



Review

Description of multilingual participants who stutter

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ABSTRACT

Purpose: The purpose of this review was to examine the descriptions of multilingual participants provided in stuttering literature to determine how frequently and consistently relevant factors of language profile are reported.

Method: We conducted a systematic search of published studies that included multilingual participants who stutter and reviewed the level of detail provided regarding language history, function, proficiency, stability, mode, accent, covert speech, and affective factors.

Results: Twenty-three studies qualified to be included in the systematic review, consisting of 342 different multilingual stuttering participants. Of these 23 studies, the most frequently reported information included language proficiency (70%), history (56%), and function (43%). The specificity of the information used to define these factors was inconsistent. Affect was mentioned in 22% of studies, and language stability, mode, and accent information was included in less than 10% of the studies.

Conclusions: Results demonstrate that description of multilingual stuttering participants is inadequate and inconsistent. A recommended framework is provided for future studies to facilitate cross-study comparisons and enhance our ability to interpret the manifestation of stuttering in multilingual participants.

Educational objectives: The reader will be able to: (a) summarize the current validity of cross-study comparisons in available research of multilingual participants who stutter; (b) describe the range of language factors to be included when providing descriptions of multilingual participants who stutter; (c) discuss the importance of consistency when describing language profiles of multilingual research participants.

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1. Introduction

The rapid growth of linguistically diverse populations offers a unique challenge, and opportunity, for researchers in the field of stuttering. In the United States (U.S.), an estimated 20% (approximately 59 million individuals) of the population over the age of 5 speak a language other than English at home (U.S. Census Bureau, 2010). Stuttering affects an estimated 1% of adults in the U.S. (approximately 3 million individuals). While the exact number of multilingual people who stutter is unknown, we can estimate that the number of individuals who are both multilingual and stutter will increase with the growing diversity of our culture.

Research focusing on the multilingual stuttering population is still in its early stages and published data are limited. Two key issues compromise interpretation of available data. First, investigations of multilingual participants who stutter are often restricted to case studies (Ardila, Ramos, & Barrocas, 2011; Bakhtiar & Packman, 2009; Bernstein Ratner & Benitez, 1985; Carias & Ingram, 2006; Dale, 1977; Druce, Debney, & Byrt, 1997; Jankelowitz & Bortz, 1996; Jayaram, 1977; Karniol, 1992; Koushik, Shenker, & Onslow, 2009; Lattermann, Shenker, & Thordardottir, 2005; Nwokah, 1988; Roberts, 2002; Woods & Wright, 1998) or prevalence studies (Howell, Davis, & Williams, 2009; Mohamadi, Nilipour, & Yadegari, 2008; Stern, 1948; Travis, Johnson, & Shover, 1937). Few studies have compared performance between monolingual and bilingual groups (Jayaram, 1982, 1983, 1984, 1989) and only one has compared participants grouped by language dominance (Lim, Lincoln, Chan, & Onslow, 2008). Second, the language abilities and experiences of multilingual participants are heterogeneous. Inconsistencies in participant descriptions compromise interpretation of results within and across studies and limit meta-analytic efforts.

Small-scale studies are common in multilingual stuttering research because large groups of multilingual participants who stutter are typically not as accessible to researchers. Case studies are limited in terms of generalization and comparisons between or across such studies are considered invalid. One solution, as noted by Hammer (2011), is to supplement multilingual research with detailed participant descriptions. Comprehensive language profile information would better equip researchers to account for variation observed between studies, regardless of size, and enhance interpretation of limited available data.

Language abilities of multilingual speakers are difficult to characterize in a consistent manner given the diversity of multilingual experiences. In his classic papers on bilingual research, Grosjean (1997, 1998, 2004) noted that some of the conflicting research outcomes were due, in part, to inconsistent interpretation of how multilingual speakers acquire and use each language. Grosjean emphasized that multilingual speakers usually learn and develop language skills for different purposes, within different environments, and with different people. Certain speakers may be in the process of gaining or losing proficiency in a language, while others may have reached a level of stability. As such, language performance and proficiency is rarely equal in all communicative environments or stable across the lifespan. Along with the clinical implications noted by Shenker (2011), lack of homogeneity across language experiences and proficiency hinders comparison of multilingual participants who stutter across studies.

Cross-study comparisons are further compromised by the lack of a standardized protocol and terminology to describe the multilingual experience. In stuttering research, language abilities of multilingual participants have typically been reported in terms of language “dominance.” Dominance has been defined by a number of different factors, including frequency of use (Bakhtiar & Packman, 2009; Bernstein Ratner & Benitez, 1985), self-rated proficiency (Roberts, 2002), subjective measurement of proficiency by researcher (Dale, 1977), and objective measures of proficiency (Ardila et al., 2011; Carias & Ingram, 2006; Jankelowitz & Bortz, 1996). Inconsistencies in how dominance is defined may lead to conflicting outcomes. For example, Nwokah (1988) found 16 participants, described simply as “balanced bilinguals,” typically stuttered in one language more so than the other. In contrast, Lim, Lincoln, et al. (2008) collected detailed language profile criteria from 30 participants to create three dominance-based groups (e.g., English-dominant, Mandarin-dominant, or language balanced groups). Results suggested balanced bilinguals did not stutter more in either language; rather, multilinguals who were

Table 1
Factors included across selected multilingual language profile questionnaires.

Questionnaire	History	Function	Proficiency	Stability	Mode	Accent	Covert speech	Affect
History of Bilingualism, and language background questionnaires ^a	✓	✓	✓					
Language background questionnaire ^b	✓	✓	✓					
Family history, language history, and language use questionnaires ^c	✓	✓	✓		✓			✓
Parent–teacher questionnaire ^d		✓	✓		✓			
Language history questionnaire ^e	✓	✓	✓		✓	✓	✓	✓
Language Experience and Proficiency Questionnaire ^f	✓	✓	✓			✓		✓
Bilingual language history and proficiency form ^g	✓	✓	✓					
Self-classification tool for English–Mandarin ^h	✓	✓	✓					
Bilingual Dominance Scale ⁱ	✓	✓	✓	✓		✓	✓	✓
Bilingualism and emotions questionnaire ^j	✓	✓	✓		✓		✓	✓

Note: Full questionnaires found in the following sources:

^a Subtests of the Bilingual Aphasia Test (Paradis, 1987, pp. 46–51).

^b Liow and Poon (1998).

^c Muñoz, Marquardt, and Copeland (1999).

^d Gutiérrez-Clellen and Kreiter (2003).

^e Li, Sepanski, and Zhao (2006).

^f Marian et al. (2007).

^g Roberts and Shenker (2007).

^h Lim, Liow, et al. (2008).

ⁱ Dunn and Fox Tree (2009).

^j Dewaele (2010, pp. 224–230).

dominant in one language stuttered more in the less dominant language. To better interpret such discrepant findings, there is a need for more consistent participant description criteria comparable to that used by the broader multilingual research community.

In this paper we apply a detailed model for characterizing language profiles of multilingual participants who stutter. We will first define and discuss the theoretical importance of factors associated with language experience and abilities based on Grosjean's (2004) criteria: language history, function, proficiency, stability, and mode. Three additional factors not addressed in Grosjean's (2004) framework but frequently reported across multilingual language profile questionnaires will also be included: degree of accent, language of covert speech, and affective variables (see summary of selected instruments in Table 1). Based on this eight-factor framework, we will then complete a systematic review of multilingual stuttering literature. Finally, we will provide a suggested framework for future description of this population.

Language history refers to when and how language skills were first acquired. According to Grosjean (2004), elements of language history include the age and environment of acquisition (e.g., school, work, home, country of residence), order of acquisition, patterns of use during acquisition (e.g., amount of time each language was used and with whom), and linguistic relationship between the languages. A speaker's current abilities within each language are impacted by early language exposure. For example, age of initial exposure to a second language (L2) has been correlated with a wide range of language skills in L2, including phonetic (Fowler, Aramco, Ostry, Rowland, & Halle, 2008), phonological (Flege, Yeni-Komshian, & Liu, 1999; Jia, Strange, Wu, Collado, & Guan, 2006), lexical (Hammer, Lawrence, & Miccio, 2008), semantic (Newman, Tremblay, Nichols, Neville, & Ullman, 2012), and syntactic abilities (Birdsong & Molis, 2001). Beyond the amount of language exposure, the nature of exposure can have independent predictive value for specific language abilities. For example, Flege et al. (1999) found years of formal education to predict L2 morphosyntactic knowledge in adults when controlling for age of initial exposure.

The effects of quantity and quality of exposure on specific language skills are particularly evident at younger ages. Bedore et al. (2012) found the amount a language was used at home, rather than age of exposure, uniquely predicted semantic and morphosyntactic scores. Further, as suggested by Hammer et al. (2012), the constellation of factors that impact specific language skills may differ between first language (L1) and L2. Bohman, Bedore, Peña, Mendez-Perez, and Gillam (2010) found that while language output was relevant to semantic and morphosyntactic skills in both languages, language input predicted these skills in L1 alone. Taken together, findings suggest that the heterogeneity of multilingual experiences during acquisition, and resulting language skills in L1 and L2, cannot be captured by a single descriptor of language history. The dynamic influence of language history on current language abilities warrants a detailed account of the circumstances in which languages were first acquired.

Language function refers to the current environmental demands for language use. Language skills can fluctuate based on how often each language is used on a daily basis and for what purposes. As noted by Grosjean (2004), it is not uncommon for one language to be used only at work or school, while another language is used at home or social situations. General language proficiency has been shown to interact with the amount of use within specific environments (Hakuta & D'Andrea, 1992), as well as the nature of language experiences (Jia & Aaronson, 2003). For example, Jia and Aaronson found that while bilingual children exhibited greater L2 proficiency than older immigrants, these children were also exposed to richer L2 experiences beyond those of immersive schooling (e.g., greater number of L2 speaking peers, L2 books read for leisure, instructional L2 television programs, and L2 spoken with family members). Similar to language history, the quantity and

quality of language use exhibit unique predictive value for specific language skills. For example, while frequent L2 use has been found to increase phonological accuracy in adults, sheer frequency of use did not predict phonological knowledge as well as experiential factors outside formal classroom settings (Derwing, Munro, & Thomson, 2007; Flege & Liu, 2001; Moyer, 2011).

The impact of how and when language is used on specific language skills is particularly true for children. In addition to semantic and morphosyntactic outcomes reported by Bedore et al. (2012) and Bohman et al. (2010), vocabulary skills are often stronger in L1 if both L1 and L2 are spoken in the home environment (Hammer, Davison, Lawrence, & Miccio, 2009). That is, without exposure to both L1 and L2 at home, overall vocabulary knowledge is often lower in bilingual children due to context-dependent use of certain vocabulary (or “distributed” vocabulary). As observed with language history, the interaction between language use and language skills in multilinguals is less than straightforward. Evidence supports language use, and resultant language skills, cannot be captured by a single descriptor and supports comprehensive description of the frequency and nature of use as salient predictors of language skills, particularly in younger bilinguals.

Language proficiency is defined by Grosjean (2004) as the current degree of skill within each language domain: speaking, listening, reading and writing. Global measurements of proficiency may occlude differences between specific language skills, such as phonological, lexical, semantic, and/or morphosyntactic abilities. For example, Oller, Pearson, and Cobo-Lewis (2007) found children learning a second language may continue to exhibit differences in L1 and L2 vocabulary knowledge even after morphosyntactic and reading abilities appeared to reach near native proficiency. In this large, longitudinal study difficulties were observed in expressive vocabulary relative to receptive vocabulary in L1. As discussed by Gibson, Oller, Jarmulowicz, and Ethington (2012), the L1 receptive-expressive “gap” found in early L2 learners could be due to suppression of L1 as an adaptive mechanism for learning a second language. These findings suggest that overall proficiency does not necessarily reflect abilities across all areas of language. Thus, in efforts to minimize over- and under-estimation of language proficiency in multilingual participants, performance across a range of specific language skills should be considered.

Language stability refers to whether one or both languages are currently being acquired, or in some cases, lost. Acquisition or deterioration of language skills can occur due to changes in residence, amount of exposure, or day-to-day use. Differences in proficiency during periods of acquisition are thought to reflect restructuring of the mental lexicon. For example, L2 latencies for picture naming (i.e., semantic tasks) and word translation (i.e., lexical-phonological task) are similar in adult multilinguals who have reached stable proficiency (for review, see Kroll, Van Hell, Tokowicz, & Green, 2010). In contrast, multilinguals still in the process of learning are faster translating L2 words than naming L2 pictures, and less vulnerable to phonological or semantic distracters (Sunderman & Kroll, 2006). These patterns suggest speakers with stable proficiency mediate between languages at a conceptual level, while in-acquisition speakers mediate at a lexical level.

For speakers still acquiring a language, L1 attrition is a well-documented product of language instability and environmental demand. For example, adults exhibit L1 attrition if immersed in a new country for only a short period of time (Linck, Kroll, & Sunderman, 2009). In children, L1 attrition effects are commonly observed as a product of L2 immersive schooling. Children who learn a second language under these circumstances often lose or lag in proficiency in L1 and make greater gains in L2 than adult L2 learners (Jia, Aaronson, & Wu, 2002; Kohnert, Bates, & Hernandez, 1999). Taken together, evidence suggests speakers in the process of learning L2, compared to speakers with more stable language skills, may be particularly susceptible to losses in L1 proficiency when operating within environments in which L1 is not maintained (Anderson, 2004). These data support consideration of language stability during participant description to inform L2 and L1 performance in multilingual speakers. In addition, shifts in language stability can occur subtly over time without speaker awareness (Jia et al., 2002; Linck et al., 2009). Therefore, the possibility of language loss should be explicitly addressed during participant description.

Language mode refers to the linguistic processing that occurs when a bilingual speaker interacts with bilingual interlocutors or situations (i.e., in “bilingual mode”) versus monolingual situations (i.e., in “monolingual mode”). Knowledge of language(s) spoken or preferred by an interlocutor has been shown to mediate the degree of code-switching that occurs during conversation (Paradis & Nicoladis, 2007). Bilingual language mode can be induced during experimental paradigms, even after brief exposure to multilingual stimuli. Levy, McVeigh, Marful, and Anderson (2007) found evidence of reduced L1 suppression during bilingual picture naming task. In this study, L2 learners were less accurate in retrieving L1 picture names after ten repetitions of picture names in L2. Bilingual language mode may also be associated with increased demand on processing resources. During bilingual picture-naming tasks, processing costs (slowed naming) were associated when switching from L2 to L1 (Rayner & Ellis, 2007). This pattern may be more pronounced when language dominance is asymmetrical (Costa & Santesteban, 2004). Further evidence suggests that bilinguals never fully suppress the other language even during monolingual tasks (Colomé, 2001). Findings suggest that during both monolingual and multilingual tasks, subtle differences in language processing may be present in multilingual speakers that impact language performance.

Degree of accent has been described as a “rough index” of L2 experience (Flege et al., 1999). Data have consistently found degree of L2 accent negatively correlated with age of acquisition and language use (Flege, MacKay, & Piske, 2002; Munro & Mann, 2005), although other evidence suggests the quality of language experiences, rather than the sheer quantity, are better predictors of foreign accent (Flege et al., 2006; Moyer, 2011). Degree of accent has direct consequences for phonetic and phonological properties of speech (Arslan & Hansen, 1997; Flege et al., 2002), as well as suprasegmental aspects of speech production (Trofimovich & Baker, 2007). In addition, MacKay and Flege (2004) found accented production was associated with increased phonological substitutions, both real and perceived. Given these findings, consideration of accent

may provide supplemental evidence of language proficiency and be of particular relevance to research that investigates phonetic or phonological properties of speech output.

Covert speech (aka “mental speech” or “inner speech”) has been a suggested product of frequency of use of L2 (Dewaele, 2007). Dewaele found multilinguals typically prefer L1 during mental language formulation, although patterns were mediated by language history and use. During silent rhyme judgment tasks in L2, bilingual adults suppress phonological information from L1, although suppression is often incomplete (Carrasco-Ortiz, Midgley, & Frenck-Mestre, 2012; Wu & Thierry, 2011). Similar to degree of accent, language of covert speech may serve as supplemental data to determine language dominance, and of particular importance for nonverbal experimental studies (e.g., neuroimaging, manual reaction time tasks).

Affective variables can characterize the overall comfort and willingness to speak in a given language, particularly a non-dominant language. Level of comfort could potentially impact the speed, quantity, or quality of output observed during testing. For example, Dewaele (2010) reported greater foreign language anxiety in younger L2 learners than older L2 learners, and elevated anxiety was associated with lower levels of proficiency. Jia et al. (2002) reported greater L2 proficiency correlated with less avoidance of L2 speaking opportunities. From a lexical perspective, emotions may play a unique role in multilingual language processing. Emotional words in L2 are retrieved more slowly (Opitz & Degner, 2012) and induce less behavioral and autonomic reaction (Harris, 2004) than emotional words in L1. These findings suggest that L2 words may be weakly associated with “emotional” semantic knowledge and require greater processing time during retrieval. A slightly different interpretation, offered by Marian and Kaushanskaya (2008), is emotionality or preference toward speaking a certain language may impact lexical retrieval in a bi-directional manner. That is, speakers may prefer to speak in L2 because it provides more emotional distance from negative memories strongly encoded in L1. Consideration of affective variables may provide insight regarding overall comfort and lexical retrieval during production.

A basic framework for language profile description would improve our understanding of fundamental questions within multilingual stuttering literature. For example, Van Borsel (2011) suggested that the role of language dominance and stuttering remains uncertain due, in part, to the heterogeneity of the multilingual population. In the broader multilingual literature, individual factors used to determine dominance, such as history, proficiency, and function, have been found to uniquely interact with specific language abilities. By including each of these factors in the multilingual stuttering literature, the relative contribution of each to the manifestation of stuttering can be more carefully considered. Consistent use of the proposed framework in future studies allows the findings for these and other critical research questions, such as generalization of treatment across languages and language-specific interactions with stuttering, to be reliably interpreted by accounting for potential sources of variability unique to the multilingual population.

In sum, a broad range of language factors reported for participants in multilingual research can influence the interpretation of results. An eight-factor framework emerged based on Grosjean's (2004) recommendations for participant description and information from language profile questionnaires (see summary of selected instruments in Table 1): history, function, proficiency, stability, mode, accent, covert speech, and affect. Based on this framework, we examined the extent to which these factors are represented in the stuttering research literature. Our research questions are as follows:

1. What is the breadth of language profile information provided for bilingual or multilingual participants who stutter in the available literature? Specifically, how often are each of the eight factors included across studies, and how consistently do factors co-occur within studies?
2. What is the depth of language profile information provided for bilingual or multilingual participants who stutter in the available literature? Specifically, how many different descriptors are used to convey information about each of the eight factors, and how consistently are these descriptors used across studies?

2. Methods

A systematic review of multilingual participant descriptions provided in stuttering literature was conducted based on the described eight-factor framework. This framework allowed comprehensive appraisal of information provided in participant descriptions within the multilingual stuttering literature.

2.1. Factor description

To determine the specific information to be associated with each language factor, unique descriptors were established prior to review. Table 2 provides descriptors derived for each of the eight language factors. Descriptors were first drawn from research questions posed by Grosjean (2004, pp. 34–35), that if answered would provide descriptive information for each factor. For example, Grosjean posed the following questions to determine participants' language stability: “Are one or several languages still being acquired? Is the bilingual in the process of restructuring (maybe even losing) a language or language skills because of change of linguistic environment? Has a certain language stability been reached?” Information that would satisfy these questions was considered a unique descriptor of language stability (i.e., “Degree of proficiency loss, if any?” and “Age of proficiency loss, if any?”).

Table 2
Descriptors for language profile factors.

Factor	Descriptors
History	Age or years since first exposure Simultaneous/order of acquisition Languages spoken or heard at home as a child Language spoken or taught school Years of formal language instruction
Function	Amount of use per language (e.g., hourly, daily, weekly, monthly, yearly, overall) Amount of current media exposure to each language Languages currently spoken at work/home/school/social events Languages currently spoken with friends/family/co-workers
Proficiency	Subjective or objective ability to speak, understand, read and/or write each language
Stability	Degree of proficiency loss, if any Age of proficiency loss, if any
Mode	Participant reported as aware of bilingual testing or communicative partner Frequency or context of code-switching Languages currently spoken by family/friends/spouse/co-workers
Accent	Degree of accent perceived by speaker or by others
Covert Speech	Language used when performing mental arithmetic or forming sentences silently
Affect	Age of comfort Level of anxiety toward speaking Overall language preference Language used when expressing emotion

Note: Descriptors adapted from Grosjean (2004, pp. 34–35) and questions provided within the following language profile questionnaires: Dewaele (2010, pp. 224–230); Dunn and Fox Tree (2009), Gutiérrez-Clellen and Kreiter (2003), Li et al. (2006), Lim, Liow, et al. (2008); Liow and Poon (1998), Marian et al. (2007), Muñoz et al. (1999), Paradis (1987, pp. 46–51), Roberts and Shenker (2007).

Next, in order to maximize the number of descriptors for each factor, all questions within the 10 commonly used questionnaires outlined in Table 1 were reviewed and categorized relative to Grosjean's (2004) factors. For example, question 11 of the Bilingual Dominance Scale (Dunn & Fox Tree, 2009, pp. 287–288) stated: "Do you feel that you have lost any fluency in a particular language? If yes, which one? At what age?" In this case, information gained from these questions overlapped with Grosjean's description of language stability and were not included as additional descriptors. However, certain questions added greater depth to Grosjean's factor descriptions. For example question 5 on the Language Experience and Proficiency Questionnaire (Marian, Blumenfeld, & Kaushanskaya, 2007, p. 967) stated: "Please rate to what extent you are currently exposed to Language X in the following contexts: interacting with friends, interacting with family, watching TV, listening to radio/music, reading, and language-lab/self-instruction." Specific media-related aspects of these questions were considered unique and non-overlapping with those presented by Grosjean. As such, it was included as a unique descriptor of language function (i.e., "Amount of current media exposure to each language").

2.2. Search procedure

Investigators searched three online databases: (1) EBSCO, including the following databases: PsychINFO, Academic Search Complete, ERIC, MEDLINE, CINAHL Plus, eBook Collection, Communication & Mass Media Complete, MasterFILE Premier, Newspaper Source, MLA International Bibliography, Health Source, Professional Development Collection, PsycARTICLES, Regional Business News, Teacher Reference Center, and Vocational and Career Collection; (2) MEDLINE, with lemmatization turned on (i.e., searched for alternative forms of the search terms); and (3) Google Scholar Advanced, including the following categorical subject areas: (a) Biology, Life Sciences and Environmental Science, (b) Medicine, Pharmacology, and Veterinary Science, and (c) Social Sciences, Arts, and Humanities. Search terms occurred in the title of the article in Google Scholar, and the time frame for all databases included items published between January 1900 and September 2011.

In addition, a manual search of studies cited in book chapters dedicated to this topic (Bernstein Ratner, 2004; Roberts & Shenker, 2007; Van Borsel, 2011) and a relevant literature review (Van Borsel, Maes, & Foulon, 2001) was performed. Reviewers included the first author and a research assistant.

2.2.1. Search terms

The following search terms were used to locate studies including multilingual participants who stuttered in two main categories: *bilingual*, with alternate terms including *bilingualism*, *multilingual*, *multilingualism*; and *stutter*, with alternate terms including *stuttering*, *disfluent*, *disfluency*, *dysfluent*, *dysfluency*, *stammer*, *stammering*. All possible combinations of multilingual and stuttering terms resulted in 32 search term combinations. A total of 270 non-overlapping entries were found from these terms.

2.2.2. Inclusionary and exclusionary criteria

Abstracts, background/introduction, and methods of the 270 were identified by the first author and subsequently reviewed by the first author and a research assistant. Studies were selected for inclusion in the synthesis if they met the following inclusion criteria: (1) adult or child participants were described as both stuttering and speaking or having knowledge of more than one language, (2) provided original and previously unpublished data, and (3) published in English. Articles were excluded from the systematic review if stuttering was described only as normal disfluencies (i.e., single whole-word repetitions, phrase repetitions, revisions, interjections), or if stuttering was described as acquired, neurogenic, or otherwise non-developmental. Non-refereed publications, unpublished manuscripts or reports, conference proceedings and posters were not included in the review.

2.2.3. Search review

Of the 270 unique items yielded from the search terms, 130 were not peer-reviewed; another 23 papers did not present original or previously unpublished data; 31 papers did not describe participants as bilingual or multilingual; 55 papers were excluded because participants or participants' speech was not described as stuttering according to the established criteria; two articles were excluded because stuttering was characterized as acquired or neurogenic; six were not published in English; one article could not be accessed online or via inter-library loan (Watt, 2000). This resulted in 22 articles for the review. In addition to these 22 articles, one article was identified post-review (Koushik et al., 2009). This article was identified during a cursory online search of articles that cited specific measurement tools (Roberts & Shenker, 2007). This article was not found during initial systematic review because relevant keywords were not included in the text and the citation was not offered in previous literature review (Van Borsel et al., 2001) or book chapters included in the manual search. While acknowledging this limitation in search criteria, this article satisfied all inclusionary criteria and did not qualify for removal based on exclusionary criteria. As such, this article was included in the systematic review. In total, 23 data-based, refereed articles examining multilingual stuttering participants were included in the analysis. Full copies of articles were obtained via online databases or publications available at the authors' university library.

2.3. Review procedure

The 23 articles were then analyzed using a full review of the methods, results, and discussion sections of each. Any quantitative or qualitative descriptors provided in the text were categorized based on the eight-factor framework outlined in Table 2. A study was scored as including a factor if at least one descriptor was reported.

Of the 23 usable articles, 342 total unique multilingual stuttering participants were described (see Table 3). Special consideration was taken in four studies by Jayaram. In these four studies, the same 10 participants were used (Jayaram, 1982, 1983, 1984, 1989). Although these four studies did not include original participants, each study met inclusion criteria for two key reasons. First and foremost, participant descriptions, the variable of interest in the current review, differed between each study. Second, the analysis and data provided differed between each study. For these reasons, these studies were reviewed separately. However, because Jayaram did not include unique participants, the 10 overlapping participants from these four studies were only tallied once during the final count of participants ($n = 342$).

3. Results

3.1. Breadth of language profiles

The first research question examined the breadth of language profiles reported across studies. Specifically, we were interested in (a) how frequently factors were included across all 23 studies, and (b) how frequently factors co-occur within studies. Table 3 depicts factors included across and within studies.

3.1.1. Across studies

As illustrated by Fig. 1, the most frequently provided factors, in order, were proficiency (70%), history (56%), and function (43%). Affective aspects of language (22%), stability (9%), mode (9%) and accent (4%) were infrequently provided across studies. None of the studies (0%) provided information about language of covert speech.

3.1.2. Within studies

Overall, the three most frequent factors across studies, language history, proficiency, and function, were also the most frequently co-occurring factors within studies. Of the 23 studies reviewed, seven included all three factors (30%) and six studies included two of these factors (26%). Six studies included only one of these factors (26%). The remaining four studies (17%) included no description of participants' language profile. Infrequently reported factors (i.e., stability, mode, accent, and affect) were provided only when language history information was also included within a study. The specific factors included within each study are depicted in Table 3.

Table 3
Summary of studies with multilingual participants who stutter.

Article	<i>n</i>	Age (years)	Type of study	History	Function	Proficiency	Stability	Mode	Accent	Covert speech	Affect	Total
Ardila et al. (2011)	1	27	D	✓	✓	✓						38%
Bakhtiar and Packman (2009)	1	8	T	✓	✓	✓					✓	50%
Bernstein Ratner and Benitez (1985)	1	50	D	✓	✓	✓						38%
Carias and Ingram (2006)	4	4–10	D	✓	✓	✓						38%
Dale (1977)	4	13 ^a	D	✓		✓	✓				✓	50%
Druce et al. (1997)	6	6–8	T			✓						13%
Howell et al. (2009)	38	8–12	P	✓								13%
Jankelowitz and Bortz (1996)	1	63	D	✓	✓	✓						38%
Jayaram (1977)	2	26 ^a	D			✓						13%
Jayaram (1982)	10	19–32	D									0%
Jayaram (1983)	(10)	19–32	D		✓	✓						25%
Jayaram (1984)	(10)	19–32	D			✓						13%
Jayaram (1989)	(10)	19–32	D			✓						13%
Koushik et al. (2009)	12	6–10	T	✓		✓						25%
Karniol (1992)	1	2	D	✓	✓		✓	✓			✓	63%
Lattermann et al. (2005)	4	4–5	T	✓		✓						25%
Lim, Lincoln, et al. (2008)	30	12–44	D	✓	✓	✓		✓				50%
Mohamadi et al. (2008)	129	6–14	P									0%
Nwokah (1988)	16	16–40	D	✓	✓						✓	38%
Roberts (2002)	4	19–52	D	✓	✓	✓			✓		✓	63%
Stern (1948)	9	6–16	P									0%
Travis et al. (1937)	68 ^b	4–17	P									0%
Woods and Wright (1998)	1	28	T			✓						13%
Total	342			56%	43%	70%	9%	9%	4%	0%	22%	

Note: D, descriptive data; P, prevalence data; T, treatment data. Values in parentheses denote participants identical to Jayaram (1982) and not included in the final tally of participants.

^a Average age of sample.

^b Estimated number of multilingual participants who stutter based on ratio data provided by authors.

3.2. Depth of language profiles

The second research question examined the depth of language profiles across studies. Specifically, we were interested in (a) the number of different descriptors used for each factor within and across studies, and (b) the consistency of these descriptors across studies. Tables 4–6 depict the range and consistency of descriptors across studies that included the three most frequently occurring factors: proficiency, history, and function. To illustrate the nature of description within each factor, history and function are further grouped by quantitative and qualitative descriptors, and proficiency by subjective and objective descriptors.

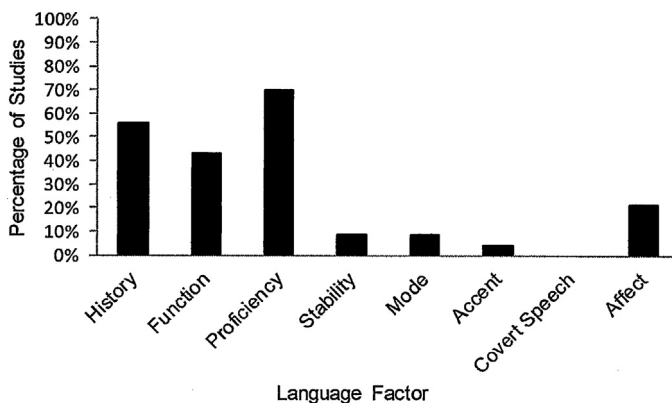


Fig. 1. Language factors provided for multilingual participants who stutter across studies.

Table 4
Descriptors of language proficiency for multilingual participants who stutter.

Descriptors	Frequency	a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p
Subjective																	
Self- or parent-ranked proficiency in L1/L2																	
1. Speaking	7		✓		✓			✓									
2. Comprehension	3		✓					✓									
3. Reading	3		✓					✓									
4. Writing	3		✓					✓									
5. Judgment of speaker or examiner	10		✓	✓		✓	✓			✓	✓			✓	✓	✓	
Objective																	
Objective measurement L1/L2																	
6. Vocabulary	2	✓						✓									
7. Grammar/syntax	3	✓					✓		✓								
8. Semantics	1	✓															
9. Phonology	1	✓															
10. Language repetition	1	✓															
11. Composite score, undefined, L1 only	4								✓	✓		✓	✓				
12. Scores across tests in L1 only	1																✓
13. Performance in bilingual classroom	1						✓										

Note: Lettered columns represent 16 studies that included language proficiency data.

During systematic review of stuttering literature, a variety of descriptors were provided by several researchers to convey information about a specific factor (e.g., “performance in bilingual classroom” as a measure of level of bilingual proficiency) that were not included in Grosjean’s (2004) criteria or selected questionnaires. To fully illustrate the variation in language profile description provided in the stuttering literature, all descriptors provided in the selected studies were included in the analysis and reported in Tables 4–6.

Table 5
Descriptors of language history of multilingual participants who stutter.

Descriptors	Frequency	a	b	c	d	e	f	g	h	i	j	k	l	m
Quantitative														
Age or years since first exposure														
1. L2	6		✓	✓	✓	✓		✓	✓					
2. L1	1										✓			
3. Order of acquisition	7	✓			✓	✓	✓	✓						
Frequency of exposure														
4. % L1 and L2 at home	1		✓											
5. % L1 and L2 at school	1		✓											
6. Hours/day in L2	1	✓												
7. Estimated exposure to L2	1					✓								
8. Hours/day in L3	1				✓									
Years of formal education														
9. L2	1									✓				
10. L1	1									✓				
11. Age of exposure to L2 reading/writing	1		✓											
12. Age of exposure to L2 media	2						✓					✓		
Qualitative														
Home language spoken to child														
13. Overall	12	✓	✓		✓				✓	✓	✓	✓	✓	✓
14. Both parents	2	✓	✓											
15. Father	2										✓		✓	
16. Mother	2										✓		✓	
17. Sibling	1											✓		
18. Grandparent	2	✓						✓						
Language of education														
19. Formal education in L2	3	✓							✓		✓			
20. Formal education in L1	2								✓		✓			
21. Language of school	3		✓				✓							✓
Mono- or bilingual family member														
22. Father	2				✓						✓			
23. Mother	2				✓						✓			
24. Grandmother	1				✓									
25. Sibling	1				✓									
26. Age of exposure	1													✓
27. Type of L2 media	1						✓							
28. Social acquisition of L2	1		✓											
29. Country of travel	1				✓									

Note: Lettered columns represent 13 studies that included language history data.

Table 6

Descriptors of language function for multilingual participants who stutter.

Descriptors	Frequency	a	b	c	d	e	f	g	h	i	j
Quantitative											
Frequency of use											
1. L1 and L2 used daily	1							✓			
2. % L1 and L2 at school/work	1		✓								
3. % L1 and L2 at social events	1		✓								
4. L1 used daily	1				✓						
5. L3 used monthly	1				✓						
6. Amount L2 spoken by parents	2				✓						
7. Amount L2 spoken by child	1				✓						
Qualitative											
Languages spoken in different environments											
8. At home with family	3			✓				✓	✓		
9. At work/school	7		✓	✓			✓	✓	✓		✓
10. At social activities	4		✓	✓				✓	✓		
11. General estimation by the speaker	9	✓	✓	✓		✓	✓	✓	✓	✓	✓
12. Languages spoken with peers	2			✓			✓				
13. Languages preferred for reading and writing	2			✓				✓			

Note: Lettered columns represent 10 studies that included language function data.

3.2.1. Number of different descriptors

Overall, the three most frequent factors (i.e., proficiency, history, and function) were also described with the greatest number of different descriptors. For proficiency, 13 different descriptors were reported across the 16 studies that included proficiency data, including judgment of speaker or examiner, self- or parent-scaled proficiency, and objective measurement (Table 4). For history, 29 different descriptors were reported across the 13 studies that included history data, including language spoken at home during childhood, age or years since first exposure, order of acquisition, and language of education (Table 5). For function, 13 different descriptors were reported across the 10 studies that included function data, including language(s) spoken in different environments and general estimation of use by speaker (Table 6). Less frequently occurring factors were reported with a more restricted range of unique descriptors. Affective variables were described with 11 different descriptors in the five studies that included affect data, including anxiety toward speaking, language of preference, and negative experiences in a specific language due to stuttering. For stability, only two descriptors were used in the two studies that included stability data. For mode, two descriptors were used in the two studies that included mode data. Only one descriptor was used in one study to describe accent. Covert speech was not reported in any studies.

3.2.2. Consistency of descriptors

Overall, the three most frequently reported factors across studies were not described in a consistent manner. Of the 13 different descriptors used to convey information regarding language proficiency, three descriptors were reported most frequently: self- or parent-rated proficiency, overall judgment by speaker or examiner, and objective measurements of proficiency. Results suggest descriptions of proficiency were often subjective (i.e., self-rated or general estimation) rather than objective in nature. As depicted in Table 4, specific descriptors rarely overlapped between studies. For example, self- or parent-rated proficiency information was reported in only three studies. Objective measurement data of both L1 and L2 were reported in four studies, with syntactic performance reported in three studies and vocabulary in two studies. Only one study included lexical, syntactic, semantic, and phonological data. Overall judgment of speaker or examiner represents the most consistently provided information across studies that reported proficiency data (i.e., 9/16 studies). Judgment of speaker served as the sole descriptor of proficiency in six of these nine studies and was frequently reported in nonspecific terms (e.g., “all were found to be quite proficient in L1 and L2”).

Of the 29 descriptors used to determine language history, two qualitative descriptors were used most frequently within and across studies: language(s) spoken to child at home and language of education. The second most frequently used descriptors were quantitative in nature: age or years since first exposure, and order of acquisition. All other descriptors were mentioned fewer than three times across studies. Descriptors used to convey information about language history was more often qualitative than quantitative. As depicted in Table 5, descriptors infrequently overlapped between studies. Overall language(s) spoken at home was reported in nine of 13 studies. Amount both L1 and L2 were spoken at home was provided in only one study. Although a history of formal education information was provided in three studies, the amount of formal education was provided in only one study. Age of acquisition was not reported in over half of the studies that provided language history data (i.e., 7/12 studies).

Of the 13 descriptors used to determine language function, two qualitative descriptors were used most frequently within and across studies: language(s) used in different environments and general estimation of use by speakers. All remaining quantitative and qualitative descriptors were mentioned fewer than three times in the literature. Descriptors used to convey information about language function were disproportionately qualitative, with only three studies reporting the amount of language use. As depicted in Table 6, information about languages used in work/school, home, and social activities were

included across most studies (i.e., 6/10 studies), but only three provided information about all three communicative environments. A single study reported the amount of L1 and L2 use across environments (i.e., school/work and social activities). Estimated use by speaker was reported across a majority of studies (i.e., 7/10 studies), but similar to proficiency, was often stated in nonspecific terms (e.g., “presently he uses both languages”).

Descriptors used to characterize affect variables were inconsistent across studies. Of the 11 descriptors used to convey information regarding affective elements of language, level of anxiety toward speaking was most frequent, reported nine times within the reviewed literature. Descriptors of positive or negative experiences when speaking were reported six times. Descriptors related to language preference were mentioned three times and characterized exclusively by negative comments toward L2. Results suggest descriptions of anxiety toward speaking were most commonly provided in the literature. However, most information regarding affect was derived from two studies. Of these two studies, only two descriptors overlapped (i.e., external pressure to maintain L1 and negative experiences pertaining to L1).

Due to the limited number of descriptors used to describe the least frequently occurring factors (i.e., stability, accent, mode, and covert speech), assessment of consistency across studies was limited. Of the two descriptors used to address stability, both studies described loss of L1 proficiency due to disuse. Degree of accent observed by examiner was provided once across studies and no variance in consistency was possible. The nature of descriptors used to address language mode did not overlap across studies. That is, one study provided seven accounts that participants adjusted speech behavior due to awareness of bilingual listener. The other study reported participants were made explicitly aware of the bilingual status of the examiner and instructed to code-switch if needed during speech sample. Again, language of covert speech was not mentioned in any study.

4. Discussion

To review, our understanding of the manifestation of stuttering in multilingual speakers is often limited to case studies. These data are valuable, but compromised by the inconsistency and inadequacy in which participants are described. An eight-factor framework to describe multilingual participants was derived from Grosjean's (2004) criteria and information available in established language profile questionnaires. This framework was applied to a systematic review of research that included multilingual participants who stutter. Overall, descriptions of multilinguals who stutter include less information compared to Grosjean's suggested criteria and information available in multilingual measurement tools. Proficiency, history, and function were most commonly reported. Other factors (i.e., stability, mode, accent, affect, and covert speech) were infrequently reported. The descriptors used to define each factor varied significantly.

4.1. Breadth of information

Our first research question investigated breadth of participant description. Specifically, how frequently were each of the eight factors included within and across in the available multilingual stuttering literature. Results indicated that proficiency, history, and function were reported most frequently across studies (16/23, 13/23, and 10/23, respectively). The emphasis of proficiency, history, and function is likely driven by dominance-based theories of stuttering. As mentioned in the introduction, language history and function can serve as valid indicators of proficiency, a term related to (but not synonymous with) dominance. As further noted, certain aspects of each factor interact with specific language skills across the lifespan (Bedore et al., 2012; Bohman et al., 2010; Flege et al., 1999). Given the relevance of each factor on language abilities in multilinguals and the prominence of dominance-based theories of stuttering, proficiency, history, and function data should be considered *primary* factors to be included in participant descriptions in future studies. The remaining factors (i.e., stability, mode, accent, affect, and covert speech) should be considered *secondary* or supplemental information to enhance interpretation of data once primary factors have been established.

The subtle effects of secondary factors may also be more apparent as research moves beyond preliminary data toward more advanced descriptive and experimental paradigms. Review of the nonstuttering literature indicates that stability, mode, and affect can influence language processing of multilingual participants in a complex manner during lexical retrieval. For example, a bilingual in monolingual mode during picture naming tasks may exhibit slower reaction times due to L1 suppression, particularly if the language being suppressed is the stronger language (Costa & Santesteban, 2004; Rayner & Ellis, 2007). Differences in processing speed or accuracy due to factors unique to multilingual speakers should be considered during future experimental tasks, as each may have implications for the maintenance of fluent speech in multilingual participants.

Other secondary factors may be more appropriate given the theoretical motivation or design of the study. For example, review of nonstuttering multilingual literature indicated that degree of accent is associated with phonetic properties of speech and phonological errors. As such, degree of accent has direct impact on targeted investigations into phonological and phonetic properties of stuttered speech in multilingual speakers. In addition, consideration of the language of covert speech may be warranted as the current trend of nonverbal language tasks in monolingual stuttering population extends into the multilingual stuttering population. Future research should acknowledge the theoretical importance of these factors during experimental design and interpretation of results, and explicitly report each when appropriate to the nature of the study.

Although primary factors of proficiency, history, and function were included most frequently across studies, outcomes from these studies do not currently converge (e.g., Bernstein Ratner & Benitez, 1985; cf. Carias & Ingram, 2006). As revealed

in our second analysis regarding depth of description, information used to determine each language factor was inconsistent and substantial heterogeneity between participant descriptions was observed. The degree of variation between participant descriptions may account, in part, for the variation in participant outcomes across studies.

4.2. Depth of information

Our second research question examined depth of participant description. Specifically, how was each factor described and how consistently did these descriptions occur across studies. Results indicated the depth of description for each of these factors was inconsistent, particularly for proficiency, history, and function. Proficiency was determined using numerous descriptors and frequently described per speaker or examiner's general estimation of proficiency or dominance. The remaining primary factors, history and function, were described with a broad range of descriptors, with history more often described in qualitative terms and function described almost exclusively in quantitative terms. Data from this review indicate that stuttering research has not yet provided consistent description of participants across studies to determine the influence of language-based factors in multilingual individuals who stutter.

Review of nonstuttering multilingual literature suggests both quantitative and qualitative aspects of language history and function can impact specific language skills, and global measurements of proficiency do not necessarily reflect uniform abilities in all areas of language. At present, quantitative and qualitative descriptors were reported inconsistently in stuttering literature, and proficiency was commonly described using subjective assessment or an isolated linguistic skill. Only one case study included data for multiple language skills in both L1 and L2 (Ardila et al., 2011). As such, the interaction between specific language skills and stuttering in multilinguals cannot be determined given the inconsistent data available. Consistent description in future studies should be encouraged to examine the relationship between specific language abilities, language experience, and stuttering in multilingual participants.

Secondary factors of language stability, mode, accent, and covert speech were mentioned infrequently and provided limited depth of description (i.e., two or fewer descriptors per factor). One secondary factor, affective variables, received relatively greater attention (included in five of 23 studies), and relatively wider range of descriptors (11 descriptors), although descriptors were inconsistent between studies. Nonetheless, greater emphasis on affective aspects of language in reviewed studies may reflect the prominence of affective variables within broader stuttering literature. Across two studies that included detailed description of affective variables (Dale, 1977; Nwokah, 1988), older children and adult bilinguals reported anxiety when speaking due to negative cultural perceptions of stuttering. These same participants also reported less anxiety and reduced stuttering when speaking in languages in which previous negative experiences did not occur. Findings are in accordance with Marian and Kaushanskaya (2004), who found negative autobiographical narratives correlated with decreased positive valence, as judged by independent observers, when bilingual speakers described the events in the language these experiences occurred. Marian and Kaushanskaya (2008) found older bilinguals preferred to describe negative immigration experiences in their second language, rather than their native language, suggesting language preference often plays a more predictable role than proficiency when speaking of emotional memories. That is, participants chose to speak in one language or the other given the emotional content of the message. Given the dynamic interplay of language and emotion, negative experiences with stuttering may further exacerbate emotional status of bilingual adults with a lifelong history of stuttered speech or in cases of severe stuttering. It is possible that, regardless of proficiency, a bilingual adult who stutters may choose to speak in the language with less negative associations. Future studies should carefully consider the emotionality of the speaker, content of message, and preference toward speaking either language during interpretation of data, particularly when collecting speech samples from multilingual participants who stutter.

4.3. Consistent factor description

Re-examination of dominance-based studies to date may illustrate the usefulness of consistent description of language factors across studies. For example, six dominance-based studies provided inconsistent subjective and objective descriptors to determine proficiency (e.g., “were quite proficient in Spanish and English,” “theoretically equally competent in both languages,” written achievement tests, and MLU) and inconsistent quantitative or qualitative information about language history (e.g., languages spoken by parents, age of exposure) and use (e.g., “uses both languages interchangeably,” or “spoke both at home, work, and school since birth”). Of the 27 participants included in these studies, two participants supported the “weak language” hypothesis (i.e., greater stuttering in weaker language, equally distributed in balanced bilinguals), four supported the “strong language” hypothesis (i.e., greater stuttering in stronger language, equally distributed in balanced bilinguals), and 21 provided no support for either (i.e., balanced bilinguals showing greater stuttering in one language).

Two studies provided ample participant description to allow meaningful interpretations to be drawn across studies. Lim, Lincoln, et al. (2008) grouped 30 bilingual adults who stutter by language dominance. Language dominance was determined using the following criteria provided in the article: (a) higher proficiency in speaking, comprehension, reading and writing, (b) spoken and heard daily, (c) used for either reading or writing weekly, and (d) used in at least two of three communicative environments – work/school, home, or social activities (see Lim, Liow, Lincoln, Chan, & Onslow, 2008). Authors also provided supplemental information about language history, including age of exposure, years of exposure and years of formal instruction (however, specific data about current environmental use were not reported). Findings from this study supported the ‘weak language’ hypothesis.

Comprehensive description and detailed grouping criteria by Lim, Lincoln, et al. (2008) enable comparisons of participants across studies providing similar levels of detail. For example, Roberts (2002) also provided substantial description of four adult bilinguals who stutter. Although participants were considered dominant based solely by self-rated proficiency, supplemental information allowed data to be re-aligned with Lim et al.'s grouping criteria. With the exception of writing proficiency and age of L2 exposure, balanced and dominant cohorts were similar in language profile to between studies. Findings between studies were also similar; that is, in both studies, bilingual speakers stuttered more in less dominant languages, while balanced bilinguals exhibited equal distribution of stuttering in both languages. Additional considerations are still required to adequately compare findings across studies, such as the influence of affective factors in adult participants, nature of speech samples, and similarity of languages. Nevertheless, the use of detailed description of language profiles in future studies will move the field closer to valid cross-study comparisons for a wider range of research questions.

4.4. Insufficient data

Of greater concern than limited or inconsistent data were studies that largely omitted any language profile data. Eight of 23 studies provided information on one or fewer factors. Three of these eight studies were prevalence studies (Mohamadi et al., 2008; Stern, 1948; Travis et al., 1937). One might argue it challenging to collect language profile data given the focus and size of these studies. However, detailed language profile data can and has been successfully collected in large-scale studies of nonstuttering multilingual participants (e.g., Bedore et al., 2012: $n = 1029$; Bohman et al., 2010: $n = 757$). Thus, it is feasible for researchers in stuttering to adopt protocol commensurate with that of broader multilingual research. If achieved, data from large-scale studies would provide a considerable boost for (pooled) sample size across studies. The number of questionnaires that cover a broad range of data with similar depth (see Table 1), as well as numerous multilingual studies that have reported similar breadth and depth of information without established questionnaires (Flege et al., 2002; Jia et al., 2002), provide evidence that obtaining and reporting this information is practical and should be encouraged during the publication process.

4.5. Limitations

Two limitations should be noted. First, authors did not consider grammatical or linguistic similarity between languages spoken by participants, although this was a prominent theme among much of the stuttering and nonstuttering literature. Subsequent review found that all selected articles identified languages spoken by participants. While important, the relationship between languages is deemed somewhat consistent across participants who speak the same combination of languages, while experiential factors included within the model (i.e., history, function, proficiency) can vary uniquely by participant. Nonetheless, future research should continue to consider the similarity between each language in multilingual speakers, considering its possible, if not pivotal, influence on stuttering in the context of bilingualism. Second, demographic information (e.g., age, gender, race/ethnicity, SES) was not incorporated within the participant description framework. This is certainly not to suggest that these factors are not important. Age and gender can have obvious implications on both language development and stuttering. However, age, gender, and race/ethnicity were unanimously reported across 23 studies reviewed. Only in the case of SES were the studies insufficient. Five of 23 studies reported participants' level of education (Ardila et al., 2011; Lim, Lincoln, et al., 2008; Nwokah, 1988; Roberts, 2002; Woods & Wright, 1998). Given the relevance of SES to quality of vocabulary input in bilinguals (Goldberg, Paradis, & Crago, 2008) and overall L2 proficiency (Hakuta, Bialystok, & Wiley, 2003), this information may provide insight into language differences between participant groups. However, unlike the other factors put forth in the current framework, no reliable links between stuttering and SES have been noted (Keating, Turrell, & Ozanne, 2001; McKinnon, McLeod, & Reilly, 2007). Nonetheless, this area of research should not be over-looked and considered in future research with regards to stuttering.

5. Conclusion

The results from this study indicate that description of multilingual stuttering participants is limited relative to the recommended Grosjean (2004) framework and the amount of information available in common language profile questionnaires. Future research should include information suggested within the eight-factor framework provided in this review. Specifically, data regarding language proficiency, history, and function in each language should be regarded as primary factors to be reported in a consistent fashion across studies given the theoretical interaction of language abilities in multilingual participants who stutter. Variables such as mode, stability, accent, affect and covert speech should be used as secondary sources of information and emphasized in future research as needed. Upon consideration of these factors, researchers may be better prepared to draw conclusions based on specific data and more readily account for variability between outcomes.

While all factors within this framework *could* be included within all studies of this population, it is important to consider whether all these factors *should* be included. The purpose of this review was not to imply that all eight factors are necessary in all multilingual stuttering research. As such, it should not be concerning to see that certain factors were less commonly included given the nature of the study. However, what is of relevant concern is the variation in which we describe these factors if included. We hope that this article will serve as a catalyst to the development and use of a multilingual participant description protocol that will facilitate meta-analytical efforts in a population.

CONTINUING EDUCATION

Description of multilingual participants who stutter

QUESTIONS

- (1) To date, published research of multilingual participants who stutter consist mostly of:
 - a. Large-scale prevalence studies.
 - b. Small-scale case studies.
 - c. Group studies comparing multilingual and monolingual children.
 - d. Group studies comparing multilingual and monolingual adults.
 - e. Experimental studies in adults.
- (2) Across studies, language profile descriptions of multilingual participants who stutter are:
 - a. Limited and inconsistent.
 - b. Limited but consistent.
 - c. Ample but inconsistent.
 - d. Ample and consistent.
 - e. Similar in detail to nonstuttering multilingual literature.
- (3) Which of the following were considered primary factors of a multilingual language profile:
 - a. Language function, language stability, and language mode.
 - b. Language proficiency, degree of accent, and language function.
 - c. Language stability, language proficiency, and affective variables of language.
 - d. Language proficiency, language history, and language function.
 - e. Language history, language function, and language mode.
- (4) According to Grosjean (2004), language function refers to:
 - a. Current degree of skill when speaking, understanding, reading, and writing each language.
 - b. Whether one or more languages are currently being acquired or lost.
 - c. Degree of language acquisition via formal instruction.
 - d. How and when language skills were first acquired.
 - e. Current environmental demands for language use.
- (5) Secondary language factors should be reported based on:
 - a. Theoretical motivation and experimental design of the study.
 - b. Age of the participants.
 - c. Degree of native language attrition.
 - d. Proficiency of second-language abilities.
 - e. Frequency of stuttering observed in each language.

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