

Treatment Effectiveness for School Age Children Who Stutter

Efficacité du traitement d'enfants bégues d'âge scolaire

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Abstract

A single-participant design was used to assess treatment efficacy for five school-aged children who stutter, three experimental (one with a concomitant phonological delay) and two, no-treatment comparison participants. Outcome measures included speech samples, parent interviews, visual analogue rating scales completed by naïve judges, and attitude and self-esteem tests. Attitudes were defined as thoughts and feelings about stuttering as measured by the Communication Attitude Test-Revised (CAT-R). Self-esteem was defined as the evaluative notions one holds about oneself as measured by the Culture-Free Self-Esteem Inventory (CFSEI). Posttherapy and follow-up measures indicated that experimental participants' fluency and speech attitudes improved moderately compared to participants who did not receive treatment. Issues surrounding treatment efficacy for children who stutter (CWS) severely and CWS with concomitant phonological delays are discussed.

Abrégé

Un modèle de participant unique a été utilisé pour évaluer l'efficacité du traitement de cinq enfants bégues d'âge scolaire, trois expérimentaux (dont un ayant un retard phonologique concomitant) et deux participants ne faisant l'objet d'aucun traitement, pour fins de comparaison. Les mesures de résultats ont compris des échantillons de la parole, des entrevues avec les parents, des échelles visuelles et analogiques d'évaluation effectuées par des juges novices et des épreuves d'attitude et d'estime de soi. Les attitudes ont été définies comme étant les pensées et les sentiments sur le bégaiement, tels que mesurés par le *Communication Attitude Test-Revised (CAT-R)*. On a défini l'estime de soi comme étant les notions évaluatives qu'une personne maintient à son propre égard, mesurées par le *Culture-Free Self-Esteem Inventory (CFSEI)*. Des mesures post-thérapie et lors de suivis ont indiqué que la fluidité et les attitudes de la parole des participants expérimentaux se sont améliorées de manière modérée comparativement à celles des participants qui n'ont reçu aucun traitement. Les questions entourant l'efficacité du traitement pour les enfants bégues graves et ceux ayant des retards phonologiques concomitants sont examinées.

Key words: treatment, cognitive therapy, phonological delay, stuttering, school age, children, Culture-Free Self-Esteem Inventory, Communication Attitudes Test-Revised

Stuttering may permeate children who stutters' (CWS) entire lives and become the nucleus around which they focus their existence. Timely treatment can greatly improve the communication abilities of a CWS and meaningfully affect all facets of the child's personal and social life (Conture, 1996). Stuttering is a prevalent and potentially disabling disorder. Andrews and Harris (1964) reported that 50% of children who reported having stuttered at one time recovered by age six and 67% had spontaneously

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recovered by age 14. In his review of the research literature, Cooper (1972) found that 83% of children who stuttered at one time had spontaneously recovered by age eight and 94% had recovered by age ten. These researchers proposed that recovery is a gradual process that could occur at any age and needed to be taken into account in research methodology when investigating the effectiveness treatment.

Research has demonstrated a high success rate for stuttering treatment programs. A meta-analysis of 42 different types of stuttering therapy programs for 756 people who stuttered performed by Andrew, Guitar, and Howie (1980) found that stuttering treatment was clearly effective. The average treated person who stuttered was more fluent speaking than 90% of his untreated fellows, a significant and meaningful gain. Costello-Ingham and Riley (1998) reviewed 11 studies of various treatment types and found that 67% of the 42 children who stuttered were treated successfully compared to the 43% of historical controls who recovered.

The success of *intensive* stuttering treatment programs is a topic of considerable controversy. Advocates of intensive designs (therapies involving a focused period of intervention when external influences are minimized) provide evidence that success is good for many intensive and semi-intensive-type programs for adults and children (Andrews et al., 1980; Ryan & Van Kirk Ryan, 1983; Ward, 1992). Although research indicates that intensive treatment is effective in the short term, many researchers concur that one of the most notable concerns about the effectiveness of intensive stuttering treatment programs is the conflicting evidence regarding its long-term effectiveness (Cooper, 1986; Gregory, 1980; Perkins, Rudas, Johnson, Michael, & Curlee, 1974).

The failure to deal with cognitive aspects of stuttering and attitudes toward speaking in children and adults who stutter has been cited as a reason for poor maintenance of fluency data reported for some intensive programs (Craig & Andrews, 1985; Sheehan, 1970). Many clinical researchers have realized the importance of attitude change in the long-term maintenance of fluency (Watson, 1988). Researchers have suggested that negative speech attitudes not addressed in therapy may cause people who stutter to relapse after positive speech behaviour gains were made in therapy (Andrews & Cutler, 1974; Lawson, Pring, & Fawcus, 1993). Guitar and Bass (1978) found the percentage of participants who relapsed in follow-up measures differed significantly for two groups divided by scores on the Modified Erickson Scale of Communication Attitudes. Scores after therapy were moderately predictive of future percentage of syllables stuttered. Guitar and Bass proposed that

unchanged attitudes brought speech behaviours back into line with feelings and caused relapse.

Little, if any, research has been performed with school age children who stutter to achieve an understanding of the predictive nature of attitudes toward speaking for therapeutic success. The uncertainty and potential for relapse necessitates that the treatment for CWS also include behavioural, attitudinal, and emotional components (Blood, 1993). This is especially true if, as is proposed with adults who stutter, negative attitudes toward speaking are both present and predictive of relapse in children.

Results of the Communication Attitudes Test (CAT) developed by Brutten (1985) revealed that stuttering children evidenced significantly more negative attitudes toward speech than did their nonstuttering peers. This difference was present from age seven, the youngest age studied. Woods (1974) found less favourable attitudes toward speech among 3rd to 6th grade children who stuttered than nonstuttering children. In a study comparing stutterers' and nonstutterers' self-reports in affective, cognitive, and behavioural areas, Watson (1988) found that at least some school age CWS have already developed reactive patterns such as word substitution and speech avoidance. De Nil and Brutten (1991) also found negative speech-associated attitudes of stuttering compared to nonstuttering children.

Research suggests that attitudes toward speaking are affected in at least some children who stutter; however, two questions remain. It remains to be determined if a combined cognitive and behavioural treatment approach will lead to long-term fluency gains and positive attitude change in this population. It remains to be determined whether or not children who stutter have lower self-esteem than children who do not. One preliminary investigation into this area suggested that self-esteem was not affected in CWS until adolescence (Yovetich, Leschied, & Flicht, 2000). A replicative study in this area is indicated.

Method

Participants

No attempt was made to preselect ideal research participants; rather, participants reflected the population one might find in a typical clinic. Storch (2002) reported that how well an intervention works with the typical population under actual clinical conditions provides meaningful results about the real world benefits of a treatment. Three boys who contacted the University of Western Ontario Speech Clinic regarding semi-intensive stuttering therapy agreed to participate as experimental participants. The likelihood

of spontaneous recovery from the disorder and/or regression to a more fluent state was accounted for by using matched comparison participants who did not receive treatment in the research design (as suggested by Curlee & Yairi, 1997 and Yairi, 1993). Comparison participants were willing but unable to participate in the program due to transportation issues. Participants had various treatment experiences prior to the experimental treatment. Treatment history was not controlled beyond the fact that no participants received treatment in the three months before the program began or in the two months following the experiment.

Experimental Participant W was a native English-speaking, eleven-year-old boy. A narrative sample and conversational speech sample analyzed by a certified speech-language pathologist (SLP) revealed age-appropriate speech and expressive language development. Receptive language skills were not assessed. According to parent and teacher reports he was achieving at a high level in his class. He stuttered severely and displayed moderate facial grimacing, part-word repetitions (up to five), and prolongations. He began stuttering at age six and had a maternal uncle who stuttered.

Experimental Participant L was a native English-speaking, nine-year-old boy. A narrative sample and conversational speech sample analyzed by a certified SLP revealed age-appropriate speech and expressive language development. Receptive language skills were not assessed. According to parent and teacher reports he was achieving at an average level in the classroom. Initially, he stuttered mildly and disfluencies were characterized by phrase repetition and very short duration part or whole word repetition (typically 0.5 seconds). He was noted on one occasion to evidence a prolonged repetition (seven or more times) with severe facial grimacing. He began stuttering at age five and his older sister spontaneously recovered from stuttering at age eight.

Experimental Participant S was a native-English speaking nine-year-old boy. A narrative sample and conversational speech sample analysis by a certified SLP revealed lateralized production of fricatives 's' 'sh' and affricates 'ch' and 'j' as well as gliding 'r' and 'l.' Expressive language was age appropriate and receptive language skills were not assessed. According to parent and teacher report, S was functioning at a low-average level in the class. He stuttered severely and disfluencies were characterized by long, loud prolongations, forceful exhalations, running out of air when speaking, and speaking on inhalation. He began stuttering at age four and had a maternal uncle who stuttered.

Comparison Participant J was native-English speaking eleven-year-old boy. A narrative sample and conversational speech sample analysis by a certified SLP revealed age appropriate expressive language. Receptive language skills were not assessed. According to parent and teacher report, J was achieving at a low-average level in the classroom. He stuttered severely and disfluencies were characterized by facial grimacing, short forceful prolongations, a high-pitched whimpering used as a starter, and multiple (four to six) part-word repetitions. He began stuttering at approximately age four and had an uncle and several cousins (born of that uncle) who stuttered.

Comparison Participant R was native-Serbian speaking twelve-year-old boy. He had been exposed to English for approximately three years. A narrative sample and conversational speech sample analysis by a certified SLP revealed good articulation skills and a well-developed use of English. Receptive language skills were not assessed. Parents reported no concerns with his language abilities in his native language. According to parent and teacher reports he was achieving at a low-average level in the classroom. He stuttered moderately and disfluencies were characterized by multiple, part-word repetitions and repeated opening and closing of the mouth during silent blocks. He began stuttering at approximately age six and had no family history of stuttering.

Setting

Therapy was carried out at the University of Western Ontario Speech and Hearing Clinic. A technician unfamiliar with the participants conducted pre- and posttherapy videotapes in a laboratory unfamiliar to the participants. Speech samples were obtained in an unfamiliar room and with an unfamiliar interviewer to minimize the possible effect of clinic bound cues for controlled speech (as suggested by Kully & Boberg, 1991 and Langevin & Boberg, 1993). The therapy program was semi-intensive and took place for three consecutive weeks in July, Monday to Friday from 9:00 a.m. to 12:00 p.m.

Therapy

Cognitive behavioural therapy was used for the present therapy program. Cognitive stuttering therapeutic techniques focused on the remediation of the negative attitudes, thought processes, and avoidance tendencies of the person who stutters. The cognitive aspects of the therapy program were modeled after Williams' School Age Therapy (See Williams, 1971 for a more detailed description). William's therapy was based on the theoretical perspective that stuttering is learned. More recent evidence suggests that in addition to some

learned aspects, a predisposition toward stuttering may be neurologically/genetically based (Kent, 2000). In view of this evidence, a combined program was adopted to blend together strategies that served to both enhance the fluency (which may be a combination of biologically based and learned behaviours) and address the negative attitudes (learned from experience) of CWS.

Cognitive techniques (employing self-monitoring, facilitating positive attitudes, desensitization) suggested by Williams are valid and useful techniques that continue to be recommended for school age children today (Ham, 1999). Conture and Guitar (1993) reviewed nine stuttering treatments that had been evaluated with efficacy research in the last 15 years. None of the programs reviewed directly encouraged children to explore and address their negative attitudes toward communication as thoroughly as is described in Williams' (1971) treatment.

Behavioural stuttering therapeutic techniques focused on the remediation of the actual speech movements and speaking rate of the person who stutters. Fluency enhancing techniques used in the program are summarized by Ham (1999) and included blending, easy onsets, cancellations, pull-outs, and preparatory sets. This program was also a practical choice as it was the program clinicians running the program were trained in and comfortable using (as suggested by Costello-Ingham & Riley, 1998).

All parents participated in a three-hour group counselling session concerning what they could do at home to help their child. Homework assignments were included in the program (e.g., practising and delivering a speech, introducing themselves to strangers, making telephone calls) and are detailed in Williams (1971).

Design and Procedure

A single-participant design was chosen because this study was experimental clinical research (Portney & Watkins, 1993). Single-participant designs are tools researchers can use to integrate research with practice. They are easily incorporated into clinical practice and are most capable of detecting predictive factors of success at an individual level (Costello-Ingham & Riley, 1998; Klassen, 1995; Ladouceur, Caron, & Caron, 1989; Tomas & Howell, 2001; and Williams, 1993). Single-participant designs may be especially useful in determining individual differences among CWS with concomitant speech difficulties that are predictive of therapeutic success (Nippold, 1990).

Using an ABA single-participant design, the target behaviour (stuttering) was measured repeatedly across baseline, intervention, and postexperimental phases. Three three-minute speech samples were obtained from

participants at weekly intervals during the baseline and intervention phases. A one and two-month follow-up speech sample was also taken for each participant. The length of baseline and intervention phases were approximately equal at 19 and 21 days respectively (as suggested by Williams, 1993). Due to difficulty with transportation only one baseline, one treatment, and a one-month follow-up sample were attained for control participant R. Follow-up measures were limited to two months because 90% of the participants went back into therapy after two months.

Baseline, intervention, and posttherapy videos consisted of a three-minute story reformulation task. Each time a measure was taken, one of eight different ten-minute segments from a TV series were used, in a randomized order. To minimize treatment bias, stuttering measures were always taken before and independent of any treatment practice, and by clinicians who were unfamiliar to the participants.

Outcome Measures

Speech outcome measures included percentage of disfluent speech time, words per minute, and percentage of word stuttered per minute. Nonspeech outcome measures included the Culture-Free Self-Esteem Inventory (CFSEI by Battle, 1992) and an 18-item modification of the Communication Attitudes Test-Revised (Brutten & Dunham, 1989). The CAT-R was reduced to 18 items as a practicality relating to time constraints. The modified normative scores were validated by a sample of 30 nonstuttering, age-matched peers ($M = 4.8$, $SD = 1.7$; see Table 4).

Nonspeech measures also included parent interviews and visual analogue rating scales completed by five naïve judges (see Lomas, McNaughton, & Parnes, 1986). Naïve judges watched pre- and posttherapy videotapes and completed a visual analogue scale rating each participant on five stuttering characteristics, specifically overall abnormality, facial grimacing, frustration, number of stutters, and length of stutters. Changes in participants' performance were measured by converting the millimetre (mm) differences in pre- and posttherapy ratings on the scale into a percent improvement score (i.e., 10/50 mm to 25-50 mm = 25% improvement). Naïve judges were used because an instrument used in an effectiveness study can only be considered ecologically valid if it incorporates the judgements of naïve listeners (Franken, Boves, Peters, & Webster, 1995).

Results

Table 1 displays the percentage of disfluent speech time obtained for each participant pre- and posttherapy. As this was a time-exhaustive procedure only the last

Table 1
Percentage of Disfluent Speech Time

Participant	Pretherapy	Posttherapy	Difference (pre-post)	Percent Improvement
W	22.8	4.7	18.1	79.4%
L	19.8	8	11.8	59.6%
S	35.4	11.5	23.9	67.5%
J	41.3	34	7.3	17.6%
R	17.2	24.1	-6.9	-18%

baseline and the last therapy sample were calculated per participant. Table 1 data reveal the decreased stuttering severity demonstrated by the experimental participants posttherapy. Measures of the duration of stuttering events are more valid measures of severity than frequency counts alone and are reliably made with a wave-form analyzer with acoustic playback (Ingham, 1993; Starkweather, 1993).

Table 2 displays participants' words per minute (WPM) pre- and posttherapy. Results from Table 2 indicate that S's and W's WPM decreased during early treatment and then increased again as treatment concluded. Participants J, R, and L's WPM tend to decrease over time. W's WPM decreased again two months posttreatment.

Table 3 displays the participants' percentage of words stuttered per minute pre- and posttherapy. Results from Table 3 indicate no improvement in the percent of syllables stuttered by comparison participants or L. Only S shows a decrease in percentage of words stuttered during treatment and follow-up. W shows some improvement at the one-month follow-up but this improvement disappears at the two-month follow-up.

Table 4 displays CAT-R scores obtained for each participant pre- and posttherapy. Due to extenuating circumstances, the pretherapy CAT-R scores for

participants W and J were not kept in the historical files and were lost. Results from Table 4 indicate that all experimental participants displayed improvement or normalized CAT-R scores after treatment. S's continued negative attitudes were most likely attributable to his continuing articulation difficulties. Control participants' scores worsened or remained highly negative. The CFSEI scores obtained by all participants pretherapy were well above the 10th

percentile of the normative population (a score of 24) and W, L, S, J, and R obtained total scores of 45, 32, 38, 42, and 38 respectively.

Naïve Listener Judgments

Figure 1 displays the five naïve judges' average percentage improvement/deterioration ratings for pre- and posttherapy speech samples of each participant. Positive scores indicated average percentage improvement and negative scores indicated the average percentage deterioration.

Statistical Analysis

Judges rated experimental participants W, L, and S as significantly improved when scores were averaged across all five characteristics of stuttering (normality, facial grimacing, frustration, number, and length of stutters) on visual analogue scales, $t(24) = -10.7, p < .01$; $t(24) = -4.2, p < .01$, and $t(24) = -21.8, p < .01$ respectively. Judges rated J and R as significantly deteriorated across all five characteristics of stuttering $t(24) = -6.0, p < .01$ and $t(24) = -14.9, p < .01$, respectively.

Intra and Interrater Reliability

Point-by-point percentage interrater agreement and intrarater agreement on percentage of words stuttered per minute were good (82% and 90% respectively).

Agreement was based on a random sample of 20% of the videos taken. The second rater was blinded to the conditions of the study and the time the videos were taken. An intraclass correlation coefficient showed significant agreement among the five, naïve judges ($r = 0.77, p < .01$; Portney & Watkins, 1993).

Discussion

The importance of evaluating the outcome of speech treatment

Table 2
Words Per Minute (WPM)

Participant	Baseline			Therapy			Follow-up	
	1	2	3	1	2	3	1 mo	2 mo
W	82.4	51.3	68.0	52.0	57.0	51.7	91.0	60.0
L	130.6	132.6	161.0	115.0	85.8	106.0	84.0	85.4
S	104.0	76.3	57.5	90.3	83.7	92.8	84.0	101.0
J	85.5	68.0	70.2	62.0	76.6	68.6	72.0	61.6
R	105.9			94.1			77.0	

Table 3
Percentage of Words Stuttered Per Minute

Participant	Baseline			Therapy			Follow-up	
	1	2	3	1	2	3	1 mo	2 mo
W	22.8	27.9	19	28.8	25	20.8	11.7	23.5
L	2.8	5.6	2.5	3.4	3.2	3.6	5.4	2.3
S	9.5	19	21.6	21.4	15	13.4	15	7.4
J	30.5	33.8	28	31.2	35.9	31.4	31	35.8
R	9.7			9.2			25.1	

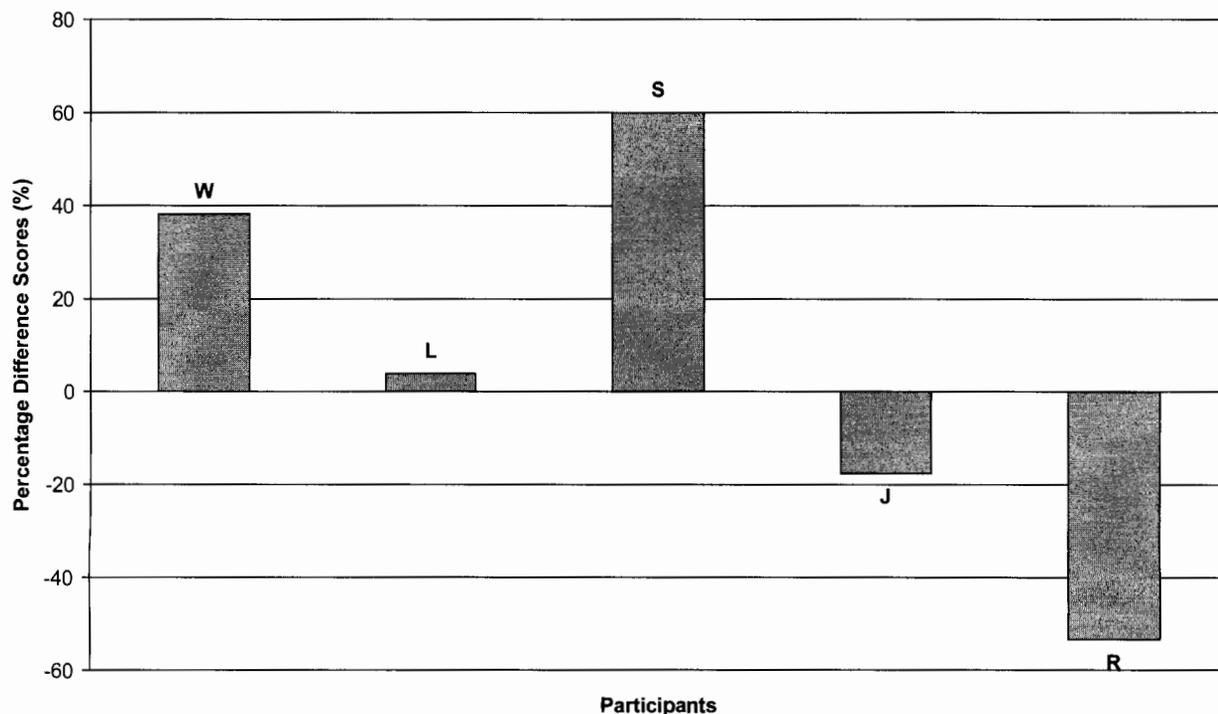
for scientific, economic, and social reasons is widely recognized (Yarsus, 1997; Franken et al., 1995). Parents and administrators expect and are entitled to verification of program effectiveness and documentation of individual gain. It is the speech-language professionals' ethical responsibility to question if treatment methods are optimally effective (Williams, 1993). The present study planned and incorporated a variety of valid and reliable outcome measures to document stuttering therapy effectiveness in a clinical setting.

Results of this study indicated that a combined cognitive behavioural therapy program was partially effective in the alleviation of both behavioural and attitudinal stuttering symptoms. The use of matched

comparison participants allowed researchers to conclude that positive effects demonstrated by experimental participants were over and above that expected from spontaneous recovery or regression to the mean (Andrews, Guitar, & Howie, 1980).

Remaining disfluency levels suggested that experimental participants may have required additional practice to decrease disfluency to acceptable levels. Andrews, Guitar, and Howie reported that substantial gains were most likely to be seen in treatment programs with at least 100 hours of therapy for adults who stutter severely. Boberg and Kully (1994) found that 70% of 25 adolescent stutterers (from mild to severe) who participated in an intensive 90-100 hour treatment

Figure 1.
Naive judges percent difference scores between pre- and posttherapy as rated on visual analogue scales.



program maintained acceptable fluency levels 24 months posttreatment. Ward (1992) found that a 30-hour semi-intensive treatment program reduced the percent of syllables stuttered for five PWS (mild to severe) from 6-29% pretherapy to 1-7% posttherapy. These results suggest that intensive and semi-intensive programs work well for older participants who stutter both mildly and severely.

Reviewed studies suggest that programs carried out over a long period of time with a smaller number of total hours are very effective for young children or children who stutter mildly. Ryan and Van Kirk Ryan (1995) reviewed two school age stuttering treatments for children who stuttered mildly and found that after 18.3 session hours percent of syllables stuttered went from 7.9 stuttered words per minute to less than one, which was maintained at the 14 month follow-up. Ryan and Van Kirk Ryan (1983) reviewed four treatments for school age children who stuttered mildly and found that after 10-18 hours, percent syllables stuttered went from six to seven stuttered words per minute to one to two stuttered words per minute both at home and school. Costello-Ingham and Riley (1998) found good fluency gains for a young child (six years) after 24 hours of treatment, two hours per week. Druce, Debney, and Byrt (1997) found good fluency gains for mild stutterers, but relapse of severe stutterers after 32.5 hours of semi-intensive treatment. Less intensive programs did not benefit CWS severely to the same extent as those who stuttered mildly.

Both W and S stuttered severely. They improved, but not to the point of 'normal fluency.' Normal fluency was defined as less than 7-10 disfluencies of any types per 100 words for a child (see Guitar, 1998) or four stutter-like disfluencies per 100 words for a child (see Ambrose & Yairi, 1999). Only partial recovery of severe PWS was also found by Ladouceur et al. (1989), Craig et al. (1996), and Hancock et al. (1998). They suggested that adults and children who stutter severely were more likely to relapse and therefore might need specialized and more intensive programs. They suggested that clinicians who serve children who stutter severely may not expect to achieve normal fluency with their clinical populations, as this may not be a realistic goal; rather, graduated goals may have better clinical impact.

Conture, Louko, and Edwards (1993) found that experimental participants with severe stuttering and concomitant articulation difficulties (like S) may be more likely to show partial fluency gains rather than spontaneous fluency. Andrews and Harris (1964) found that poor speech was a variable associated with persistent stuttering. Several research studies have shown that a high percentage (30-44%) of CWS have concomitant speech and/or language delays (Druce et al., 1997; Arndt

& Healey, 2001; Bloodstein, 1987; Louko, Edwards, & Conture, 1990). These researchers and others (Nippold, 1990) proposed that future research is needed to investigate whether or not children with concomitant speech and language disorders differ from "pure" stuttering children in terms of rate and level of progress and performance on different types of outcome measure tasks.

An important limitation to the study was the lack of both overt and covert speech sample measures. Howie, Tanner, and Andrews (1981) and Andrews and Craig (1982) reported considerable agreement between the overt and covert speech samples of participants who stuttered, which served to justify the drawing of conclusions about real-life speech on the basis of overtly recorded samples. Cognitive behavioural treatment teaches the child to use fluency control strategies (slower rate, stretching, bobbling, etc.) only when they are perceived as needed (William, 1971). It is possible that the children did not feel that fluency control strategies were needed during the samples. Testing the child's ability to use the consciously controlled fluency strategies taught in therapy is a valid measure of their capability to maintain fluency in situations outside of the therapy setting; however, it was only measured indirectly through parent report.

Decreases in the percentage of disfluent speech time by experimental participants relative to controls indicated that treatment may have been responsible for the experimental participant's improvement in stuttering behaviours. The percentage of disfluent speech time measure showed itself to be more sensitive to qualitative changes in stuttering not taken into account by frequency counts alone, a result that served to confirm the value and validity of that measure. Clinicians serving the school age population may consider including stuttering duration as a measure of treatment effectiveness. More research into the criterion validity of the percentage of disfluent speech time measure as well as into the establishment of normative data is clearly necessary in the field of fluency.

The CAT-R has been shown to be sensitive to changes in attitude toward speaking pre- and posttherapy and has found these differences consistently in this age group (Brutten & Dunham, 1989). The findings of this study have important implications for the future of the CAT-R pertaining to its use as a sensitive pre-post test measure effective for small groups of children and single participants. Posttherapy CAT-R scores obtained by experimental participants in this study suggested that therapy may have been responsible for improving the initially negative attitudes of experimental participants

and for continued maintenance of therapy gains in the longer term.

One surprising finding was that W's and L's CAT-R scores indicated a positive attitude toward speaking after therapy and yet syllables stuttered measures indicated relapse at the second month follow-up. This finding suggested that attitude change alone may not be able to stave off relapse. Boberg and Kully (1994) found that some participants enrolled in both attitude directed and behaviourally directed stuttering therapy experienced relapse. They concluded that a culmination of complex factors not yet fully understood are responsible for the relapse phenomenon and that there is an obvious need for continued investigation into the causes of relapse. Arranging continuing support for and practice of speech skills after intensive treatment is completed or phasing out participants more gradually from cues for fluent speech present during treatment may prove more useful in decreasing the occurrence of relapse.

Results of the CFSEI suggested that children who stuttered were not different from age-matched nonstuttering peers in a measure of general self-esteem. Both experimental participants and control participant scores fell within the expected range for children their age. This finding confirmed previous research in this area (Yovetich, Leschied, & Flicht, 2000) and suggested that the general self-esteem of school age children may not be measurably affected by stuttering until later years.

Naïve judges' ratings were used to confirm that changes in fluency were due to the treatment effect and not to confounding variables such as the placebo effect or bias in measurement. Judges consistently rated the experimental participants as improved and the control participants as deteriorating. This result suggested that the treatment effect may have been responsible for experimental participant improvement. Naïve judge ratings were highly consistent with percentage of disfluent speech time measures. This consistency served to verify the validity of naïve judge ratings as a measure of the effectiveness of stuttering therapy.

Parents' interviews were helpful in the determination of treatment effectiveness at home. Self-reports from people who stutter or their significant others about speech behaviour and attitudes toward speaking add validity to laboratory measures in any major report of treatment success (Conture, 1996; Hancock et al., 1998). All experimental participant's parents rated therapy as very effective despite the fact that they noted the presence of some continuing disfluency. Parents may have wanted to please the experimenter by reporting positive results, or experimental participants may have been more fluent at

home than during the speech samples taken at the clinic. Parents appeared to have considered the decreased duration of stuttering events in their children as a significant improvement despite the continuing frequency of stuttering events.

In conclusion, findings from the present study indicated that a combined cognitive behavioural therapy program was partially effective for the experimental participants in alleviating behavioural and attitudinal symptoms associated with stuttering. Results suggest this therapeutic approach has potential, specifically for children with severe stuttering and/or with concomitant speech and language delays. Systematic modifications (e.g., increased hours per day, increased maintenance support, and increased length of treatment) of this treatment program may improve both frequency and duration of stuttering outcomes more significantly in this population.

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Manuscript received: November 11, 2002

Accepted: February 6, 2003

