EFFICACY OF A COGNITIVE BEHAVIORAL THERAPY-BASED INTENSIVE SUMMER CAMP FOR AN ADOLESCENT WHO STUTTERS: SINGLE-SUBJECT DATA

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ABSTRACT

Clinicians are increasingly incorporating cognitive behavioral therapy (CBT)-based approaches into fluency treatment for children and adolescents who stutter. However, minimal research examines the efficacy of such programs. The present study assesses the efficacy of a CBT-based, intensive, five-day summer camp that promotes self-acceptance and aims to improve the quality of life of adolescents who stutter. Specifically, this study examines whether the camp is effective in reducing state and trait anxiety, decreasing the negative impact of stuttering on daily life, and increasing fluency. A single-subject design on a 14-year old, male adolescent who stutters, LM, and personal interview data with LM's mother, MM, are utilized. Post-treatment, LM's scores reflect improvements in self-efficacy surrounding communication situations, as measured by the Self-Efficacy for Adolescents Scale (SEA-Scale), and improvements in overall speaking-related quality of life, as measured by the Overall Assessment of the Speaker's Experience of Stuttering – Teen (OASES-T). These improvements were maintained at one and three months follow-up. Nonetheless, a large degree of variation in percent syllables stuttered (%SS) and LM's consistently low rates of state and trait anxiety, as measured by the State-Trait Anxiety Inventory for Children (STAIC), suggest that additional study is warranted before conclusions can be drawn about the efficacy of the summer camp program on reducing stuttering severity and anxiety.

Dedicated to Julia B. Grayer, my best friend.

Without you, I would have given up on this.

Thanks for pulling me out of the fire.

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LITERATURE REVIEW

Introduction

A substantial body of research has documented a relationship between anxiety and stuttering (Miller & Watson, 1992). In particular, adolescents who stutter have been shown to have higher rates of state and trait anxiety (Mulcahy et al., 2008) and negative communication-related attitudes (Vanryckeghem & Brutten, 1997). Living with stuttering sets these adolescents apart, making them feel very "different" during a developmental stage associated with an increased reliance on the peer group and a desire to "fit in" (Coleman & Hendry, 1999). The following literature review describes the research that has examined the relationship between stuttering and anxiety among people who stutter. Next, the literature documenting the presence of anxiety and the negative speech-related attitudes among adolescents who stutter is summarized. The importance of addressing the psychological implications of stuttering is discussed next, and a review of the research on CBT-based approaches to stuttering treatment on children and adolescents is reviewed.

Anxiety among People Who Stutter

Numerous studies have found that anxiety is one of the most common psychological concomitants of stuttering (Menzies, Onslow, & Packman, 1999). In their randomized, telephone survey of households in New South Wales, Australia, Craig et al. (2003) found that stuttering is associated with higher levels of trait anxiety in people who

stutter. State anxiety is defined as anxiety about a particular event. It's transitory and varies over time. On the other hand, trait anxiety is anxiety as a personal characteristic. It's a stable susceptibility to experience state anxiety frequently (Spielberger, 1983). Also, stuttering among those seeking speech therapy is associated with a dramatically heightened risk of anxiety disorder, as well as panic disorder and social phobia, as determined by the DSM-IV and the ICD-10, (Iverach et al., 2009; Stein, Baird, & Walker, 1996). Although this research is compelling, a significant number of studies have found that people who stutter are not significantly different than people who do not stutter in terms of personality or mood (Craig & Hancock, 1996; Miller & Watson, 1992; Oliver, 1981, for example). This conflicting evidence has led some to conclude that it cannot be unequivocally stated that people who stutter are more anxious than those who do not stutter (Craig et al., 2003). However, a recent literature review found that research published in the last 15 years has focused more on social anxiety, expectancies of social harm, and fears of negative evaluation among people who stutter, as opposed to looking at generalized anxiety (Iverach et al., 2011). This difference in how anxiety is operationalized could be behind the discrepancies in the research.

Furthermore, evidence has shown that anxiety in people who stutter is restricted to their attitudes toward specific communication situations and is a response to negative communication experiences (Miller & Waston, 1992). Menzies et al. (1999) state that when measures specific to social anxiety, rather than trait anxiety, are used, there is a strong, positive relationship between anxiety and stuttering. Lincoln, Onslow, and Menzies (1996) found that people who stutter commonly report that they experience

anxiety surrounding their speech. According to Bloodstein (1987), anxiety contributes to stuttering behaviors, and circumlocutions, word substitutions, sound prolongations, and part-word repetitions are associated with the fear of stuttering. Additionally, people who stutter differ significantly from controls in their expectations of negative social evaluation (Messenger, Onslow, Packman, & Menzies, 2004). People who stutter may also display higher levels of emotional tension or discomfort in social situations and, as a result, they may engage in social interactions less compared to their more typically-fluent peers (Kraaimaat, Vanryckeghem, and Van Dam-Baggen, 2002). Stuttering severity also increases under conditions thought to increase social anxiety, like audience size and conversational partner (Siegel & Haugen, 1964).

Notably, a 2014 meta-analysis of 19 studies confirmed that people who stutter have both elevated trait and social anxiety (Craig & Tran, 2014). The authors state that the majority of adults who stutter have *at least moderately elevated* trait anxiety and *substantially elevated* social anxiety, with effect sizes of .57 and .82, respectively. Some researchers have concluded that anxiety is a predictable response to stuttering (Poulton & Andrews, 1994; Miller & Watson, 1992). Indeed, Menzies et al. (1999) argue that it would be surprising if social anxiety was not in some way involved in the disorder.

Anxiety and Speech-Associated Attitudes among Children Who Stutter

Children and adolescents who stutter experience negative social consequences as a result of their speech disorder and are negatively evaluated by their peers (Langevin & Hagler, 2004). Langevin (2001) found that 81% of children who stutter are bullied at school at some point. Hugh-Jones and Smith (1999) reported that a majority of the 276

people who stutter in their study reported being bullied at school, and many reported that this bullying had a negative impact on friendship-making. When asked whether the bullying that they experienced "affected" them at the time, 63% responded "yes." Furthermore, 32% of the sample responded "yes" to the question, "Does the bullying that you experienced in school affect you now?" Negative consequences of stuttering such as bullying, it is hypothesized, place children at an increased risk of developing anxiety (Smith, Iverach, O'Brian, Kefalianos, & Reilly, 2014). Additionally, Davis, Howell, and Cooke (2002) showed that children who stutter have difficulty establishing relationships with their peers as compared to more typically-fluent children. Menzies et al. (2009) have argued that this may lead to fear of negative evaluation in social situations later in life.

A small body of research has focused on the communication-related attitudes and feelings in children and adolescents who stutter. As early as age six, children who stutter exhibit significantly stronger negative speech-associated attitudes as compared to their typically-fluent peers (Vanryckeghem & Brutten, 1997). This difference increases with age, as children who stutter develop even stronger negative attitudes toward their speech (Vanryckeghem & Brutten, 1997). Erikson and Block (2013) found that adolescents who stutter reported high levels of communication apprehension on the "Meetings" and "Public Speaking" subscales of the Personal Report of Communication Apprehension. Using the same assessment, Blood et al. (2001) found that adolescents who stutter had substantially higher scores on the "Meetings" and "Group Discussion" subscales as

compared to their more typically-fluent peers. Additionally, stuttering may be accompanied by low self-esteem and low self-confidence (Manning, 1994).

According to Smith et al. (2014), the negative social consequences of stuttering might intensify during adolescence, which is characterized by emotional conflicts that can potentially interact with the anxiety surrounding stuttering. Mulcahy et al. (2008) found that when compared to typically-fluent controls, adolescents who stuttered showed significantly higher levels of trait, state, and social anxiety and had a greater fear of being negatively evaluated (Mulcahy et al., 2008). Davis et al. (2007) found no difference in trait anxiety between children who stutter and controls but found that the persistent stuttering group had higher state anxiety as compared to a recovered group and the control group. In their review of the research on anxiety among children and adolescents who stutter, Smith et al. (2014) conclude that young people who stutter face a significantly increased risk of developing social anxiety disorder in adulthood. This risk of developing anxiety increases as children who stutter approach adolescence and adulthood (Smith et al., 2014).

Addressing the Psychological Implications of Stuttering

Perhaps surprisingly, research has found that children's level of fluency may be only moderately related, or even unrelated, to the negative impact that stuttering has on their life (Beilby, Byrnes, & Yaruss, 2012; Blumgart, Tran, Yaruss, & Craig, 2012; Vanryckeghem and Brutten, 1996). Research with adults has suggested that speech-associated attitudes do not improve when fluency increases (Andrews & Cutler, 1974; Guitar, 1976), and anxiety predicts poor response to speech-restructuring treatments

(Kraaimaat, Janssen & Brutten, 1988). Iverach et al. (2009) found that participants with mental health problems receiving only speech-restructuring treatment did not maintain the benefits from treatment in the long-term. Negative experiences can also interfere with the progress that a child makes in therapy (Healy, Trautman & Susca, 2004). Yaruss, Coleman, & Quesal (2012) argue that these findings indicate that a comprehensive approach to fluency treatment for children and adolescents who stutter is essential.

The research on the psychological impact of stuttering on children and adolescents has led many experts to conclude that it's imperative to address the stuttering-related attitudes among this population. According to Vanryckeghem and Brutten (1997), "It follows from these data, and the present finding that mal-attitude toward speech tends to increase as children who stutter mature, that clinicians would be advised to address, early on, both these youngsters' fluency failures and their speech-associated attitude" (p. 72). Smith et al. (2014) further argue that since childhood anxiety disorders might predict anxiety in adulthood, intervening early is crucial to prevent the impact of anxiety across the lifespan, not just in childhood. Adolescence may be the last chance to address the development of stuttering before it becomes chronic in adulthood (Hearne et al., 2008).

Indeed, clinicians are also acknowledging the need to assess and treat the psychological implications of stuttering (see Yaruss, Coleman, & Quesal, 2012 for review), as stuttering is increasingly being thought of a multi-dimensional disorder (Conture, 2001). Lincoln, Onslow, and Menzies (1996) found that one third of the

clinicians they surveyed reported using anxiety management procedures in therapy with adults. Furthermore, the American Speech-Language-Hearing Association (ASHA) advocates for a comprehensive approach that includes addressing the psychosocial impact of stuttering. According to the ASHA Practice Portal , "It is the responsibility of the clinician to consider the entire impact of disfluency on the child's communication and life as a whole (and to help the family understand this aspect of the child's experience of stuttering) in order to develop a comprehensive plan of treatment" (American Speech-Language-Hearing Association, n.d.).

CBT-Based Approaches to Fluency Treatment

In response to the need to address attitudes in people who stutter, some researchers and clinicians have turned to cognitive behavioral therapy (CBT) approaches to stuttering treatment. Developed in the fields of clinical psychology and psychiatry, CBT is one of the most extensively researched forms of psychotherapy (Butler, Chapman, Forman & Beck, 2006). CBT has been shown to be effective in reducing anxiety in adults, children, and adolescents (Hoffman & Smits, 2008, Butler, Chapman, Forman & Beck, 2006) as well as in treatment of a wide range of mental health problems (Butler, Chapman, Forman & Beck, 2006). CBT is based on the proposition that symptoms and dysfunctional behaviors are often cognitively mediated, and improvement can be made by modifying those dysfunctional thoughts and beliefs (Dobson & Dozois, 2001). CBT is typically short-term and problem-focused, and the goal is always the same: to teach patients that they can control how they interpret and manage their environment (Dobson, 2009).

Craig and Tran (2006) called for the use of CBT in fluency treatment for all people who stutter, regardless of whether they met the criteria for social phobia. The efficacy of CBT in people who stutter has been assessed in a handful of studies, and positive results have been reported. This research, however, has primarily focused on adults who stutter. Additionally, many studies assess treatment approaches that combine CBT and more traditional therapy approaches, like stuttering modification or fluency shaping, making it difficult to parse out the relative effectiveness of CBT.

The few studies that have addressed the efficacy of CBT-only interventions in adults who stutter have found positive results. McColl et al. (2001) assessed the efficacy of a CBT program on 11 adults who stutter who had failed to apply the gains that they had made in a speech-restructuring program into their daily lives. After 12 sessions of the CBT program, participants showed reductions in fears of negative evaluation and scores on the State-Trait Anxiety Inventory and the Global Self-Rating of Stuttering Severity. St. Clare et al. (2009) used the same CBT program for five sessions of treatment on 26 people who stutter and found similar results. Specifically, every subject showed a reduction in scores on the "Unhelpful Thoughts and Beliefs about Stuttering" checklist (St. Clare et al., 2009). Notably, scores decreased by an average of 40%. In a study assessing a CBT treatment package on 13 adults who stuttered and had a diagnosis of social phobia, Ezrati-Vinacour et al. (2007) found that participants had shown improvements in daily functioning, less anxiety, and less emotional reactivity to stuttering post-treatment. Menzies et al. (2008) assessed a randomized controlled trial of 12 CBT sessions among 32 subjects and found that at post-treatment and at follow-up,

participants who had received CBT in addition to speech-restructuring treatment scored higher on the "Global Assessment of Functioning," were less likely to meet criteria for social phobia, and were able to complete more "Behavioral Avoidance Tasks" involving speaking situations as compared to participants who received only speech-restructuring treatment. It should be noted that the occurrence of stuttering behaviors was also measured in addition to psycho-social outcomes in Menzies et al. (2008) and Ezrati-Vincour (2007), and no differences were found between pre- and post-treatment in the overall frequency of stuttering.

CBT-Based Approaches to Fluency Treatment for Children and Adolescents

Many researchers have argued that stuttering treatment with children and adolescents should target not only increased fluency, but the acceptance of oneself as a person who stutters and decreasing the negative consequences of stuttering as well (Healy & Scott, 1995; Ramig & Bennet, 1995; Murphy, Yaruss & Quesal, 2007; Yaruss, Coleman, & Quesal, 2012). Yaruss, Coleman, and Quesal (2012) use the label "comprehensive approaches to treatment" to describe this take on therapy. In fact, according to the ASHA, "Stuttering treatment should target not only surface level impairment (disfluency), but the entire communicative experience of the person who stutters, including personal and environmental context, and activities of daily living" (American Speech-Language-Hearing Association, n.d.).

A number of treatments that do just that have been developed (e.g. Manning, 2010; Millard, 2011), but only a handful of studies assess the efficacy of programs that combine CBT and more traditional approaches that target restructuring of stuttering

behaviors. Fry, Botterill, and Pring (2009) investigated the efficacy of a group therapy intervention that incorporates CBT with speech management skills and communication skills training for teenagers aged 16-19 years. The authors presented data from only one participant, who showed a decrease in overt and covert features of stuttering as well as increases in self-efficacy related to speaking, and these gains were maintained at 10-months post-treatment (Fry, Botterill & Pring, 2009). Fry, Millard, and Botterill (2014) sought to replicate this study by assessing the same intervention on three subjects. Reduced stuttering frequency, increased self-efficacy about speaking, and reduced overt and covert aspects of stuttering were observed for all three subjects post-treatment. Blood (1995) assessed POWER2, a CBT package for relapse management that includes training techniques like problem solving, general communication skills, cognitive re-structuring, coping, assertiveness, as well as knowledge of stuttering. Three high school students, ages 14-15, saw decreases in stuttering as well as positive changes in attitudes and feelings at 10 months post-treatment.

Although the previous studies provide promising, albeit limited, evidence on the efficacy of comprehensive approaches to fluency treatment among children and adolescents, it should be again noted that assessments of such programs do not determine the relative efficacy of the CBT-and behavior-based components of the treatment programs. To summarize, although the research has been equivocal about whether people who stutter have elevated trait anxiety or state anxiety or if anxiety is limited to communication situations, the previous review suggests that that anxiety plays a substantial role in the lives of many people who stutter. In particular, children and

adolescents often face significant negative social ramifications as a result of stuttering, such as bullying. This has led many researchers to conclude that the psychological consequences of stuttering should be addressed early as part of a more comprehensive approach. In addition to directly targeting increased fluency, clinicians are increasingly incorporating CBT activities into their therapy plans to address the negative attitudes that many children and adolescents have toward stuttering. What's more, a number of researchers have called for the inclusion of CBT in treatment with this population. However, the research on the efficacy of such programs on children and adolescents who stutter is scarce. Moreover, the evidence for the efficacy of CBT treatments and treatments that incorporate CBT and speech restructuring with adults who stutter is promising and suggests that similar results could be obtained with children. The proposed study seeks to add to this body of research by assessing the efficacy of a CBT-based, intensive, five-day summer camp program for children and adolescents who stutter.

Research Questions

Guided by the previous literature review, the following research questions were addressed:

RQ1: Does a CBT-based, intensive, five-day summer camp program decrease the overall negative impact of stuttering on the lives of adolescents who stutter?

RQ2: Does a CBT-based, intensive, five-day summer camp program reduce state and trait anxiety among adolescents who stutter?

RQ3: Does a CBT-based, intensive, five-day summer camp program improve fluency among adolescents who stutter?

CHAPTER 2

DESCRIPTION OF PROGRAM

Speak Now is a CBT-based, intensive, five-day summer day camp for adolescents who stutter that runs every summer. The present study focused on the most recent camp session, which ran from August 3 to August 7, 2015. The camp began at 9:00 am and ended at 4:00 pm each day and was held on Temple University's Ambler campus. The camp curriculum is organized and designed by Kim Sabourin, M.A., CCC-SLP, a board-certified specialist in fluency disorders, who supervised and managed camp activities. Additionally, six graduate student clinicians in speech-language pathology, who received course credit for their involvement, provided instruction and led both individual and group activities. These graduate students received training on CBT prior to the start of Speak Now. In addition to treatment activities, time was allotted for lunch, team building exercises, games, sports, and a talent show.

The Speak Now camp curriculum aims to reduce speech-related anxiety among participants by combining CBT-based group activities and individual, one-hour therapy sessions led by graduate student clinicians. Speak Now incorporates three CBT techniques: cognitive restructuring, graded exposure, and behavioral experiments. In cognitive restructuring, participants identify "problematic thoughts," identify cognitive distortions, rationally dispute problematic thoughts, and develop a rational rebuttal to the problematic thought (Hope et al., 2010). The conduction of behavioral experiments is combined with graded exposure. Here, the negative predictions that participants make are tested when the participant is exposed to a situation that would cause fear or anxiety

(Butler, 1996). The individual is asked to confront the situation without the use of avoidance behaviors and remain in the situation until the anxiety diminishes (Menzies et al., 2009). According to Menzies et al. (2009), in the beginning, exposure should be limited to low-level fear situations, but eventually, more difficult situations should be faced.

Each day, group activities at Speak Now focused on a different CBT-based theme: the stuttering cycle, creating fear hierarchies, reducing avoidance behaviors, identifying feelings and "unhelpful thoughts," and cognitive restructuring. Group therapy tasks included group discussions, brainstorming, worksheets, drawing activities, and self-reflection. The group setting allowed participants to share their experiences with stuttering and support each other in addition to learning from each other's viewpoints. CBT principles were also incorporated into games and team building exercises. On the last day of camp, parents were invited to participate in a group therapy discussion with other parents and adolescents.

Program Participants

Five English-speaking adolescents from the Philadelphia-area, one female and four males, ranging from nine to 17 years-old, attended Speak Now. These adolescents were current or past clients at the Temple University Speech Language Hearing Center (TUSLHC) or had received therapy at their school or privately. All had a documented diagnosis of stuttering from a speech-language pathologist. Recruitment of participants was completed via an advertisement on the Stuttering Foundation website, an

advertisement on the Temple summer programs website, emails to local speech-language pathologists, and referrals from TUSLHC.

CHAPTER 3

METHODOLOGY

The present research consists of data from one Speak Now camp participant, LM. Additionally, a personal interview with LM's mother, MM, was conducted.

Study Participant

A single-subject design on one participant, LM, was utilized for the current study. LM is a monolingual, English-speaking male who was 14 years old at the time of Speak Now. LM had a severe fluency disorder diagnosis and had received speech therapy at TUSLHC and at his middle school. LM attended Speak Now its first year, in the summer of 2014. LM missed the first two days of Speak Now in 2015 due to illness and therefore only attended camp for the last three days.

Research Design

Single-subject designs are alternatives to traditional group comparisons for the evaluation of clinical interventions (Nourbakhsh & Ottenbacher, 1994). Specifically, an A-B design with follow-up measures was used to assess changes in LM's performance on speech and psychological measures at seven different data points. First, four baseline measures were collected to establish within-subject controls. More specifically, all assessments were administered via phone call three times before Speak Now began. Each of the three phone calls took place two weeks after the previous phone call. Additionally, a fourth baseline measure was collected on the first day of Speak Now, before activities began. Next, one post-treatment measure was collected immediately

after Speak Now activities concluded. Traditionally, single-subject designs entail multiple measures across a course of treatment. However, the short, five-day timeframe for Speak Now precludes the completion of more than one assessment once intervention began. Fourth, follow-up measures were obtained at one and three months post-treatment. The following table summarizes the data collection schedule.

Data Point	Measure	Date	Method
1	Pre-treatment Baseline	June 30	Phone call
2	Pre-treatment Baseline	July 7	Phone call
3	Pre-treatment Baseline	July 21	Phone call
4	Pre-treatment Baseline	August 5	In-person
5	Post-treatment	August 8	Phone call
6	1 month follow-up	September 10	Phone call
7	3 months follow-up	November 9	Phone call

Data Collection

Both speech and psychological assessments were administered, reflecting a multi-faceted approach to assessment. For all baseline, post-treatment, and follow-up measures, four measures, percent syllables stuttered (%SS), the Overall Assessment of the Speaker's Experience of Stuttering (OASES-S/OASES-T), the State-Trait Anxiety Inventory/State-Trait Anxiety Inventory for Children (STAI/STAIC), and the Self-Efficacy for Adolescents Scale (SEA-Scale) were administered. For all post-treatment and follow-up data and for all but one of the baseline data points, these assessments were administered over the phone. A graduate student clinician called LM at a previously

planned date and time. Conversations were recorded using personal handheld recorders while the call was placed on speakerphone mode so that %SS could be calculated at a later date. These calls were conducted in a room with a closed door at TUSLHC. At the beginning of each call, the graduate student clinician reminded LM that the phone call was being recorded. No identifying information was connected to the recordings. Performance on each assessment was recorded onto the paper response forms for each assessment. Names and identifying information were not included on the forms.

The same three measures were collected at the fourth baseline assessment as well. However, at this data point, assessments were administered in-person by a graduate student clinician on the first day of camp, before camp activities began. The graduate student clinician recorded these assessments onto a personal voice recorder so that %SS could be calculated at a later date. Names and other identifying information were not recorded. Again, the responses that LM provided were recorded onto paper assessment forms.

Assessments/Measures

Percent Syllables Stuttered (%SS)

First, percent syllables stuttered was used as a measure of stuttering severity at each data point. Spontaneous speech samples were elicited by having the graduate student clinician engage LM in a 5-10 minute discussion about a neutral topic such as interests, school, or summer activities. Percent syllables stuttered was calculated for each speech sample by the graduate student clinician who collected it. Additionally, for 4 of

the 7 conversations, an additional graduate student clinician calculated %SS so that inter-rater reliability could be established. A Pearson correlation of 0.97 was calculated, indicating a high level of agreement between raters.

Overall Assessment of the Speaker's Experience of Stuttering - Teen (OASES-T)

The Overall Assessment of the Speaker's Experience of Stuttering for teenagers (OASES-T) (Yaruss & Quesal, 2010) was administered at each data point. The OASES-T is designed to be administered to teenagers between the ages of 13 and 17. It is a self-report assessment that measures the speaker's perception of observable stuttering behaviors, reactions to stuttering, and difficulties in day-to-day activities that require speaking, and provides a severity rating of the overall impact of stuttering on the speaker's life. The OASES-T is standardized and has established construct and content validity as well as test-retest reliability. Items are scored on a 5-point scale, with higher scores indicating a greater negative impact of stuttering.

The OASES-T contains 4 sections based on the World Health Organization's International Classification of Functioning, Disability, and Health (ICF, 2001). The first section, "General Information," assesses the speaker's perception of his or her stuttering, which includes self-ratings of speech fluency, naturalness, and knowledge about self-help and treatment options. Section 2, "Your Reactions to Stuttering," addresses the affective (shame, embarrassment, and guilt) behavioral (tension, struggle, and avoidance), and cognitive (beliefs about speaking and stuttering) reactions the speaker experiences as a result of dysfluency. Difficulties that the speaker has when communicating in daily situations are included in section 3, "Communication in Daily Situations." This section

measures the difficulty that the speaker has in communication situations that are often difficult for people who stutter, like talking to a group. Last, the "Quality of Life" section measures the degree to which stuttering interferes with the speaker's personal relationships and their life participation.

It should be noted that the OASES-T is designed to be self-administered. Mailing out copies of the OASES-T or designing a digital version were considered. However, it was decided that survey items would be read to LM over the phone to reduce the probability of low response rates. The OASES-T took approximately 10 minutes to be administered to LM at each data point.

State-Trait Anxiety Inventory for Children (STAIC)

The State-Trait Anxiety Inventory for children (STAIC) was also administered to LM. The STAIC is designed for children in elementary and junior high school. The STAIC is a self-report inventory that contains 40 items with 3-point scales designed to measure two forms of anxiety, state anxiety and trait anxiety. Items used to assess state anxiety ask the respondent how they feel "right now, at this moment." This scale was used to measure LM's communication-related state anxiety since he was speaking with a clinician on the phone as he responded to the items. Conversely, items used to assess trait anxiety ask respondents how they, "generally feel." The STAIC is standardized, and multiple studies have documented its test-retest reliability, construct validity, and concurrent validity (Perrin & Last, 1992; Spielberger, 1989; Spielberger et al, 1971). Higher scores indicate higher anxiety. Test administration of the STAIC took about ten minutes at each data point. Like the OASES-T, the STAIC was designed to be self-

administered, but a graduate student clinician read the items to LM during the phone calls. The STAIC took approximately five minutes to be administered to LM.

Self-Efficacy for Adolescents Scale (SEA-Scale)

The third and last psychological assessment administered to LM was the Self-Efficacy for Adolescents Scale (SEA-Scale), an unpublished assessment presented at an ASHA convention in 1994 (Manning, 1994). This assessment consists of 100 questions that measure how comfortable adolescents are entering into and speaking in 100 different speaking situations (for example, "Talking with two new people in your class who just began attending your school"). Responses are on a scale from one to 10, where one is "no way, I would be too uptight to speak," and 10 is, "No problem, I would be confident speaking." Responses on all 100 items are averaged to get a score. Watson (1988) found that adolescents who stutter scored significantly lower on the SEA-Scale as compared to a matched group of their more typically-fluent peers. The SEA-Scale took approximately 15 minutes to be administered to LM.

CHAPTER 4

DATA ANALYSIS

Visual inspection has been the traditional method of data analysis for single-subject designs (Gingerich, 1983) and was utilized for the current study. In single-subject designs, each participant serves as their own control, making tests of significance that look at group averages, like t-tests, inappropriate. Although statistical methods have been developed for single-subject designs, none of these analyses are appropriate for the current study because of the lack of multiple data points during the treatment period. As discussed, because Speak Now took place over the course of just five days, multiple assessments during the treatment period would have been inappropriate. Furthermore, according to Parsonson and Baer (1986), visual analysis is insensitive to weak treatment effects, which insures that only large treatment effects with obvious clinical significance will be allowed into the research literature. A graph of LM's scores on each of the four outcome measures at each of the seven data points was created using Microsoft Excel to enable visual inspection.

Results

Percent Syllables Stuttered (%SS)

First, LM's stuttering severity was examined by looking at %SS. LM had a high level of variability on this measure across baseline, post-treatment, and follow-up scores, ranging from 5.95% to 22.17%. Most importantly, no trend was detected by visual inspection. The following graph plots the %SS in LM's speech across all data points.

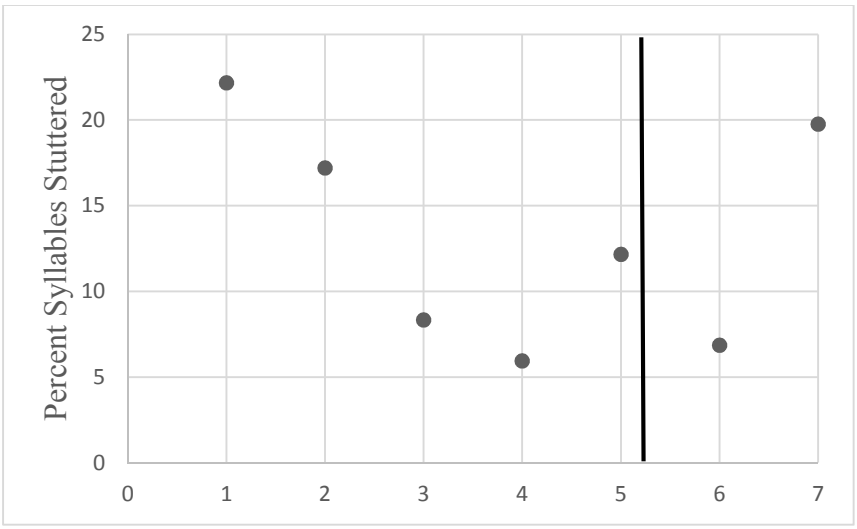

Figure 1: Percent Syllables Stuttered

The observed variability in LM's %SS is not surprising given that the variability of the frequency of stuttering is one of the hallmarks of the disorder (Manning, 2010). People who stutter can be speaking fluently one moment and then a moment later, struggle as they try to say a word they had just said fluently (Manning, 2012). According to Bloodstein (1987), "The great variability of stuttering from time to time under different conditions is liable to result in assessments that are unrepresentative" (p. 386).

Overall Assessment of the Speaker's Experience of Stuttering - Teen (OASES-T)

Next, LM's scores on the OASES-T were analyzed across all seven data points. Visual inspection of the data indicates that a stable baseline was established for the first four pre-treatment data points, providing evidence of internal validity for this assessment. Furthermore, at baseline, LM's scores fell in the moderate range, indicating that his stuttering was having a moderate overall impact on his life. Specifically, LM's scores ranged from 2.62 to 2.68 during the baseline phase. At 1.49, LM's post-treatment score

was in the mild/moderate range. At one month follow-up, LM's score was 1.78, and at three months follow-up, his score was 1.91, both of which put LM in the mild/moderate range. Hence, a decrease in LM's OASES-T score was seen at post-treatment, indicating improvements in the overall impact that stuttering had on his life. It appears that there may be a lack of maintenance of treatment effects at follow-up, as LM's scores appear to be beginning to trend upward. However, it's important to note that even at three months follow-up, LM's scores on the OASES-T were still considerably lower than his scores at baseline.

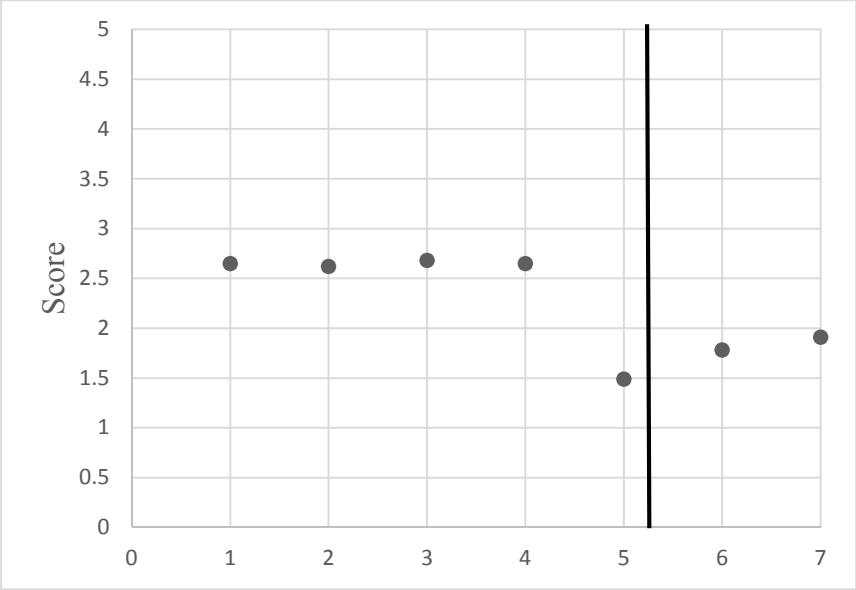

Figure 2: Overall Assessment of the Speaker's Experience of Stuttering-Teen

State-Trait Anxiety Inventory for Children (STAIC)

Third, the data on LM's scores on the STAIC were analyzed, and LM's scores for both state and trait anxiety were consistently low and did not change from baseline to post-treatment to follow-up. In fact, LM received the same scores on the STAIC on five

of the seven data points. However, LM's responses to questions about anxiety on the OASES-T and the SEA-Scale indicate that he likely experiences a high level of anxiety surrounding communication. It is possible that the STAIC does not capture the anxiety that LM feels as it relates to specific communication situations. It was assumed that the items used to measure state anxiety on the STAIC would account for the anxiety that LM would feel in speaking situations, since he was on the phone, an anxiety-producing speaking situation for many people who stutter. However, it's possible that for LM, speaking on the phone with the graduate student clinician was not anxiety-producing. If this is the case, the STAIC would not be a valid measurement of communication-related state anxiety.

Self-Efficacy for Adolescents Scale (SEA-Scale)

Last, LM's scores on the SEA-Scale were analyzed and plotted to enable visual inspection. A stable baseline was established for the four pre-treatment data points based on visual inspection. Specifically, for baseline data, LM's scores ranged from 6.19 to 6.64. LM's post-treatment and follow-up data indicate improvements that were maintained after camp. Specifically, at post-treatment, one month follow-up, and three months follow-up, LM's scores were 8.41, 8.54, and 8.75, respectively.

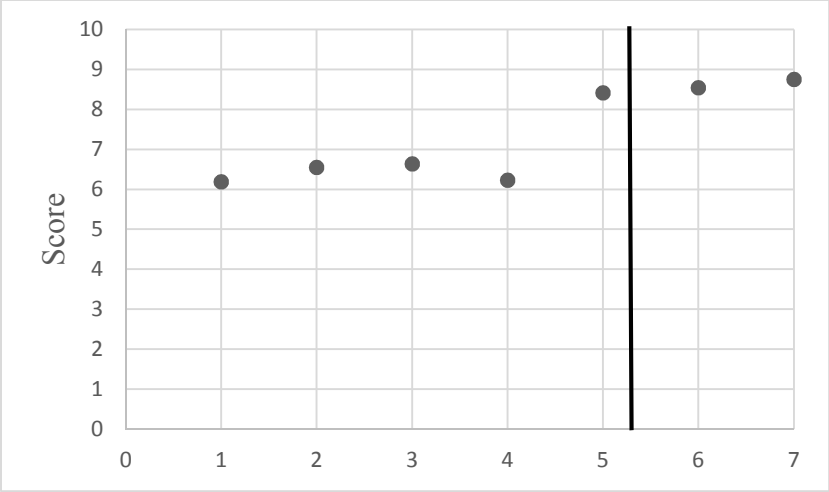

Figure 3: Self-Efficacy for Adolescents Scale

Personal Interview

In addition to the single-subject data already presented, an unstructured, personal interview with LM's mother, MM, was conducted as part of the current study. This interview was conducted over the phone by the primary investigator and was recorded on a personal voice recorder for later analysis. MM said that she "loves" Speak Now, stating that she saw a "big difference" in her son as a result of the camp and that the camp "worked for him." When asked to elaborate, she stated that the camp helped LM accept himself as a person who stutters and that he benefited from being around other adolescents who stutter. She stated that Speak Now helped build LM's confidence in speaking situations, noting that before camp, he wouldn't play sports at school because he didn't want to talk to the other kids. After Speak Now was over, he started playing two different sports in school.

Furthermore, MM commented on the impact Speak Now had on her own life. She stated that the camp "helped me out as a parent" and "allowed me to break down the walls with the emotional problems that I was having with LM's speech." She said that her friends didn't understand what she was going through and that she benefited from meeting other parents of adolescents who stutter. She went on to say, "I needed to see that I wasn't the only one having the feelings that I was having, and it felt good to express how I feel. It was an outlet for me. The other parents actually understood what I was going through." She concluded by stating that Speak Now was "life-changing" for both her and LM.

CHAPTER 5

DISCUSSION

The current study provides promising evidence from single subject data from a single case and a personal interview that an intensive CBT-based intervention could be effective at reducing the negative impact of stuttering on quality of life and increasing self-efficacy in communication situations among adolescents who stutter. More specifically, LM's scores on both the OASES-T and the SEA-Scale improved at post-treatment and were maintained, for the most part, at one and three months follow-up. On the other hand, because of the variability in %SS throughout all seven data points, no conclusions can be made about how Speak Now might have influenced stuttering severity. Also, LM's scores on the STAIC, which were consistently low across all data points, may suggest that the STAIC is either an invalid measure of his state and trait anxiety or may indicate that he does not exhibit signs of anxiety. Last, during the personal interview, MM reported that she saw significant changes in her son after Speak Now in terms of improvements in confidence, decreases in avoidance of social situations, and acceptance of his stuttering. She also stated that Speak Now helped her deal with the feelings she had surrounding LM's stuttering.

Limitations

The present research has several limitations. First and foremost, the present study utilizes a single-subject design with data from a single adolescent as well as personal interview data, so no claims of causality can be made from the data reported here. It's

possible that extraneous variables are behind the positive results seen in LM's OASES-T and SEA-Scale scores. Additionally, it cannot be assumed that LM represents all adolescents who stutter and that the same changes seen in LM's scores would be seen in other adolescents who stutter. In other words, no claims of generalizability can be made.

Furthermore, LM attended Speak Now two years in a row and has a history of previous CBT-based therapy at TUSLHC. So although he wasn't receiving therapy at the time of camp, it could be that the improvements seen in the data are a result of an interaction between previous therapy and the Speak Now intervention. On the other hand, it's also possible that a larger effect would have been seen if LM had never been exposed to CBT-based therapy before the start of camp. Additionally, LM missed the first two days of camp, so it's possible that the difference in pre- and post- treatment measures would have been larger if he had attended all five days.

As discussed previously, the STAIC may not have accurately captured LM's level of anxiety surrounding communication situations, underestimating his speech-related anxiety. Future research assessing CBT among adolescents who stutter should specifically look at communication-related anxiety across speaking situations.

Last, in terms of the personal interview portion of the present study, it's possible that MM may have felt compelled to speak highly of the camp in her phone call with the primary investigator, whom she knew was associated with the camp. However, MM shared negative opinions about one aspect of camp logistics, the lack of transportation to camp, which makes it appear that she felt comfortable providing critical feedback.

Conclusion

In conclusion, the present study provides promising data, albeit limited, that intensive CBT-based interventions could have a significant impact on reducing the negative psychological impact of stuttering among adolescents who stutter. Future research should examine the efficacy of CBT-based programs on quality of life and anxiety among larger samples of adolescents who stutter.

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