Exploratory examination of speech disfluencies in spoken narrative samples of school-age bidialectal children

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Abstract

Purpose: This study examined the relationship between school-age children's speech disfluencies and the use of and variation of Mainstream American English (MAE) and African American English (AAE). Given that bilingual children may present with notably more speech disfluencies than monolingual children (Byrd, Bedore, et al., 2015), it was hypothesized that bidialectal speaking children (i.e., those that use both MAE and AAE) may exhibit higher speech disfluencies, as compared to children who speak mainly MAE and those who mainly speak AAE. It was also hypothesized that bidialectal speaking children would exhibit a greater variety of speech disfluency types when compared to the other two dialect groups (i.e., MAE and AAE).

Method: School-age children (*n* = 61) with typical development and fluency were classified into three dialect groups: MAE speakers (*n* = 21), bidialectal MAE-AAE speakers (*n* = 11), and AAE speakers (*n* = 29). Tell-retell narrative samples were elicited from each participant using a wordless picture book. Speech disfluencies exhibited during these narrative samples were examined for frequency of stuttering-like and nonstuttering-like speech disfluencies and type of speech disfluency.

Results: Findings indicated that bidialectal speaking children do not present with a higher frequency of speech disfluencies when compared to children who speak MAE and children who speak AAE. Additionally, there were no differences in the types of speech disfluencies exhibited by the different dialect groups.

Conclusions: Unexpected findings of the current study nullify both hypotheses and suggest that bidialectalism, in comparison to bilingualism, has less of an impact on speech fluency. Findings provide evidence that bidialectal speaking children are not at an increased risk for stuttering or a misdiagnosis of stuttering. Clinically, these preliminary findings provide some scientific validity and specification to the appropriateness of using already established diagnostic criteria commonly used for stuttering with dialect speakers.

Exploratory examination of speech disfluencies in spoken narrative samples of school-age bidialectal children

The presence of speech disfluencies, or an "interruption in the flow of speech", is a discernable characteristic of developmental stuttering in children and adults (Ambrose & Yairi, 1999, p. 895; Bloodstein, 1960). Speech disfluencies are also present in the speech of individuals who do not stutter. Speech disfluencies being present in both individuals who do and do not stutter creates a need to be specific in the attention given to the types of speech disfluencies, distinguishing individuals who stutter from those who do not. Individuals who stutter are more likely to present with noticeably more speech disfluencies occurring at the word-level or within the word than those who do not stutter (Conture, 2001).

Speech disfluencies occurring within the word are commonly referred to as stuttering-like speech disfluencies (SLDs) and help distinguish children who stutter from those with normal fluency (Ambrose & Yairi, 1999; Pellowski & Conture, 2002; Yaruss et al., 1998). Specifically, children who stutter are known to display a higher frequency of SLDs in comparison to children who do not stutter. They are also known to exhibit a greater average of iterations and increased muscle tension depending on the severity (Ambrose & Yairi, 1999; Pellowski & Conture, 2002). These SLDs include (a) repetitions of sounds or syllables within a word, (b) monosyllabic whole-word repetitions, (c) audible sound prolongations, and (d) inaudible sound prolongations (Ambrose & Yairi, 1999; Pellowski & Conture, 2002; Yaruss, et al., 1998). Other speech disfluencies can occur between words instead of within a word and include (a) phrase repetitions, (b)revisions, and (c) interjections. These types of speech disfluencies are often termed nonstuttering-like speech disfluencies (nSLDs) and represent disfluencies that are normal or typical. Whereas research supports the frequency of SLDs as a distinguishing factor between children who stutter (CWS) and typically disfluent children (TD), frequency of nSLDs does not differentiate CWS from TD children (Ambrose & Yairi, 1999).

It is important to mention that determining the presence or absence of developmental stuttering in school-age children should never be based solely on the presence or absence of SLDs. In addition to SLDs, several other factors are also considered in the differential diagnosis process (e.g., time since stuttering onset, measurement of iterations, duration of SLDs, physical tension, speaking rate, severity; Pellowski & Conture, 2002; Yaruss et al., 1998; Zebrowski, 1991). However, it is fair to say that frequency of SLDs exhibited by a child during an assessment is a vital component to the diagnosis process in considering the presence or absence of developmental stuttering (Eichorn et al., 2012; Guitar, 2014). Commonly applied diagnostic criteria to assist in differentiating children who stutter from children who do not is the presence of 3% or more SLDs per speech sample of at least 300 words (Boey et al., 2007; Conture, 2001; Tumanova et al., 2014; Yairi & Ambrose, 2005). This criterion, however, is based on data from monolingual English-speaking children and raises the question of its applicability to children from culturally and linguistically diverse backgrounds.

Impact of Spanish-English Bilingualism on Speech Disfluencies

Empirical interest in fluency and stuttering in culturally and linguistically diverse children in the United States is growing. However, attention is being given namely to bilingual children and, to the authors' knowledge, no focus on those who speak more than one dialect. This increased interest is likely motivated by the fact that over 65 million individuals in the United States speak a language other than English in the home. It is also reported that 60% of the US population will speak both English and Spanish within the next 50 years (U.S. Census Bureau, 2010, 2016; Zeigler & Camarota, 2018). Therefore, it is not surprising that most of what is known about speech disfluencies, childhood stuttering, and bilingualism in the US is mainly based on bilingual Spanish-English speaking children who do and do not stutter as well as how best to distinguish one group from the other (e.g., Byrd, Bedore et al., 2015; Byrd, Watson et al., 2015; Gkalitsiou et al., 2017; Rincon et al., 2020; Taliancich-Klinger et al., 2013).

There has been empirical interest focused on typical fluency in bilingual Spanish-English speaking children. And while there is some evidence suggesting that stuttering is more present in bilingual speaking individuals (Van Borsel et al., 2001), more recent findings provide evidence of increased disfluent speech in bilingual speakers as the result of language learning rather than stuttering (Guitar, 2019). For example, Byrd, Bedore, and Ramos (2015) examined the frequency of SLDs in typically developing bilingual Spanish-English speaking kindergarteners who do not stutter during narrative retells in both Spanish and English. Findings indicated that bilingual children presented with an SLD frequency ranging from 3% to 22% and presented with more SLDs in Spanish versus English (*M* = 5.78; *SD* 5.05); language dominance did not influence this trend. Furthermore, most of these participants exceeded the 3% SLD criteria commonly used in clinical assessments for stuttering. Byrd et al. (2015) does note that these findings could differ in older age groups due to changes in the development of two languages over time.

To examine stuttering in bilingual Spanish-English speaking children, Taliancich-Klinger and colleagues (2013) conducted a single-subject investigation of a bilingual Spanish-English speaking kindergartner with confirmed stuttering. For this participant, SLDs and nSLDs were examined during a conversational- and narrative retell sample in both languages. Findings indicated distinct differences in the frequency of speech disfluencies in Spanish compared to English. Although the child was more disfluent in English, they presented with more SLDs in Spanish, suggesting distinct patterns of disfluent speech behavior across languages and variation across sample type.

Rincon, Johnson, and Byrd (2020) conducted a study comparing a small group (*n* = 3) of bilingual 5- to 7-year-old bilingual Spanish-English speaking children who stutter to a small group (*n* = 3) of bilingual Spanish-English speaking children who do not stutter during a narrative retell task in Spanish and English. Results indicated that the bilingual children with typical fluency, regardless of the language, presented with a frequency of SLDs that exceeded the 3% SLD criteria as did the bilingual children who

stuttered. Findings supported the notion that bilingual children with typical fluency are at increased risk of misdiagnosis of stuttering.

Taken together, these studies indicate that young bilingual Spanish-English speaking children who do not stutter are far more likely to exceed the diagnostic criteria typically used to identify developmental stuttering in monolingual English-speaking children. This increase in speech disfluencies has been attributed to the idea that bilingual children produce a high frequency of repetitions resulting from linguistic uncertainty. This uncertainty comes with learning more than one language as well as linguistic use and development of two languages rather than developmental stuttering (Fiestas et al., 2005). For example, a Spanish-speaking child communicating in a newly learned language (e.g., English) may have a need to express a thought, but be uncertain or less than confident in which English word(s) is used to convey that thought. As a result, during that moment of thought while speaking, could result in repeated sounds or words as well as switching back to the Spanish word for that thought. Consequently, young bilingual Spanish-English speaking children are at a greater risk for being misidentified as a child who stutters than their monolingual peers. If this linguistic uncertainty caused by a child developing use and mastery of two languages results in increased speech disfluencies, it is plausible that a child developing the use of two dialects can also result in increased speech disfluency.

Impact of Bidialectalism on Speech Disfluencies

Although there has been a substantial growth in research centered on speech disfluencies in Spanish-English bilingual speakers in the US, there is a very limited number of empirical investigations related to speech disfluencies in bidialectal speakers. Moreover, studies that exist compare speakers on different dialects or focus on speakers of one dialect and do not mention clinical implications for assessments or differential diagnosis. For example, Mackey, Finn, and Ingham (1997) compared the impact of dialect on listener speech naturalness ratings from a General American English speaker who stuttered with General American English speakers who did not stutter as well as the third group of non-

General American English speakers who did not stutter. The non-General American English speakers spoke English and another language (e.g., Chinese, Dutch); they also spoke one or more dialects of either language. Findings indicated that listener speech naturalness ratings were influenced by the type of dialect (e.g., non-General American, General American dialect), speech fluency, and speaking rate, as well as the strength of the dialect (e.g., non-General American, General American dialect). Implications suggest that dialect be considered an important factor when devising stuttering treatment plans that include speech naturalness.

A very small set of studies have examined stuttering in African Americans. Some of these studies pose cultural-based questions. For example, Daniels et al. (2006) studied culturally-based identity of African American men who stutter; Robinson and Crowe (1998) highlighted culturally-based considerations for stuttering therapy with African American families. Others have examined the characteristics of speech disfluencies in African American children. For example, Olsen, Steelman, and Montague (1999), compared the stuttering behaviors, secondary behaviors, and speaking attitude of African American school-age children who stutter to those of European American school-age children who stutter. This study did not account for or mention dialect usage. Results indicated no race-based differences in fluency. Similarly, Proctor, Yairi, Duff and Zhang (2008) compared the prevalence of stuttering behaviors of African American and European American preschool-age children. Again, considerations for dialect usage were not mentioned or accounted for. Findings indicated no statistically significant difference in the prevalence of stuttering between the two racial groups. Taken together, Olsen et al. (1999) and Proctor et al. (2008) indicate that fluency between African American and European American children is equivalent from preschool to school-age. However, neither studies contribute to the gap in knowledge addressing the impact of bidialectalism involving AAE on speech disfluencies and stuttering.

Theoretical Framework

To review, bilingualism is traditionally defined as the use of two distinct languages across contexts and levels (Antoniou et al., 2016; Brice, 1997; Lee-James & Washington, 2018). Likewise, bidialectalism refers to the use of two dialects or variations of one language across contexts and levels with an association that can be specific to geographical regions or social groups. Bidialectal speakers may also choose to use one dialect over another (i.e., code-switching) to best communicate with conversation partners across communicative contexts (Mills & Washington, 2015; Wolfram & Schilling-Estes, 1998).

Dialects can be categorized as mainstream or nonmainstream (Lee-James & Washington, 2018; Wolfram & Schilling-Estes, 1998). As the result of migration to the US from a variety of geographical, cultural, linguistic backgrounds, and secondary to ideologies of language standardization, English is classified as mainstream American English (MAE) or nonmainstream American English (NMAE). In the US, MAE is the dialect of wider communication (see Mills et al., 2021). In the US, African American English (AAE) is the most studied dialect of NMAE (Green, 2002; Lee-James and Washington, 2018; Wolfram & Thomas, 2002). African American English is a variation of English replete with rules governing its sound structure, word structure, and sentence structure (Craig & Washington, 2006). Speakers of AAE are not directly tied to race. In other words, merely identifying as African American does not consequentially mean that the individual is an AAE speaker. Furthermore, individuals who do not identify as African American can still be considered an AAE speaker or be bidialectal based on their environmental exposure to AAE (Wheeler & Swords, 2006).

There has been scientific and theoretical interest in similarities between bilingualism and bidialectalism relative to language skills. For example, Lee-James and Washington (2018) presented a comparative theoretical discussion centered on the linguistic and cognitive skills of bilingual Spanish-speaking children and bidialectal AAE-speaking children. Clinically, Lee-James and Washington (2018) attribute the importance of considering such comparisons to the fact that student populations in urban

communities consist primarily of “children who speak more than one language or dialect in their homes and communities” while clinicians in these settings are deficient in their “knowledge of various cultural and regional dialects [which] has the potential to impact quality of services” (p. 6). Lee-James and Washington (2018) go further to speculate that both bilingual and bidialectal children are at greater risk of being erroneously diagnosed since assessing and diagnosing language disorders in these subgroups of children can be difficult. Furthermore, Lee-James and Washington (2018) call future research to focus on how to develop protocols that meet the needs of bilingual and bidialectal speakers together as well as identify “points of intersection” to benefit AAE and bilingual Spanish-English speaking students in the US (p. 21).

Purpose of the Present Study

Research in the US continues to expand what is known about the characteristics of speech disfluencies in bilingual Spanish-English speaking children. However, a critical gap is becoming more apparent. To date, we have no knowledge of how speech disfluencies present in bidialectal children in the US. Particularly, we lack information on what are arguably the most common mainstream and nonmainstream dialects spoken in the US.

Therefore, the purpose of this study is to examine speech disfluencies produced in the spoken narratives of school-age children identified as MAE speakers, AAE speakers, and bidialectal MAE-AAE speakers. Findings from this preliminary study will inform us whether the presentation of speech disfluencies by bidialectal speaking children places them at an increased risk of a misdiagnosis of stuttering.

This study presented two research questions and hypotheses. First, does the frequency of speech disfluencies (nSLDs and SLDs) differ across three dialect groups (1. MAE, 2. Bidialectal, 3. AAE) in school-age children with typical development and fluency? For this research question, it was hypothesized that the frequency of speech disfluencies would be higher in the bidialectal group in

comparison to the other two dialect groups (i.e., MAE and AAE). This hypothesis is based on the postulation that bidialectal children will present similarly to bilingual children in terms of their frequency in stuttering since bidialectal children use two dialects of English (i.e., MAE and AAE) compared to bilingual children who use two languages (Byrd, Bedore et al., 2015; Rincon et al., 2020). But, those identified as monodialectal or speakers of one dialect (i.e., MAE *or* AAE) will be dissimilar in comparison to the frequency of bidialectal speakers.

The second research question asked whether the type of speech disfluencies (nSLDs and SLDs) differ across 3 dialect groups. For this research question, it was hypothesized that the bidialectal group would exhibit a greater variety of speech disfluency types when compared to the other two dialect groups (i.e., MAE and AAE). Again, this hypothesis is based on the idea that bidialectal children and bilingual children present with similar types of speech disfluency, which would mean the presence of SLDs as well as nSLDs disfluencies (Rincon et al., 2020).

Methods

Participants

Participants for the present study did not stutter and consisted of 61 children (32 females; 29 males) classified as MAE speakers (*n* = 21), 2. Bidialectal speakers (*n* = 11), or 3. AAE speakers (*n* = 29). All participants for the current study were included in two previous studies conducted by the second author (Mills, 2015; Mills & Fox, 2016) for the purpose of investigating relationships among language, literacy, and social capital in children from high-need communities. Group classifications for the present study were determined in the initial Mills (2015) study (see Mills, 2015 and Mills & Fox (2016) for a detailed review of the purposes and findings of these studies).

Participants were students attending public elementary schools in central Ohio and were educated in general education classrooms. One parent of each child participant completed a one-page demographic survey providing information about the child's age, race/ethnicity, family socioeconomic

status (SES), and special education placement (see Mills, 2015 and Mills & Fox, 2016 for details on family SES). Informed consent was obtained by parents/guardians of each child; the Institutional Review Board at The Ohio State University approved data collection for the study.

Age and group classification. To be included in this study, participants needed to be between the ages of 7;0 (years; months) and 11;11. There was no statistically significant between-group difference in age as measured in months, F (2,58) = 2.054, p > .05 (MAE: M = 110.05 [months], SD = 14.264; Bidialectal: M = 120.64 [months], SD = 14.596; AAE: M = 116.59 [months], SD =15.846).

Race. For the present study, participants were from the following racial/ethnic groups: 85.2% African American (n = 52); 8.2% African immigrant (n = 5); 4.9% European American (n = 3); and 1.6% Asian (n = 1). All parent reports indicated that no participants from the initial study had ever receive any special education services, including speech-language and hearing, prior to participating in the initial study (see Mills, 2015 and Mills & Fox, 2016 for further details on the initial dataset).

Excluded Participants. From the outset, all participants from the initial study data set (n = 93) were considered for the present study. Of the total dataset from the initial study, 7 participants were excluded for having samples that were deemed to be low in intelligibility and/or having an abnormally fast rate of speech, thus impacting the ability of the sample to be coded for speech disfluencies as determined by both coders. One participant was excluded for not meeting the age requirements for the current study. The remaining 85 participants were classified into three groups: 1. MAE (i.e., mainly MAE speakers or no variation from MAE), 2. Bidialectal (i.e., MAE-AAE speakers or some variation from MAE), and 3. AAE (i.e., mainly AAE speakers or a strong variation from MAE).

Twenty-four of the remaining 85 participants were excluded (No Variation: n = 9; Some Variation: n = 4; Strong Variation: n = 11) for having speech sample sizes +/- 1 standard deviation from the mean speech sample size for participants in their respective dialect groups based on the number of words being the unit of analysis (MAE: M = 332.38, SD = 75.994; Bidialectal: M = 332.50, SD = 97.059;

AAE: M = 343.03, SD = 88.418). This resulted in the final sample size of 61 participants for the present study (MAE: n = 21; Bidialectal: n = 11; AAE: n = 29), F (2,58) = .050, p > .05. Findings suggest that a substantial variation in speech sample size within a participant group can result in differences in the percentage of stuttering. Thus, eliminating outliers ensures a more confined sample size with less variation (Sawyer & Yairi, 2006).

Testing

Speech-Language and Hearing Testing. As detailed in Mills and Fox (2016), two graduate clinicians in communication sciences and disorders, under the supervision of a certified speech-language pathologist, administered tests to formally measure each participant's overall cognitive, vocabulary, and narrative skills. Testing occurred in semi-private rooms in a local elementary school. Participants were administered the Test of Nonverbal Intelligence-4 (TONI-4; Brown et al., 2012); Peabody Picture Vocabulary Test, Fourth Edition (PPVT-4; Dunn & Dunn, 2007) to assess single-word receptive vocabulary and the Test of Narrative Language (TNL; Gillam & Pearson, 2004) to appraise narrative comprehension and production. Participants performed within normal limits based on standard score ranges (standard deviations) on the TONI-4: 78-112 (8.84); PPVT-4: 75-123 (11.21); and TNL: 76-136 (12.74). Each participant also participated in a pure-tone air conduction hearing screening in which all passed.

Group Classification. Part I of the DELV, differentiates children who speak a variation of English from those who speak Mainstream American English. Results classify children into one of the three language variation categories: *no*, *some*, or *strong* variation from MAE. Group classification was determined by administering Part I of the Diagnostic Evaluation of Language Variation-Screening Test (DELV-S; Seymour et al., 2003) to all participants to assess language variation use. The DELV-S consists of two parts and was developed to identify children with typical language differences that include cultural or regional dialect patterns from children with true indications of a language disorder or delay (Moland & Oetting, 2021). For this study, the categories of *no*, *some*, or *strong* variation from MAE were converted

into MAE, bidialectal, and AAE speakers, respectively.

Narrative Procedures

Elicitation. As reported in Mills and Fox (2016), narratives were elicited by a certified speech-language pathologist in a tell-retell manner by having each participant listen to the *Frog, where are You?* (FWAY) story (Mayer, 1963) while looking at corresponding pictures from this wordless picture book. Then each participant retold the story while looking through the picture book again (to review the *Frog, Where Are You?* Script used to elicit narratives, see Mills and Fox, 2016). These narrative samples were audio recorded. No video recordings were captured. This limitation to the current study will be discussed and addressed later as a caveat to the current study.

Speech disfluency Coding. All samples were coded in words for SLDs (i.e., whole-word monosyllabic repetitions, sound/syllable repetitions, audible sound prolongations, inaudible sound prolongations) and nSLDs (i.e., phrase repetitions, interjections, revisions) using a coding process established, discussed, and implemented by Conture (1990) and Yaruss (1998). Based on the first authors' formal clinical and research training as well as future interest in empirical comparisons to similar studies in stuttering (Kabani, 2020; Rincon et al., 2020), the authors deemed it appropriate to code speech disfluencies in words rather than syllables. Coding speech disfluencies in words versus syllables is a longstanding debate with some suggesting syllables be used rather than words (Ambrose & Yairi, 1999). But, it is an accepted reality that speech disfluencies can be reported in words or syllables for purposes of practicality or interest in making comparisons across studies, as is the case with the present study (Yaruss, 2000).

Coding was done independently by two second year graduate student research assistants. Both coders were formally educated on stuttering and coding speech disfluencies by the first author as part of their graduate program curriculum and extensive training and experience coding speech disfluencies for a previous study (i.e., Rincon et al.,2020). The first-author is a board-certified speech-language pathologist

with extensive clinical experience with stuttering as well as experience with disfluency coding and disfluency coding training of graduate students and clinicians. Training was provided through the use of in-person instruction and training utilizing video samples of stuttering and nonstuttering clinical cases.

Dependent Measures

The following dependent measures were used for data analyses: (1) total speech disfluencies (SLDs + nSLDs)/number of words spoken, (2) SLDs/number of words spoken, and (3) ratio of SLDs to total disfluencies.

Reliability

Reliability of speech disfluency coding was conducted in a manner similar to processes published by studies with similar purpose and methodological design; reliability was based on judge agreement (e.g., Byrd, Bedore et al., 2015; Rincon, 2020). For the current study, reliability coding was completed by graduate student research assistants who initially coded the samples and then recoded 18% (n=11) of the samples. While coding 20% of the data is considered common practice for determining reliability, the percentage of the data coded can vary depending on factors related to the type of data (McLean & Pratt, 2006; Syed & Nelson, 2015). The portion for the current study was determined based on the complexity and time constraint of the coders. The interrater reliability for disfluency coding was 89% and the intrarater reliability was 99%. Both coders were second year graduate students with previous formal education and training on fluency disorders and speech disfluency coding as part of their graduate program curriculum.

Statistical Analysis

To review, the first hypothesis was that the frequency of speech disfluencies would be higher in the bidialectal group in comparison to the other two dialect groups (*AAE speakers, MAE speakers*). To address this hypothesis, a multivariate analysis of variance was conducted with the speaker groups as the independent variable and the (1) percent of total speech disfluencies per number

of words spoken, (2) percent of SLDs per number of words spoken, and (3) ratio of SLDs to total speech disfluencies. An alpha level of 0.05 was set to determine statistical significance. Effect sizes were measures by using partial eta squared. Partial eta squared characterizes effect sizes as small (0.01); medium (0.06); or large (0.14) (Cohen, 1988). The second hypothesis was that bidialectal CWNS would exhibit more types of speech disfluencies when compared to children in the two monodialectal groups. This hypothesis was addressed with a Kruskal-Wallis test due to non-normal distribution of the data. Again, an alpha level of 0.05 was set to determine statistical significance.

Results

Frequency of Speech Disfluencies Between Dialect Speaker Groups

To test the first hypothesis related to the frequency of speech disfluencies across the three dialect speaker groups, data was subjected to multivariate analyses of variance (MANOVA) after visual inspection of a histogram deemed total speech disfluency data to be normally distributed. Initial statistical analysis of the total speech disfluencies per total number of words spoken revealed no significant between- group differences, $F(2,58) = .191$, $p = .83$, $\eta_p^2 = .007$ (see Fig. 1). All three dialect speaker groups presented with very similar percentages of total speech disfluencies per total words spoken between 4 and 5% (MAE: $M = 4.84$; $SD = .028$; bidialectal: $M = 4.83$; $SD = .026$; AAE: $M = 5.23$; $SD = .022$).

INSERT FIGURE 1 HERE

Also, there were no significant between-group differences in the total SLDs per total number of words spoken, $F(2,58) = .526$, $p = .59$, $\eta_p^2 = .018$ (see Fig. 1). All three dialect speaker groups presented with a percentage of SLDs per total words spoken that was less than 2% (MAE: $M = 1.48$; $SD = .012$; Bidialectal: $M = 1.83$; $SD = .014$; AAE: $M = 1.82$; $SD = .013$).

INSERT FIGURE 2 HERE

Lastly, there were no significant between group differences in the ratio of SLDs per total speech disfluencies, $F(2,58) = .777$, $p = .47$, $\eta_p^2 = .026$ (see Fig. 3). The three dialect speaker groups presented with a very similar percentages of SLDs per total speech disfluencies (MAE: $M = 29.33$; $SD = .179$; Bidialectal: $M = 37.82$; $SD = .273$; AAE: $M = 33.740$; $SD = .156$). All effect sizes were small.

INSERT FIGURE 3 HERE

Type of Speech Disfluencies Between Dialect Speaker Groups

Non-parametric testing was used to address the second hypothesis due to the non-normal distribution of data points for speech disfluencies by type. An independent-samples Kruskal-Wallis Test was used. Of the SLDs, there were no significant between-group differences in the types of disfluencies exhibited (monosyllabic whole-word repetitions, $H(2) = 2.15$, $p = .32$; sound/syllable repetitions, $H(2) = 2.49$, $p = .89$; audible sound prolongations, $H(2) = .818$, $p = .45$; inaudible sound prolongations, $H(2) = .893$, $p = .60$). Of the nSLDs, there were also no significant between-group differences in the types of disfluencies exhibited (phrase repetitions, $H(2) = .655$, $p = .09$; interjections, $H(2) = .357$, $p = .59$; revisions, $H(2) = .485$ $p = .40$. Means and standard deviations are reported in Figure 4.

INSERT FIGURE 4 HERE

Discussion

The present exploratory study examined the speech disfluencies produced in the spoken narratives of school-age MAE , bidialectal, and AAE speakers. This study questioned whether the

frequency and type of speech disfluencies presented during these narratives differed across the three dialect groups. In considering the hypotheses formulated with these questions, the present study resulted in two main important findings.

First, contrary to what is seen in bilingual Spanish-English speaking children with typical disfluency, bidialectal MAE-AAE speaking children (ages 7-11 years) with typical disfluency did not present with a frequency of speech disfluencies that differed from the MAE and AAE dialect speaker groups. This unexpected finding nullifies the first hypothesis that the frequency of speech disfluencies would be higher in the bidialectal group in comparison to the other two monodialectal groups.

The second main finding is that bidialectal in the present study do not present with different types of speech disfluencies in comparison to the other two monodialectal groups. This finding also nullifies the second hypothesis that the bidialectal group would exhibit a greater variety of speech disfluency types when compared to the other two monodialectal groups. Both findings are discussed below.

No Increased Frequency of Speech Disfluencies in Bidialectal Children

The first main finding indicates that bidialectal children do not present with a frequency of speech disfluencies that is higher than their peers who may primarily speak in MAE or AAE. Additionally, the frequency exhibited by all participants, including those who were deemed to be bidialectal, did not approach frequency levels commonly seen in bilingual children with typical disfluencies. Although a null finding, the implications of this finding are important as findings are considered alongside what is known about the speech disfluencies of bilingual children.

The present findings are incongruent with findings from studies that have examined the same question in bilingual Spanish-English speaking children of similar age as those in the present study (e.g., Byrd, Bedore, et al., 2015; Byrd, Watson, et al., 2015; Rincon, et al., 2020). Collectively, these studies have consistently reported that typically developing bilingual Spanish-English speaking children with no

presence of stuttering exhibit a higher frequency of SLDs and nSLDs, in comparison to monolingual English-speaking children with no presence of stuttering. In fact, their frequency more often mimics that of monolingual English-speaking children who stutter. This increased presence of speech disfluencies places bilingual Spanish-English speaking children at risk for being erroneously diagnosed with developmental stuttering.

Based on previously reported similarities between bilingualism and bidialectalism (Lee-James & Washington, 2018) we speculated that the same underlying processes resulting in increased speech disfluencies for bilingual children would also be present with bidialectal children. Bilingual children must master switching between the two languages based on the context or environment as does bidialectal children who must master switching between two dialects (Kroll et al., 2014; Mills & Washington, 2015). Furthermore, Bilingual children, as done with bidialectal children in this study, can also be classified based on their use of both languages (e.g., simultaneous, sequential; see Amengual, 2019 for more discussion on types of bilingualism). However, based on the findings of the present study, that does not appear to be the case.

There are a few explanations to consider. Bidialectal and bilingual children shift between systems of communication. However, for bidialectal children, the shift occurs *within* the same language system (e.g., English). For bilingual children, the shift occurs *between* two distinct language systems (e.g., Spanish and English). In other words, codeswitching by bidialectal children still occurs within one language. However, codeswitching for bilingual children means navigating the semantics and rules of two separate languages, which obviously would require greater skill (Lee-James & Washington, 2018). It certainly seems to be the case that shifting between two separate language systems, particularly in children who are may still be in the earlier stages of language development, places a heavy load on the speech and language skills of the child resulting in a noticeably high frequency of speech disfluencies.

This null finding is also important since the frequency of stuttering is often considered in the diagnosis of developmental stuttering in children (e.g., Ambrose & Yairi, 1999). As previously said, this point raises the risk of a misdiagnosis of stuttering in bilingual children. However, this risk of misdiagnosis does not appear to be the case for bidialectal speakers of MAE and AAE in the present study. In general, the preliminary finding suggests to clinicians that the same diagnostic criteria used for the frequency and type of core stuttering behaviors or speech disfluencies with monolingual English speakers may also be used with bidialectal speakers of English. This finding does support previous work that has examined speech disfluencies in African American speakers (Olsen et al.,1999; Proctor et al., 2008) both indicating no difference between the fluency of African American children and European American.

Again, previous studies made comparisons based on the racial identity of the participants. Olsen et al. (1999) compared African American boys who stutter to White boys who stutter and found no differences in the presentation of stuttering behaviors. But, those findings alone, as presented, assume that all children in each group were similar in cultural diversity and do not account for the roles that linguistic diversity or dialects play. Findings from Procter et al. (2008) support and build on Olsen et al. (1999) by utilizing a sample of boys and girls identifying and European American and African American and reported no differences in the presence of stuttering across racial groups. While this study does reference both groups presenting with various dialectal differences, this factor is not controlled for and still leaves the question of the role linguistic diversity may have played. These studies relate to the current study since the findings are consistent with the previously mentioned studies and linguistic diversity is included as a variable. Collectively, these studies provide empirical support towards the notion of how best to assess stuttering in bidialectal children. The present study was necessary, given that dialect is not necessarily tied to race. Bidialectal speakers may be of various races, depending on environmental exposure. Furthermore, members of the same racial identity need not speak the same dialect. Although

participants in the present study were chiefly African American, they were not all categorized into the same language variation group. That is, children were categorized along the language variation continuum based on the DELV-S.

Although the findings of the present study suggest less concern with misdiagnosing bidialectal children with typical speech disfluencies as stuttering, it is important to be mindful of not using the results of this current study to under-diagnose bidialectal speakers. Rather, it is most important to conduct a comprehensive examination of stuttering behaviors and related characteristics commonly noted to distinguish children who stutter from those who do not. Tabulating speech disfluencies for frequency and type is only one component of the assessment process (Coleman & Yaruss, 2014; Yaruss, 1998). The assessment process should include other methods of evaluation prioritizing assessment tools that have been normed and even tested on culturally diverse populations (e.g., *Test of Childhood Stuttering*; Gillam, Logan, & Pearson, 2009; *Overall Assessment of the Speaker's Experience of Stuttering*; Yaruss & Quesal, 2006). Stuttering should never be diagnosed solely based on the frequency and type of speech disfluencies presented by the speaker (Coleman & Yaruss, 2014; Yaruss, 1998).

No Differences in Types of Speech Disfluencies in Bidialectal Children

The second main finding from the present study indicates that bidialectal children do not differ in the types of speech disfluencies presented in comparison to their peers who primarily speak in MAE or AAE. Collectively, participants in the current study exhibited all types of nSLDs and SLDs with interjections being the most common nSLD and monosyllabic whole-word repetitions as the most common SLDs. These points of presenting with all types of speech disfluencies, including the most common nSLD (i.e., interjections) and SLDs (i.e., monosyllabic whole-word repetitions), remained true of each individual dialect group as well. This is not surprising given that participants were normally disfluent with no diagnoses of stuttering. This finding is somewhat in line with previous studies that have reported monosyllabic whole-word and sound/syllable repetitions to be the most common type of

speech disfluencies presented by normally disfluent bilingual children (e.g., Rincon et al., 2020). This finding is also in line with reports on types of disfluencies exhibited by monolingual English-speaking children who do not stutter (Ambrose & Yairi, 1999).

Based on similarities between bilingualism and bidialectalism, the authors of the present study speculated that bidialectal speakers with typical disfluency would present with more types of SLDs as well as nSLDs compared to the monodialectal groups. Research findings to-date, although based on bilingual and monolingual speakers and not dialect speakers, agree with the types of SLDs (i.e., part-word and monosyllabic whole-word repetitions) and types of nSLDs (i.e., interjections, phrase repetitions, and revisions) exhibited (e.g., Ambrose & Yairi, 1999; Byrd, Bedore, et al., 2015). Research surrounding bilingual children and speech disfluencies indicates that differences in speech disfluency type occur between bilingual children who stutter and those who do not (Rincon et al., 2020). However, findings from the current study do not suggest the type of speech disfluency presented to be impacted by the use of more than one dialect.

Based on previous reports of children narrating from wordless frog story books, it is reasonable to expect a high frequency of repetitions as the result of linguistic uncertainty or using the linguistic skill of switching between two dialects (Fiestas et al., 2005). However, it is difficult to say whether the types of disfluencies displayed by the participants in the current study result from the impact of dialect variation or simply what is typical behavior from children who do not stutter, regardless of their dialect or language. Just like the monolingual English-speaking children and bilingual Spanish-English speaking children, the bidialectal and monodialectal children with normal fluency in the present study exhibited some SLDs in the form of part-word and monosyllabic whole-word repetitions and, on average, less than one prolongation across the three groups. Additionally, they presented with an equal number of nSLDs. Based on this finding, for bidialectal children, the type of speech disfluencies exhibited does not place them at a greater risk for misdiagnosis of stuttering.

Limitations and Future Directions

The current study examined speech disfluencies in school-age bidialectal children within a narrative retell task. However, the task itself may have reduced children's speech disfluencies. Future studies are needed to examine speech disfluencies in tasks that require a generation of an original story rather than retelling a story which would provide more opportunities for disfluent speech (see DiSegna Merritt and Liles, 1989 for more discussion on story generation and story retelling). Possible tasks may include a narrative generation task (e.g., Child is provided with a stem ["Once upon a time, a family was on an island in the middle of the ocean.] to generate a story) which provides less language structuring than a narrative retell task (e.g., Child is told a story from the *Frog where are you?* series and is asked to retell the story). If children are to tell a story with fewer cues, they will be presented with a higher cognitive load and, therefore, be more likely to stutter or exhibit disfluent speech. For example, it may be of interest to examine the speech disfluencies in samples elicited for Mills and Fox (2016) where AAE and MAE speaking children as well as bidialectal MAE- AAE speaking children provided spoken narratives elicited from a prompt. This task format allows children to create or tell their own story rather than retell a story told to them by an examiner which means they must be skillful at utilizing language and story-telling structure while simultaneously maintaining fluency.

Another limitation of the present study involves the mode of the recorded samples which were audio. Although the audio recordings were of good quality, not having a video to accompany the audio may affect the coding of speech disfluencies that are not audible (inaudible sound prolongations). It is often suggested to both video and audio record when assessing stuttering with video recording being necessary as "subtleties of stuttering would be missed if only an audiotape were used (Guitar, 2019, p167). However, this limitation is considered less of a concern given that the children included in the present study do not stutter. Inaudible sound prolongations, a type of speech disfluency less audible than others, is categorized as an SLD and is more often present in those who are older than the present

sample more advanced in stuttering severity both with speech behaviors and secondary or 'struggle' behaviors (e.g., hand tapping, foot tapping, head nodding) parallel to stuttering moments which could go unnoticed with an audio-only sample (Guitar, 2019).

Lastly, it is necessary to consider the factor of age in the current results when comparing the present findings to bilingual studies previously cited (e.g., Byrd et al, 2015a; Talianchich-Klinger et al., 2013). The school-age children in these studies are notably younger (ages 5-6 years old) than the school-age participants in the present study (ages 7-11 years old). It could be the case that findings from the current study differ from bilingual findings due to both groups of participants being at somewhat different stages of language acquisition with children included in the bilingual studies being closer to early acquisition of language which could contribute to more disfluent speech. As previously mentioned, Byrd et al, 2015a suggest that disfluent speech as result of language development can change with age. Thus, future studies may consider examining speech disfluencies in a younger sample of bidialectal speakers.

Conclusion

The current study examined speech disfluencies produced in the spoken narratives of school-age African American children identified as MAE speakers to those identified as AAE speakers and children identified as bidialectal speakers. The findings from the present study are innovative, given that they contribute to very limited literature on the characteristics of speech disfluencies within subsets of children based on cultural and linguistic diversity. In the case of the present study, the cultural and linguistic diversity is based on dialect use rather than language use.

The findings from this study, although preliminary in nature, resulted in a null finding, but still have the potential for noteworthy impact on service delivery to bidialectal children, particularly those who speak MAE and AAE. Clinicians can use these findings to support clinical decision-making relative to stuttering with dialect speaking children rather than solely rely on what is currently utilized and based

on children with no specificity for linguistic diversity. Findings also provide some scientific validity and specification to the appropriateness of using already established diagnostic criteria commonly used for stuttering with dialect speakers at least when the analyses of speech disfluencies are based on story-retell samples. Based on this study, bidialectalism does not place one at an increased risk for a misdiagnosis of stuttering and should not be considered a risk factor for a stuttering.

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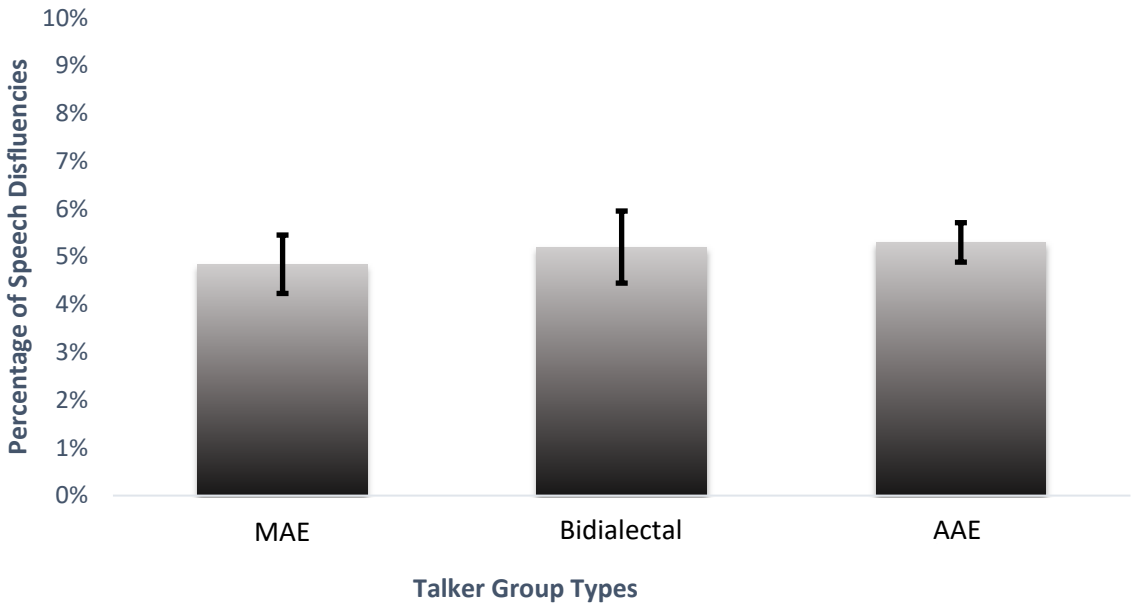
Figure 1

Total Speech Disfluencies per Spoken Words



Note. Total Speech Disfluencies per Spoken Words is a calculation based on the total amount of all speech disfluencies elicited in the sample divided by the total number of words spoken in the sample.

Figure 2

Stuttering-Like Disfluencies per Spoken Words

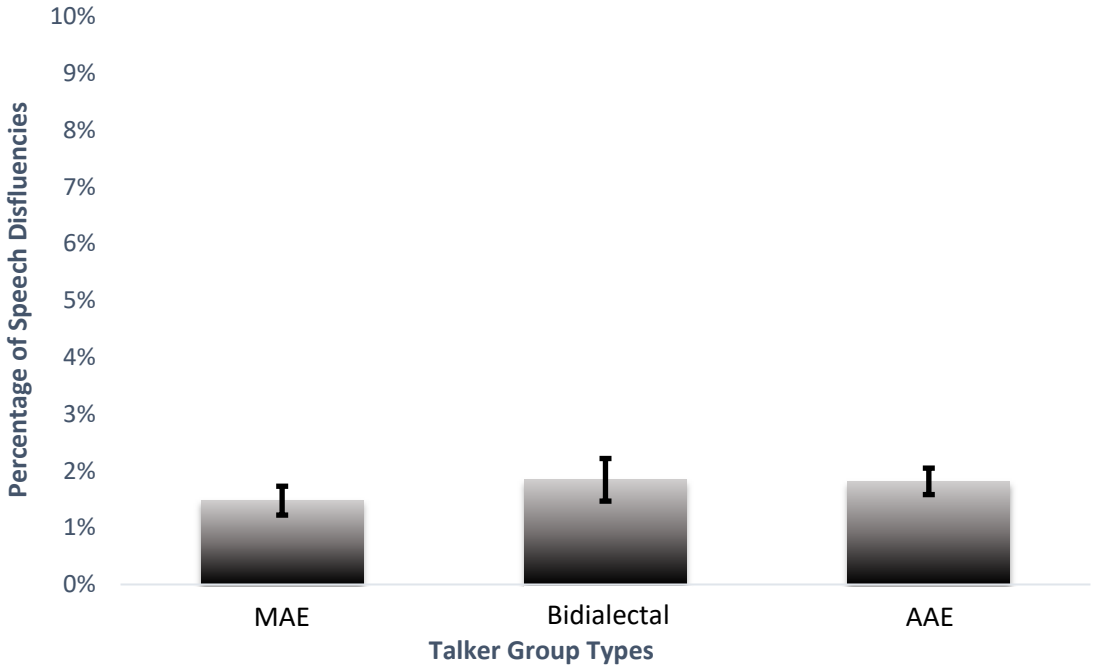


Figure 3

Ratio of Stuttering-like Disfluencies per Total Speech Disfluencies

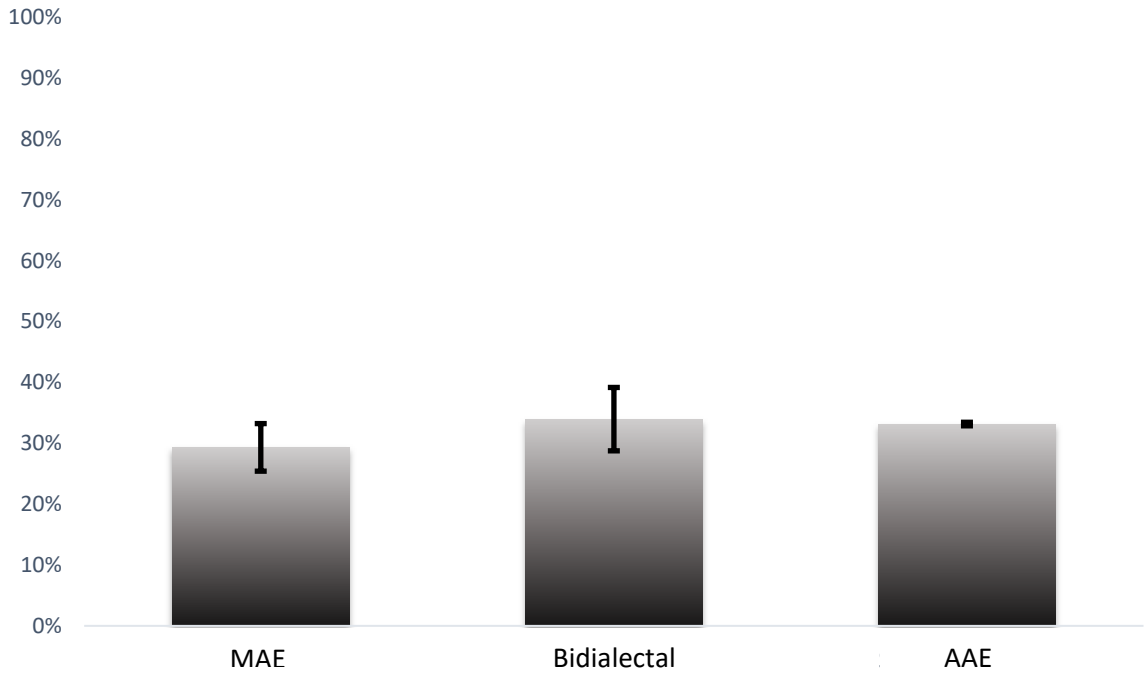
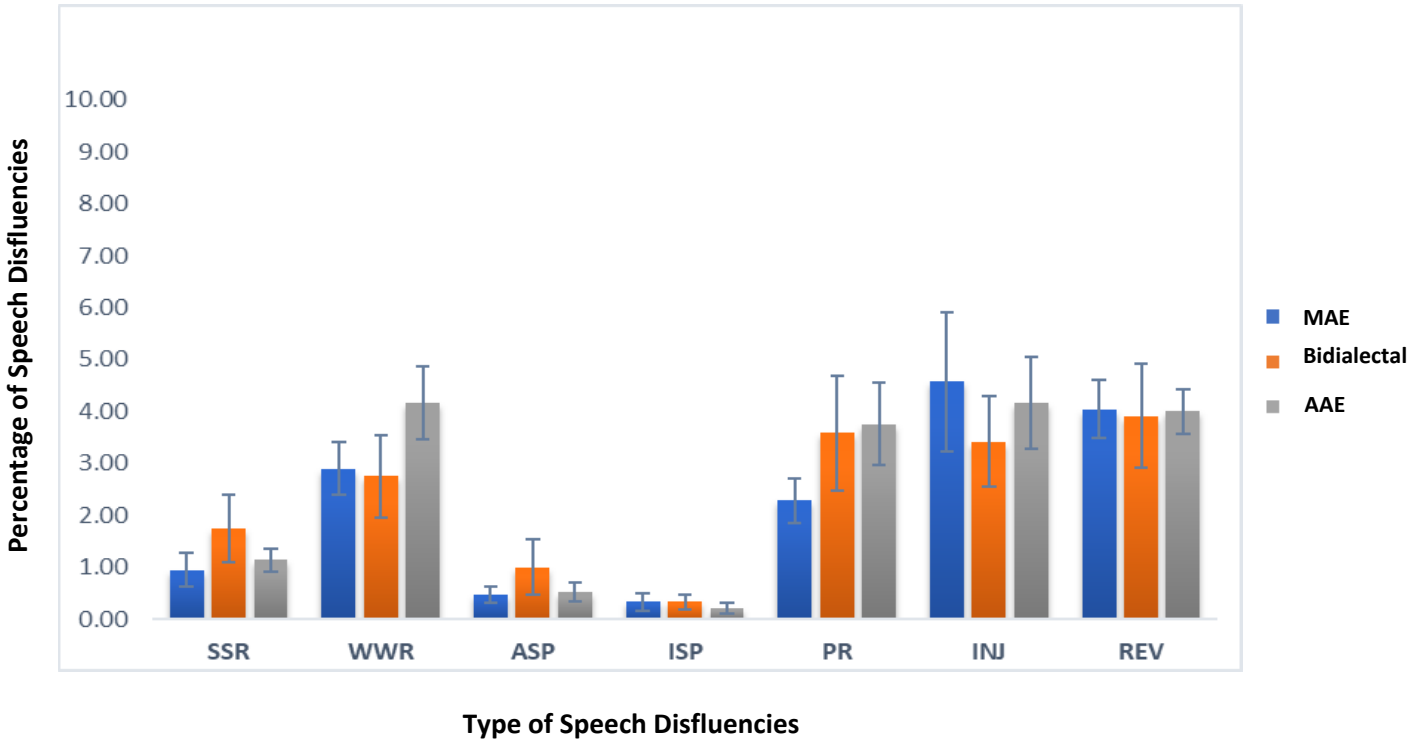


Figure 4

Percentage of Speech Disfluencies by Type



Note. The types of speech disfluencies are categorized by stuttering-like speech disfluencies (SSR – sound syllable repetitions, WWR – monosyllabic whole-word repetitions, ASP – audible sound prolongations, ISP – inaudible sound prolongations) and nonstuttering-like speech disfluencies (PR – phrase repetitions, INJ – interjections, REV – revisions).