hearing Screening
1	7, 9	Female	Yes	300	300	Pass
2	6, 2	Male	Yes	236	264	Pass
3	5, 2	Male	Yes	188	300	Pass
4	6, 4	Female	Yes	300	300	Pass
5	7, 11	Male	Yes	300	300	Pass
6	6,0	Male	Yes	300	300	Pass

Table 6: ID= Participant Identification, BIOS= Bilingual Input Output Survey (Participants have at least 40-60% input and output in both Urdu and English.

Table 7. CWNS -1 Frequency Disfluency Data Profile

	Urdu Narrative	English Narrative	Urdu Conversation	English Conversation
%TDs	11%	7%	5.3%	7.3%
%SLDs	8.3%	3%	1.3%	.3%
%SLDs/TD	75.8%	42.9%	25%	4.5%

Table 7: %TDs= % of total disfluencies in words, %SLDs= % of stuttering-like disfluencies in words, %SLD/TD= % of stuttering-like disfluencies per total disfluencies in words.

Table 8. CWNS-2 Frequency Disfluency Data Profile

	Urdu Narrative	English Narrative	Urdu Conversation	English Conversation
%TDs	10.1%	10.2%	2.6%	3%
%SLDs	6.1%	6.1%	1.7%	.7%
%SLDs/TD	60.9%	60%	50%	22.2%

Table 8: %TDs= % of total disfluencies in words, %SLDs= % of stuttering-like disfluencies in words, %SLD/TD= % of stuttering-like disfluencies per total disfluencies in words.

Table 9. CWNS-3 Frequency Disfluency Data Profile

	Urdu Narrative	English Narrative	Urdu Conversation	English Conversation
%TDs	2.1%	7.1%	4.6%	5%
%SLDs	.4%	5%	3.1%	2.7%
%SLDs/TD	20%	70%	66.7%	53.3%

Table 9: %TDs= % of total disfluencies in words, %SLDs= % of stuttering-like disfluencies in words, %SLD/TD= % of stuttering-like disfluencies per total disfluencies in words.

Table 10. CWNS-4 Frequency Disfluency Data Profile

	Urdu Narrative	English Narrative	Urdu Conversation	English Conversation
%TDs	2%	2.3%	1.3%	1%
%SLDs	.7%	1.3%	.3%	0%
%SLDs/TD	33.3%	57.1%	25%	0%

Table 10: %TDs= % of total disfluencies in words, %SLDs= % of stuttering-like disfluencies in words, %SLD/TD= % of stuttering-like disfluencies per total disfluencies in words.

Table 11. CWNS-5 Frequency Disfluency Data Profile

	Urdu Narrative	English Narrative	Urdu Conversation	English Conversation
%TDs	7.7%	6%	5.7%	7%
%SLDs	2%	2%	1%	1.3%
%SLDs/TD	26.1%	33.3%	17.6%	19%

Table 11: %TDs= % of total disfluencies in words, %SLDs= % of stuttering-like disfluencies in words, %SLD/TD= % of stuttering-like disfluencies per total disfluencies in words.

Table 12. CWNS-6 Frequency Disfluency Data Profile

	Urdu Narrative	English Narrative	Urdu Conversation	English Conversation
%TDs	1.7%	1.7%	.7%	3.3%
%SLDs	.7%	.3%	0%	.3%
%SLDs/TD	40%	20%	0 %	1%

Table 12: %TDs= % of total disfluencies in words, %SLDs= % of stuttering-like disfluencies in words, %SLD/TD= % of stuttering-like disfluencies per total disfluencies in words.

Table 13. SE CWNS -1 Disfluency Type Exhibited by U-E Children

Disfluency Type	Urdu Narrative	English Narrative	Urdu Conversation	English Conversation
SSR	9	2	1	1
WWR	16	6	3	0
ASP	0	1	0	0
ISP	0	0	0	0
PR	2	7	0	1
INT	1	1	12	16
REV	5	3	0	4

Table 13: SSR = Sound Syllable Repetition, WWR = Whole Word Repetition, ASP = Audible Sound Prolongation, ISP = Inaudible Sound Prolongation, PR =Phrase Repetition, INT = Interjection, REV = Revisions.

Table 14. SE CWNS -2 Disfluency Type Exhibited by U-E Children

Disfluency Type	Urdu Narrative	English Narrative	Urdu Conversation	English Conversation
SSR	5	8	8	2
WWR	9	7	7	2
ASP	0	0	0	0
ISP	0	0	0	0
PR	1	0	5	1
INT	5	4	4	0
REV	3	1	1	2

Table 14: SSR = Sound Syllable Repetition, WWR = Whole Word Repetition, ASP = Audible Sound Prolongation, ISP = Inaudible Sound Prolongation, PR =Phrase Repetition, INT = Interjection, REV = Revisions.

Table 15. SE CWNS -3 Disfluency Type Exhibited by U-E Children

Disfluency Type	Urdu Narrative	English Narrative	Urdu Conversation	English Conversation
SSR	1	4	5	0
WWR	0	3	1	0
ASP	0	0	0	0
ISP	0	0	0	0
PR	0	0	0	1
INT	3	1	1	1
REV	1	2	0	1

Table 15: SSR = Sound Syllable Repetition, WWR = Whole Word Repetition, ASP = Audible Sound Prolongation, ISP = Inaudible Sound Prolongation, PR =Phrase Repetition, INT = Interjection, REV = Revisions.

Table 16. SE CWNS -4 Disfluency Type Exhibited by U-E Children

Disfluency Type	Urdu Narrative	English Narrative	Urdu Conversation	English Conversation
SSR	1	2	2	0
WWR	1	2	1	0
ASP	0	0	0	0
ISP	0	0	0	0
PR	0	0	0	1
INT	3	3	2	1
REV	1	0	0	1

Table 16: SSR = Sound Syllable Repetition, WWR = Whole Word Repetition, ASP = Audible Sound Prolongation, ISP = Inaudible Sound Prolongation, PR =Phrase Repetition, INT = Interjection, REV = Revisions.

Table 17. SE CWNS -5 Disfluency Type Exhibited by U-E Children

Disfluency Type	Urdu Narrative	English Narrative	Urdu Conversation	English Conversation
SSR	2	0	0	1
WWR	4	6	3	0
ASP	0	0	0	0
ISP	0	0	0	0
PR	0	0	4	1
INT	16	9	10	4
REV	1	0	3	4

Table 17: SSR = Sound Syllable Repetition, WWR = Whole Word Repetition, ASP = Audible Sound Prolongation, ISP = Inaudible Sound Prolongation, PR =Phrase Repetition, INT = Interjection, REV = Revisions.

Table 18. SE CWNS -6 Disfluency Type Exhibited by U-E Children

Disfluency Type	Urdu Narrative	English Narrative	Urdu Conversation	English Conversation
SSR	1	0	0	1
WWR	1	1	0	0
ASP	0	0	0	0
ISP	0	0	0	0
PR	0	0	0	0
INT	3	2	1	4
REV	0	2	1	4

Table 18: SSR = Sound Syllable Repetition, WWR = Whole Word Repetition, ASP = Audible Sound Prolongation, ISP = Inaudible Sound Prolongation, PR =Phrase Repetition, INT = Interjection, REV = Revisions.

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