STUTTERING VARIABILITY IN BI/MULTILINGUAL PERSONS WITH STUTTERING

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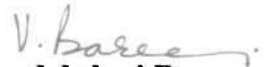University of Mysore, Mysore.

April, 2008

ALL INDIA INSTITUTE OF SPEECH AND HEARING
MANASAGANGOTHRI
MYSORE-570 006

CERTIFICATE

This is to certify that this dissertation entitled *"Stuttering Variability in Bi/Multilingual Persons with Stuttering"* is the bonafide work submitted in part fulfillment for the degree of Master of Science (Speech Language Pathology) of the student (Registration No. 06SLP011). This has been carried out under the guidance of a faculty of this institute and has not been submitted earlier to any other University for the award of any other Diploma or Degree.

Mysore

April, 2008

Dr. Vijayalakshmi Basavaraj
Director
All India Institute of Speech and Hearing
Manasagangothri
Mysore-570 006.

DECLARATION

This is to certify that this dissertation entitled *"Stuttering Variability in Bi/Multilingual Persons with Stuttering"* is the result of my own study under the guidance of Dr. Y. V. Geetha, Professor of Speech Sciences, Department of Speech Language Sciences, All India Institute of Speech and Hearing, Mysore, and has not been submitted in any other university for the award of any diploma or degree.

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CHAPTER I

INTRODUCTION

Stuttering refers to "disorders in the rhythm of speech in which the individual knows precisely what he wishes to say but at the same time is unable to say it because of an involuntary repetition, prolongation or cessation of a sound" (WHO, 1977). However, it cannot be denied that what is identified as stuttering is sometimes evident not only in the intermittent impairment of fluency but also in the rate, pitch, loudness, inflectional patterns, articulation, facial expression and postural adjustments of the speaker.

Stuttering is a disorder of high inter and intra individual variability and in spite of decades of research it remains a mystery with regards to its definition, characteristic features, its assessment and management. The term "stuttering", as popularly used, covers a wide spectrum of severity: it may encompass individuals with barely perceptible impediments, for whom the disorder is largely cosmetic, as well as others with extremely severe symptoms, for whom the problem can effectively prevent most oral communication. Primary stuttering behaviors are the overt, observable signs of speech fluency breakdown including repeating sounds, syllables, words or phrases, silent blocks and prolongation of sounds. These differ from the normal disfluencies found in all speakers in that, stuttering disfluencies may last longer, occur more frequently and are produced with more effort and strain. There is also a debate as to whether the term disfluency or dysfluency should be used to refer to stuttering. Some researchers prefer the use of the term dysfluency to indicate abnormal disfluencies seen in stuttering and other

fluency disorders. However, there is no consensus on the use of the term disfluency or dysfluency to refer to stuttering. While the so called normal disfluencies (NDs) are seen in all individuals including persons with stuttering (PWS), stuttering like disfluencies (SLDs) are not seen in normal individuals. Stuttering disfluencies also vary in quality: normal disfluencies involve repetition of whole words, phrases or parts of sentences, pauses (both filled and unfilled), interjections and hesitations while stuttering like disfluencies are characterized by prolongations, blocks and part-word repetitions (sound/syllable repetitions). Secondary stuttering behaviors are unrelated to speech production and are learned behaviors which become linked to the primary behaviors. Secondary behaviors include *escape behaviors*, in which PWS attempt to terminate a moment of stuttering using various bodily movements like facial grimaces, head or hand movements during the moments of disfluencies. Secondary behaviors also refer to the use of *avoidance strategies* such as avoiding specific words, people or situations that the person finds difficult. Some PWS successfully use extensive avoidance of situations and words to maintain fluency and may have little or no evidence of primary stuttering behaviors. Such individuals with covert stuttering often have high levels of anxiety and extreme fear of even a mild disfluency. Thus, there is high level of variability in the quality and quantity of disfluencies in PWS, both within and among individuals, depending on the speaking situations and the language related factors.

The influence of linguistic and language variables on stuttering have been studied from the time of Brown (1938, 1945) by many authors. Linguistic factors have been considered relevant to stuttering especially since Brown

(1938, 1945) demonstrated their strong influence on the occurrence of stuttering events or "moments of stuttering," in specific locations of the speech stream (e.g., the beginning of sentences and phrases) and in words of certain grammatical classes (e.g., verbs and adjectives). The link between stuttering and language is especially intuitive in young children. Several scholars have noted that stuttering onset, typically between ages 2 and 4 years, coincides with the critical period of accelerated expansion in children's expressive and receptive language (Levina, 1963; Yairi, 1983 and Ratner, 1997). Thirty years ago, Cheverkeva (1977) proposed that stuttering is basically a disorder of language development, an idea recently echoed by Bloodstein (2002). Although it is widely known that both are closely associated, nature of such associations is not very well understood. The possible stuttering-language link has become a focus of scientific interest, reflected in several stuttering models with psycholinguistic viewpoints. Among these are the Demands-Capacity Model (Starkweather, 1987), the Covert-Repair Hypothesis (Postma & Kolk, 1993), the Trade-Off Hypothesis (Ratner, 1997) and the Cognitive Interference Model (Bosshardt, 2002). Investigators have focused their studies on five distinct linguistic variables: (a) phonological aspects, (b) loci of stuttering, (c) language complexity, (d) pragmatics (child's use of language) and (e) language skills. For example, research concerned with the first variable listed above has provided evidence that stuttering is increased as a function of language complexity (Logan & Conture, 1995; Zackheim & Conture, 2003). In summary, although it is believed that association between stuttering and several linguistic variables do exist, so far no clear causal relations have been established and there is no consensus on

their precise role or contributions as risk factors for the onset of stuttering and its persistence, or their influence on natural recovery. This and several other aspects of the stuttering-language connections continue to be the subject of scientific discussions and controversies (Wingate, 2001; Nippold, 2004). Thus, in this context it becomes increasingly relevant to talk about bilingualism or multilingualism and its effect on stuttering.

The term *bilingualism* in its broadest sense refers 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).

Stuttering in bilinguals is an area that has not received much attention. But, the belief that stuttering is more prevalent in bilinguals than in monolinguals seems to be widespread (Eisenson, 1984; Shames, 1989; Karniol, 1992). Many of the "facts" about stuttering and its development are derived from studies of monolingual speakers, virtually all of whom are English speakers. It is, however, important to note that it is estimated that over 50% of world's population is bilingual (De Houwer, 1998) and that about 1% of the world's population stutters (Bloodstein, 1995). Thus in providing services to bilingual individuals who stutter, clinicians may be faced with unique problems such as making reliable and valid judgments about the presence of stuttering in a language that is not one's own, advising the parents of a bilingual child with stuttering regarding exposure to two languages, therapy outcome in bilingual speakers etc. Apart from its clinical significance, the study of stuttering and bilingualism is also interesting from a theoretical viewpoint. According to Cabrera &

Bernstein Ratner (2000), bilingual clients 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 speaker would seem to weaken purely motoric accounts of stuttering. However, few studies have actually calculated the prevalence of stuttering in bilinguals and these studies date to the first half of the previous century. A study done by Karniol (1992), who reported stuttering in a Hebrew-English speaking child assumed a direct link between the occurrence of stuttering and bilingualism.

Age of acquisition of the second language is also another important factor to be considered. Seeman (1974) pointed out that in early bilingualism; there is a higher risk for stuttering to arise. A survey by Au-Yeung and Howell, P. (2000) reported that "middle bilinguals" stuttered less often than did "early" or "late" bilinguals.

Studies done by Jayaram (1983) reported that some bilingual individuals with stuttering may differ in the severity of their stuttering in both languages, but not in the pattern or distribution of stuttering. This finding was supported by Shenker (1998) who studied an English French bilingual child. Earlier Jayaram (1977) also noted that persons with stuttering showed a higher rate of speech in Kannada than in English. Nwokah (1988) reported that stuttering occurred more frequently on initial consonants than vowels in English whereas in Igbo it was the opposite pattern that was seen. Recently Sneha, Shruthi and Geetha (2008) made an attempt to study the pattern of distribution of stuttering in bilingual PWS. The results of the study indicated that there is no significant difference in stuttering in the two languages used by bilinguals

with regard to severity and percentage of SLDs and NDs, although there were individual variations with regard to different speaking conditions.

Two main questions arise concerning PWS who speak more than one language. First, do they stutter equally in each of the languages they speak and second, do some PWS speak totally fluently in one language but stutter in another? Bernstein-Ratner & Benitez (1985) in a case study of one bilingual PWS showed that although "C" did not believe himself to be more or less fluent in either language, he was almost twice as disfluent in English as in Spanish in spontaneous speech. Evangeline Nwokah (1988) spoke about three theoretical possibilities to explain the manifestation of stuttering in bilinguals. One possibility is that ***stuttering occurs in one language but not the other***. The second possibility is that ***stuttering occurs in both languages: the same–hypothesis***. The third hypothesis was **that *stuttering occurs in both languages: the difference hypothesis***. A number of authors have reported cases that are consistent with this latter hypothesis; including Nwokah herself i.e. bilingual PWS who are disfluent in both languages more often show different patterns in one language than the other.

Thus, in spite of the potential significance for both clinicians and researchers, data on stuttering and bilingualism are rare. Hence, it becomes important to study the nature of disfluencies in bilingual individuals with stuttering.

Need For the Study:

Data on stuttering and bilingualism are scanty. India is a multilingual country where majority of the population speaks more than one language and most school going children are exposed to at least three languages by the middle school and beyond. Hence it is important especially with respect to the Indian context to study about stuttering in relation to bilingualism. Also, the few studies that have been done in Indian context have mostly been comparisons between monolinguals and bilinguals and have not focused on comparing aspects of stuttering between the languages that a PWS speaks. Therefore the present study was planned with the following objectives.

Aims of the Study

The main aims of the study were to test the following hypotheses:

1. PWS do not differ in their disfluency characteristics (SLDs and normal disfluencies) between L1 and L2.

2. PWS do not differ with respect to severity of stuttering in L1 and L2.

3. PWS do not differ with respect to frequency and types of disfluencies with respect to speaking conditions such as reading, narration and conversation in L1 and L2.

CHAPTER II

REVIEW OF LITERATURE

Stuttering is a disorder of rhythm, where fluency is affected. Recent investigations into stuttering have been towards exploring the linguistic side of the disorder. As linguistic aspects in stuttering gained more focus, the use of a second language and its influence on the primary language of the speaker also has come into light. It is said that bilingualism contributes to structural changes through borrowing across languages (Mackay, W.F., 1953). It is true that bilinguals have a high level of concept formation since they have access to two verbal codes (Cummins, J., 1973). The domain of usage of each language also influences the primary language of a speaker (Afendras, B. A., 1977). What effect all these factors have on spontaneous speech of a speaker is not known, but it is important to evaluate the effects of these factors on the fluency of a speaker, in both his/her first and second languages.

Variability of stuttering

Stuttering still remains a puzzle today because of its variable nature, the many factors associated with it and its elusive nature to be understood and treated. Stuttering is a disorder of high variability, both inter and intra individual. This variability can be with respect to the type of disfluencies, frequency and duration of disfluencies and presence of secondaries. Stuttering also varies with respect to situations, particularly with places, people and language.

1. Variability in stuttering characteristics: The frequency of stuttering is usually expressed as number or percentage of moments of stuttering or of stuttered words or syllables. Studies have shown that the "average" stutterer is disfluent on approximately 10 percent of words. Bloodstein (1944) studied oral reading of thirty individuals with stuttering and found that they stuttered on a mean of 10.8% of the words and ranged from 0 to 47% of words stuttered. Frequency of the different disfluency types, especially of the stuttering like disfluencies is an important measure in stuttering. Syllable repetitions, blocks and prolongations are considered as stuttering like disfluencies whereas hesitations, interjections, pauses and revisions are considered as normal disfluencies. Mean duration of stuttering is another measure of stuttering. The average duration of a stuttering block has been judged to be about one second. Blocks tend to vary in duration only within a few seconds, although some appear to be extremely fleeting and those of severe stutterers may occasionally be observed to continue for longer than a minute. Johnson and Colley found (1945) found that the combined mean of the ten longest blocks was 0.41 seconds. Speech rate is another type of objective measure in the assessment of fluency. Rate of speech is usually measured in terms of syllables per minute (SPM). Stuttering tends to retard the speaker's speed of verbal output in both oral reading and spontaneous speech (Bloodstein, 1944 and Wingate, 1988). Rate of speech is also said to decrease with increase in severity of stuttering (Andrade and Sassi, 2003). However, when rate is calculated excluding the duration of disfluent moments, often it is reported to be faster in many PWS and perceptual judgments also reveal faster speaking rates in many. Brown (1938a, 1938b, 1945) reported that most adults who stutter do so more on sound in word initial position. All these measures can vary when measured at

different instants of time. Test re-test reliability has been one of the major issues in research in the field of stuttering.

People who stutter do not enjoy stuttering, rather they dread it. They react to their repetitions, prolongations and blocks by trying to end them quickly if they cannot avoid them altogether. Such reactions may begin as a random struggle but soon turn into well learned patterns. These are called secondary behaviors and are basically divided into two broad classes: escape behaviors and avoidance behaviors (Guitar, 2000). Briefly, escape behaviors occur when a speaker is stuttering and attempts to terminate the stutter and finish the word. Common examples of escape behaviors are eye blinks, head nods and interjections of extra sounds, such as 'uh' which are often followed by the termination of a stutter and are, therefore reinforced. Avoidance behaviors on the other hand, are learned when an individual anticipates stuttering and recalls the negative experiences he has had when stuttering. To avoid stuttering and the negative experiences that it entails, he often resorts to behaviors he has used previously to escape from moments of stuttering, such as, eye blinks or "uh's", or, he may try something different, such as changing the word he was planning to say. They may also use avoidance tendencies such as postponements or hurrying by increasing the rate of speech, which will only aggravate the problem. These behaviors are also variable depending on variables such as person (or self) variables, place, situation etc.

2. Situational variability: Situational variability is one of the hallmarks of stuttering. Nevertheless, differences in frequency of stuttering across different speaking situations have not been thoroughly investigated. PWS commonly report dramatically

increased fluency when talking in unison with another speaker, copying another's speech, whispering, singing, and acting or when talking to pets, young children, or themselves. Other situations, such as public speaking and speaking on the telephone are often greatly feared by PWS, and increased stuttering reported in such situations.

Yaruss (1997) examined variability in the frequency of disfluencies produced by 45 preschool children who stutter (mean age = 42.3 months) in five different speaking situations (parent-child interaction, play with clinician, play with pressures imposed, story retell, and picture description). Significant differences were found in the frequency of disfluencies between these situations, and the variability between situations was significantly greater than the variability seen within a single speaking situation. In general, the "play with pressure" situation elicited the highest frequency of disfluencies from many subjects, though subjects exhibited highly individualized patterns of variability. Finally, children with a higher average frequency of "less typical" disfluency types exhibited a significantly higher degree of variability.

3. Variability with respect to speech task: Stuttering can also vary depending on the speaking tasks being performed, such as reading, spontaneous speech, recitation, narration etc. But, there are not many reports on this account, although there are some client reports of less stuttering while reading as compared to a conversation. This is an important factor to be considered while assessing an individual with stuttering.

4. Linguistic determinants of the moments of stuttering: A long line of research has tried to investigate whether there is a consistent pattern to stuttered episodes and which linguistic aspects determine whether a word is more likely to be stuttered. In 1945, Brown summarized his previous research and identified four basic factors that

determined whether words will be spoken disfluently by adults who stutter. The factors are: (1) word class (this has subsequently been interpreted as showing that content words are more prone to stuttering than function words); (2) word length (long words are more difficult); (3) sentence position (words that appear in early positions are more likely to be stuttered); (4) phonemes the word starts with (words starting with consonants are more difficult than those that start with vowels). This finding was supported subsequently by many other authors and Williams (1968) noted the same factors in 5 to 13 year old children. Geetha (1979) studied the linguistic variables in oral reading and conversation samples in Kannada. It again confirmed most of Brown's earlier findings. The study of linguistic determinants of disfluencies is not just descriptive in nature, i.e. providing a part of the facts of stuttering, but rather the findings have both scientific and theoretical implications.

5. Language factors related to stuttering: Linguistic and language variables play an important role in the moments of stuttering that it has attracted wider research during the past four to five decades. Various studies have dealt with phonological, linguistic or language factors related to stuttering in children to see if there is any pattern to differentiate them from normally disfluent peers. There is continuing interest in the possibility that stuttering may be some form of language related variable (Hamre, 1984; Homzie and Lindsay, 1984). This is more so because most stuttering begins when language is developing and because children who stutter often have delayed language development (Bloodstein, 1981). Starkweather (1987) also reported increased instances of stuttering in children undergoing therapy for delayed speech and language and in children of speech language pathologists. He tried to explain these factors in terms of his demands capacity model of stuttering, emphasizing the

excessive demands imposed on speaking resulting in breakdown in fluency. Bloodstein, 1981 reported approximately one-third of the children who stuttered to have delay in language acquisition. Merits Patterson and Reed, 1981 observed that children with delayed language were more disfluent if and only if they have been in therapy. It was suggested that the demands placed on the child with regard to the use of language leads to increased stuttering in them.

Based on numerous studies documenting the concomitant communication disorders in children who stutter, it appears that of all the speech language problems that co-occur with stuttering, articulation and/or phonological problems are the most common (Andrews and Harris, 1964; Van Riper, 1982). Louko, Edwards and Conture (1990) observed that a disproportionately high number of children who stutter exhibit concomitant problems, especially phonological problems, based on a study on thirty 4 year old children with stuttering. They suggested that young CWS exhibiting disordered phonology may represent a subgroup of stutterers and require a different nature and course of treatment.

There are various studies reporting delay or deviancy in speech and language development, including reading and writing in more than one third of CWS. Children with learning disability have been reported to have disfluencies, but, documentation of the disfluency characteristics of children with LD in the literature is limited at best. Phonological impairment is the most common speech problem that coexists with stuttering in children (Conture, 2001; Throneburg, Yairi, & Paden, 1994). Louko, Conture, and Edwards (1999) talked about management of children with stuttering and having concomitant language problems, and proposed that stuttering and a

concomitant phonological problem can and should be treated simultaneously. This is supported by data from Arndt and Healey (2001). They found that the majority of clinicians treating a fluency disorder and a concomitant phonological and/or language disorder used a blended approach in which both disorders were addressed simultaneously in the treatment program. Although the literature is unclear on whether the language skills of children who stutter are equivalent to their fluent peers (Yairi, Watkins, Ambrose, & Paden, 2001), most experts agree that children who stutter, as a group, don't exhibit gross language disorders (Guitar; 2006; Yairi, Watkins, Ambrose, & Paden, 2001)

Stuttering and Bi/Multilingualism

There has also been increasing interest in the stuttering characteristics seen to occur in bilingual individuals with stuttering. There are several issues while talking about stuttering and bilingualism, starting with the definition of the term *bilingualism.* This has been a subject of much debate. Bloomfield (1933) said that bilingualism resulted from the addition of a perfectly learned foreign language to one's own, undiminished native language and added that the definition of 'perfect' was relative. Weinreich (1953) on the other hand, defined bilingualism as the alternate use of two languages. The term bilingualism in its broadest sense refers 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). 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.

a. Prevalence of stuttering in mono/bilingual children: The belief that stuttering is more prevalent in bilinguals than in monolinguals seems to be widespread (Eisenson, 1984; Shames, 1989; Karniol, 1992). However, few studies have actually calculated the prevalence of stuttering in bilinguals and these studies date to the first half of the previous century. Travis, Johnson and Shover (1937) surveyed public schools in East Chicago. 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. A similar finding was reported by Stern (1948) who studied 1861 children in four schools in Johannesburg, South Africa. In monolingual children prevalence of stuttering was 1.66%, whereas, 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.

Karniol (1992), who reported stuttering in a Hebrew-English speaking child assumed 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, H. B.; Herbrich, K. E.; Hoyt, B.D. & Rosenfield, D. (1989) to account for it. Briefly this model proposes

that disfluencies reflect moments of instability in a multiloop 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 capacities to meet fluency demands. It could be assumed that, in the case of stuttering in bilingual children, using two languages places demands on them that exceed their capacities. However, differences in prevalence of stuttering between monolinguals and bilinguals cannot be attributed only to bilingualism. There are other factors which can play a role such as economic insecurity and emotional instability during the time when the child is acquiring a second language (Travis, et al 1937).

b. Age of acquisition of bilingualism, its proficiency and nature of the two languages: Depending on the age of exposure to two (or more) languages, bilinguals can be classified into early and late bilinguals. Seeman (1974) pointed out that in early bilingualism; there is a higher risk for stuttering to arise. Au-Yeung, Howell, Davis, Charles and Sackin (2000) conducted a survey on 794 individuals to obtain more information about the occurrence of stuttering in monolinguals and bilinguals and, also to study the relationship between age of language acquisition and stuttering. The survey was conducted mainly through the internet. Paper versions of the test were also used when requested by the respondents. The respondents were required to a fill a questionnaire (in English) which included questions regarding personal

information, e.g. gender, date of birth, ethnic background, occupational background, educational level etc. Information on various aspects of language usage was also collected, for example, the age of onset and self-reported proficiency level of L1 and L2 (if applicable). The proportion of language usage in L1 and L2 and the environment under which they were used were also recorded. Details of parental language usage were also asked for. Finally, any language disorder and details of it and family history of language disorder were also recorded. Results reported that no significant difference in frequency of stutterers between bilingual and monolingual speakers for either the male or female population. Also, it was seen that "middle bilinguals" (those who started second language acquisition between ages 7 and 12 years) stuttered less often than did "early" or "late" bilinguals. 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.

Interestingly, stuttering onset 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 great deal of controversy in literature on second language acquisition in adults and children, that is, whether it is same or different (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. Kim et al (1997) hypothesized that once cortical representations of languages are formed by exposure in early 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 interesting. It can be hypothesized 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 second language. However, age of acquisition may not be the only determinant of the cortical representation of a second language. Perani, Paulesu, Galles, Dupoux, Dehaene, Bettardini, Cappa, Fazio, and Mehler (1998) studied Italian-English bilinguals using positron emission tomography (PET). The authors concluded that proficiency may be more important than age of acquisition in determining the cortical representation of a second language.

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 stuttering in bilingual children with a predisposition to stuttering. Based on the finding that monolingual PWS often mix two synonymous words or phrases, it was hypothesized that speech production is impeded in CWS, because they find it difficult to select only one of the two equivalent linguistic items crossing their mind. This difficulty would be increased when two languages are used quasisimultaneously.

c. Effect of similarities and differences between the two languages on stuttering:

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 may produce more confusion and therefore more disfluencies than more different pairs. However, it could also be that non-related pairs demand more resources in learning two different lexical and syntactic systems and cause more disfluencies 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 direction the effect, would support the linkage of bilingualism to the occurrence of stuttering. Unfortunately, there are no studies in this direction.

d. Manifestation of stuttering in the two languages in bilingual speakers:

Evangeline Nwokah (1988) spoke about three theoretical possibilities to explain the manifestation of stuttering in bilinguals. One possibility is that *stuttering occurs in one language but not the other*. Nwokah suspected that this would be unusual, and that if such persons exist, they may be bilingual persons who are far more dominant in one language than the other. Nwokah analyzed the stuttering behavior of sixteen high school-educated PWS, between the ages of 16 and 40 years in Anambra State, Nigeria (balanced bilinguals). Samples of reading aloud (300 word passage) and conversation were analyzed. It was seen that there was no overall difference in the amount of stuttering in either Igbo or English in both reading and spontaneous speech. The only significant results were more blocks per 100 words in English than

Igbo in the reading, and a lower number of words per minute in reading in Igbo, that is, none of the subjects stuttered in one language only. 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 is not clear. All four subjects were quite proficient in Spanish and English, but none of them exhibited disfluent speech while speaking in English. While speaking in Spanish, however, varying degrees of disfluencies were observed. According to Dale, sociological and cultural factors played a major role in the development of this pattern. Dale assumed that the 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 disfluencies. These were identified as stuttering by their parents. These findings confirm Nwokah's assumption that language specific stuttering occurs in association with unbalanced language proficiency.

The second possibility is that ***stuttering occurs in both languages: the same–hypothesis***. When a bilingual person stutters, it is far more common that he or she stutters in both languages. In accordance with this hypothesis, a study done by Van Riper showed that some individuals seem to show a similar speaking pattern in both languages. 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. But, 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). Therefore the case described by Lebrun et al (1990) should be considered in light of this. This view would tend to be found among etiological theories, which place an emphasis on a behavioral approach focusing on the speech itself (Goldiamond 1965, Mysak 1960). If stuttering is regarded as a reinforced pattern of disfluent speech that can be changed by breath management skills and teaching correct voicing and articulation, i.e., learning a new speech pattern, then differences between languages might not be expected, and the client could apply a particular technique to any language. Jayaram (1977) analyzed the speech of two bilingual speakers in Kannada and English and found similar amounts of stuttering in each language, but differences in speech rate (words per minute); the speech rate in reading and spontaneous speech was slower in Kannada than in English.

The third hypothesis was **that *stuttering occurs in both languages: the difference hypothesis*.** This hypothesis arises from two main bases. One is a concern with the social-psychological situation of PWS (Krause, 1982) and personal concepts and attitudes (Fransella, 1972). Here, even if stuttering is viewed as a learned behavior, it is quite likely to vary in the different languages. This will depend on where, when, and to whom the languages are usually spoken by the PWS and personal attitudes to and experiences with the languages. Another factor may also be the perceived social status of the languages within the community. A different reason for a dissimilarity of stuttering might be the actual linguistic structure of the two languages. A number of authors have reported cases that are consistent with this hypothesis; including Nwokah herself i.e. bilingual PWS who are dysfluent in both

languages more often show different patterns in one language than the other. In the study done by Nwokah, results showed that all but one subject stuttered more in one language than the other in both spontaneous speech and reading. The subjects reported having problems with certain sounds. An analysis was therefore made, comparing Igbo and English to see on which phonemes most stuttering occurred and to test the hypothesis that stuttering varies from one language to another. Analysis showed that stuttering occurred more frequently on initial consonants than vowels in English whereas in Igbo it was the opposite pattern that was seen. All the PWS in the study were aware of which language they stuttered the most. Subjects' explanations for the imbalance in severity of their stuttering behaviour 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. Nwokah referred 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, socio-psychological aspects appeared to play an important role. Nwokah reported a trend for subjects to stutter

most in the language with which they had more negative experiences at school or at home.

A case reported by Shenker et al (1998) seems to confirm this possibility. They studied the impact of bilingualism on developing fluency in an English-French speaking pre-school age child. Observations of the child'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 child's spontaneous speech samples revealed more stuttering like disfluencies in English than in French (13.51% and 9.89% respectively). More word repetitions were noted in French and more part-word repetitions were noted in English, but this reflected the child'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.

Bernstein-Ratner and Benitez (1985) in a case study of one bilingual CWS showed that although "C" did not believe himself to be more or less fluent in either language, he was almost twice as disfluent in English as in Spanish in spontaneous speech. Howell et al (1999) compared the patterns of stuttering in Spanish monolinguals and Spanish/English bilinguals, who had Spanish as their dominant language (imbalanced bilinguals). Samples of spontaneous speech (conversation with the clinician) and monologue were analyzed. Stuttering rates on function and content words in the two languages of a bilingual speaker were examined. Results showed that the absolute stuttering rates were higher overall in Spanish. Also, the differences in percentages of words stuttered across function and content words were higher for

monologues than in conversation for both languages. Most importantly, for both types of material, there is less of a difference between function and content word stuttering in Spanish than for corresponding material in English.

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. 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 disfluent in Afrikaans as in English. Moreover his disfluencies were predominantly more typical than atypical in Afrikaans than in English. The subject was more proficient and stuttered less in his predominant language, leading authors to believe that his language proficiency and dysfluent behaviour were interrelated and that his language ability influenced the distribution, frequency and nature of his disfluencies.

In the Indian context, Jayaram (1983) studied ten bilingual male PWS, aged 19 – 32 years (mean age 25.6 years) who knew both English and Kannada 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 English, particularly in spontaneous speech, though this difference may not have been statistically significant. This study suggests that some bilingual PWS may differ in the severity of their stuttering in both the languages, but not in the pattern or distribution of

stuttering. More recently Sneha, Shruthi and Geetha (2008) studied the pattern of distribution of stuttering in 10 adult bilingual PWS. The results of the study indicate that there is no significant difference in stuttering in the two languages used by bilinguals with regard to severity and percentage of SLDs and NDs, although there were individual variations with regard to different speaking conditions.

From the various studies done, it can be seen that there is disparity in the findings reported in the studies of bilingual PWS. Thus, it calls for further research in this area. India being a multilingual country where majority of the population speaks more than one language and most school going children are exposed to at least three languages by the middle school and beyond, it is important especially in this context to study about stuttering in relation to bilingualism. Also the few studies that have been done in Indian context have mostly been comparisons between monolinguals and bilinguals and have not focused on comparing aspects of stuttering between the languages that a PWS speaks. Further, Kannada, one of the Dravidian languages spoken in Karnataka is a syllabic language and quite different from English and hence studying the pattern of distribution of stuttering in the two languages may throw more light on the nature of this intriguing disorder of speech.

CHAPTER III
METHOD

The study was carried out in two parts. In the first part materials required for the collection of data to answer the research questions were compiled and a pilot study was done to check for the utility of the same and to ascertain the appropriateness of the procedure. Although it was aimed to take the audiovisual samples for data collection initially, due to some technical problems it could not be done and only audio recordings of all samples were obtained. The detailed procedure used for the study is as follows:

Participants

Twelve adult males in the ages of 16-40 years diagnosed as having stuttering by speech language pathologists were taken as the subjects for the study. The subjects were selected on the basis of language proficiency in Kannada and English languages. The subjects were required to have roughly equal proficiency in both the languages. The proficiency in both languages was compared based on the subjects' educational history as well as their ratings in the questionnaire. The participants were proficient in speaking, reading and writing in both languages and had studied them for at least 8-10 years in school. A modified version of the International Second Language Proficiency Rating (Elaine Wylie and David Ingram, 1978) was also used to assess proficiency in English language. The descriptive categories in ISLPR were simplified into four sections, namely speaking, listening, writing and reading. A four point rating scale was given and the subjects had to rate their abilities in each of the four categories. The

criteria for selection of subjects were a rating of 2 or 3 in all the four criteria. (The Questionnaire is given in appendix II). Also, it was ensured that the subjects had no other associated speech, language and hearing problems.

Materials Used

The test materials used in the study included:

> Questionnaire for obtaining general information and subjects' perceptual rating.

> International Second Language Proficiency Rating (Elaine Wylie and David Ingram, 1978)

> Stuttering Severity Instrument – 3 (Riley, 1994)

> Rainbow passage

> 300 word Passage in Kannada (Savithri and Jayram, 2004)

> A set of questions for eliciting conversational sample (common for all subjects)

Procedure:

Initially, each subject was interviewed to elicit details about their problem and asked to complete a questionnaire for general information. This included questions regarding their disfluencies, age of onset, which language they stutter the most while speaking and reading, subject's perceptual rating of severity specific to tasks, details regarding therapy, language preference for therapy etc (the questionnaire is given in appendix I).

A modified version of the International Second Language Proficiency Rating (Elaine Wylie and David Ingram, 1978) was also used to assess proficiency in English language based on which subjects were selected for the study.

Reading samples (Rainbow passage for English and 300 words standard passage in Kannada), conversation samples (a set of common questions) and narration samples (regarding what they normally do in a day) were audio recorded using Wavesurfer software. Broad transcription and analysis of the samples were done and the following parameters were analyzed in both the languages:

    i. Severity of stuttering in general as well as particular to each of the three tasks of reading, conversation and monologue

    ii. Patterns of disfluencies (stuttering like disfluencies and normal disfluencies) and

    iii. Rate of speech in the above tasks.

After a gap of two weeks the entire testing was carried out again on two randomly selected clients to check for intra-tester reliability. Two randomly selected samples were also separately rated by a qualified professional to check for inter-tester reliability.

Scoring:

Severity of stuttering for each subject was calculated as per SSI norms. Severity of stuttering for individual tasks was done by doubling the score obtained for the particular task and then SSI-3 criteria were used to obtain the severity rating. The

doubling of the score was done based on the scores used for children (in SSI), where only one task, that is, a picture description task is used for calculating severity. Here, the scores are double that of a single task used for calculating severity scores in older children and adults (including job task and reading task).

Rate of speech was calculated for L1 and L2 as number of syllables uttered per minute. The disfluent utterances were omitted from the sample while calculating rate of speech. Other measures were noted, such as frequency of stuttering like disfluencies, frequency of normal disfluencies, pattern of distribution and phonemes on which stuttering occurred most in both Kannada and English languages. Syllable repetitions, prolongations and blocks were considered as stuttering like disfluencies whereas hesitations, interjections, pauses, revisions etc were considered as normal disfluencies. Secondary behaviors, if any, shown by the subjects were also noted. Comparison of results were made between L1 and L2 for subjects with regard to severity of stuttering in general and across each task, type of disfluencies, subjects' perceived ratings of severity and objective measures of severity.

The results of the study were analyzed using suitable statistical measures and discussed accordingly.

CHAPTER IV

RESULTS AND DISCUSSION

Speech samples collected for three tasks of conversation, narration and reading in Kannada (L1) and English (L2) languages were transcribed and analyzed using SPSS software. Analysis of results was done for frequency, type and pattern of distribution of disfluencies as well as severity based on SSI-3. Severity was obtained for individual tasks as well as in general. Results obtained were as follows.

1. Severity of Stuttering:

a. Overall severity of stuttering

The severity of stuttering (not specific to task), calculated as per SSI norms was compared between Kannada and English speaking bilingual persons with stuttering is shown in the graph below.
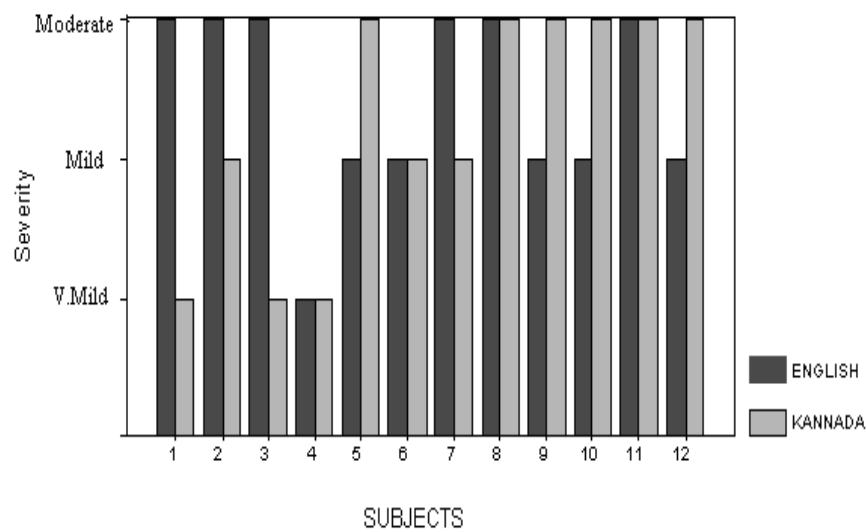
Graph 1: Overall severity of stuttering in Kannada and English languages

From the graph it can be seen that four of the twelve subjects (33%) had greater severity of stuttering in Kannada (L1) as compared to English (L2) and four subjects had greater degree of severity in English (L2) as compared to Kannada (L1). An equal number of subjects had the same degree of severity in the two languages. Thus, no consistent pattern of degree of severity in either L1 (Kannada) or L2 (English) was seen. This is in consensus with the nature of stuttering, a disorder of high inter and intra individual variability. These findings refute the results obtained by Nwokah (1988), where they found that bilingual PWS are likely to stutter more in one language than the other. The graph shows subjects having same degree of stuttering in L1 and L2 as well as subjects with greater degree of stuttering in both L1 and L2 (four subjects each). Nwokah's (1988) study also suggested that the imbalance in stuttering in the two languages may not always be noticeable to the listener. But, on the contrary, in the present study, eleven out of the twelve subjects reported to have more stuttering in Kannada (L1), even though this was not reflected in the results. The perception of increased stuttering in Kannada may be due to factors such as age of acquisition and frequency of usage of Kannada, as well as feedback from peers. That is, Kannada was the mother tongue for all the subjects and English was acquired much later. So, the onset of stuttering which occurred in early childhood might have resulted in more conditioned fear and stabilized patterns of stuttering in Kannada before the second language was acquired.

b. Comparison of severity across speaking tasks: A comparison of severity of stuttering in both languages (Kannada and English), specific to tasks (conversation, narration and reading tasks) was also done.

i. Conversation: In conversation task, nine out of twelve (75%) subjects had the same degree of severity in both Kannada and English languages. The other three subjects (25%) had greater degree of severity in Kannada (L1) language.
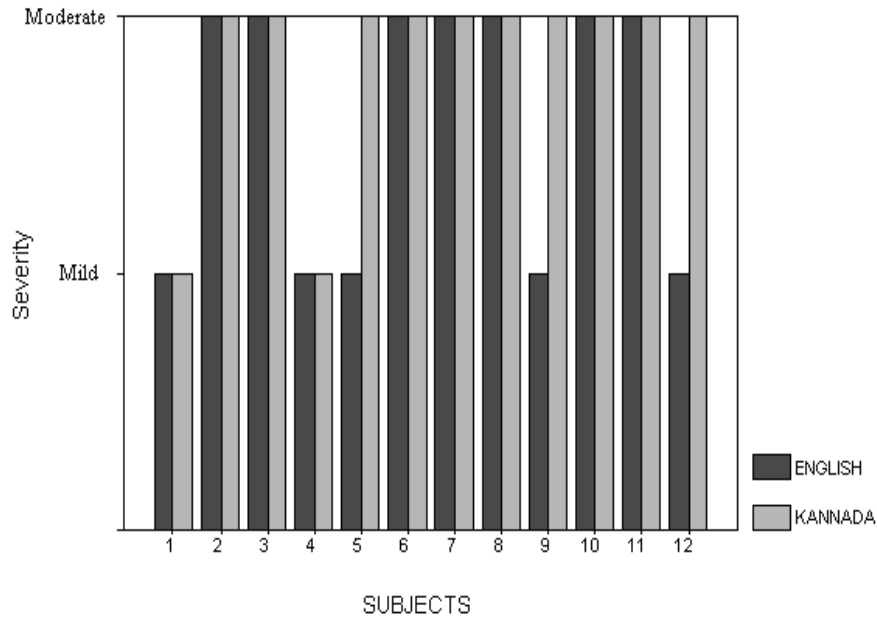
Graph 2: Severity of stuttering in Kannada and English languages – conversation task.

ii. Narration: In narration task, eight subjects (66.7%) had the same degree of severity in Kannada and English languages, three subjects (25%) showed greater degree of stuttering in Kannada, and one subject (8.3%) had greater severity of stuttering in English.
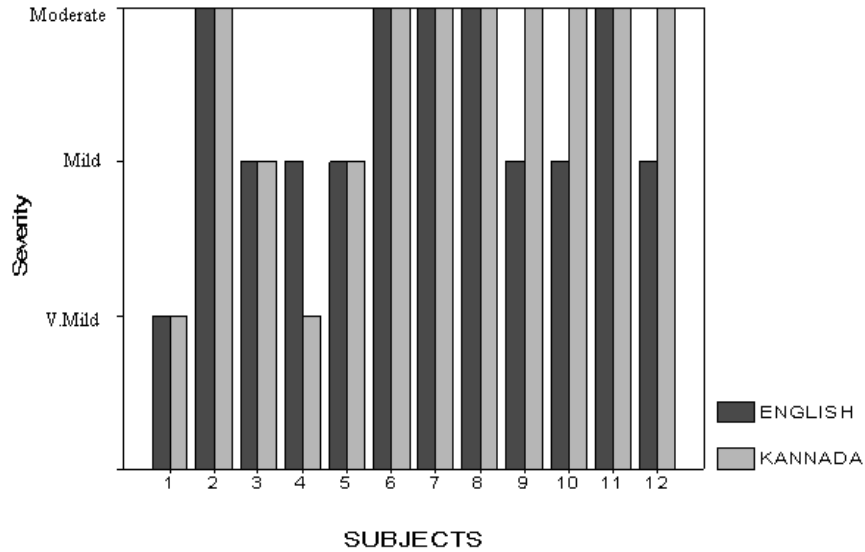
Graph 3: Severity of stuttering in Kannada and English languages – narration task

iii. Reading: In reading task, six subjects (50%) had same degree of severity in Kannada and English languages, four subjects (33.3%) showed greater degree of stuttering in Kannada, and two subjects (16.67%) had greater severity of stuttering in English.
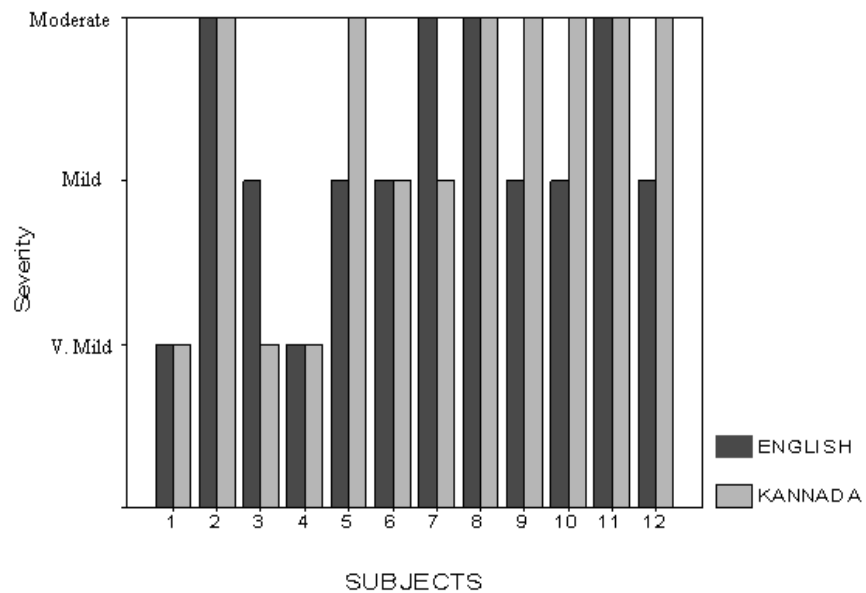
Graph 4: Severity of stuttering in Kannada and English languages – reading task.

Thus, taking into consideration all the three tasks, it can be observed that more than fifty percent of the subjects showed no difference in the degree of stuttering severity in Kannada (L1) and English (L2) languages. Among the remaining subjects, there were more number of subjects having greater degree of severity in Kannada (L1) than in English (L2).

The comparison of degree of severity between Kannada (L1) and English (L2) appears to be similar across the three tasks, with most subjects showing similar degree of stuttering in both languages, few subjects with more stuttering in Kannada (L1) and very few subjects with greater degree of stuttering in English (L2). Therefore, it can probably be said that there is no significant interaction between language and task with regard to stuttering severity. But it can be seen that in conversation task severity of stuttering varied from mild to moderate degree, whereas in narration and reading tasks the degree of stuttering varied from very mild to moderate. This difference in severity of stuttering across tasks (not specific to language) is in accordance with Nwokah's (1988) study which reported a difference in stuttering between spontaneous speech and reading tasks. This confirms that assessment and management should take into consideration different speaking conditions.

2. Rate:

Two-way repeated measures ANOVA was done to compare the rate of speech between L1 (Kannada) and L2 (English), across speech tasks (conversation, narration and reading), in bilingual individuals with stuttering. Significant difference was seen

between languages, within each task (F [1, 11] = 17.347, p<0.05). No significant difference was seen across the different tasks within languages.

Paired T-Test revealed that there was significant difference between Kannada and English languages for all the three tasks at 0.05 level of significance.

Table 1: Mean and Standard Deviation (SD) scores for rate of speech.

Language	Task	Mean Rate (SPM)	SD
English	Conversation	195.4167	30.9030
	Narration	200.4167	36.4753
	Reading	204.6667	29.9768
Kannada	Conversation	212.9167	32.1572
	Narration	217.1667	29.9328
	Reading	225.3333	33.3367

Rate was found to be significantly higher in Kannada (L1) than in English (L2), for all the three tasks. This result supports the study by Jayaram (1977), who also reported higher rate of speech in Kannada as compared to English. The higher rate of speech may be due to increased familiarity with the language or it may be due to the inherent characteristics of languages, such as Kannada being a syllable-timed language, whereas English is a stress-timed language. Higher rate of speech may also be a consequence of anticipation of stuttering and a desire to avoid the same. Thus, this reflects a difference in processing between the two languages, which may have an effect on the fluency of an individual in a particular language. Also, languages differ in their syllabic 'proclivities' (Kannada has more multi-syllabic common nouns than

English.) and hence rate calculated in percentage stuttered syllables may not look equivalent across two language samples.

3. Frequency and types of disfluencies:

Three-way repeated measures ANOVA was done to compare stuttering like disfluencies (SLD's) and normal disfluencies (ND's) between Kannada (L1) and English (L2) languages across conversation, narration and reading tasks. Significant difference was seen across tasks (F [2, 22] = 41.507, p<0.005) and between disfuencies (F [1, 11] = 4.846, p<0.005). Also significant interaction between language and disfluencies was seen (F [1, 11] = 12.488, p<0.005). But, no significant interaction across tasks and language, tasks and disfluencies and language, task and disfluencies were obtained. Bonferroni's pair-wise comparison for tasks revealed significant difference between all the three pairs of tasks, that is, between conversation and narration, narration and reading, and conversation and reading, at 0.05 level of confidence.

a. Comparison of SLDs and NDs in English and Kannada languages

Two- way repeated measures ANOVA was done to compare stuttering like disfluencies across the different tasks within English language. Significant difference was seen across the tasks (F [2, 22] = 35.575, p<0.005). Bonferroni's pair-wise comparison revealed that there was a significant difference in stuttering like disfluencies between all three pairs, that is, conversation and narration, narration and reading, and conversation and reading, in English language.

Looking at mean scores, it can be seen that the frequency of SLDs is highest in conversation and lowest in reading task. This implies differences in frequency of disfluencies across tasks.

Table 2: Mean Frequency and Standard Deviation of SLDs in English language.

Language	Task	Mean Frequency	SD
English	Conversation	15.75	4.6734
	Narration	11.5833	4.1442
	Reading	7.5	4.3797

Two- way repeated measures ANOVA was done to compare stuttering like disfluencies across the different tasks within Kannada language. Significant difference was seen across the tasks (F [2, 22] = 9.178, p<0.005). Bonferroni's pair-wise comparison revealed that there was a significant difference in stuttering like disfluencies between conversation and reading, and narration and reading, in Kannada.

Table 3: Mean Frequency and Standard Deviation of SLDs in Kannada.

Language	Task	Mean Frequency	SD
Kannada	Conversation	18.1667	4.4073
	Narration	15.4167	7.2420
	Reading	12.833	6.4644

Mean scores again show a similar pattern in Kannada language as seen in English with highest frequency of SLDs occurring in conversation task and lowest in reading. But, there is no significant difference between conversation and narration tasks.

Two- way repeated measures ANOVA was done to compare normal disfluencies across the different tasks within English language. Significant difference was seen across the tasks (F [2, 22] = 18.207, p<0.005). Bonferroni's pair-wise comparison revealed that there was a significant difference in stuttering like disfluencies between conversation and reading, and narration and reading, in English.

Table 4: Mean Frequency and Standard Deviation of NDs in English.

Language	Task	Mean Frequency	SD
English	Conversation	13.25	4.3927
	Narration	11.6667	6.6104
	Reading	4.75	2.7010

The mean scores of frequency of occurrence of SLD follows the same pattern with conversation task having highest frequency and reading task having the lowest.

Two- way repeated measures ANOVA was done to compare normal disfluencies across the different tasks within Kannada language. Significant difference was seen across the tasks (F [2, 22] = 16.517, p<0.005). Bonferroni's pair-wise comparison revealed that there was a significant difference in normal disfluencies between conversation and reading, and conversation and narration, in Kannada. The

mean scores shows higher frequency of SLDs in conversation task and lowest in reading task.

Table 5: Mean Frequency and Standard Deviation of NDs in Kannada

Language	Task	Mean Frequency	SD
Kannada	Conversation	13.4167	3.7285
	Narration	9.5833	4.4611
	Reading	7.5833	4.2950

Thus, SLDs and NDs show significant differences across tasks in Kannada as well as English languages. Not many previous studies have been done on frequency of stuttering across different tasks. Stuttering like disfluencies (SLDs) and normal disfluencies (NDs) were found to be higher in conversation task followed by narration and then, reading tasks. This may be related to the differences in the type and coordination of cognitive processes such as retrieval, organization and sequencing involved in the tasks. A proper coordination of all these processes with the motor act of producing speech is important for fluent speech production. In reading task, the above mentioned processes are taxed to a lesser extent as compared to conversation or narration task. In narration task, the individual usually speaks about a series of related events or occurrences, centered on a common theme, whereas, during conversation there are two or more communication partners and hence the control on the flow of conversation is different. It can be speculated that these reasons result in differences in the frequency of stuttering across different tasks. The subjects also reported higher degree of stuttering in conversation and narration tasks as compared to reading tasks.

b. Comparison of SLDs and NDs between English and Kannada languages

Paired T test was done to compare the dysfluency types (SLD's and ND's) between Kannada and English for each of the task. Results revealed that there was significant difference in stuttering like disfluencies (t [11] = 4.182, p<.005) as well as in normal disfluencies (t[11] = 2.927, p<.005) between Kannada and English, for the reading task.

The frequency of SLDs and NDs being significantly less in English as compared to Kannada, may be due to increased familiarity with reading English material. This can be attributed to the educational system, English being the medium of instruction. Whereas, language may not have an effect on speech tasks as reflected in the graphs depicting severity of stuttering in different tasks

c. Comparison of types of SLDs between Kannada and English:

A comparison of the different types of stuttering like disfluencies between Kannada and English languages was also done.
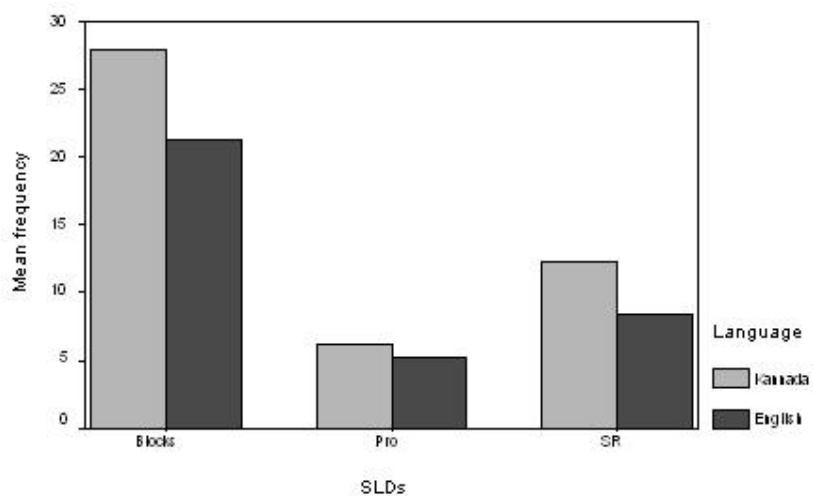
Graph 5: Frequency of different types of SLD's in Kannada and English

The graph 5 above shows that frequency of blocks, prolongations and syllable repetitions (types of SLD's) is more in Kannada when compared with English (considering the three tasks). But Paired T test revealed significant difference only in block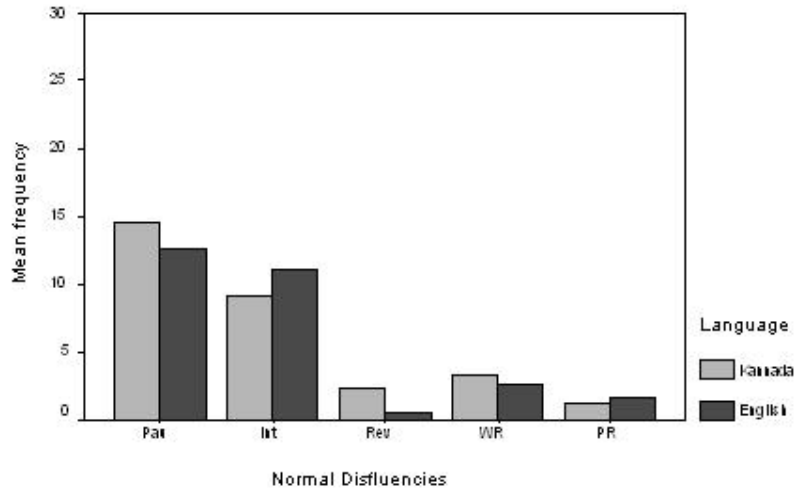s between Kannada and English (t [11] = 2.377, p<.005). From the graph it can be observed that blocks were the most commonly occurring stuttering like dysfluency. The finding that blocks are significantly higher in Kannada than English supports the perception of subjects that they had greater degrees of stuttering in Kannada. This finding is relevant, especially from the point of view that this difference was not reflected when overall severity was compared between Kannada and English (Graph 1). This may be due to the fact that severity obtained based on SSI-3 also takes into account durational aspects of disfluencies and secondary behaviors in addition to frequency of disfluencies. This finding supports the results obtained by Shenker et al (1998), who studied the impact of bilingualism on developing fluency in an English-French speaking pre-school age child. A disfluency analysis of transcripts of the child's spontaneous speech samples revealed more stuttering like disfluencies in English than in French. This finding has great implications in terms of assessment and management of bilingual persons with stuttering.

d. Comparison of types of NDs between Kannada and English:

Different types of normal disfluencies were also compared between Kannada and English languages.

Graph 6: Frequency of different types of ND's: between Kannada and English.

The graph shows that frequency of pauses, revisions and word repetitions (types of ND's) is higher in Kannada when compared with English, whereas, a higher frequency of interjections and phrase repetitions are seen in English (considering the three tasks). But, no significant difference was revealed in Paired T test. Thus, it shows that normal disfluencies are not specific to languages in bilingual persons with stuttering.

e. Objective and Subjective Ratings of Severity:

Kappa coefficient was calculated to check for the agreement between the degrees of severity of stuttering obtained based on SSI-3 scores and perceptual rating of severity by the subjects. The coefficients obtained are given below.

Table 6: Comparison of SSI-3 and perceptual self ratings of severity

Language	Variable	Kappa coefficient	Agreement
English	Conversation	22%	Low
	Narration	9.6%	Very Low
	Reading	34.7%	Low
	General	56.6%	Moderate
Kannada	Conversation	0%	Nil
	Narration	2.1%	Very Low
	Reading	7.1%	Very Low
	General	5.8%	Very Low

The agreement between severity rating on SSI-3 and perceptual rating by the subjects is relatively better (moderate agreement) in English, in the general severity scoring, that is, not specific to tasks. There is low or no agreement in the remaining severity ratings. The agreement is particularly low in Kannada severity ratings. Most of the subjects reported having greater degree of stuttering in Kannada as compared to English (which may be attributed to factors such as early age of acquisition and frequency of usage). The questionnaire provided to the subjects for self ratings on stuttering severity in each language and specific to tasks had three options: mild, moderate and severe. Thus, in order to make a distinction between their degrees of stuttering in both the languages, they may have rated their severity in Kannada at a higher degree than English. But this may not have correlated with the SSI-3 scorings owing to the range of scores pertaining to each severity level. This may be the reason for particularly low agreement between SSI-3 severity ratings and perceptual ratings by the subjects. This finding refutes the results obtained in the study done by Sneha, Shruthi and Geetha (2008), where it was seen that the severity of stuttering according to the subject's assessment correlated with the with the SSI results except in four clients

Test Re-test Reliability

Stuttering being a variable disorder, re-testing of two randomly selected subjects (second and ninth subject) was done two weeks after the initial testing. The sample obtained on the re-test was analyzed and severity rating was done for each task in both Kannada and English languages. The numerical scores obtained on SSI-3 varied, but, the degree of severity was the same as that of the initial testing for both conversation and narration tasks. Slight differences in reading task was seen, which may be attributed to adaptation effects.

To summarize, stuttering occurred in both L1 (Kannada) and L2 (English) in all the subjects, but no consistent pattern with respect to degree of stuttering in both languages was observed. However, analysis of the stuttering like disfluencies showed significantly higher frequency of blocks in Kannada, the first language of the subjects. The other types of stuttering like disfluencies, such as syllable repetitions and prolongations were also seen to be occurring in higher frequency in Kannada, though not statistically significant. This finding has relevant implications in bilingual persons with stuttering in terms of assessment and management of stuttering. Considering stuttering variability across tasks, it was seen that there was significant differences between speech tasks and reading tasks which again stresses on assessment of stuttering severity in each of the tasks and also considering the same during management. However, no effect of language was seen on stuttering severity across different tasks. Finally, a comparison of the severity ratings obtained based on SSI-3 and subjects' perceptual ratings of severity revealed moderate agreement in English, in the general severity scoring, whereas, agreement was particularly low in Kannada severity ratings. Thus, the *first hypothesis* made in the study is refuted, that is,

persons with stuttering differ in their dysfluency characteristics. However, the study supports the **second hypothesis**, as no significant difference in severity between L1 and L2 were obtained. The difference probably lies in the fact that while considering severity based on SSI-3, duration and secondary behaviours are taken into consideration in addition to SLDs. The findings of this study refute the **third hypothesis** as no interaction between language and tasks were seen, but, within a language differences across tasks were seen to occur.

Stuttering and bilingualism is an area that has not been very widely studied. With over 50% of the world's population being estimated as bilingual and about one percent of the population being estimated as persons with stuttering, this study has implications in providing services to bilingual individual with stuttering. The findings of the study show the relevance of assessing a bi/multilingual individual with stuttering in the languages used or spoken, in order to provide more effective rehabilitative services to these individuals with stuttering. This study also highlights the importance of assessing occurrence of disfluencies specific to ask and also to focus on specific tasks in management. Apart from its clinical implication, this study also provides impetus in further research on the factors that act on stuttering in bilingual individuals. Thus, it opens up further avenues of research in the field of stuttering and bilingualism.

CHAPTER V

SUMMARY AND CONCLUSION

Stuttering is a disorder of high inter and intra individual variability and in spite of decades of research it remains a mystery with regards to its definition, characteristic features, its assessment and management. Linguistic factors have been considered relevant to stuttering especially since Brown (1938, 1945) demonstrated their strong influence on the occurrence of stuttering events or "moments of stuttering". Although it is widely known that language and stuttering are closely associated, nature of this association is not very well understood. The possible stuttering-language link has become a focus of scientific interest. Thus, in this context it becomes increasingly relevant to talk about bilingualism or multilingualism and its effect on stuttering.

Stuttering in bilinguals is an area that has not received much attention. Most of the "facts" about stuttering are derived from studies of monolingual speakers, virtually all of whom are English speakers. Authors have reported stuttering to be widespread in bilinguals as compared to monolinguals (Eisenson, 1984 and Karniol, 1992). Age of acquisition of the second language, language proficiency in languages known, inherent characteristics of the languages (stress pattern, syllable structure etc) are some of the important factors that are important in bi/multilingual persons with stuttering. India being a multilingual and multi-cultural (which are known to influence stuttering) country, where majority of the population speaks more than one language, it becomes important to study about stuttering in relation to bilingualism. Also, the few studies that have been done in Indian context have mostly been comparisons between monolinguals and bilinguals and have not focused on

comparing aspects of stuttering between the languages that a PWS speaks. Thus the objectives of this study were to study the differences in the disfluency characteristics between L1 and L2 as well as the differences in severity of stuttering in L1 and L2 in bilingual persons with stuttering. The study also aimed at studying differences in frequency and types of disfluencies with respect to speaking conditions such as reading, narration and conversation in L1 & L2.

The participants of the study included twelve adult males, in the age range of 16 - 40 years diagnosed as having stuttering by speech language pathologists. The subjects had roughly equal proficiency in both the languages. Initially, each subject was interviewed for a case history and asked to complete a questionnaire for general information which included questions regarding their disfluencies, age of onset, which language they stutter the most while speaking and reading, subject's perceptual rating of severity specific to tasks, details regarding therapy, language preference for therapy etc. A modified version of the International Second Language Proficiency Rating (Wylie and Elaine) was also used to assess proficiency in English language. Reading samples (rainbow passage for English and 300 word standard passage in Kannada), conversation samples (a set of common questions) and narration samples (regarding what they normally do in a day) were audio recorded, transcribed and analyzed. The following parameters were analyzed in both the languages: severity of stuttering in general as well as particular to each of the three tasks of reading, conversation and monologue, patterns of disfluencies, (stuttering like disfluencies and normal disfluencies) and rate of speech. After a gap of two weeks the entire testing was carried out again on two randomly selected clients to check for intra-tester reliability.

Analysis of the speech samples yielded the following results:

1. Stuttering was seen to occur in L1 (Kannada) and L2 (English) of the subjects, but, no consistent pattern of stuttering severity was obtained in either language.

2. Analysis of stuttering like disfluencies (SSR, prolongation and blocks) showed significantly higher frequency of blocks in Kannada, the first language of the subjects. The other types of stuttering like disfluencies, such as syllable repetitions and prolongations were also seen to be occurring in higher frequency in Kannada, though not statistically significant.

3. Though not revealed in the overall severity of stuttering, a pattern of greater occurrence of disfluencies in the first language of subjects (Kannada) was seen. This finding has relevant implications in bilingual persons with stuttering in terms of assessment and management of stuttering.

4. Considering stuttering variability across tasks, it was seen that there was significant differences in frequency of occurrence of disfluencies between speech tasks and reading tasks, which once again stresses on assessment of stuttering severity in each of the tasks and also consideration of the same during management. However, no effect of language was seen on stuttering severity across different tasks.

5. A comparison of the severity ratings obtained based on SSI-3 and subjects' perceptual ratings of severity revealed moderate agreement in English, in the general severity scoring, whereas, agreement was particularly low in Kannada severity ratings.

Thus, considering the results of the study, the ***first hypothesis*** is refuted, that is, persons with stuttering differ in their dysfluency characteristics. However, the study supports the ***second hypothesis***, as no significant difference in severity between L1 and L2 were obtained. The difference probably lies in the fact that while considering severity based on SSI-3, duration and secondary behaviors are taken into consideration in addition to SLDs. The findings of this study refute the ***third hypothesis*** as no interaction between language and tasks were seen, but, within a language differences across tasks were seen to occur.

Hence, the findings of this study put focus on the relevance of assessing a bi/multilingual individual with stuttering in the languages used or spoken, in order to provide more effective rehabilitative services to these individuals with stuttering. This study also highlights the importance of assessing disfluencies specific to task and also to focus on specific tasks in management. This study showing that there is a difference in stuttering in the two languages also opens up further avenues of research in the area of stuttering and bi/multilingualism.

Limitations of the study:

1. Due to paucity of time and non availability of subjects satisfying the criteria for inclusion, the subjects taken for the study is insufficient to draw any generalizations.

2. Although attempts were made to take subjects having proficiency in both L1 and L2, it could not be objectively assessed to draw comparisons across all subjects

3. As the number of subjects was less, comparisons could not be made across different subgroups of bilingual population such as simultaneous or successive group. This could have enabled us to answer some of the issues related to language mastery or proficiency related to stuttering.

4. Comparisons also could not be made with respect to different severity groups.

Future Research Directions:

The further avenues of research in the area of stuttering and bi/multilingualism can be:

1. Factors governing the differences seen in stuttering in languages, which would further prove useful in terms of counseling parents of bilingual children with stuttering, in terms of introducing a second language.

2. A comparison of bi/multi-lingual adults and children with stuttering and those with simultaneous acquisition of two or more languages may also prove useful in understanding the underlying factors.

3. Effect of similarities or differences between languages on stuttering can also be studied.

Hence, apart from its clinical implication, this study also provides thoughts for further research.

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APPENDIX I

Checklist for Assessment of Disfluencies in Bilingual PWS

Case name: Age/sex: Case no:

Provisional diagnosis: Education:

Mother tongue: Other languages known:

- Age of Onset:

- Family History: Yes/No

- Age of acquisition of Kannada:
  1-<3 years;   2- 3 to 6 years;   3 - 6 to10 years;   4 - >10 years

- Age of acquisition of English:
  1-<3 years;   2- 3 to 6 years;   3 - 6 to10 years;   4 - >10 years

- How frequently you use Kannada?
  1-25%;   2-50%;   3-75%;   4-100%

- How frequently you use English?
  1-25%;   2-50%;   3-75%;   4-100%

- How frequently you use other languages?
  1-25%;   2-50%;   3-75%;   4-100%

- How proficient are you in Kannada?
  1- poor;   2-average;   3-good;   4- v. good

- How proficient are you in English?
  1- poor;   2-average;   3-good;   4- v. good

- How proficient are you in other language/s?

 1- poor;   2-average;   3-good;   4- v. good

- Sound specificity in stuttering: Yes/No

    If yes, specify: In Kannada-   In English-   In other languages-

- Earlier history of therapy: Yes/No   If yes, specify:
- Duration of therapy:

    1) < 3 months;   2) 3 to 6 months;   3) 6 to12 months;   4) > 12 months

- Language preference for therapy:
    1 - Kannada;   2 - English;   3 – Both

How do you rate your stuttering in the following situations? Please answer the following statements on a four point scale as:
1-Nil;   2-Mild;   3-Moderate;   4-Severe

1. How much stuttering do you experience while speaking in Kannada?

                    1   2   3   4

2. How much stuttering do you experience while speaking in English?

                    1   2   3   4

3. How much stuttering do you experience while speaking in other language?

                    1   2   3   4

4. How much stuttering do you experience while reading in Kannada?

                    1   2   3   4

5. How much stuttering do you experience while reading in English?

                    1   2   3   4

6. How much stuttering do you experience while reading in other language?

                    1   2   3   4

7. With treatment did your stuttering:

    1-increase;   2- decrease;   3-remain same?

8. Did the treatment benefit seen in:

1-only Kannada;   2-only English   3-both languages

APPENDIX II

INTERNATIONAL SECOND LANGUAGE PROFICIENCY RATING (ISLPR)

I. Speaking		**0**	**1**	**2**	**3**
II. Listening		**0**	**1**	**2**	**3**
III. Writing		**0**	**1**	**2**	**3**
IV. Reading		**0**	**1**	**2**	**3**

0 - Zero Proficiency- Unable to function in and comprehend the language (in all four categories)

1 - Limited proficiency- Able to operate in a limited capacity within predictable areas of need and able to satisfy basic survival needs (in all four categories).

2 -Vocational proficiency- Able to comprehend and use the language fluently and accurately on all levels normally pertinent to personal, social, academic or vocational needs (in all four categories).

3 - Native like proficiency- Speaking, understanding, reading and writing proficiency equivalent to that of a native speaker of the same socio-cultural variety.