



Stuttering and bilingualism

A review

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Abstract

Although stuttering in bilinguals is an area of interest to both clinicians and researchers, data on bilingualism and stuttering are scanty. This paper reviews the available literature on stuttering and bilingualism. Major findings are that stuttering is probably more prevalent in bilinguals than in monolinguals, that stuttering can affect one or both languages, that the two languages may be equally or differently affected, and that diagnosis and treatment in bilingual stutterers seem to require a particular approach. *Educational objectives:* The reader will learn about the prevalence of stuttering in bilinguals. The reader will learn about and be able to describe the different patterns of the manifestation of stuttering in bilinguals. The reader will learn about and know some issues to consider in diagnosing and treating dysfluent bilingual clients. © 2001 Elsevier Science Inc. All rights reserved.

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1. Introduction

Stuttering in bilinguals is an area that has not received much attention. This is rather remarkable in light of estimates that over 50% of the world's population is bilingual (De Houwer, 1998) and that about 1% of the world's population stutters (Bloodstein, 1995). Therefore, it is clear that many speech–language pathologists

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have a fair chance of being confronted one day with bilingual individuals who stutter. In providing services to bilingual individuals who stutter, clinicians may be faced with unique problems and questions that go beyond their ordinary competency with fluency disorders. For example, can one make a reliable and valid judgement about the presence of stuttering in a language that is not one's own language? Should one advise the parents of a bilingual child who stutters to stop exposing the child to two languages until it has acquired good control over one language? Is outcome of therapy in bilingual speakers worse than in monolingual speakers?

Apart from its immediate clinical significance, the study of stuttering in bilinguals is also interesting from a scientific and theoretical point of view. Many so-called "facts" about stuttering and its development derive from studies of monolingual speakers, virtually all of whom are English speakers, and have as yet not been tested either crosslinguistically or within bilingual populations. Bernstein Ratner and Benitez (1985) suggested that bilingual stutters may be ideal clinical cases for testing the validity of models postulating that linguistic factors play a role in the precipitation of stuttering moments. Bilingual cases allow the study of whether presumed linguistically governed regularities in stuttering loci and incidence remain constant regardless of language spoken. For example, inconsistency of phonological loci across languages spoken by the same speaker would seem to weaken purely motoric accounts of stuttering; consistency in syntactic loci would appear to strengthen models that implicate a compromised sentence planning component (Cabrera & Bernstein Rartner, 2000).

In spite of the potential significance for both clinicians and researchers, data on stuttering and bilingualism are scanty, and systematic research of the relation between both phenomena is rare. This article presents an overview of what is currently known about stuttering and bilingualism. The prevalence and manifestation of stuttering in bilinguals are discussed, as well as some diagnostic and therapeutic issues. It is hoped that this information can help clinicians in their assessment and treatment of bilingual clients and will provide researchers with guidance for future research directions. One cautionary remark, however, is that the literature on bilingualism and stuttering is quite diverse with regards to issues such as number and age of subjects reported, language pairs involved, age of language acquisition, proficiency and usage of both languages, and the methodology used in assessing stuttering, as well as bilingualism. Moreover, not all sources give sufficient information to adequately judge their findings. Consequently, the conclusions and generalizations formulated from this review must be considered as tentative.

Unless otherwise stated, the term "stuttering" refers to the developmental condition defined by the World Health Organization as "disorders in the rhythm of speech in which the individual knows precisely what he wishes to say but at the time is unable to say because of an involuntary repetition, prolongation, or cessation of a sound" (World Health Organization, 1977, p. 202). As such, stuttering is differentiated from normal dysfluencies and from dysfluencies like

hesitations and repetitions, whose origin is limited proficiency in a language. The term “bilingualism” is used in its broadest sense, referring to a condition that ranges from “the total, simultaneous and alternating mastery of two languages” to “some degree of knowledge of a second language in addition to spontaneous skills which any individual possesses in his (her) first language” (Siguan & Mackay, 1987, p. 13). By extension, “bilingualism” is used to refer to multilingualism as well.

2. The prevalence of stuttering in bilinguals

Seeman (1974) pointed out that in early bilingualism, there is a higher risk for stuttering to arise and referred to colleagues sharing this opinion, among whom were Froeschels, Pichon, Borel-Maisonny, and Metreau. The belief that stuttering is more prevalent in bilinguals than in monolinguals seems to be widespread indeed (see, for instance, Eisenson, 1984; Karniol, 1992; Mattes & Omark, 1991; Shames, 1989). One implication of this belief is the advice often heard not to expose children to a second language until they have acquired good control of their first language. However, few studies have actually calculated the prevalence of stuttering in bilinguals, and these studies date to the first half of the previous century. For example, Travis, Johnson and Shover (1937) surveyed public schools in East Chicago, IN. A total of 4827 children (2405 boys and 2422 girls), ages 4–17 years (average 8;54 years), were interviewed at their respective schools. Determination of whether or not stuttering was present was based on reading and conversation. For non-English-speaking children, the help of an interpreter was called upon. Overall, stuttering prevalence was 2.61%, but prevalence was significantly lower in monolingual English-speaking children than in those speaking one or two foreign languages in addition to English (1.80% vs. 2.80% and 2.38%, respectively). A similar finding was reported by Stern (1948) (cited in Bloodstein, 1995) who studied 1861 children in four schools in Johannesburg, South Africa. In monolingual children, prevalence of stuttering was 1.66%, however, in children who were bilingual prior to age six years, stuttering prevalence was 2.16%. Moreover, three times as many bilinguals as monolinguals were judged to evidence severe stuttering.

One drawback of studies like that of Travis et al. (1937), and perhaps also that of Stern (1948), is that clinical judgements of the presence of stuttering were based on a single assessment. In view of the well-known variability in symptoms of stuttering across time and situation (Ingham & Costello, 1984), it can be argued that single assessment is not a valid procedure. An alternative is to use self-reports of stuttering in gathering prevalence data. One such study, an Internet survey on bilingualism and stuttering (webpage: <http://www.speech.psychol.ucl.ac.uk/survey1/bilingual.html>) was started only recently at University College London (Au-Yeung, Howell, Davis, Charles, & Sackin, 2000). The survey asks for personal information (gender, date of birth, ethnic background, occupational

background, educational level, . . .), language usage (when languages were learned, proficiency level in the different languages used, proportion of language usage), the environment under which the languages are used (including parental usage), and the occurrence of speech disorders, in particular stuttering. Thus far (last update May 2000), 794 responses have been received from 40 countries around the world. The respondents, 656 (i.e., 82.62%) bilinguals and 138 (i.e., 17.38%) monolinguals, reported 52 different mother tongues and 70 different second languages. Preliminary results do not corroborate the findings of Stern and Travis et al. The percentage of speakers reporting stuttering, either currently or in the past, was almost identical among monolingual and bilingual speakers (21.74% and 21.65%, respectively). As the authors themselves have pointed out, there are pros and cons for conducting surveys on the Internet, and some biases are unavoidable. One apparent bias in this study is that responses received, thus far, were mostly from females. To what extent this preponderance of female respondents influenced results is not clear. Considering the well-established male to female sex ratio of about 3 to 1 in stuttering (Bloodstein, 1995), it is a fact to be kept in mind at any rate. Even more worrisome is the high ratio of respondents in both groups (i.e., bilinguals and monolinguals) who reported a history of stuttering. A lifetime incidence of 21% is much higher than that found in previous studies, which mostly cluster closely around 5% (Bloodstein, 1995). Of course, people are likely to seek out websites of their main interests or concerns which may explain the elevated ratio of respondents who stuttered. Another possibility, however, is that the high ratio may reflect a definitional problem. Nowhere in this survey were respondents instructed which behaviors should be considered as stuttering and which should not. They were asked only if they “ever experienced stuttering (stammering).” It is conceivable, therefore, that a number of respondents may have confused stuttering with other forms of dysfluency (normal childhood nonfluency, language formulation problems, cluttering). Regardless, the large difference between the incidence found in this study and that of previous studies compels that caution be used in interpreting this survey’s findings and suggests that self-reports may not be more valid than single assessments.

Except for the results reported by Au-Yeung et al. (2000), the available data suggest that stuttering is more prevalent among bilinguals than among monolingual speakers. One may wonder, then, how a higher prevalence of stuttering among bilinguals may be explained. The data of Travis et al. (1937) suggest that there might be a direct link between bilingualism and stuttering, at least in some subjects. For 26% of the bilingual stutterers in their study, the age of onset of stuttering coincided with the introduction of a second language. Indeed, some authors seem to assume that bilingualism is directly at the origin of the fluency disorder. Pichon and Borel-Maisonny (1964), for instance, mention that stuttering could be ascribed to bilingualism in 25 (i.e., 14%) of the stutterers they studied. In addition, Karniol (1992), who reported stuttering in a Hebrew–English-speaking child in an article entitled “Stuttering out of bilingualism,”

seems to assume a direct link between the occurrence of stuttering and bilingualism. She suggested that stuttering in this case was a function of syntactic overload and referred to the neuroscience model of stuttering proposed by Nudelman, Herbrich, Hoyt, and Rosenfield (1989) to account for it. Briefly, this model proposes that dysfluencies reflect moments of instability in a multi-loop system. Speech motor control involves two major control loops, an outer loop for ideation and linguistic programming and an inner phonatory loop for motor programming of the vocal apparatus. Bilingualism, then, leads to instability as a result of the additional processing time required for either the outer loop, inner loop, or both. Another theory that Karniol considered but dismissed because of doubts about its scientific usefulness is Starkweather's (1987) Demands and Capacities model. According to this model, stuttering occurs when a child lacks the capacities to meet fluency demands. One could assume that, in the case of stuttering in bilingual children, using two languages places demands on them that exceed their capacities.

Some caution is needed, however. Travis et al. (1937) noted with respect to their own findings that one cannot attribute differences in prevalence of stuttering between monolinguals and bilinguals solely to bilingualism. Other factors they considered, which may have played a role, were the economic insecurity and emotional instability found in many foreign homes and the confusion resulting from being placed in a strange and new environment during the process of second language acquisition. Travis et al. stressed that the observed difference between bilingual and English-speaking subjects may have limited significance, because it was a very small difference and the fact that 97.20% of the bilinguals did not stutter should not be overlooked. The possibility that being placed in a novel situation may be a contributing factor in some cases of bilingual stutterers was also noted by Mussafia (1967) in discussing the occurrence of speech and language disorders among children of foreign mine workers in the Borinage, Belgium. According to Mussafia, stuttering and other speech and language disorders arise when children must change abruptly from one language to another upon their arrival in a new country. Less talented children in particular would have more difficulty in adapting, and Mussafia felt that they had a higher risk of becoming anxious and demonstrating speech and language disorders.

It should also be noted that these three studies (Karniol, 1992; Mussafia, 1967; Travis et al., 1937) may involve two different types of bilingualism. Karniol (1992) described a case of simultaneous bilingualism, whereas Mussafia (1967) and Travis et al. (1937) discussed consecutive bilingualism. In simultaneous bilingualism, a child learns two languages from birth onwards. In consecutive bilingualism, a second language is introduced after a child has already mastered to some degree a first language. It may be that the factors contributing to the more frequent occurrence of stuttering in bilinguals differ for these subtypes of bilingualism.

Lebrun and Paradis (1984) pointed out yet another factor that could contribute to the development of stuttering in bilinguals. They stressed the importance of the

linguistic input to bilingually raised children. In particular, they suggested that the input of linguistically mixed utterances might trigger the development of stuttering in bilingual children with a predisposition to stuttering. Based on the finding that monolingual stutterers not infrequently mix two synonymous words or phrases, it was hypothesized that speech production is impeded in stuttering children, because they find it difficult to select only one of two equivalent linguistic items crossing their mind. This difficulty would be increased when two languages are used quasimultaneously.

Interestingly, Agius (1995), compared the language skills of a bilingual Maltese–English stuttering child aged 6;9 years and an age-matched Maltese–English nonstuttering child of similar sex and comparable socioeconomic background, academic performance record and place in family and found a higher percentage of mixed utterances in the stuttering child. Moreover, an analysis of the loci of dysfluencies in the stuttering child showed that stuttered dysfluencies in this child's speech far more often preceded mixed utterances than did normal dysfluencies, 48.7% vs. 17%, respectively. According to the author this might have reflected the child's difficulty in differentiating between Maltese and English lexicals. Although the study of Agius was limited to the comparison of one stuttering and one nonstuttering bilingual child, its findings are still interesting. In addition, Cabrera and Bernstein Ratner (2000), who studied a 5-year-old Spanish–English bilingual boy, reported an association between code-switching events and the occurrence of fluency failures. They mentioned that some of his code-switching events attracted stutters. It is not clear, however, whether this child really demonstrated a stuttering disorder. The authors felt that the majority of this child's dysfluencies could be due to language formulation rather than stuttering. On the other hand, in a case study reported by Shenker, Conte, Gingras, Courcey, and Polomeno (1998), examination of the mixed utterances of a French–English-speaking preschool child, did not suggest an increase in stutter-like dysfluencies. Nonetheless, it was noted that code mixed utterances were later substituted for word finding difficulties, in which interjections would have been used at an earlier stage.

Clearly, the relationship between dysfluencies and mixed utterances in bilingual stutterers deserves particular attention and needs further investigation. If bilingual children who stutter are found to have a higher number of code-mixed utterances than nonstuttering peers and a tendency for dysfluencies to occur primarily in association with code mixed utterances, the causal link between bilingualism and the occurrence of stuttering, as was suggested by Karniol (1992) and Pichon and Borel-Maisonny (1964), would seem more likely. On a practical level, this could justify the clinical practice of temporarily deferring or eliminating bilingual education of children at risk for stuttering. On a theoretical level, a functional association between the loci of stuttering moments and code mixing would support the role of language encoding difficulty in stuttering onsets (Cabrera & Bernstein Ratner, 2000). It has been reported (Redlinger & Park, 1980) that code mixing in young bilinguals is a

function of linguistic proficiency. Higher frequencies of mixing are seen during the earliest stages of bilingual development, which decrease with advancing linguistic abilities. However, there is also the possibility of an alternative interpretation of the eventual association between code mixing and the occurrence of stuttering in bilingual children. As suggested by Karniol, code mixing in bilingual stuttering children could be a strategy to cope with dysfluencies. She interpreted her data as indicating that switching from one language to another in midsentence was a way of coping with blocking. It is not clear if the dysfluencies in mixed utterances of bilingual children who stutter always precede instances of code mixing rather than follow them. If so, this would support the interpretation of mixed utterances being used as coping strategies. Assuming that code mixing is a strategy that bilingual children adopt to escape or avoid dysfluencies, temporarily withholding such children's exposure to a second language as a therapeutic measure might not be indicated.

Another point that awaits further investigation is whether or not prevalence of stuttering in bilinguals is affected by the similarities of the languages involved. For example, is stuttering prevalence higher in individuals speaking two linguistically related languages than in those who speak two totally different languages? It is conceivable that closely related pairs of languages (e.g., a standard language and its regional variety) may produce more confusion and, therefore, more dysfluencies than more different pairs. However, it could also be that nonrelated pairs demand more resources in learning two different lexical and syntactic systems and cause more dysfluencies for that reason. The finding that a linguistic variable, such as the similarity of the languages involved, is a factor in the prevalence of stuttering in bilinguals, whatever the direction the effect, would support the linkage of bilingualism to the occurrence of stuttering. Unfortunately, the available data do not provide an answer to that question.

Still another factor warranting further investigation is the relation between the prevalence of stuttering and the age at which the second language is acquired. Of the bilinguals surveyed by Au-Yeung et al. (2000), "middle" bilinguals (i.e., those who started second language acquisition between ages 7 and 12) stuttered less often than did "early" bilinguals (i.e., second language acquisition between 0 and 6 years) or "late" bilinguals (i.e., second language acquisition after age 12). Within the group of early bilinguals, those who started second language acquisition around age 3 stuttered more often than other age groups. Differences were only significant, however, for females, not males. Notwithstanding the possibility that some survey respondents may have confused stuttering with normal nonfluencies, these data raise an important issue. It seems that younger children are especially vulnerable to developing stuttering if they are exposed to two languages. Likewise in the study by Stern (1948) (cited in Bloodstein, 1995), the bilingual subjects who had a higher prevalence rate of stuttering than did monolingual speakers, had been bilingual prior to the age of 6 years. Most studies of stuttering in bilinguals have described subjects who were exposed to more than one language from birth onward. It is also interesting to note that stuttering onset, as far as we know, has never been reported

in adults learning a second language. The reasons for adult second language learners' apparent "immunity" to developing stuttering are not clear.

There is a good deal of controversy in the literature on second language acquisition concerning whether or not language acquisition in adults differs from that in children (Larsen-Freeman & Long, 1991). Some claim that second language acquisition is the same process irrespective of whether the learner begins as a child or an adult, whereas others believe that children and adults go about acquisition differently. One difference that could influence the likelihood of developing stuttering concerns brain organization. Recent findings from brain imaging studies indicate that age of acquisition is a major factor in the cortical organization of second language processing. Kim, Relkin, Lee, and Hirsch (1997) obtained functional magnetic resonance images (fMRI) of six late bilinguals (i.e., exposure to a second language in early adulthood) and six early bilinguals (i.e., exposure to two languages during infancy) during silent, internally expressive linguistic tasks (i.e., describing events that occurred during a specified period of the previous day). Ten languages were represented. All subjects reported approximately equal fluency and frequency of usage in each language at the time of testing. Kim et al. (1997) found that second languages were spatially separated from native languages within Broca's area in the late bilinguals, whereas native and second languages tended to be represented in common frontal cortical areas in the early bilinguals. The regions activated within Wernicke's area by the native and second languages overlapped in both groups, regardless of the age of second language acquisition. Similarly, Dehaene et al. (1997) found distinct cortical areas associated with native and second languages in late bilinguals for language comprehension. Using fMRI, they assessed cortical representation of language comprehension processes in eight fluent French–English bilinguals. All subjects had French parents, and none had been exposed to English before age seven. Listening to stories in French always activated a similar set of areas in the left temporal lobe, clustered along the left superior temporal sulcus. Listening to stories in English, however, activated a highly variable network of left and right temporal and frontal areas, which were sometimes restricted to right-hemispheric regions.

Why distinct cortical areas are activated by native and second languages in late bilinguals is not clear. Kim et al. (1997) hypothesized that once cortical representations of languages are formed by exposure early in life, they are not modified subsequently, making it necessary to utilize adjacent cortical areas for second languages learned later in life. As far as stuttering in bilinguals is concerned, the finding that the same brain areas are recruited for learning and processing both languages in early bilinguals whereas multiple and variable and different areas are recruited in late bilinguals is particularly interesting at any rate. One could hypothesize that early bilinguals are more vulnerable to stuttering precisely because the same brain structures are utilized for learning both languages, and stuttering reflects a functional overload of these structures. Late bilinguals or adults learning a second language, in contrast, would be far less

prone to stutter because different structures are recruited for the second language. Moreover, this hypothesis seems to fit well with recent brain imaging findings in stutterers suggesting the possibility of a left hemispheric dysfunction in developmental stuttering. In several studies, an absence of the normal pattern of hemispherical dominance for language in stutterers has been reported (Braun & Ludlow, 1995; Braun et al., 1997; Fox et al., 1996; Kroll, De Nil, Kapur, & Houle, 1997; Pool, Devous, Freeman, Watson, & Finitzo, 1991; Wu et al., 1995). It should be noted, however, that age of acquisition may not be the only determinant of the cortical representation of a second language. A series of experiments using positron emission tomography (PET) by Perani et al. (1996, 1998) in Italian–English bilinguals yielded quite different patterns of cortical activity for each language in low language proficiency subjects but not in high proficiency subjects, regardless of the age of acquisition of the second language. The authors concluded that proficiency may be more important than age of acquisition in determining the cortical representation of a second language. Although Dehaene et al. (1997) found distinct cortical areas associated with native and second language comprehension in late bilinguals, there was also considerable intersubject variability in the areas activated while listening to the second language, with some subjects showing similar activation foci for both the native and second language. Dehaene et al. suspected that, in addition to age of onset of second language acquisition, such variability among subjects might be due to the specific conditions under which the second language was learned (e.g., different methods of teaching might favor different strategies for language processing and hence distinct cerebral circuits) or to an intrinsic difference in brain organization. Perhaps future brain imaging studies of bilingual stutterers will help solve the question why younger children are especially vulnerable to the development of stuttering if they are exposed to two languages.

3. The manifestation of stuttering in bilinguals

If a bilingual speaker stutters, how then does the stuttering manifest itself? Nwokah (1988) proposed at least three theoretical possibilities. One possibility is that stuttering occurs in one language but not the other. Another possibility is that stuttering occurs in both languages with speech behavior patterns that are similar in each language, which Nwokah referred to as the same-hypothesis. Or stuttering could occur in both languages but vary from one language to another. The latter possibility was called the difference-hypothesis.

3.1. Stuttering occurs in one language but not the other

With respect to the possibility that stuttering occurs in one language and not in the other, Nwokah (1988) suspected that this would be unusual. She studied 16 bilingual stutterers from Anambra state, Nigeria, speaking Igbo (a Nigerian

Table 1

Summary of the literature reporting cases of stuttering in bilinguals including a comparison of the stuttering in both languages

Source	Languages involved ^a	No. of subjects	Age of the subject(s)
Van Riper, 1971	<i>Eskimo/English</i>	1	?
Van Riper, 1971	<i>English/Pahlevi^b</i>	1	?
Van Riper, 1971	<i>Japanese/English/German</i>	1	?
Dale, 1977	<i>Spanish/English</i>	4	13 years (average)
Nwokah, 1988	<i>Igbo/English</i>	16	16 to 40 years (mean 24;3 years)
Jarayam, 1983	<i>Kannada/English</i>	10	19 to 32 years (mean 25;6 years)
Bernstein Ratner & Benitez, 1985	<i>Spanish/English</i>	1	50 years
Lebrun et al., 1990	<i>French/Dutch</i>	1	58 years
Jankelowitz & Bortz, 1996	<i>English/Afrikaans</i>	1	63 years
Shenker et al., 1998	<i>English/French</i>	1	2 years 8 months
Cabrera & Bernstein Ratner, 2000	<i>Spanish/English</i>	1	5 years
Scott Trautman & Keller, 2000	<i>Spanish/English</i>	1	20 years

^a Language in italic is the predominant language. Both languages in italic indicates equal usage. No indication means absence of information.

^b We assume that English was this person's first language as English is the official language in Pakistan, but the text is not clear in this respect.

language) and English. None of these subjects stuttered in one language only. This led Nwokah to conclude that bilinguals who stutter in one language and not the other, if such persons exist, may be bilinguals who are far more dominant in one language than another.

Table 1 provides an overview of the literature on stuttering in bilinguals. Only those reports that included a comparison of the stuttering in both languages are listed. As can be seen bilingual persons who stutter in one language and not the other are, indeed, rather exceptional.

Manifestation of stuttering		
Only in one language	In two (or more) languages	
	Similar pattern	Different pattern
English	–	–
English	–	–
–	+	–
Spanish	–	–
–	–	Overuse of fillers such as “er” or “mm” common in English but absent in Igbo
–	–	In English initial consonants more frequently stuttered upon than vowels, in Igbo the opposite pattern
–	–	More stuttering in Kannada than in English, particularly in spontaneous speech
–	–	Twice as dysfluent in English as in Spanish
–	–	More likely to have difficulty in initiating sentences or clauses in Spanish than in English. Initial noun phrases attracted as much dysfluency as did verbs in English but were not a large source of dysfluency in Spanish. Conjunctions and clause introducers seemed to attract twice as much dysfluency in Spanish as in English
–	+	–
–	–	Stuttered less in English
–	–	More aware of his stuttering in Afrikaans than in English
–	–	A greater adaptation effect in Afrikaans than in English
–	–	A greater consistency in English than in Afrikaans
–	–	Predominantly more typical than less typical disfluent behaviors in Afrikaans than in English
–	–	More stuttered like disfluencies in English than in French
–	–	Higher proportion of stutters on reflexives in Spanish; higher rate of stuttering on adjectives in English
–	–	More stuttering in Spanish than in English

Van Riper (1971) quoted E. Douglas, a Canadian psychiatric social worker, who visited the Southampton Island’s Eskimo population and reported that none of the Southampton population at that time stuttered “except for the Hudson Bay Company Clerk who stutters in English but not in Eskimo.” Van Riper also included an excerpt from a letter by a Pakistani stutterer who wrote: “You see I am a Parsi by faith and our Holy Book is written in very old ‘Pahlevi Script.’ Now naturally, when I read our holy book, I never can understand a word of the script and incidentally I rarely stammer while reading it.”

Apart from these anecdotal remarks, there is, to the best of our knowledge, only one other reference to language-specific stuttering. Dale (1977) studied four Cuban–American male adolescents (average age 13 years), all of whom were born in the United States but spoke only Spanish at home. Each of the four subjects was reported to have begun to stutter in Spanish within a year of assessment. Whether or not there was a family history of stuttering in any subject is not clear. All four subjects were quite proficient in Spanish and English, but none of them exhibited dysfluent speech while speaking English. While conversing in Spanish, however, varying degrees of dysfluency were observed. According to Dale, sociological and cultural factors played a major role in the development of this pattern. It appeared that the boys were subjected to extreme pressure by their Cuban–American community to retain their knowledge of Spanish and to speak it without error. Dale assumed that these boys' stuttering originated during the Americanization process when they began to forget some of their Spanish vocabulary. As they groped for appropriate Spanish words, the boys demonstrated normal dysfluencies. These were identified as stuttering by their parents. It was hypothesized that the pressure to speak Spanish fluently induced fear in the boys, leading to further dysfluency in Spanish.

The cases reported by Dale (1977) and the case of the Pakistani stutterer quoted by Van Riper (1971) seem to confirm Nwokah's assumption that language specific stuttering occurs in association with an unbalanced language proficiency. The subjects in Dale's study were more proficient in English than Spanish and were beginning to forget some of their Spanish vocabulary. The subject quoted by Van Riper was also more dominant in one language than in the other. He could read Pahlevi script but did not understand it. Remarkably enough, the latter subject stuttered in the language he was most familiar with, whereas the opposite pattern was seen in the Cuban subjects reported by Dale. In searching for a possible explanation for this apparently contradictory pattern, one should remember that the stuttering histories of the subjects in Dale's study differed from that of the Pakistani stutterer quoted by Van Riper. The subjects in Dale's study did not stutter until the demands for fluent Spanish arose, whereas the subject quoted by Van Riper reported that he does not stutter in one particular condition, when reading a language that he does not understand.

3.2. Stuttering occurs in both languages: the same-hypothesis

When a bilingual person stutters, it is apparently far more common that he or she stutters in both languages. In accordance with the same-hypothesis formulated by Nwokah (1988), some individuals seem to show a similar speaking pattern in both languages. One such case was cited by Van Riper (1971). A Japanese stutterer communicated that he had exactly the same fears of Japanese sounds than he had of English sounds and that, when he learned German, he also had the same fears of German sounds that he had of Japanese sounds. Another case consistent with the same-hypothesis was described by Lebrun, Bijleveld, and Rousseau (1990). Their

patient, a right-handed French–Dutch-speaking male, began to stutter following brain damage. Authors reported that the severity of his speech impediment fluctuated but never disappeared and “affected his French and Dutch equally” (p. 255). It is important to stress that the latter case’s stuttering was associated with acquired neurological disease. The literature suggests that stuttering of neurogenic origin may be more pervasive than developmental stuttering, and tends to occur across all speech tasks (Ringo & Dietrich, 1995). Perhaps the case described by Lebrun et al. (1990) should be considered in light of this.

3.3. Stuttering occurs in both languages: the difference-hypothesis

Bilingual stutterers who are dysfluent in both languages more often show different patterns in one language than in the other. A number of authors have reported cases that are consistent with Nwokah’s (1988) difference-hypothesis, including Nwokah herself.

Jarayam (1983) studied 10 bilingual male stutterers, ages 19–32 years (mean 25;6 years) who knew both English and Kannada, a language spoken in South India, but Kannada was their primary language. There appeared to be no difference in the two languages in either the pattern or distribution of stuttering on different sound groups, however, subjects were reported to stutter more in Kannada than in English, particularly in spontaneous speech, though this difference may not have been statistically significant.

This study (Jarayam, 1983) suggests that some bilingual stutterers may differ in the severity of their stuttering in both languages, but not in the pattern or distribution of stuttering. A case reported by Shenker et al. (1998) seems to confirm this possibility. Shenker et al. studied the impact of bilingualism on developing fluency in an English–French-speaking preschool-age girl. Observations of the girl’s interactions with her parents on in-clinic and out-clinic video tapes indicated that English was her predominant language. A dysfluency analysis of transcripts of the girl’s spontaneous speech samples using the CHILDES system coded the frequency and type of dysfluencies according to guidelines proposed by Bernstein Ratner, Rooney, and MacWhinney (1996), and revealed more stutter-like dysfluencies in English than in French (13.51% and 9.89%, respectively). Analysis of the loci of stuttering, classified according to type of dysfluency, placement of stuttered word in a sentence, and word length, found no significant differences between English and French. More word repetitions were noted in French and more part-word repetitions in English, but this reflected the girl’s uneven language development in English and French. There was a higher frequency of monosyllabic words in French in the sample, hence more word than part-word repetitions.

Although similar patterns and distributions of stuttering but different degrees of stuttering severity in each language does occur in bilingual stutterers, it is more common to find that both the severity and distribution of dysfluencies differ from one language to another. Thus, Bernstein Ratner and Benitez (1985) described a

50-year-old adult male bilingual stutterer who had spoken Spanish and English since learning to speak and used both languages almost equally. He also had stuttered in both languages since learning to speak. Although the clinicians and the subject thought that his fluency was equally compromised in English and Spanish, an analysis of spontaneous speech samples showed that he was almost twice as dysfluent in English as in Spanish. He had more difficulty initiating sentences or clauses in Spanish than in English, and his initial noun phrases attracted as much dysfluency as did verb phrases in English, but they were not a large source of dysfluency in Spanish. In addition, conjunctions and clause initial words seemed to attract twice as much dysfluency in Spanish as in English. A phonemic analysis showed that there was a tendency for fluency breakdown to occur on vowel-initiated words in both languages but that Spanish vowels were represented almost twice as often. The authors could not find account for the difference as to severity of the stuttering, however, the differences in the loci of dysfluencies across the two languages were believed to be associated mainly with differences between English and Spanish sentence structure. Evidence that sentence structure may influence the loci of stuttering, was also seen in a case reported by Cabrera and Bernstein Ratner (2000), a 5-year-old Spanish–English bilingual boy. He demonstrated higher proportions of dysfluencies on reflexives in Spanish, and higher proportions on adjectives in English. The authors suspected that differences in sentence structure were at the origin of these findings. Spanish reflexives are word-initial rather than word-final as in English, and English adjectives precede, rather than follow the nouns they modify as in Spanish. The boy's overall degree of dysfluency in each language was not reported.

Nwokah's (1988) analysis of the stuttering behaviors of 16 high-school-educated bilingual stutterers in Anambra State, Nigeria, found a difference in both the nature and severity of the stuttering. The subjects in this study (four women, twelve men between 16 and 40 years) were said to be equally competent in Igbo and English and to use both languages daily. Yet, all but one stuttered more in one language than the other (either English or Igbo) in both spontaneous speech and reading. Comparison of the fluency failures showed that an overuse of fillers such as "er" or "mm" was common in English, whereas these did not occur in Igbo. In addition, English-initial consonants were more frequently stuttered than were vowels, whereas the opposite pattern was seen in Igbo. All of the stutterers in this study were fully aware of which language they stuttered the most. Subjects' explanations for the imbalance in the severity of their stuttering behavior were that English was easier to speak because it needed more planning and anticipation, or that it was harder for the same reason and, therefore, less spontaneous. Nwokah believed that there are two bases for there to be more stuttering in English in some subjects and more in Igbo in others. Referring to Fiedler and Standop's (1983) neuropsychological model of the origin and maintenance of stuttering and to the observations of Krashen and Pon (1975) on monitoring in second language acquisition, Nwokah proposed that the monitoring system involved in monitoring stuttered speech is the same system

that monitors second language production. This monitoring system would act as an inhibitor for some subjects, creating a conscious control of stuttering behavior, thereby reducing the frequency of stuttering. For others, it would act as an activator, introducing tension and anticipation and increasing stuttering. In addition, sociopsychological aspects appeared to play an important role. Nwokah reported a trend for subjects to stutter most in the language with which they had had more negative experiences at home or school.

Another study that reported a difference in both the nature and severity of stuttering in a bilingual speaker is that of Jankelowitz and Bortz (1996). They studied the fluency failures of a 63-year-old English–Afrikaans-speaking male who used both languages interchangeably but was more proficient in English than in Afrikaans. Stuttering was first noted when the subject was six years old, but he had never received speech therapy. The subject tended to be more aware of his stuttering in Afrikaans than in English, and evidenced a greater adaptation effect in Afrikaans than in English but a greater consistency in English than in Afrikaans. Overall, he was twice as dysfluent in Afrikaans as in English, with mean dysfluencies per 100 syllables of 14.86 and 7.42, respectively. Moreover, his dysfluencies were predominantly more typical than atypical in Afrikaans than in English. The subject was more proficient and stuttered less in his predominant language, leading the authors to believe that his language proficiency and dysfluent behavior were interrelated, and that his language ability influenced the distribution, frequency, and nature of his dysfluencies.

Another case indicating that language proficiency may be a factor in the origin of a differential stuttering pattern in bilingual stutterers was reported recently by Scott Trautman and Keller (2000). They studied a 20-year-old male from Cancun, Mexico whose native language was Spanish but who also spoke limited English. He had stuttered since age 5 and had never received clinical intervention. He stuttered in both Spanish and English, approximately 10% in Spanish, 14% in English. No differences in the nature or distribution of his dysfluencies were reported.

The likelihood that language proficiency may be an important factor in the origin of differential stuttering patterns in bilingual stutterers is also supported by the findings from an experiment with normal speakers by MacKay (see MacKay & Bowman, 1969). It is well known that delayed auditory feedback produces a temporary disruption of speech in normal speakers, which is somewhat reminiscent of stuttering (Fairbanks, 1955; Lee, 1950). MacKay found that the speech of bilinguals under delayed auditory feedback is disrupted less when they are speaking the language with which they are more familiar.

4. Diagnostic considerations

Although speech–language pathologists have shown considerable interest in working with bilingual clients in recent years (e.g., see the guidelines of the

College of Speech and Language Therapists, 1990 and the position papers of the American Speech–Language–Hearing Association, 1985, 1989, 1994), few specific guidelines for the diagnosis of stuttering in bilinguals are available. An important diagnostic issue raised by Mattes and Omark (1991) was differentiating stuttering from other types of dysfluency and cited the example of a 7-year-old Hispanic male who was learning English as a second language. In English, the child's speech was characterized by frequent hesitations and word repetitions suggestive of stuttering, but these problems were not observed in Spanish. It appeared, however, that these hesitations and word repetitions tended to occur whenever the child was having difficulty thinking of the appropriate English word to use to express his thoughts. Thus, the dysfluencies observed appeared to reflect the child's limited proficiency in English rather than a stuttering disorder. Mattes and Omark advised that bilingual children who are suspected of stuttering should be assessed in both languages. Assuming that stuttering almost always manifests itself in both languages, they noted that when dysfluent speech is observed in only one language, it is likely that it reflects a limited proficiency in that language. They did recognize, however, that stuttering may be much more apparent in one language than in the other.

A more extensive framework for assessing a bilingual stutterer was presented by Watson and Kayser (1994), based on the premises that stuttering is a unique problem that has been observed across cultures and languages and that bilingualism is a dynamic, evolving condition that reflects varying levels of language proficiency. They also pointed out the importance of differentiating features of stuttering from dysfluencies associated with being a second-language learner. Like Mattes and Omark (1991), they stressed that distinct stuttering behaviors must be observed in both languages when identifying a stuttering problem in a bilingual speaker. If dysfluencies are observed solely in the second language, they are, according to Watson and Kayser, related to the acquisition and development of two languages and may be quite different from the dysfluencies of a stutterer. An additional diagnostic sign of importance mentioned by Watson and Kayser is the presence or absence of secondary behaviors. If a bilingual speaker's dysfluencies are not accompanied by noticeable tension or such behaviors as eye blinks or body movement, then it is likely that the child is not an incipient stutterer.

There are, of course, other features whose assessment may aid the diagnostic process. It is generally recognized that stuttering is typically characterized not only by behavioral characteristics but also by affective and cognitive components. Many stutterers develop negative feelings and attitudes about communication, in general, and stuttering, in particular (Van Riper, 1971). One would not expect a similar development in reaction to dysfluencies associated with being a second-language learner. Assessment of the affective and cognitive components, therefore, may help distinguish a second language dysfluency pattern from stuttering. Although standardized instruments for assessing feelings and attitudes

may not be available in some languages, careful listening and recording of client's statements during an interview can yield much valuable information.

In addition, several studies have reported (see Bloodstein, 1995 for an overview) that developmental stutterers very often have (i.e., one-third to two-thirds of cases) a family history of stuttering. Therefore, the presence of a positive family history of stuttering in a dysfluent bilingual child increases the likelihood that the child may be stuttering.

As pointed out by Finn and Cordes (1997) identification of stuttering in a bilingual speaker may be particularly difficult if the second language spoken is one with which the clinician is not familiar or if the clinician is not similarly bilingual. For instance, confusion may arise when the unfamiliar language uses reduplication as a morphophonemic marker, as in some Native American languages. The clinician may mistakenly perceive such reduplications as instances of stuttering. Irrespective of whether or not such linguistic reduplication is involved, it is not known if or how well clinicians are able to make reliable or valid judgements about the presence of stuttering in languages or dialects other than their own. One strategy suggested by Finn and Cordes that may help in identifying stuttering in an unfamiliar language, is for the clinician to compare his or her judgement with the client's self-judgements. One can, for instance, ask the client to provide a nonverbal signal (e.g., raising a hand) whenever he or she stutters. In addition, the use of fluency-inducing conditions (e.g., rhythmic stimulation, reduced speech rate, delayed or masked auditory feedback, frequency altered feedback) may help to differentiate stuttered from nonstuttered speech.

Another possible strategy for monolingual speech–language pathologists is to call upon a native speaker when assessing a bilingual stutterer, as has been recommended by Taylor (1986), and Watson and Kayser (1994). Not only can native speakers help in determining normal fluency parameters of the language that the speech–language pathologist is not familiar with, they can also assist in assessing the client's environment, communication skills, and significant attitudes. Finding native speakers who can function as reliable observers may be difficult, however. Finn and Cordes (1997) stressed that untrained, inexperienced interpreters may not provide useful or dependable information about stuttered speech. English-language investigations (Cordes & Ingham, 1994; Young, 1984) have found, for example, that untrained, inexperienced judges display unacceptable low levels of interjudge and intrajudge reliability for stuttering judgements. On the other hand, the use of native speakers as informants may be highly instructive and in many cases the best solution available.

5. Therapeutic considerations

Just as there are no specific guidelines for the diagnosis of stuttering in bilingual speakers, there are no standard therapeutic approaches either. An often heard advice for alleviating or eliminating stuttering (e.g., Biesalski, 1978;

Eisenson, 1986; Rustin, Botterill, & Kelman, 1996) is to temporarily reduce the number of linguistic systems to which a bilingually raised stuttering child is exposed. As Rustin et al. (1996) pointed out, it is, of course, important that the family understands the rationale for such an action and that the language chosen as the primary language is the one most commonly used by all members of the household. Evidence from Karniol (1992), who documented the development of stuttering in a Hebrew–English-speaking child, suggested that interrupting a child's bilingual education may indeed prove helpful. The child described by Karniol started to stutter in his first language (Hebrew), as well as in his second language (English) at age 25 months, approximately 1 month after the child's awareness of bilingualism was evident. Within 4 weeks, stuttering became so severe that the child could barely produce a single utterance in either language without a stutter, and the parents decided to stop addressing their child in English. Consequently, the child's use of English was reduced drastically, but stuttering dropped out entirely at the same time. When the child started speaking English again, about 6 months after stuttering had stopped, he occasionally evidenced only minor dysfluencies in both languages.

On the basis of her data, Karniol (1992) concluded that Eisenson (1986) was correct when he suggested that a child not be exposed to a second language until he or she has acquired good control of the first language. Not everyone agrees, however, with this recommendation. For example, Stahl and Totten (1995) believe that it should not be assumed that counseling bilingual families to limit themselves to one language is desirable or effective in preventing chronic stuttering. They suggest that only for particular subgroups of bilingual children who are at-risk for chronic stuttering, such as those children with first and second degree family histories of stuttering, or those with speech and language delays in their dominant language, would temporarily eliminating bilingualism be a reasonable action. It is impossible to document if deferring a bilingual education prevents a child from chronic stuttering. Moreover, many families' circumstances are complex and providing a child with only monolingual experience may not be an option. For example, when parents speak different mother tongues and have poor command of each others' language, choosing a single language for interaction with their children may be very difficult and impractical. When temporary monolingual education is not possible, Rustin et al. (1996) advise that each person with whom the child communicates should use a consistent language so that the child can identify and predict the language he or she is likely to hear. This advice is based on the principle of "one person one language," which is also called Grammont's principle after the French phonetician Maurice Grammont (1866–1946) who first formulated it, and is frequently adhered to in bilingual education in general.

Temporary elimination of bilingualism is clearly not a necessary prerequisite to successfully reduce dysfluency in all bilingual stutterers, as the bilingual English–French-speaking preschooler described by Shenker et al. (1998) illustrated. The impracticality of providing a monolingual education led the authors to

initiate indirect treatment of this child's stuttering while maintaining bilingualism. Treatment was started 6 months postonset at age 2;11 years when the child was showing multiple iteration repetitions, tense onsets, and audible and inaudible prolongations. Therapy was conducted only in English, the child's predominant language, and consisted first of training parents to model slower turn taking to reduce interruptions, reductions of linguistic complexity, and rate reductions through frequent pausing. The parents were encouraged to pursue bilingualism at home but not to mix languages. The father spoke English to the child, the mother French. After 4 months, the child's frequency of dysfluency remained over 10% in both English and French, and a more direct operant approach was initiated, guided by the work of Onslow (1996). Therapy continued solely in English until stutter-like dysfluencies decreased to 3% or less when French was initiated for half of each session. The child's frequency of stutter-like dysfluencies in French, then decreased to 5.5%. A comparison of the number of iterations per stutter-like dysfluency at the onset of therapy with those at the end showed that both the number and severity of the child's stutter-like dysfluencies had decreased in both English and French.

A noteworthy aspect of the approach of Shenker et al. (1998) is that therapy was initially conducted exclusively in the child's predominant language (English). Therapy in the second language (French) was initiated only after the number of dysfluencies had significantly decreased in the child's predominant language. A similar phased approach was adopted by Scott Trautman and Keller (2000) in treating a 20-year-old Spanish–English bilingual male who stuttered. They, too, started intervention in the subject's predominant language (Spanish) and introduced treatment in the second language (English) only after target behaviors had reached a criterion in the predominant language. In both studies, therapy in the predominant language continued after introduction of therapy in the second language. Why the investigators started therapy in the predominant language, is not really clear. Shenker et al. commented that they chose English for initial treatment because the child produced more complex sentences in English than in French. Similarly, Scott Trautman and Keller noted that they chose Spanish for the new target behaviors because their subject "experienced greater fluency in Spanish and had better language proficiency in Spanish." Neither is it clear why the investigators in these two studies opted initially to provide monolingual treatment. Although this approach resulted in a significant increase in fluency in both languages in both cases, one may wonder if bilingual intervention from the start might have reduced therapy time. Alternatively, one could question if bilingual treatment was necessary and if there might not have been an automatic transfer of the targeted fluency behaviors to the nontreated language. As Scott Trautman and Keller pointed out, there is a critical need for studies to compare bilingual to monolingual intervention for such cases.

Data from a study by Druce, Debney, and Byrt (1997) suggest that therapy outcomes of bilingual stutterers are neither worse nor better than those of monolingual speakers. Their study was designed to investigate the short- and

long-term effects of an intensive, behaviorally oriented treatment program for 6- to 8-year-old children who stutter. Six of the fifteen subjects involved were bilingual. The languages spoken by these children in addition to English were Slovenian, German, Greek, Hindi, and Italian. All had started bilingual education during the first 5 years of life and all understood and spoke English well. Whether or not these bilingual children stuttered in both languages and if so, showed the same pattern of stuttering in both was not mentioned. However, treatment and measures of treatment outcome were apparently confined to English. At any rate, comparisons of the six bilingual and nine monolingual English speaking children in terms of percentage of syllables stuttered in a 2-min sample of conversational speech showed no significant difference between the two groups and no significant association between bilingualism and outcome. This confirmed the results of a similar investigation (Debney & Druce, 1988) of children, aged 8–15 years, in which no link was found between bilingualism and long-term treatment outcome.

Treatment outcomes of bilingual stutterers has also been reported to be less favorable than those of monolingual stutterers, however. Waheed-Khan (1998), at the Hospital for Sick Children in Toronto, Canada, found that bilingual children seen in the treatment program of that Hospital were far less successful in achieving fluency and in consistently self-correcting their dysfluencies in conversation than were monolingual English-speaking children. In addition, the average number of therapy sessions attended and completion of homework assignments was lower among bilingual speakers than English speakers. It was only when a specialized therapy program was developed for bilingual speakers did the success rate increase and approach that of monolingual speakers. A key component of this specialized therapy program was the mandatory participation of a family member who functioned as a “speech helper.” This individual attended therapy sessions, learned fluency targets, reviewed lessons with the child, modeled target-assisted speech in conversations at home, provided the clinician with appropriate stimulus materials, and assisted the clinician in developing homework exercises. As this study illustrates, incorporation of a client’s family in the fluency therapy may be essential for treatment to be successful for some children.

6. The bicultural stutterer

A final important consideration pertaining to both assessment and treatment is that bilingual stutterers are often bicultural as well. Clinicians need to be aware of the possibility that cultural differences may affect the diagnostic and therapeutic processes. Several examples of cultural factors that may influence clinical contacts with bilingual stutterers were discussed by Leith (1986). For instance, some cultures have a different orientation to time so that scheduling diagnostic and therapeutic sessions may be a problem; the diagnostic interview may be hampered

if the father always functions as the spokesperson for the family in the family's culture so that direct questioning of the mother is not possible or if family matters are private and not to be shared with strangers in the client's culture; therapy may suffer if the family's culture does not allow a female child to be alone with a male stranger or if females do not assume an authority's role, such as that of a clinician, in the client's culture. Clinicians should also keep in mind that maintaining eye contact is a sign of aggressive, or even hostile behavior in some cultures; that children are not allowed to initiate a conversation with an adult in some cultures; and that a child's stuttering is considered a religious punishment for something the parents have done which can be removed only if the parents atone for their sins in some cultures. Finn and Cordes (1997) and Leith have provided a number of recommendations for incorporating the cultural background of bilingual clients who stutter in their assessment and treatment. They also stress, however, as did Shames (1989), that empirical data concerning the interactions between cultures and stuttering are lacking and that much remains to be learned.

7. Fluency out of bilingualism?

As discussed above, bilingualism may be a contributing factor to the development of stuttering, and a number of authors (Biesalski, 1978; Eisenson, 1986; Karniol, 1992; Rustin et al., 1996) have suggested deferring bilingual experience in order to prevent stuttering. Remarkably enough, just the opposite, initiating experience to another language to overcome stuttering, has also been recommended. Jean Marc Itard, a 19th century French physician, sometimes advised that stuttering children be placed in the care of a foreign governess who would compel the use of a foreign language (Eldridge, 1968). Similarly, Böhme (1981) suggested that bilingualism can be used as a therapeutic factor in the treatment of cluttering. Indeed, it has been observed that children often do not stutter or stutter less, at least initially, when they learn a foreign language (Seeman, 1974). A neurolinguistic explanation for this finding offered by Lebrun (1997) hypothesizes that the extrapyramidal system takes part in speech production under the control of the cortex under normal circumstances and takes care of the more routinized or less deliberate aspects of speech, such as articulation and rate of speech. However, when a speaker uses a foreign language that he has not fully mastered, he probably has to rely mostly, if not exclusively, on the cortex. Under these circumstances, extrapyramidal intervention is minimal because few if any routines have been created. He further hypothesized that cortical control over extrapyramidal participation in speech production is inadequate in developmental stutters. However, when a stutterer uses a foreign language for which he or she has only a limited command, he or she is not likely to stutter in that language, because he or she can rely almost exclusively on the cortex. It is only when a good command of the foreign language is achieved eventually through practice and exercise that stuttering is likely to manifest itself in that language. A number

of routines have then come about, thus, increasing the part played by the extrapyramidal system. According to this theory, speaking a foreign language would be comparable to other techniques that require an unusual way of speaking and that can induce fluency such as syllable-timed speech, singing, whispering, and speaking in a sing-song way. Perhaps future brain studies of stutterers may provide evidence supporting this theory.

8. Conclusions

The major conclusions from this review can be summarized as follows. There is some suggestion that stuttering is more prevalent in bilinguals than in monolinguals, but recent studies that corroborate this suggestion are lacking. Preliminary results of an Internet survey (Au-Yeung et al., 2000) showed nearly identical percentages of stutterers in monolingual and bilingual speakers, but this study is methodologically weak. It is likely that bilingualism is a contributing factor to the development of stuttering, at least in some cases, but other factors such as being placed in a new situation or exposure to mixed linguistic input may play a role as well. Why early bilinguals seem to be more prone to develop stuttering and the extent to which the similarity of the languages learned plays a role is not clear at present. Stuttering can affect one or both languages of bilinguals. When stuttering occurs in both languages, they may be equally affected. However, the dominant pattern seems to be that one language is affected more than the other. Various factors may determine which language is more affected including language ability and psychosocial and cultural factors, while linguistic factors may influence the distribution of dysfluencies in a language. An important diagnostic consideration is distinguishing stuttering from dysfluencies due to limited proficiency in a language. Signs that support a diagnosis of stuttering include: dysfluencies occur in both languages; an individual demonstrates secondary behavior and/or negative feelings and attitudes about communication; and a family history of stuttering. Indirect therapeutic approaches for bilingual children who are developing stuttering may temporarily eliminate one language, or if this is not feasible, apply the principle of one person, one language. Whether or not deferring bilingualism prevents stuttering is uncertain. There is also a need for studies that compare monolingual to bilingual intervention outcomes. Therapy outcomes of bilingual stutterers may be, but not necessarily, less favorable than those of monolingual stutterers. The assistance of a native speaker of a language that the clinician has not mastered is advisable for both diagnostic and for therapeutic purposes. Finally, clinicians should remain aware of the possibility that cultural differences can affect diagnostic and therapeutic procedures and results. Here, too much information is needed, and until that information is available clinicians will have to rely on their professional judgement.

The relationship between bilingualism and stuttering has been called enigmatic (Karniol, 1992). As the present review revealed, there is a disparity in the

findings reported in studies of bilingual stutterers, even with respect to such essential aspects as the prevalence of stuttering, its manifestations and therapy outcomes. This calls for further research in this area. Perhaps some of the divergence in studies findings is a reflection of the heterogeneity of the population under study. In developing future studies of bilingualism and stuttering, investigators should take into account that both stutterers and bilinguals are heterogeneous populations. No two bilinguals are alike, and as Haugen (1953) viewed it, the only common thing about bilinguals is that they are not monolingual. This heterogeneity must also be reckoned with by clinicians in their evaluation and treatment of bilingual stutterers.

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CONTINUING EDUCATION

Stuttering and bilingualism: A review

QUESTIONS

1. Most of the available data suggest that stuttering
 - (a) is as prevalent among monolinguals than among bilingual speakers
 - (b) is more prevalent among monolinguals than among bilingual speakers
 - (c) never occurs in bilingual speakers
 - (d) has a prevalence of 50% in bilingual speakers
 - (e) is more prevalent among bilinguals than among monolingual speakers
2. The available data suggest that
 - (a) children who are exposed to more than language from birth onward are not vulnerable to stuttering
 - (b) only children who are exposed to more than one language from birth onward are vulnerable to stuttering
 - (c) younger children especially are vulnerable to stuttering if they are exposed to two languages
 - (d) only children who are exposed to more than two languages are vulnerable to stuttering
 - (e) adult second language learners especially are vulnerable to stuttering
3. If a bilingual speaker stutters
 - (a) it is common that he/she stutters in both languages
 - (b) he/she always stutters in both languages
 - (c) he/she never stutters in both languages

- (d) he/she always shows a similar speaking pattern in both languages
 - (e) he/she never shows a similar speaking pattern in both languages
4. A temporary elimination of bilingualism in a stuttering child
- (a) is not helpful to reduce dysfluency
 - (b) is a necessary prerequisite to successfully reduce dysfluency
 - (c) may reduce fluency
 - (d) is sometimes called “Grammont’s principle”
 - (e) will prevent a child from chronic stuttering
5. The available data suggest that in bilingual children
- (a) only monolingual treatment has a favorable outcome
 - (b) only bilingual treatment has a favorable outcome
 - (c) therapy outcomes may be affected by cultural factors
 - (d) therapy outcomes are better than those of monolingual children
 - (e) therapy outcomes are worse than those of monolingual children