A PRELIMINARY INVESTIGATION OF SPEECH DISFLUENCIES IN BILINGUAL URDU-ENGLISH CHILDREN

A Senior Honor's Thesis

Presented to

The Faculty of the Department

of Communication Sciences and Disorders

University of Houston

In Partial Fulfillment

Of the Requirements for the Degree of

Bachelor of Science

By

Syeda Raoosa Naqvi

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ABSTRACT

Bilingual Spanish-English (SE) speaking children who do not stutter (CWNS) are known to exceed the diagnostic criteria for developmental stuttering based on data of monolingual English speakers. While this indicates the risk of misdiagnosis amongst SE speakers, it further questions how speech disfluencies present in other bilingual speakers. Urdu, the native language of Pakistan and its surrounding areas, is currently one of the fastest growing languages in the United States (US). The purpose of this study is to examine the speech disfluencies of bilingual Urdu-English (UE) speaking CWNS during narrative and conversational samples elicited in Urdu and English to provide preliminary information about this population. Participants included 3 bilingual UE children ranging in age from 5 years to 7 years and 11 months who were recruited from the surrounding Houston, Texas area. Findings indicate that, much like SE children, bilingual UE speaking children can meet or exceed the diagnostic criteria for developmental stuttering. The study also found UE children to display stuttering-like disfluencies (SLDs) in the form of sound-syllable repetitions (SSR) and whole-word repetitions (WWR), which is identical to the findings in SE children. The results of this study may contribute to further research into the speech disfluencies of UE children, both CWS and CWNS, as well as other languages spoken in the US in order to contribute to the appropriate diagnostic criteria for stuttering amongst culturally and linguistically diverse populations.

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I extend my gratitude to the committee chair, Dr. Kia Noelle Johnson, for being an integral part of the research study. The support and mentorship you provided throughout this year has allowed me to explore my research interests, step away from my comfort zone, and grow immensely. Thank you for not only seeing my potential, but for helping me apply it. I am grateful of all that I have learned and accomplished under your guidance.

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INTRODUCTION

Bilingualism in the United States

A bilingual language speaker is proficient in using at least two languages by a person in a dynamic manner across experiences, time, tasks, and topics (American Speech-Language-Hearing Association, 2014). Bilingualism is a growing feature in the United States (US) population with more than one in five US residents speaking a foreign language in the home. Approximately 67 million Americans over the age of five speaking a language other than English (e.g. Spanish, French, Vietnamese, Urdu, Arabic, Hindi, or Chinese; Zeigler & Camarota, 2018). Of the languages spoken in the US, the Census Bureau reports Urdu and Arabic speakers as having the greatest growth in bilingual residents with a 23% increase from 2010 to 2014 (Camarota & Zeigler, 2014). According to the 2013 American Community Survey, over 439,000 Americans spoke Urdu in the home at that time (Camarota & Zeigler, 2014). The overall population of bilingual school-age children remains to be more than one in five Americans, with non-immigrants making up forty-four percent (Camarota & Zeigler, 2014).

There has been an increase in Urdu speakers in the US after the removal of restrictive immigration laws in 1970. Since, the US has seen a significant influx of migrants from the Indian subcontinent (Lopez, Ruiz, & Patten, 2017). This overall growth of Urdu speakers in the US naturally results in expected growth of children in US classrooms with exposure to and experience with speaking Urdu. This makes Urdu-English speaking children an additional bilingual population that speech-language pathologists in the US should be knowledgeable about given the suspected impact that bilingualism has on communication fluency.

The Urdu Language

Urdu is the national language of Pakistan, spoken by approximately 100 million individuals globally, including those living in surrounding areas such as India, Nepal, Bangladesh, and parts of the Middle East (Shackle, 2004). It is an extended set of Arabic letters, which appear and sound identical; however, Urdu orthography typically refrains from the use of the Arabic diacritics with the exception of a few letters. The phonemic inventory of Urdu consists of 44 consonants, 18 vowels, and numerous diphthongs (Hussain, 2008), a number that comparatively surpasses the total of 44 phonemes in English. Some of the Urdu phonemes that do not exist in English include the trilled /r/, aspirated /b/, aspirated nasalized /m/, aspirated voiceless /t/ and /d/, alveolar voiceless /t/, and the aspirated voiceless /g/ (Saleem, Kabir, Riaz, Rafique, Khalid, & Shahid, 2002). Another distinct characteristic is in the transformation of certain Urdu consonants into vowels depending on syllabic positions, as seen with the Urdu letters 'alef' (ا), 'vao' (و), and 'yay' (ی or ے). In vowels, /∑/ is generally only expressed with a following /h/, which does not match the English use of /∑/ (Hussain, 2008). The wide range of differences in the phonemic inventories of Urdu and English indicates that speech differences may be found between speakers of the two respective languages. Thus, for a child developing speech and language skills in Urdu and English, navigating between these differences while achieving fluency may be challenging.

Normal Disfluencies and Stuttering

An increased frequency of normal disfluencies is characteristic of bilingual speakers with growing empirical support mainly based on studies completed with Spanish-English (SE) speakers (e.g., Byrd et al., 2015). Given no research– to this author's knowledge – has been done to investigate speech disfluencies in Urdu-English speakers, it is safe to assume,

that SLPs have little to no knowledge of how speech disfluencies are presented in Urdu-English speakers.

The term speech disfluencies defines interruptions in speech production, which may be perceived by listeners as repetitions, pauses, or other impediments in the flow of speech. While nonstuttering-like disfluencies (nSLD) are present in most individuals, stutter-like disfluencies (SLD) culminate into what is known as a stutter. Stuttering-like disfluencies are present in the form of sound, syllable, and word repetitions as (Guitar, 2013). Nonstuttering-like disfluencies are perceived as revision, unfinished word, phrase repetition, interjection, and polysyllabic word repetition (Ambrose & Yairi, 1999). While stuttering and non-stuttering individuals all exhibit speech disfluencies, the stuttering individual will have higher frequencies of disfluency (Guitar, 2013).

The assessment of stuttering includes not only the primary characteristics of a client's speech disfluencies, measured by frequency, types, duration, and severity, but also factors that impact the client's disfluencies as well as the attitudes and behaviors of the client on his or her disfluencies. The impacting factors include linguistic and situational contexts of occurring disfluencies. A client's overall speaking rate, articulation rate, and response time latency are also vital to the occurrences of the client's disfluencies. Further, the client's reaction to his speech disfluencies and communication can be measured to diagnose stuttering. This includes all attitudes related to the client's speech disfluencies and overall mode of communication, as well as the presence or absence of avoidance behaviors in speech (Yarruss, 1997).

This current diagnostic data used to assist in determining a diagnosis of developmental stuttering is based on monolingual English speaking children, which calls into question its generalizability to other populations (i.e., bilingual speaking children). The

clinical diagnostic standard of normalcy for the quantity (i.e., frequency) and quality (i.e., type) of speech disfluencies in children who do not stutter is based solely on monolingual English speakers (Byrd et al., 2015) with no reports of cultural or linguistic diversity representation (i.e., bilingualism or multilingualism with other non-English languages). The frequency criteria (i.e., quantity) typically used to identify stuttering in monolingual speakers is 3% of stuttering-like disfluencies per 100 spoken words. The type of speech disfluencies (i.e., quality) typically exhibited by monolingual speakers who stutter include substantially more types of stuttering-like disfluencies (i.e., whole and part-word repetitions, audible and inaudible sound prolongations) than types of nonstuttering-like disfluencies (i.e., phrase repetitions, interjections, revisions). This also creates another bilingual population of children who are at risk of being falsely identified for a communication disorder.

Bilingualism and Stuttering

A high frequency of speech disfluencies is one characteristic that has been commonly reported in children bilingual in Spanish-English. Currently, it is unknown whether this characteristic is also present in bilingual Urdu-English speaking children.

A review of the literature demonstrates some interest in stuttering relative to bilingual individuals who speak languages spoken around the world. A limited number of studies have been conducted to examine speech disfluencies in Mandarin-English speakers (Lim, Lincoln, Chan & Onslow, 2008) and Kannada-English speakers (Maruthy, Raj, Geetha, & Priya, 2015). Given the languages spoken in the US, most of what is known about bilingualism and stuttering is largely based on examination of speech disfluencies in typically developing bilingual Spanish-English speaking children who do not stutter.

There are a very limited amount of studies that examine speech disfluencies in bilingual Spanish-English speaking children who stutter. Previous reports indicate that

bilingual Spanish-English speaking children are at a higher risk of stuttering and show lower rates of recovery in comparison to children who do not stutter and speak an alternative language exclusively, as well as children who stutter and speak English only (Howell, Davis & Williams, 2009). Howell and colleagues (2009) deduced that the concurrent learning of English and a "minority" language in children, before the age of 5, increases the odds of a stuttering onset and lowers chances of recovery, whereas acquiring the minority language solely and primarily will significantly reduce these risks.

However, recent investigation of speech disfluencies in Spanish-English speaking children who do and do not stutter aim to improve the available diagnostic criteria for assessing developmental stuttering in bilingual Spanish-English children. Byrd, Bedore, and Ramos' (2015) study of 18 kindergarten-aged typically fluent, bilingual boys and girls found Spanish-English speaking children to have significantly higher frequencies of stuttering-like speech behaviors as compared to monolingual children. The results of their study indicated the highest frequencies of speech disfluencies in the form of monosyllabic word repetitions in typically fluent, bilingual children. Byrd et al. (2015) suggest a necessity to clinically assess bilingual Spanish-English children with mindfulness of the nature of bilingualism.

Rincon (2017) found significant differences in the frequency of stuttering-like speech disfluencies in bilingual Spanish-English speakers compared to monolingual English speakers. Results indicated that the current criteria for diagnosing developmental stuttering were not fit for the bilingual Spanish English population. Further, implications arise of the dire need for research in culturally and linguistically diverse (CLD) populations, in order to accurately assess and diagnose clients of any population.

Although Urdu is a growing language in the states, there are no studies, to the author's knowledge, that examine speech disfluencies in bilingual Urdu-English speakers.

There are studies that examine other communication disorders in Urdu-English speaking children e.g., speech disorders (Holm, Dodd, Stow, & Pert, 1999), but none – to the author's knowledge – examine speech disfluencies despite the growth in Urdu language speakers in the US. Given what is currently known in Spanish-English speaking children, it leads to the question of whether similar characteristics are present in the Urdu-English population.

Further, there are no known formal speech or language assessments for bilingual Urdu-English speaking children. However, there is a tool for monolingual Urdu speaking children between 8 and 11 years of age known as the Oral Language Assessment in Hindu/Urdu Speaking Children (Warmington, Hitch, Babayigit, Clarke, & Kandru-Pothineni). Currently, the Bilingual Assessment of Simple Sentences (*BASS*) under development for children who speak Urdu (Pert & Stow, 2019).

The present study is essential in the identification of how speech disfluencies are presented in the bilingual Urdu-English speaking children and how their speech disfluencies compare to other bilingual populations as well as monolingual English speakers. Therefore, the purpose of this study is to examine the speech disfluencies of bilingual Urdu-English speaking children who do not stutter.

The study will be the first step – to the author's knowledge - in providing preliminary data demonstrating how typical disfluencies are presented in bilingual Urdu-English children. Clinical implications of this study will impact how speech disfluencies are assessed and interpreted in Urdu-English speaking children and, as a result, aid in providing more accurate diagnoses of normal speech disfluencies in Urdu-English speaking children. Findings also give credence to reconsidering the appropriateness of using current clinical diagnostic criteria with this bilingual population.

Based on recent literature of speech disfluencies of bilingual Spanish-English speaking children who do not stutter, the design of this study will address the following research questions:

1. Do Urdu-English speaking CWNS exceed the diagnostic criteria for developmental stuttering based on the frequency of (1) total speech disfluencies and (2) stuttering-like disfluencies presented in a speech sample in Urdu and a speech sample in English?
2. What types of speech disfluencies do Urdu-English speaking CWNS exhibit during a speech sample in Urdu and a speech sample in English?

This study will address the following hypotheses:

1. Urdu-English speaking children who do not stutter will present with a frequency of total speech disfluencies that exceeds the diagnostic criteria for developmental stuttering regardless of the speech sample type (narrative; conversation) or language (Urdu; English).
2. Urdu-English speaking children who do not stutter will present with a frequency of stuttering-like disfluencies that exceeds the diagnostic criteria for developmental stuttering regardless of the sample type (narrative; conversation) or language (Urdu; English).
3. Urdu-English children who do not stutter will present with only two types of stuttering-like disfluencies (sound-syllable and whole-word repetitions).

Methods

Participants

Participants consisted of 3 bilingual UE typically developing children between the ages of 5;3 (years; months) to 7;11 (M = 6:6., SD = 1.33). All 3 participants were identified

by their parent(s) as being South Asian and included two males and one female participant. All participants were paid volunteers from the Houston, Texas metropolitan area recruited through speech-language pathologists, friends, family, and social media. None of the three participants were reported by their parent(s) as having a current or previous diagnosis of stuttering. Additionally, none were reported as having any other speech, language, or hearing problems except for one participant who was reported to currently be receiving speech therapy for a speech-sound production disorder. However, given the exploratory nature of this preliminary study, the participant was not excluded from the current study.

Initially, four total participants were seen for this study; however, one participant was excluded from data analyses due to their inability to complete testing in Urdu. This study was approved by the University of Houston Committee for Protection of Human Subjects. For all participants, parents signed an informed consent while their participating child assented to the study.

Bilingualism

To establish the participants' exposure to Urdu and English, parents of participants were administered an adapted version of the *Bilingual Input-Output Survey* (BIOS), which asks parents of the participants to report their child's daily patterns of language input and output across more than one language (Peña, Gutierrez-Clellen, Iglesias, Goldstein, & Bedore, 2014). Results from the BIOS yield a language dominance percentage, in this case, for Urdu and English. Although the BIOS was created for use with Spanish-English bilingual children, it was used in the present study since the data reported per participant compares language input/output percentages across two languages for that child with no comparisons made between children or to a normative sample. The BIOS has been used in other studies to

gauge participants' use and exposure to more than one language (Byrd, Bedore, & Ramos, 2015; Taliancich-Klinger & Byrd, 2013; Rincon, 2017).

To be eligible for the present study, participants were required to have at least 20% input and output in both languages; this criterion has been used in previous studies examining the speech disfluencies in bilingual Spanish English (SE) children (Byrd, Bedore, & Ramos, 2015; Rincon, 2017). In replicating what has been used in similar studies with SE children, for the present study participants with an Urdu-use percentage of 61%-80% were considered Urdu dominant. Participants with an English-use percentage of 61%-80% were considered English dominant. Participants with English and Urdu use percentage of 40%-60% were considered balanced bilinguals (Byrd, Bedore, & Ramos, 2015; Rincon, 2017).

Speech and Language

To determine participants' language proficiency, the *Preschool Language Scales, Fifth Edition* (*PLS*-5) *Screener* was administered to all participants. The *BASS* was also administered to two of the three participants. Access to the test stimuli of the *BASS* was not provided by the test developers in time for data collection with the first participant. All three participants passed a binaural pure tone hearing screening and two had no other speech, language, and related problems. Again, one participant was currently receiving intervention for a speech-sound production disorder.

Procedures

During a two-hour visit, graduate and undergraduate student clinicians, both of whom were bilingual native Urdu speakers, administered the *PLS*-5 Screener and *BASS* prior to obtaining four speech samples from each participant. One student clinician administered the *BASS* in Urdu and other student clinician administered the *PLS*-5 in English. The graduate student administered the BIOS to a parent of the participant. The student clinicians who

administered this testing and elicited the speech samples were native bilingual speakers of Urdu and English. However, each student clinician was designated to only communicate with the child and in front of the child in one assigned language. In other words, one clinician was assigned to only communicate in Urdu with the child and in front of the child, while the other clinician only communicated in English. This was intended to lead the participant to believe that each clinician only spoke English or Urdu to encourage and reinforce the child to communicate in both languages regardless of preference in order to collect data.

Speech samples and testing were counterbalanced to ensure that testing occurred in between speech samples with alternating languages (e.g., 1. Conversation – English sample, 2. Narrative – Urdu sample, 3. *PLS*-5, 4. Conversation – Urdu sample, 5. Narrative –English sample, 6. *BASS*).

Speech Samples

Four speech samples were elicited by the student clinicians from each participant: (1) Narrative – English sample, (2) Conversation – English sample, (3) Narrative – Urdu sample, and (4) Conversation – Urdu.

Eliciting narrative samples. Participants were instructed to view pictures from a wordless picture book – *Frog Where Are You or Frog Goes to Dinner*- while the clinician read the story to them aloud. The participants were then asked to retell the same story while reviewing the pictures again. The wordless picture book used for the English narrative was different than the story and picture book used for the Urdu narrative. Each of the four narrative samples were approximately 15-20 minutes in length to allow for a 200- to 300-word sample (M=270, SD=27).

Eliciting conversational samples. Conversational samples were elicited through informal play with age-appropriate toys to assist in stimulating conversation (e.g., legos, race

cares, playdoh). Student clinicians stimulated conversation with each participant about playing with the toys as well as conversation regarding abstract topics (e.g., activities from school, upcoming family, or family celebrations).

Dependent Measures

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), and (2) stuttering-like disfluencies/number of words spoken (SLDs).

Reliability. The graduate research assistant – trained in tabulating speech disfluency counts – coded all three samples in English and Urdu and resolved any concerns with a speech-language pathologist with expertise in Fluency Disorders.

Results

Language Testing

BIOS. Parents of all 3 participants reported at least 20% use of Urdu and English on a daily basis, which allowed them to be eligible for the study. Based on the participants' BIOS input and output percentages in English and Urdu, two participants were determined to be English dominant (Participant 2: Urdu - 43.5%, English - 56.5%; Participant 3: Urdu - 43.6%, English - 56.5%) and one participant was a balanced bilingual speaker (Participant 1 Urdu - 52%, English - 48%).

PLS-5. Two of the three participants did not meet passing criteria on the *PLS*-5 Screener test that was administered and scored according to age. Participant 1 scored 5 out of 5 points which met the passing criteria. Participant 2 scored 4 out 6 total points, which did not meet a passing score. Participant 3 scored 1 out of 6 points, which also resulted in a failing score. However, given the exploratory nature of this study, participants 2 and 3 were

not excluded from the study. Theoretical speculation of these failing scores will be explored in the discussion.

BASS. The *BASS* was in the final stages of development when the investigators of the present study were provided with access to the testing stimuli. As previously stated, this was after data collection of the first participant. However, the creators of the *BASS* have not completed the scoring procedures for this assessment. Therefore, scoring of the *BASS* was unable to be completed at this time.

Given that the investigators had not received finalized scoring procedures for the *BASS*, informal conclusions – for participant 2 and 3 – were made solely based on expressive Urdu language responses. Participants 2 and 3 completed the *BASS* and were able to accurately describe stimuli of 2D images in Urdu without assistance from the tester 6% and 77% of the time, respectively. This, paired with no parental concern for difficulty of their child to understand and transmit messages in Urdu, allowed the native bilingual Urdu testers and a certified speech-language pathologist to deem them proficient in the Urdu language for the present study. Participant 1 did not complete the *BASS*, however their language skills were tested using the Oral Language Assessment in Hindu/Urdu Speaking Children (Warmington, Hitch, Babayigit, Clarke, & Kandru-Pothineni). This test battery was appropriate to use for Participant 1 in that it is a normative assessment for children 8-11 years old with a mean age of 10, however would not be fitting for the other participants. Participant 1 scored 61% competency on the receptive test and 16% on the expressive test. These results indicate low Urdu expressive ability, which in part may be due to the participant (7 years and 11 months) being younger than the mean age of the test battery normative data.

Speech Disfluency Count

The following results address the research question: *Do Urdu-English speaking CWNS exceed the diagnostic criteria for developmental stuttering based on the frequency of (1) total speech disfluencies and (2) stuttering-like disfluencies presented in a speech sample in Urdu and a speech sample in English?*

Total Speech Disfluencies. Of the 3 participants across the 4 speech samples, 2 met the diagnostic stuttering criteria of 10% total speech disfluencies per total number of words spoken (see figure 1). Participant 1 met this criterion in Urdu-Narrative (11%); Participant 2 met this criterion in Urdu-Narrative (10%) and English-Narrative (10%). Neither met the criteria in either conversational sample. Participant 3 did not meet the criterion in any of the 4 samples.

Stuttering-Like Disfluencies. All participants met the diagnostic stuttering criteria of 3% total speech disfluencies per total number of words spoken for at least 2 of the 4 speech samples (see figure 2). Participant 1 and 2 met this criterion in Urdu-Narrative (participant 1: 8%; participant 2: 3%) and English-Narrative (participant 1: 6%; Participant 2: 5%). Participant 3 met this criterion in Urdu-Conversation (3%) and English-Narrative (5%).

The following results address the research question: *What types of speech disfluencies do Urdu-English speaking CWNS exhibit during a speech sample in Urdu and a speech sample in English?*

Types of Disfluencies. As expected with children who do not stutter, all participants exhibited nonstuttering-like disfluencies (i.e., phrase repetitions, interjections, revisions) across the 4 speech samples. Given the purpose of this study, results will focus on the presentation of stuttering-like disfluencies (SLDs; i.e. whole-word repetitions, sound-syllable repetitions, audible sound prolongations, and inaudible sound prolongations).

Stuttering-like disfluencies in Urdu samples. All participants exhibited sound-syllable repetitions (SSRs) and whole-word repetitions (WWRs) in the Urdu-Conversational sample and the Urdu-Narrative sample (see figure 3 and 4). Participants 1 and 2 exhibited SSRs (participant 1: conversation 0.5% and narrative 3%; participant 2: conversation 1% and narrative 2%) as well as WWRs (participant 1: conversation 1% and narrative 5%; participant 2: conversation 0.5% and narrative 4%) in both Urdu speech samples. Participant 3 exhibited SSRs in both samples (conversation: 3%; narrative: 0.5%) and WWRs only in the conversation sample (1%). No participants exhibited audible or inaudible sound prolongations.

Stuttering-like disfluencies in English samples. All participants exhibited SSRs and WWRs in the English-Conversational sample and the Urdu-Narrative sample (see figure 5 and 6). Participant 2 and 3 exhibited SSRs (participant 2: conversation 0.5% and narrative 3%; participant 3: conversation 1% and narrative 3%) and WWRs (participant 2: conversation 0.5% and narrative 3%; participant 3: conversation 0.5% and narrative 2%) in both English speech samples. Participant 1 exhibited SSRs in both samples (narrative: 0.5 %; conversation 1%) and WWRs only in the narrative sample (0.75%). No participants exhibited audible or inaudible sound prolongations.

Discussion

This preliminary study investigated the speech disfluencies of bilingual Urdu-English speaking children who do not stutter and presented the following research questions:

1. Do Urdu-English speaking CWNS exceed the diagnostic criteria for developmental stuttering based on the frequency of (1) total speech disfluencies and (2) stuttering-like disfluencies presented in a speech sample in Urdu and a speech sample in English?

Hypothesis: Urdu-English speaking children who do not stutter will present with a frequency of total speech disfluencies that exceeds the diagnostic criteria for developmental stuttering regardless of the speech sample type (narrative; conversation) or language (Urdu; English).

Hypothesis: Urdu-English speaking children who do not stutter will present with a frequency of stuttering-like disfluencies that exceeds the diagnostic criteria for developmental stuttering regardless of the sample type (narrative; conversation) or language (Urdu; English).

2. What types of speech disfluencies do Urdu-English speaking CWNS exhibit during a speech sample in Urdu and a speech sample in English?

   Hypothesis: Urdu-English children who do not stutter will present with only two types of stuttering-like disfluencies (sound-syllable and whole-word repetitions).

This exploratory study resulted in two main findings. First, to address research question 1, bilingual Urdu-English speaking children who do not stutter can meet or exceed the diagnostic criteria of 10% total speech disfluencies and 3% stuttering-like disfluencies, particularly in a narrative speech sample, in both Urdu and English. Secondly, to address research question 2, during this study, these children presented with stuttering-like disfluencies that are based on repetitions (SSR and WWR) and not prolongations (audible sound prolongations and inaudible sound prolongations). Both findings are consistent with findings reported in bilingual Spanish-English speaking children who do not stutter, in which the frequency of SLDs exceeded the criteria based on monolingual English-speaking children, and consisted of repetitions and no prolongations (Rincon, 2017).

An ancillary finding from this study indicates a lack of formal appropriate language assessment tools for bilingual Urdu-English speaking children as well as for children who only speak Urdu. The implications of this finding will also be discussed.

Frequency of Disfluencies

The first finding from this exploratory study clearly indicates that bilingual Urdu-English speaking children who do not stutter can meet or exceed the frequency of speech disfluencies typically used to diagnose stuttering. Current frequency criteria diagnoses stuttering at 10% in total disfluencies per total number of words as well as 3% stuttering-like disfluencies per 100 words. Stuttering assessment tools commonly used to assess children for stuttering, such as the Stuttering Severity Instrument – Fourth Edition (SSI-4) and Test of Childhood Stuttering (TOCS), are both derived from normative data on monolingual English speaking children. If these participants were held to those criteria or administered those assessment tools, it is highly likely that they could be misdiagnosed for stuttering when in fact they are exhibiting a profile that mimics other bilingual children who do not stutter.

Additionally, the higher frequencies of stuttering were often seen during narrative samples versus conversational samples which can be viewed more so as monologues rather than dialogues. Perhaps this higher frequency of speech disfluencies from a monologue sample reflects a language learner's development in narrative skills to include demonstration of syntax and semantics in both languages. Future studies are suggested to consider factors like mean length of utterance (MLU) that could vary between narratives and conversational samples and thus impact the frequency of speech disfluencies. Zackheim and colleagues (2003) have previously found linguistic components of an utterance (length and complexity) as well as language proficiency (MLU) to have an impact on stuttering-like and nonstuttering-like disfluencies.

Types of Disfluencies

The second finding from this study indicated that all three participants presented with frequently occurring SLDs consisting of some combination of whole-word and sound/syllable repetitions in both languages, often during narratives. No audible or inaudible sound prolongations were noted in any of the samples elicited. These results are consistent with previous research findings from normally disfluent bilingual Spanish-English speaking children (Bedore et al., 2006; Fiestas et al., 2005; Rincon, 2017). Most recently, Rincon (2017) reported SSRs and WWRs to be present in both bilingual Spanish-English children who stutter as well as those who do not stutter. The distinction in the type of speech disfluencies exhibited by Spanish-English children who stutter and those who did not was with audible and inaudible sound prolongations. In other words, the Spanish-English children who stuttered also exhibited audible and inaudible sound prolongations whereas the normally disfluent children did not (Rincon, 2017).

In considering the progression of stuttering severity, this finding make sense in that the speech disfluencies of disfluent children who progress to an actual diagnosis of stuttering will evolve from mild easygoing repetitions to a common trajectory toward audible sound prolongations and later inaudible sound prolongations. Thus, it is not surprising that, despite being bilingual and having a high frequency of speech disfluencies, these normally fluent children in the present study did not exhibit the types of disfluencies that would be seen in more severe cases of stuttering.

Taken together, these main findings from the current study suggest that bilingual Urdu-English speaking children who do not stutter are at a greater risk for being misdiagnosed for stuttering.

Lack of Appropriate Language Assessments for Urdu-English Speaking Children

An ancillary finding from the current study speaks to the lack of appropriate language assessment tools not only for Urdu speaking children, but bilingual Urdu-English speaking children overall. In keeping with other studies that have included a language-based inclusion/exclusion criteria (e.g., Rincon, 2017) the author of the present study wanted to also include a formal language assessment/screening tool to minimize the chance of eliciting speech disfluencies due to deficits in Urdu and English. However, it was impossible to find a formal assessment tool in Urdu or one that was deemed appropriate for bilingual Urdu-English speaking children.

Due to the low availability of Urdu language assessments, the Oral Language Assessment in Hindu/Urdu Speaking Children was primarily chosen to assess participants. This test battery is aimed for children between 8-11 years old, and thus was deemed appropriate for the first participant. Once the *BASS* was made available to the investigators of this study, it was used to assess Urdu language skills of the remaining participants for whom the Oral Language Assessment would not be appropriate age-wise.

To assess the English language skills in these bilingual Urdu-English speakers, the *PLS*-5 screener was selected prior to the study due to its familiarity with the testers as well the age range and brevity of the tool. However, as stated in the results, two of the three participants failed the *PLS*-5 screener test despite there being no known language delays or disorders present.

In considering an explanation of these results, the author and a certified speech-language pathologist examined the normative data reported in the manual of the screener and the *PLS*-5. From the normed sample used to create the *PLS*-5 there is no mention of the sample including bilingual children of any language. Additionally, the manual does not mention whether or not the screener is appropriate for bilingual children. These points taken

together with the scores from the participants of the current study yield some caution towards the appropriateness of using the *PLS*-5 screener with this population. Thus, it is not certain whether a failed score occurred due to unknown/unreported language concerns of the participants or cultural inappropriateness. Future studies are encouraged to reconsider how language abilities are determined relative to the inclusion/exclusion criteria.

Caveats

Due to the preliminary nature of this study, a small sample size (n=3) was investigated. Future implications to this study include conducting a larger sample that includes bilingual Urdu-English speaking children who do and do not stutter. Future studies should further explore the use of other language assessments that address the bilingual aspect of the children's language proficiency.

Conclusion

This exploratory study provides early evidence suggesting that bilingual Urdu-English speaking children - like Spanish-English speaking children - exhibit speech disfluencies that range in frequency and can meet or exceed the diagnostic criteria typically used to assess stuttering in children. Present findings also mimic data based on Spanish-English speaking children in that the Urdu-English children only presented with stuttering-like disfluencies that are based on repetitions. These early findings provide evidence of the potential to misdiagnose an Urdu-English speaking child. Findings from this study provide motivation to continue this line of investigation in a larger sample and a more appropriate means to screen or assess language skills for an inclusion/exclusion criteria.

Tables

Table 1. Participants' Demographic Information

ID	Age (years, months)	Gender	BIOS (Urdu, English)	Narrative Samples Average Word Length	Conversational Samples Average Word Length	BASS	PLS-5 Screener
1	7, 11	F	U 52% E 48%	300	300	N/A	5/5 (Pass)
2	6, 3	M	U 43.5% E 56.5%	237	264	Pending	4/6 (Fail)
3	5, 3	M	U 43.6% E 56.5%	188	247	Pending	1/6 (Fail)

Table 1: ID= participant idenitification, BIOS= Bilingual Input Output Survey, BASS= Bilingual Assessment of Simple Sentences (Urdu), PLS-5 Screener= Preschool Language Scales Screener Fifth Edition.

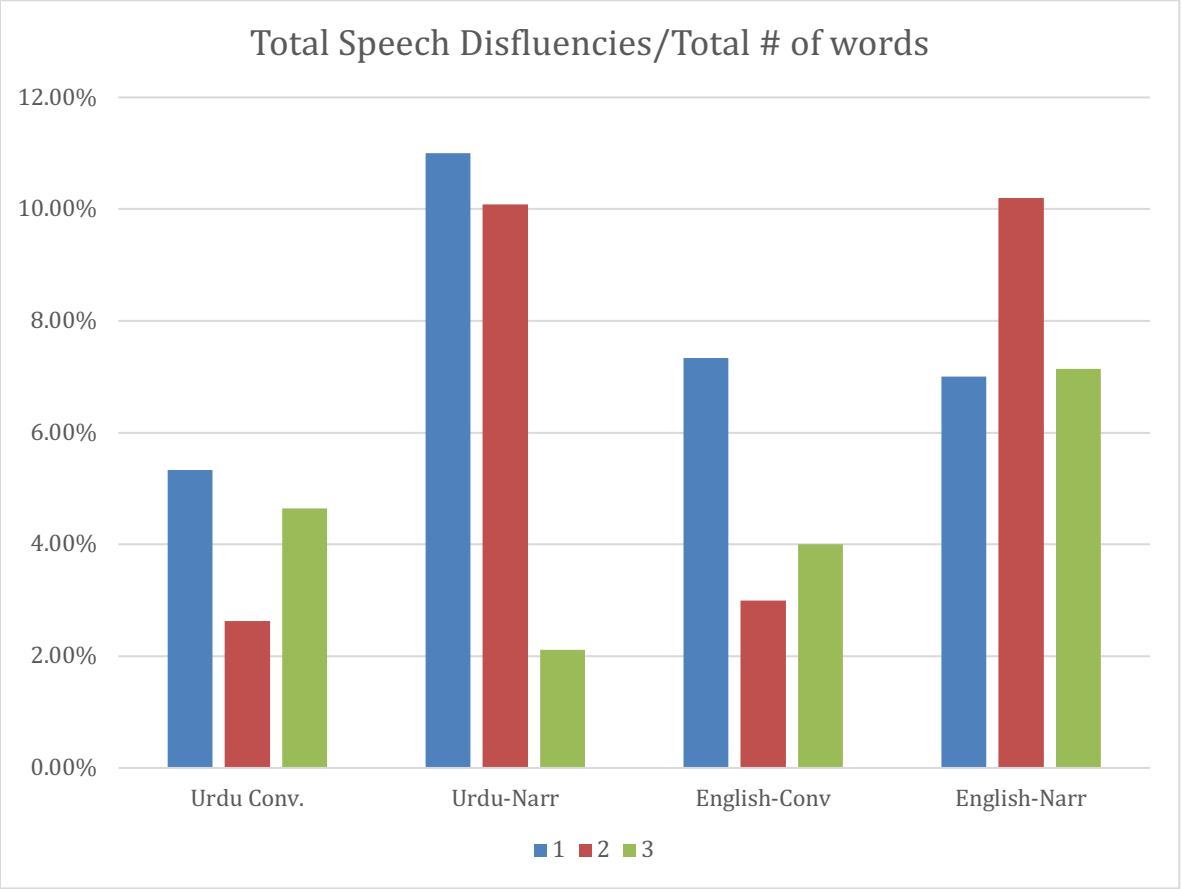

Figure 1. Total Speech Disfluencies/ Total # of words

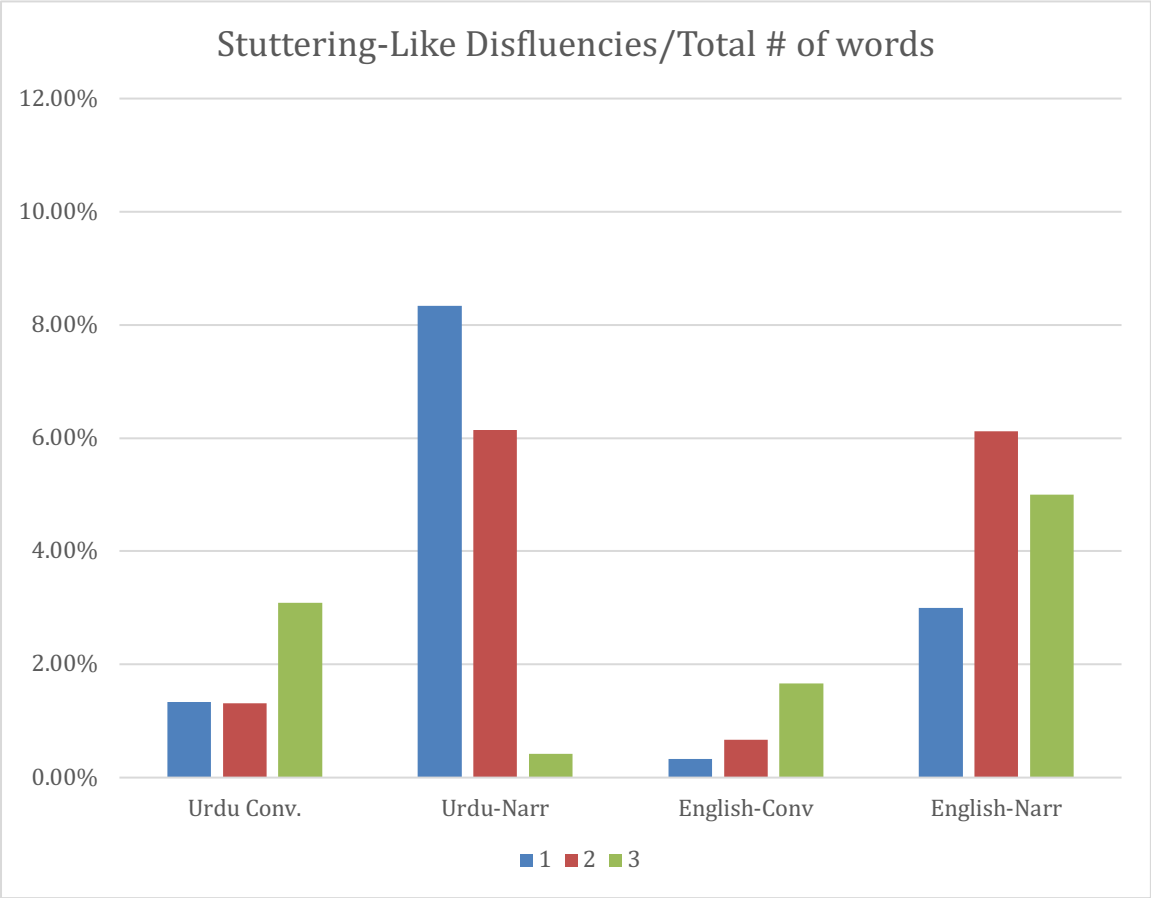

Figure 2. Stuttering-like Disfluencies/ Total # of words.

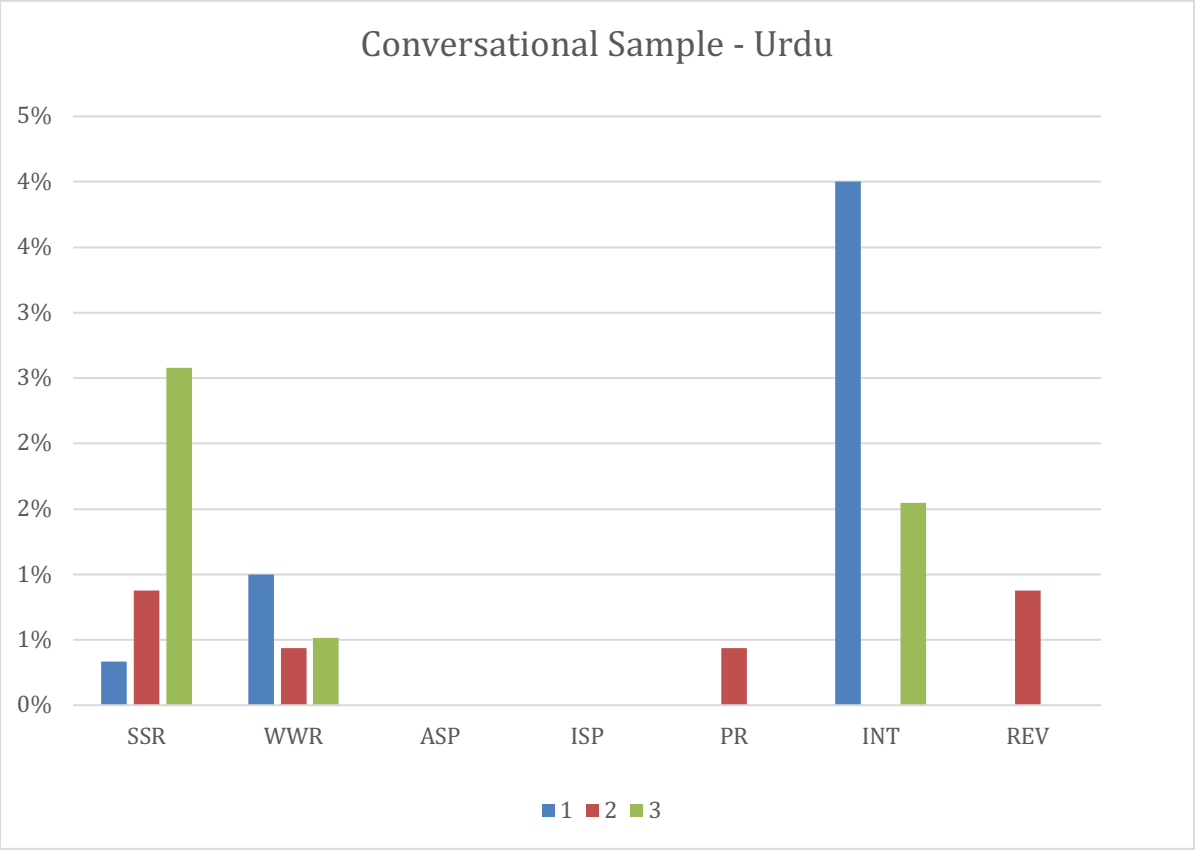

Figure 3. Urdu conversational sample. Stuttering-like disfluencies (SLD): SR=sound syllable repetitions, WWR=whole word repetitions. Nonstuttering-like disfluencies (nSLD): ASP= audible sound prolongations, ISP=inaudible sound prolongations, PR=phrase repetitions, INT=interjections, REV=revisions.

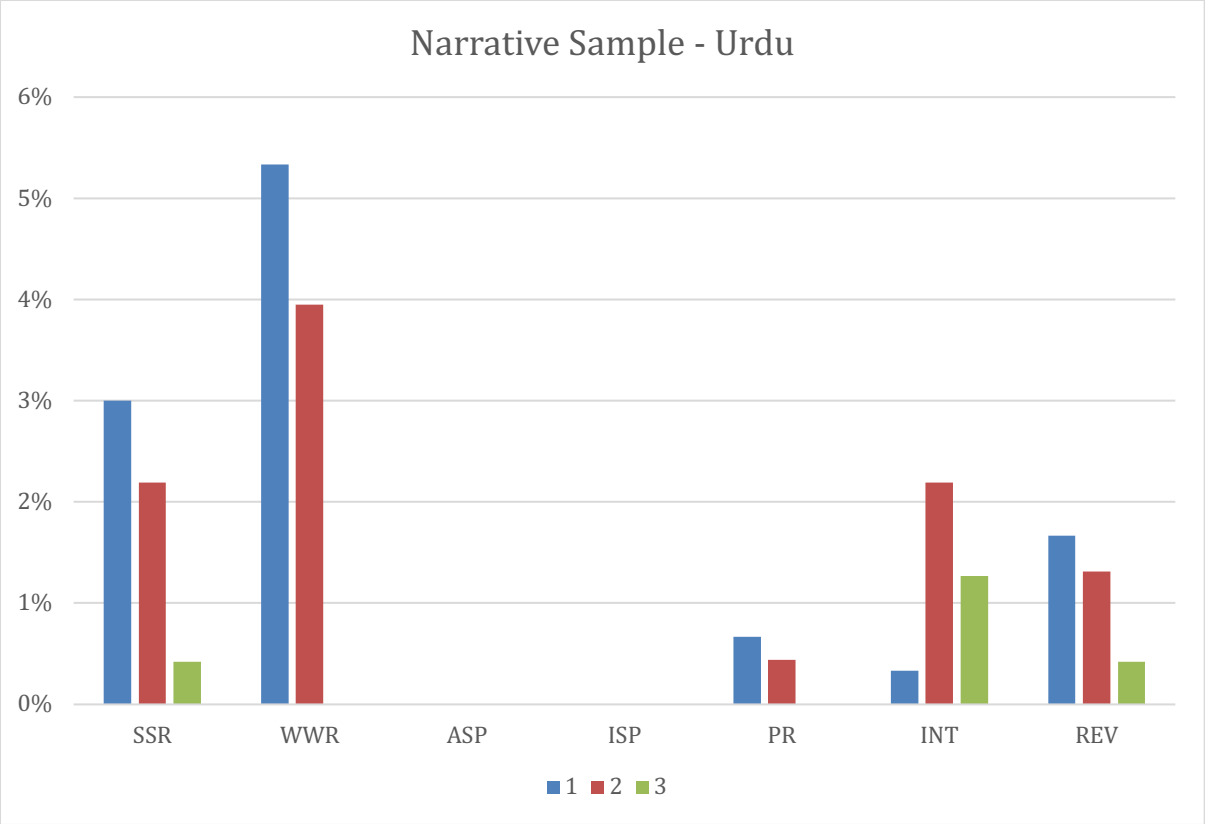

Figure 4. Urdu narrative sample. Stuttering-like disfluencies (SLD): SR=sound syllable repetitions, WWR=whole word repetitions. Nonstuttering-like disfluencies (nSLD): ASP= audible sound prolongations, ISP=inaudible sound prolongations, PR=phrase repetitions, INT=interjections, REV=revisions.

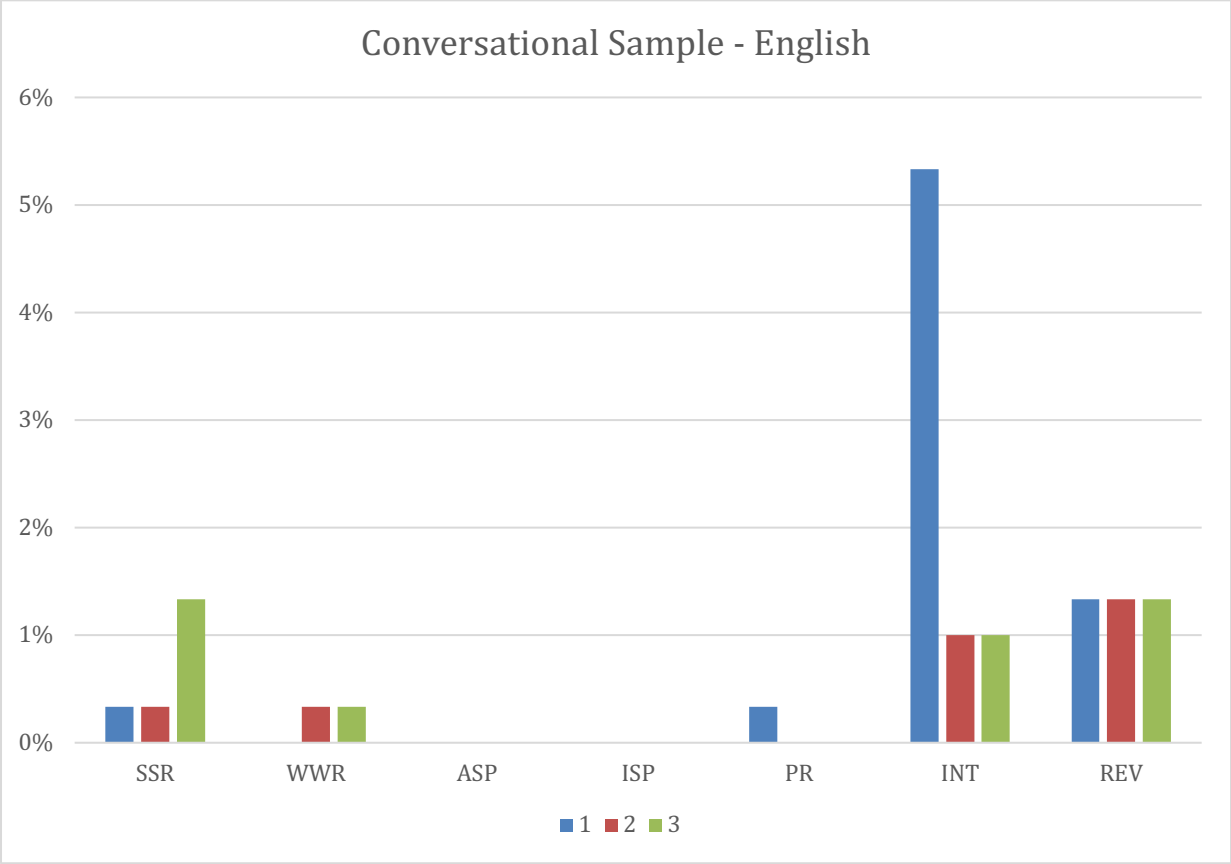

Figure 5. English conversational sample. Stuttering-like disfluencies (SLD): SR=sound syllable repetitions, WWR=whole word repetitions. Nonstuttering-like disfluencies (nSLD): ASP= audible sound prolongations, ISP=inaudible sound prolongations, PR=phrase repetitions, INT=interjections, REV=revisions.

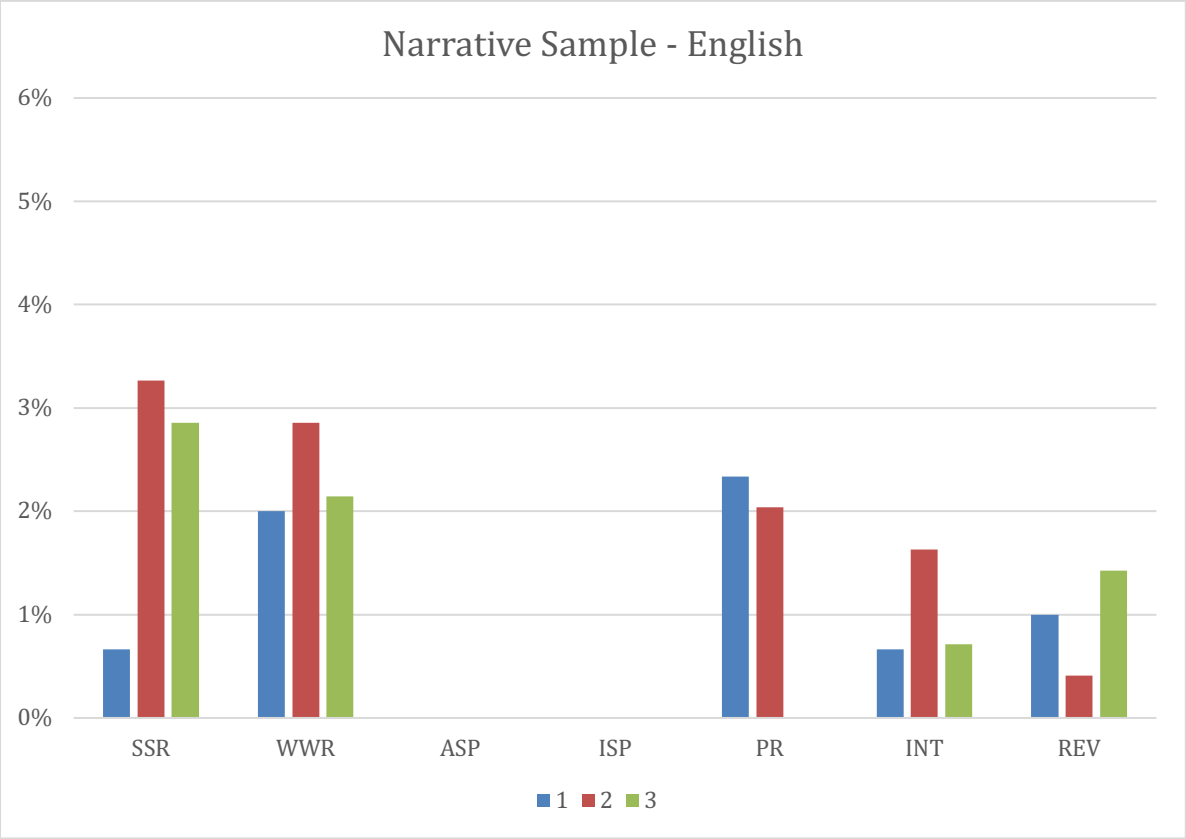

Figure 6. English narrative sample. Stuttering-like disfluencies (SLD): SR=sound syllable repetitions, WWR=whole word repetitions. Nonstuttering-like disfluencies (nSLD): ASP= audible sound prolongations, ISP=inaudible sound prolongations, PR=phrase repetitions, INT=interjections, REV=revisions.

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