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# Mindfulness Attributes as Predictors of Treatment Outcomes in Children Who Stutter

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Mindfulness Attributes as Predictors of  
Treatment Outcomes in Children Who Stutter

by

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A thesis submitted in partial fulfillment  
of the requirements for the degree of  
Master of Science in Speech Language Pathology  
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## **Abstract**

A recent U.S.-based survey (Boyle et al., 2011) estimated stuttering prevalence in American children ages 3-17 years at 1.6% or 1 in 63 children. In comparison to the reported 1 in 68 school age children living with Autism Spectrum Disorder (Centers for Disease Control and Prevention, 2010), stuttering affects nearly as many. These estimates suggest that Speech-Language Pathologist (SLPs) should increasingly develop their skill sets for identifying and providing interventions for children who stutter.

The evidence base for school-age fluency intervention, while promising, leaves much room for further development (Nippold, 2011). The majority of current interventions revolve around the traditional methods of fluency shaping and stuttering management. While these approaches are widely used, there is limited evidence to support their efficacy with the school-aged population (Bothe, et al., 2006). In addition, there is disagreement about whether treatment of stuttering in children should focus exclusively on "building fluent speech" or, whether interventions should also include cognitive/emotional components (Yaruss, Coleman, & Quesal, 2012) as are often associated with interventions for stuttering in adults.

As a solution to the need for a cognitive/emotional component, Michael Boyle (2011) suggested including mindfulness in school-aged stuttering intervention by pointing out the similarities between the advantages of mindfulness treatment and personality traits necessary for long-term fluency maintenance. Although there has not yet been any published research in direct support of this idea, the notion that these three elements influence the effects of fluency intervention provides a foundation for the proposed research questions.

## **Introduction**

Approximately three million people stutter in the United States (National Institutes of Health, 2010). While accurate determination of prevalence continues to remain a challenge, recent epidemiological estimates for school-age children have been reported to range from 0.33% (McKinnon, 2007) to 5.6% (McLeod and Harrison, 2009; Yairi and Ambrose, 2013). Crucially, the cited studies were conducted outside the United States. A recent U.S.-based survey (Boyle et al., 2011) estimated stuttering prevalence in American children ages 3-17 years at 1.6%, or 1 in 63 children. This translates to an estimated 48,000 school age children who stutter. In comparison to the reported 1 in 68 school age children living with Autism Spectrum Disorder (Centers for Disease Control and Prevention, 2010), stuttering actually affects more children. These estimates suggest that Speech-Language Pathologist (SLPs) should increasingly develop their skill sets for identifying and providing interventions for children who stutter.

A facet often left unconsidered pertains to the attitudes and behaviors of a person who stutters. While interruptions of speech and secondary behaviors are easily noticed, the internal response to stuttering is not as readily observed. Feelings of embarrassment, fear and frustration have been linked to childhood experiences with stuttering (Guitar and Conture, 2007). Many have confirmed lesser quality of life that they attribute to stuttering, rating their feelings on being called a stutterer as "very bad" (Chun, Mendes, Yaruss & Quesal, 2010). These feelings may adversely impact behavior in various social environments, reactions in certain situations and self-image. While the usual assumption of an SLP's duties regards improving communication, quality of life also falls within the Scope of Practice (ASHA, 2007).

This point is reinforced when one considers the various negative impacts of stuttering that have been documented in school age children. For example, the Communication Attitude Test revealed a relationship between the mal-adjusted attitude and negative emotions experienced by children who stutter (Vanryckeghem, Hylebos, Brutten & Peleman, 2001). Additionally, Blood and Blood (2004) found relationships between bullying and stuttering in school-age children. Higher risk of bullying correlated with indications of low self-esteem based on self-report. Higher bullying risks also correlated with reports of lower communication competence. While the majority of the current treatment approaches with children focuses on coordination and controlling speech motor movements, some treatments do include an emotional component. Still, it is not emphasized nearly enough in comparison to adult treatment models.

As a solution to the need for a cognitive/emotional component Boyle (2011) suggested including mindfulness in school-aged stuttering intervention by pointing out the similarities between the advantages of mindfulness treatment and personality traits necessary for long-term fluency maintenance. Mindfulness is a concept originally found in Satipaṭṭhāna, a well-known type of Buddhist meditation. The most common definition of mindfulness, explained by Kabat-Zinn (1994) is "...paying attention in a particular way: on purpose, in the present moment, and nonjudgmentally" (Kabat-Zinn, 1994, p.4). However, mindfulness does not intend for one to 'block out' or eliminate other thoughts. Mindfulness is intended to facilitate "lucid awareness" (Bodhi, 2011, p.4). In other words, mindfulness is the clear and unbiased observation of events with the intent of experiencing these events fully through the senses, without connotation.

Current interventions for stuttering in school-age range from response-contingency methods such as the Gradual Increase in Length and Complexity of Utterances program (GILCU) (Ryan & Ryan, 1974), to more direct stuttering modification/fluency shaping programs (Reeves & Yaruss, 2004). The latter approaches, especially, require clients to monitor and modify their speech behaviors. Additionally, there is evidence that improving fluency without

addressing emotions and attitudes about stuttering can lead to relapse (Bothe et al., 2006). Recently, Boyle (2011) suggested incorporating elements of mindfulness-based awareness training in order to foster meta-cognitive awareness (self-monitoring ability), emotional control and communication attitude (i.e., acceptance of stuttering). The aim of this investigation was to determine whether correlations exist between these three aspects of mindfulness mechanisms and the frequency of stuttering at each stage of an intensive stuttering/fluency modification treatment.

In the sections that follow, I will first address the epidemiology of stuttering in greater depth. Second, I will review current approaches to intervention for childhood stuttering, including their defining constructs and factors that influence prognosis. Finally, a comprehensive definition of mindfulness and its elements will be provided along with how it can address meta-cognitive awareness, emotional regulation and communication attitude within the school-age population.

### **Epidemiology of Childhood Stuttering, Natural Recovery and Persistence**

Epidemiology is a fundamental part of treatment research that concerns not only the current populations with a disorder, but those at risk for acquisition or development. How many children do in fact stutter? An estimate of 48,000 has already been determined for the United States population based off of the 1.63% prevalence reported by the National Institutes of Health Survey (2010). This percentage yields an estimate of 1.5 million when calculated into the current world population of about 7 billion. However according to Yairi and Ambrose (2013), recent research has found higher childhood incidence rates, ranging from roughly 5 up to 8%, which would significantly increase this number. Although progress has been made towards more effective methods of estimation, there is a noticeable amount of variation between the available prevalence percentages. One of the only reported lifetime prevalence measures was 0.72% (Craig, Hancock, Tran, Craig & Peters, 2002). As previously mentioned, obtaining exact numbers regarding school-age stuttering poses some difficulty. The majority of research regarding school-age stuttering populations has been conducted via caregiver survey. This

indirect form of data collection may be disadvantageous due to the possibility of subjective influence (Yairi & Ambrose, 2013). The amount of research in the area of childhood stuttering epidemiology seems rather limited when matched against a number of other communication disorders.

Various subgroups have been explored in research investigating stuttering epidemiology. One of the statistics most commonly speculated with any disorder remains the male-to-female ratio. Early literature reports the child male-to-female ratio at 2.8:1 (Andrews & Harris, 1964; Aron, 1962; Bloodstein, 1995; Craig et al., 2002; Gillespie and Cooper, 1973), but more recent research specific to school-age populations has reports of a smaller average ratio of 2.3:1 (Buck, Lees, & Cook, 2002; Howell, Davis, & Williams, 2008; Månsson 2000; Månsson 2005; Reilly et al., 2009; Yairi & Ambrose, 2005; Yairi & Ambrose, 2013). However, this male-to-female ratio has been found to be higher in older populations (Craig et al., 2002). Additionally, higher percentages of co-occurring speech-language disorders in males than females have been found, specifically articulation and phonology disorders (Blood, Ridenour, Qualls, & Hammer, 2003).

Other popular subgroups include race and ethnicity. According to a National Institutes of Health Survey (1997-2008), the 2.63% stuttering prevalence in non-Hispanic black children is more than double the non-Hispanic white prevalence percentage of 1.27%. This number is consistent with the 2.6% reported by Proctor, Yairi and Duff in 2008. The risk of coexisting disorders in African American children who stutter is greater than in other children too (Blood, Blood, Kreiger, O'Connor, & Qualls, 2009). The stuttering prevalence for Hispanic children was a reported 1.96% (Boyle et al., 2011), and the number of children of Asian background who stutter was the lowest amongst these ethnicities (Blood et al., 2009).

Neither socioeconomic status (SES) nor culture and its influence has been adequately researched in childhood stuttering. While other investigations have found socioeconomic status not to be statistically significant (Keating, Keating, Turrell, and Ozanne, 2001; McKinnon et al.,

2007), an association between SES influence and stuttering in the United States has been observed (Boyle et al., 2011). Factors such as income, maternal education and receipt of Medicaid all were associated with a higher prevalence of stuttering as well as other developmental disorders. Although there is limited research on culture, literature on the relationship between bilingualism and stuttering is present. In a 2009 study, stuttering was shown to occur in both languages for the majority of the cohort (95%). Those who were bilingual from birth had lower recovery rates than those who began learning a second language around kindergarten (Howell, Davis, and Williams, 2009).

Contrary to socioeconomic status and culture research on natural recovery, or recovery from stuttering without any intervention, presents a stronger evidence base. Recent studies conducted in several countries have reported natural recovery rates ranging from 68-96%, yielding an average of 73%, with recovery rates decreasing as age increases (Craig et al., 2002; Dworzynski et al., 2007; Howell et al., 2008; Howell and Davis, 2011; Johannsen, 2001; Månsson, 2000; Månsson 2005; Ryan, 2001; Yairi and Ambrose, 2005; Yairi and Ambrose, 2013). Rates specific to the United States range from 68% (Ryan, 2001) to 76% (Yairi and Ambrose, 2005). Some of these studies have shown, additionally, that natural recovery can take from 6 months to 6 years. Girls are more likely to naturally recover from stuttering than boys, and children who have a family history of natural recovery from stuttering are more likely to naturally recover as well (Yairi and Ambrose, 2005). With consideration to the notably high rate of natural recovery, one can anticipate lower rates of persistent stuttering into later childhood, but reported rates of persistent stuttering in children range from 26%-50% (Yairi and Ambrose 1999; Howell et al., 2008). Although the rates of natural recovery decline with age, persistence also decreases as age increases. This decline in persistence may be attributed to the number of children who experience spontaneous recovery at an older age.

## **Current Approaches to the Treatment of Childhood Stuttering**

Despite the limited amount of research for school-aged fluency interventions, the evidence base is not entirely absent. Recent reviews by Nye et al. (2013) and Bothe et al. (2006) examined more current research regarding the efficacy of these different types of intervention. Coincidentally, a number of these studies employed the two key treatment approaches of stuttering modification (Ryan and Ryan, 1983) and fluency shaping (Craig et al., 1996; Onslow et al., 1996). As originally established by Van Riper (1973), stuttering modification is focused on reducing one's struggle or tension during moments of stuttering. This concept includes reducing avoidance behaviors and implementing modifications to reduce severity of stuttering events. The traditional stuttering modification treatment consists of the following parts:

- 1) Identification- As the first part of the program, the clients identify their stuttering symptoms as well as secondary behaviors. To do this, clients practice the technique of "open stuttering." Also known as pseudostuttering, clients stutter on purpose while maintaining eye contact with a designated listener. Open stuttering allows the client to observe their own symptoms as well as others in the group. To further understand the processes they are witnessing, clients are taught basic anatomy of the speech mechanism as well as phonetic features such as place, manner and voicing.
  - "Stuttering easily"- a term often used during stuttering modification, this refers to reducing the tension and/or struggle experienced by a client during moments of stuttering. One of the most common characteristics of a stutter, which the clients are also asked to identify, are increased feelings of tension of the speech musculature and struggle to transition out of the stuttering moment. In efforts to reduce this tension, clients practice using light articulatory contacts and deliberate movements of the articulators.

- Elimination of secondary behaviors- before moving on to the next stage in treatment, clients are asked to identify their secondary behaviors. These can range from fine motor movements (i.e., facial grimaces, finger/toe tapping, blinking) to gross motor movements (i.e., movements of larger extremities such as the arms, hands or head). Once these are identified clients practice eliminating these behaviors by maintaining eye contact and a neutral posture when eliciting speech.
- 2) Desensitization- At this point in the treatment, clients will have essentially eliminated their secondary behaviors and grown more comfortable with the open stuttering technique. It is then taken a step further by practicing open stuttering with novel communication partners. The purpose of this exercise is to 'desensitize' the client to their reaction as well as their listener's reactions to moments of stuttering.
  - 3) Modification- During the modification phase, the client should be comfortable enough to not only stutter openly, but to modify their moments of stuttering. A common reaction to stuttering is increased tension of the speech musculature, resulting in more advanced stuttering symptoms such as audible prolongations or silent blocks. The goal here is to "stutter easily" by reducing this tension, increasing their range of motion with the articulators and trying to not 'rush through' stuttering. Specific modification techniques taught are post-block corrections and in-block corrections. Post-block corrections, also known as cancellations, are when the client pauses after a moment of stuttering, proceeds to identify their lack of movement during that moment of stuttering, and makes a second attempt at the word with more control of their articulatory movements. In-block corrections, also known as pull-outs, are when the client transitions out of the stuttering moment mid-word by identifying the lack of movement in the

articulators, establishing 'easy' phonation and exaggerating that phonation to transition out of the moment of stuttering. The final technique is known as a pre-block correction, or preparatory set. Here, the client uses the skills learned (i.e., reduced muscle tension, increased range of motion) in anticipation of a potential moment of stuttering.

- 4) Stabilization- The fourth and final portion of the stuttering modification treatment involves maintenance and generalization of their newly learned skills. Continued practice of these skills is encouraged even after the client feels they are at a mastery level or following therapy dismissal. To promote generalization, it is suggested that the client practice their techniques in novel or perhaps unfavorable speaking situations. To maintain these skills, clients should continue practice and if they relapse should repeat the four phases of the treatment with a communication partner.

The second key approach is fluency shaping. This intervention aims to decrease stuttering frequency through the conscious management of speech characteristics such as rate, prosody and breathstream (Perkins, Rudas, Johnson, Michael, & Curlee 1974). As part of this treatment clients practice "slow-normal" speech rates ranging from 120-150 words per minute. To utilize these speech rates, clients are taught to slow their speech in more stressful situations and inversely increase their speech rate in low or non-stressful speaking situations. In regards to prosody, speakers learn to emphasize certain words when using their slower speaking rate to increase the naturalness of their speech. Breathstream is managed by teaching skills similar to those of the pre-block corrections. Neutral positioning and controlled movements of the articulators are the main focus for regulating the breath stream during speech.

Research has indicated that the training of fluency shaping techniques is useful when implemented in combination with a structured, intensive, contingency-based treatment design (Bothe et al., 2006). Stuttering modification with school age children has also generated some

success (Ryan and Ryan, 1983; Yaruss and Reeves, 2004). A blend of these two treatments is optimal for clients, implementing fluency shaping techniques at the pre-block correction stage of stuttering modification. Often clients are focused on decreasing their stuttering, but by applying both of these treatment methods the client may reduce their stuttering while also developing the necessary strategies should they experience a moment of stuttering. To this date, fluency treatment across the lifespan essentially revolves around these behavior-based practices (Nye et al., 2013).

It has been established that the evidence base concerning fluency interventions geared towards the school-age population (ages 6-12) is rather narrow but nonetheless emerging. (Nippold 2011; Yaruss et al., 2012). The majority of current and effective treatment research relates to the adult and preschool stuttering populations. The Lidcombe program, which is for preschool-aged children, is the only childhood behavioral intervention with strong evidence of success (Blomgren, 2013, Nye et al., 2013). Still, the extent of the Lidcombe program's success remains unclear due to limited research of other treatment programs for comparison (Nye et al, 2013). An explanation for the lack of concurrence in treatment research may stem from the range of inconsistency between variables across studies. Substantial differences and inadequacies found amongst the included studies were age ranges, durations, sample sizes and post-treatment methods. One crucial variable directly related to the true success of an intervention is the follow-up measure to assess the maintenance of techniques implemented in treatment. Of the two most recent systematic reviews investigating behavioral stuttering therapy in children, only 12 of the 48 total studies included follow-up measures (Bothe et al., 2006; Nye et al., 2013). Moreover, only 11 of those studies included a measure of either social, emotional, or cognitive variables.

### **Factors Influencing Treatment Outcomes for Childhood Stuttering**

While the exploration of epidemiological factors of stuttering looks to increase the understanding of developmental paths, prognostic indicators can aid in predicting how a client

will respond to treatment. With this predictive information, clinicians can optimize treatment by tailoring intervention techniques to their individual clients (Guitar, 1976). Researchers have looked into various factors that may play a role in the effective treatment of persistent stuttering. While there has been longstanding interest in predictive factors in treatment for adults who stutter, there is significantly less work in predictive factors in treatment for children who stutter. In efforts to hypothesize the effects of predictive factors in children who stutter, the available research within the adult population will be reviewed.

One of the first successful studies in the realm of prognostic indicators was completed by Guitar (1976, 1978). Pretreatment measurements of stuttering severity, neuroticism and attitudes were all found to correlate with treatment outcomes based on measurements recorded 12 to 18 months post-treatment. Data revealed that pretreatment attitude was the best predictor of treatment outcomes, specifically measures of avoidance. Guitar went on to investigate the difference between clients who had improved communication attitudes versus those that did not experience attitude modification in therapy (1978). This study concluded that those who did not exhibit a 'normalization of communication attitude' did not maintain long-term fluency a year after treatment. Guitar theorized that those who were 'avoidance-conditioned' and did not alleviate the emotional repercussions of stuttering during treatment were more likely to relapse. Persistent negative emotions or feelings associated with stuttering may be detrimental to progress in treatment as well as overall mental health.

Iverach et al. (2009) explored the relationship between mental health and outcomes of stuttering treatment in adults. Interestingly, correlations were found across several different types and combinations of mental health disorders. With respect to stuttering frequency and situation avoidance, treatment outcomes were lower and poorly maintained by participants with a mental health disorder, whereas 1/3 of participants that were not diagnosed with any mental health disorders maintained post-treatment fluency levels six months following intervention. A total of 64 adults were included in this study, with 65% rate of genetic predisposition.

Genealogy has already been established as an etiological factor in regards to persistence as well as natural recovery, but there is little research considering family history as a predictor of treatment outcomes. Poulos and Webster (1991) investigated family history, looking at two developmental stuttering subgroups: 1) clients who had a genetic predisposition to stuttering and 2) those who had experienced potential events/factors that may have indirectly caused their stuttering (i.e., brain damage early in life). While evidence showed a clear etiological relationship, there was no numerical data linking family history and treatment outcomes in this study. Rather, the uncertainty of the relationship between family history of stuttering and pretreatment factors was noted along with the questioning of its overall existence. However, clients in the latter 'developmental' subgroup were shown to be less successful in improving motoric skills necessary for long-term fluency maintenance.

Similar to genealogy, neurology has been established as another common etiological factor in stuttering with limited research pertaining to its effects on treatment. Ingham, Wang, Ingham, Bothe & Grafton (2013) completed the first study examining the effects of a specific neurological region on stuttering treatment outcomes. Participants received linear forms of intervention with no functional differences, and the left putamen region of the brain was reported to consistently activate during a variety of speech tasks. Activation in the claustrum was also observed but not as clearly. The function of the putamen in relation to speech includes motor initiation and execution. The putamen has also been found to be more active when one is exhibiting more controlled motor speech movements (Price 2010, 2012). Results from this study indicate the potential benefit of decreasing putamen activity, but made note of the limited evidence base in this area.

Predictive factors of treatment outcomes in children who stutter are essentially unknown, warranting the previous analysis of adult literature to hypothesize potential prognostic indicators. One study conducted in 2009 investigated the effects of the Lidcombe Program for school-age children who stutter. While there was evidence of success with the Lidcombe program in

students older than the targeted age range, no correlation was present between relapse and the duration of time post-treatment (Koushik, Shenker & Onslow, 2009).

A more recent investigation, and perhaps the only investigation, that explored predictive factors of therapy performance in children was conducted in 2013 (Cook, Donlan & Howell). Stuttering severity was the primary factor being examined. However, based on research regarding teenage recovery and persistence (Howell and Davis, 2011), psychosocial factors and lexical diversity were also considered. Of these three factors, stuttering severity was the only one significantly correlated to treatment success. Those that were more severe were more likely to persist. Although not statistically significant, an emerging relationship between lexical diversity and therapy outcomes was observed, showing children who stutter to use less lexical diversity in comparison to children who speak fluently. Psychosocial factors were not significantly correlated with treatment outcomes. No relation was found between post-treatment stuttering measures and psychosocial impact measures, but correlation between initial stuttering severity and psychosocial impact was found. Additionally, the majority of participants reported a psychosocial impact attributed to their stuttering (Cook et al, 2013).

Using the current evidence base, Zebrowski (2011) examined the few available treatment outcome studies and epidemiological investigations to discuss several theoretical implications of factors influential to treatment outcomes. Specifically, factors not part of the actual intervention, or 'extratherapeutic' factors, were considered. Zebrowski believed that levels of reactivity, emotional response and self-regulation abilities contribute to a more assertive personality type which therefore prepares the child for various and even novel speaking situations. Concomitant disorders were mentioned as well, discussing the potential for less therapy being devoted to fluency management due to other co-existing communicative disorders.

With respect to environmental factors, parent involvement was mentioned by Zebrowski (2011). The trait of congruence, or balance of intellect and emotion, was theorized to be

beneficial to communication partners of children who stutter, finding that intense emotional responses/low emotional regulation may hinder a parent's processing of therapy information. Through congruence, parents can acquire skills to alter perspective and not only increase understanding of their child but potentially behavior.

Lastly, client-clinician relationship was considered by Zebrowski (2011) as an influence on treatment outcomes. This directly relates to the notion of unrealistic expectations. Often time children and even parents expect to see significant results in a less than significant amount of time. Essentially, it is the clinician's job to educate the child as well as the parents about the intervention while also establishing the importance of completing intervention plans regardless of duration. Being flexible with fluency clients and their parents has been said to build rapport and trust, resulting in consistency and motivation, which are key components of any form of treatment success. Even though Zebrowski provided a comprehensive theory explaining of potential treatment factors, it remains just that: potential. A commonality found within these studies continues to remain the mention of limited treatment outcomes research with children who stutter (Zebrowski, 2011).

A new theory for treatment direction was presented by Boyle in 2011. He suggested the potential need for a mindfulness component included in stuttering intervention. Mindfulness training has been used with a variety of disorders, ranging from gastro esophageal reflux, to pain relief, to anxiety and depression (Burke, 2010; Eberth and Sedlmeier, 2012). Success has been found in improving overall psychological well-being in adults as well. As outlined next, Boyle (2011) observed and explained the similarities between the advantages of mindfulness treatment and personality traits necessary for long-term fluency maintenance.

### **Mechanisms of Mindfulness**

Mindfulness is defined as "a process of regulating attention in order to bring a quality of non-elaborative awareness to current experience and a quality of relating to one's experience within an orientation of curiosity, experiential openness and acceptance" (Bishop et al., 2004, p.

234). Mindfulness is based on relaxed training of 'focused attention' and 'alert observation' to facilitate non-judgmental observations of changes to the internal and external environments (Goldin & Gross, 2010). Boyle proposed the concept of enhancing stuttering interventions with the addition of mindfulness training (2011), and divided the mechanisms of mindfulness into three categories: Meta-cognitive awareness, emotional regulation and communication attitudes. He believed that by conditioning speakers to maintain non-biased thoughts towards events, they may therefore view moments of stuttering without any emotional connotations. Without pessimistic views towards speech one has a greater likelihood for long-term success. The importance of addressing emotions and attitudes towards speech as well as the shortage of school-age treatment methods that actually address these factors has already been discussed (Bothe et al., 2006).

Metacognitive awareness is a form of self-monitoring associated with higher-order thinking. Metacognitive awareness is a skill vital to independently regulated learning (Sperling, Howard, Miller & Murphy, 2002). With mindfulness, one can improve metacognitive awareness and use that self-monitoring to immediately and objectively acknowledge mental and physical sensations/feelings. Through this non-biased perspective, clients may prevent negative thoughts from having an adverse impact (Boyle, 2011). Through metacognitive awareness one also can monitor the use of stuttering modification and fluency shaping techniques. According to Veenman (2006), metacognitive awareness is required for successful implementation of stuttering modification and fluency shaping. However, evidence shows metacognitive awareness does not adequately develop until adolescence (Veenman Wilhelm, & Beishuizen, 2004).

A second component mentioned by Boyle (2011) is emotional regulation, or the ability to manage internal feelings. Specifically, it is the regulation of the occurrence, duration and intensity of internal emotional reactivity (Thompson, 1994; Ahadi & Rothbart, 1994). Research has examined the effect of emotional regulation skills (an aspect of temperament) on fluency

treatment outcomes in children, which is already known to be significant (Anderson, Pellowski, Conture, & Kelly, 2003). Based on parent report, Anderson et al. (2003) found that children who stutter demonstrated slower adjustment to new situations or environmental changes, and exhibited less divided attention or 'distractibility'. To further support this, Karrass et al. (2006) found that children who stuttered were reported to be more reactive, exhibit more intense reactions to stressful situations and to have less/slower regulation skills. Heightened negative emotions associated with stuttering moments or prior to stuttering moments are rather common in at least some children and adults who stutter. Mindfulness training may improve emotional regulation skills of people who stutter by teaching them to separate their natural internal response to a stuttering event from the potential development of an enduring negative feeling associated with these moments.

A final mindfulness element discussed by Boyle is communication attitude, better known as acceptance, which is defined as "recognizing a problem for what it is, being willing to experience it, and finding newer or more adaptive ways of addressing it" (Yaruss, Coleman, & Quesal, 2012, p. 539). It has already been found that communication attitude is related to the negative emotions school-age children who stutter experience (Vanryckeghem et al., 2001). Not only does communication attitude relate to these negative perceptions, it also predicts success in treatment (Brutten & De Nil, 1991; Guitar 1978). Mindfulness training may improve these attitudes by promoting acceptance. Once a person accepts their stuttering, they can move on to appropriately using and generalizing stuttering modification techniques, which require a person to experience a moment of stuttering (with the exception of pre-block corrections).

These aspects of cognition all relate to one's mindfulness and may play a role in reducing avoidance behaviors and also in acquiring and transferring stuttering modification skills, which are often taught as strategies for replacing avoidance behaviors in stuttering management.

## **Summary and Research Questions**

The current prevalence of stuttering in the United States school age population is a noteworthy statistic. While attention to the treatment of this population is very much warranted, empirically supported evidence for effective interventions remains scarce. Several of the available treatment methods at this time are fashioned around stuttering modification and fluency shaping techniques. Although these methods have shown some success, their effectiveness within the school age population is relatively unknown. Another common element in the formula for most fluency interventions acknowledges the speakers' emotions, attitudes and self-monitoring. Research on the effectiveness of this element within the school age population is also rather vague. A recent method used to address emotions and attitudes in a variety of clinical settings is mindfulness training. Boyle recognized the similarities between mindfulness components and components essential for efficacious long-term fluency management: meta-cognitive awareness, emotional regulation and communication attitudes. The notion that these three elements influence the effects of fluency intervention provided a foundation for the proposed research questions. This investigation aims to further explore the link between a child's innate mindfulness abilities and appropriate usage of stuttering modification and fluency shaping techniques.

As suggested by Bothe et al. (2006), an intensive-style treatment program for school-age children who stutter was being implemented in the University of South Florida Speech-Language and Hearing Clinic. Further advice from Michael Boyle (2011) resulted in the augmentation of that program with mindfulness training. Measurements of inherent meta-cognitive awareness, emotional regulation and communication attitudes were taken before treatment. Baseline mindfulness skills in children who stutter have yet to be thoroughly investigated, which led to the following research questions: 1) Do children who stutter evidence scores that are within normal limits on self-reported scales of metacognitive awareness, emotional regulation and acceptance/communication attitude? 2) Do metacognitive awareness,

emotional regulation and acceptance comprise independent constructs of mindfulness in children who stutter, as claimed by Boyle (2011)? 3) Do the three different elements of mindfulness correlate with treatment outcomes, as measured using self-rated mindfulness surveys correlated with frequency-of-stuttering measures and correlated with effortfulness? This study explores the potential association of mindfulness skills with achievement in intensive fluency therapy.

## Methods

### Participants

Participants were five school-age children who stutter, four males and one female, between the ages of nine and eleven. Basic participant demographic information can be found in Table 1. Background history and medical information for each participant was provided by a legal guardian via the University of South Florida Speech Language and Hearing Clinic Intake Form. All students had normal or corrected-to-normal vision, with one student wearing glasses. All but one had received formal hearing tests, and there were no reports of hearing loss. No cognitive, intellectual, neurological, or other concomitant disorders were reported. One student was attended occupational therapy at the time of treatment for sensory integration and fine motor skills.

All participants were diagnosed with stuttering by a speech-language pathologist, three of which were also evaluated at the USF Speech Language and Hearing Clinic. Each participant had received past speech-language therapy services for fluency using traditional childhood stuttering treatment approaches. One child had received speech-language therapy for articulation and was discharged approximately 5 years prior. The remaining four participants did not receive additional therapy services.

Onsets of stuttering ranged from ages 2-5, having all been reported by the biological mothers of the participants. Three of the five children had an unremarkable birth history. There were no reports of lasting health complications for any of the children. Two children were bilingual speakers of Spanish, one of them speaking primarily Spanish in their home environment. Both of these children were fluent in English and no observable language difference was detected.

Table 1  
*Participant Demographic Information*

Participants	Gender		Age			Grade*				Bilingualism
	Male	Female	9	10	11	3 <sup>rd</sup>	4 <sup>th</sup>	5 <sup>th</sup>	6 <sup>th</sup>	
	4	1	2	2	1	2	1	1	1	2

\*Grade most recently completed

## Intervention

Participants attended a five-day intensive stuttering treatment program at the University of South Florida Speech Language and Hearing Clinic during June 2014. Sessions were four hours in length including scheduled breaks. Treatment focused on teaching a combination of traditional stuttering modification and fluency shaping techniques (Table 2). Intervention was developed using a variety of other published materials including Working with People Who Stutter: A Lifespan Approach (Bennett, 2006), The Source for Stuttering: Ages 7-18 (Reeves & Yaruss, 2004) and Nathan Maxfield's Program for Advanced Treatment of Stuttering (University of South Florida).

Table 2  
*Treatment Schedule Summary*

Day	Stuttering Intervention	Mindfulness Intervention
Monday	Stuttering Modification: <ul style="list-style-type: none"> <li>• Stuttering Openly/Acceptance</li> <li>• Speech Anatomy</li> <li>• Place, Manner, Voicing</li> </ul>	<ul style="list-style-type: none"> <li>• Mindful vs. Unmindful</li> <li>• 3 Major Areas of the Brain</li> </ul>
Tuesday	Stuttering Modification: <ul style="list-style-type: none"> <li>• Review of articulators &amp; open stuttering</li> <li>• Identification &amp; Elimination of Secondaries</li> </ul>	<ul style="list-style-type: none"> <li>• Core breathing exercise</li> <li>• "Taking your Time Counts" activity</li> </ul>
Wednesday	Stuttering Modification: <ul style="list-style-type: none"> <li>• Review of open stuttering, Dissection</li> <li>• Post Block Correction</li> <li>• In Block Correction</li> </ul>	<ul style="list-style-type: none"> <li>• Review of core breathing</li> <li>• Perspective Taking</li> <li>• 'Too-quick' Judgment</li> </ul>
Thursday	Fluency Shaping: <ul style="list-style-type: none"> <li>• Review of Post Block &amp; In Block Correction</li> <li>• Pre Block Correction</li> </ul>	<ul style="list-style-type: none"> <li>• Review Perspective Taking</li> <li>• Choosing Optimism &amp;</li> <li>• Optimistic Thinking</li> </ul>
Friday	Fluency Shaping: <ul style="list-style-type: none"> <li>• Review of Post, In, &amp; Pre Block Corrections</li> <li>• Naturalness &amp; Highlighting</li> </ul>	<ul style="list-style-type: none"> <li>• Mindfulness Action Plan</li> <li>• Developing a Mindfulness Motto</li> <li>• CBT Open discussion about stuttering reactions</li> </ul>

The program began with an overview of speech and anatomy followed by voluntary stuttering, cancellations and elimination of secondaries. The second half of the program was comprised of pull-outs, preparatory sets (i.e., predetermined speech) and closed with a lesson on fluency shaping techniques including highlighting and naturalness. Treatment was augmented daily with mindfulness lessons from the MindUp! Curriculum (Hawn Foundation, 2011), teaching lessons such as basic neuroanatomy, mindful breathing, mindful movement, perspective taking and optimistic thinking.

## **Measures**

### **Fluency Measures**

Students were given two tasks to elicit speech prior to the treatment program and immediately following the first, third and final treatment sessions. The first task required participants to read a passage aloud. For the second task participants were asked to create an oral narrative based on illustrations. Participants' attempts were recorded using a video camera for thorough analysis and accurate scoring.

The first task involved the participants reading short standardized passages aloud. The Dynamic Indicators of Basic Early Literacy Skills (DIBELS) was established at the University of Oregon, where research of the measure's effectiveness continues. The DIBELS was designed as a 'General Outcome Measure' (Espin and Foegen, 1996) to serve as a phonemic awareness screening primarily through assessing phoneme segmentation fluency. Materials are intended for administration at three different times during the school year beginning from kindergarten to the end of sixth grade. The reading passages included in the DIBELS are anticipated to average one minute in length. Additional phonemic awareness tasks are included in the DIBELS screening packets varying based on grade level. Participants were asked to read aloud passages chosen based on the grade most recently completed, and were not given the additional tasks (Kaminski, Cummings, Powell-Smith, and Good, 2008).

Wordless books were used as a prompt to elicit the oral narratives. Mercer Mayer's 'Frog' Series is a collection of wordless picture books, telling stories of a boy, a dog and a frog through illustration. From the collection the following books were used: A Boy, a Dog, and a Frog; One Frog Too Many; Frog, Where Are You?; and Frog Goes to Dinner. The *Story Grammar Marker* (Moreau, 2007) was provided as an optional visual aid to assist in organizing the narrative. *Story Grammar Marker* (Moreau, 2007) is a mnemonic device or visual/tactile strategy to show the framework, or macrostructure, during the retelling of a narrative story. Although a script was not used, clinicians did collaborate and agree on specific instructions to provide for each of the tasks. Subjects were not timed on either of the tasks, and given time to view the reading passage as well as the wordless book prior to eliciting speech samples. Clinicians briefly reviewed the daily lessons prior to the tasks, but did not provide any type of cueing during completion of the tasks.

Due to the potential of less utterances being produced in the narrative modality versus the pre-written reading passages and to ensure uniformity, the number of syllables analyzed per sample were controlled by examining the middle 100 syllables. Stuttering symptoms were measured using the Lidcombe Behavioral Data Language of Stuttering (LBDLS, Teesson, Packman, & Onslow, 2003). The LBDLS was developed as a systematic way for identifying the different types of stuttering behaviors. It is intended to serve as a reliable method of objectively reporting behavioral observations in children who stutter. The LBDLS consists of three stuttering categories and seven descriptors. The three categories and seven symptoms are as follows: repeated movements, which include the symptoms of syllable repetitions, incomplete syllable repetitions and multisyllable unit repetitions; fixed postures, which include the symptoms of fixed postures with audible airflow and fixed postures without audible airflow; and finally superfluous behaviors, which include the symptoms of verbal superfluous behaviors and nonverbal superfluous behaviors. Examples of the specific symptoms are provided in Table 3.

Table 3

*Examples of the Stuttering Behaviors Described in the LBDL\**

Descriptor	Examples of corresponding behavior
Syllable repetition	“where...where...where’s the ball?”
Incomplete syllable repetition	“I went to S...S...Sydney...”
Multisyllable unit repetition	“it’s a...it’s a...it’s a great...”
Fixed posture with audible airflow	“mmmmmy one” “ffffishy gone!”
Fixed posture without audible airflow	“I.....(no sound) bought...”
Superfluous verbal behaviors	“I went—oh well—ah—oh well---“
Superfluous nonverbal behaviors	“I—well I went over...” Grunting

\*Adapted from the original LDBLS article (Teesson, Packman, & Onslow, 2003)

### **Mindfulness Measures**

Mindfulness measures were taken pretreatment and post-treatment using self-administered scales. Selection of mindfulness scales was motivated by elements Michael Boyle discussed (2011) along with an overall mindfulness measure. The characteristics of mindfulness measured were metacognitive awareness, emotional regulation and communication attitude.

The Child Adolescent Mindfulness Measure (CAMM, Greco, Baer, & Smith, 2011) is a general mindfulness measure based on aspects found in the Kentucky Inventory of Mindfulness Skills (KIMS, Baer, 2004). The CAMM has been normed for grades 5-10, with an age range intended for 9 to 16 years. The survey consists of ten items asking responses to thoughts, feelings and awareness in the present moment on a five-point scale. Mindfulness aspects included on the CAMM include the following: observing, which relates to the recognition of internal and external changes such as thoughts, feelings, or sensations; acting with awareness, or devoting attention to the present moment and one’s activities in the present moment; and accepting without judgment, which refers to a willingness to experience various internal events and doing so with a neutral reaction (Greco, Baer, & Smith, 2011).

The Junior Metacognitive Awareness Inventory (Jr. MAI) (Sperling, Howard, Miller, & Murphy, 2002) is designed to assess metacognitive skills in young learners, adapted from the adult Metacognitive Awareness Inventory. This assessment is intended for grades 3-9, translating to an age range of 8-15. Two versions of the Jr. MAI were developed. The first

version, Version A, was developed for grades 3-5 with a three-point response scale and a total of twelve items. Version B, developed for grades 6-9, contained the same twelve test items and an additional six items with a five-point response scale. Items were revised with child-friendly language. Content of the assessment was primarily centered on the Brown framework of metacognition (1978). In this framework, metacognition is divided into two parts. The first part, knowledge of cognition, relates to the types of knowledge such as declarative, procedural and conditional knowledge. The second, regulation of cognition, includes the cognitive strategies of planning, monitoring and evaluation.

The Emotional Regulation Questionnaire for Children and Adolescents (Gullone and Taffe, 2011) is a revision of the Emotional Regulation Questionnaire, an adult measure. Items on the ERQ-CA have been adapted from the ERQ with more child-friendly terminology to promote comprehension. The rating scale for responses to items on the ERQ-CA has also been reduced from the seven-point scale (found on the ERQ) to five points. The ERQ-CA has been normed with children ages 10-18. Development of these surveys has been based on Gross' Emotion Regulation model (1998). In this model, Gross delineates two strategies that comprise emotional regulation: cognitive reappraisal and expressive suppression. Cognitive reappraisal is a strategy in which one reviews a potentially challenging emotional situation, and by taking a new perspective possibly changing its emotional effect. Expressive Suppression entails modifying emotional reactions by controlling behavioral responses. The survey consists of ten items assessing these two strategies.

Communication Attitudes Test-Revised (CAT-R) (Brutten & Dunham, 1989) was included as a measure of stuttering acceptance. The CAT-R is comprised of a set of true and false questions related to a child's attitudes about the way that they speak. Making for a total of thirty five items, the assessment is designed with about half of the items indicating negative attitudes about speech. In other words, the more 'true' responses that are marked on the test, the more negative the child's attitude about their communication. This survey has been normed

with children ages 6-15 and intended for grade school assessment of communication attitude in children who stutter.

Finally, the Overall Assessment of the Speaker's Experience of Stuttering for School-Age (Yaruss and Quesal, 2010) was also administered. Although not a mindfulness assessment, the OASES is a normed assessment that evaluates aspects of an individual's stuttering experiences and their well-being. OASES-S assessment was derived from the OASES. The original OASES is normed for adults ages 18-70 (Yaruss & Quesal, 2006), while the OASES-S is intended for ages 7-12. This self-reported survey is designed to evaluate the impact of stuttering, yielding an impact rating and an impact score. Specifically, questions are designed to gain insight about the client's perception of their stuttering in regards to thoughts, feelings, actions, obstacles and how stuttering affects their overall quality of life.

## **Results**

### **Analysis**

#### **Self-Rated Mindfulness Measures**

For each participant, responses on the self-rated mindfulness measures (CAMM, Jr. MAI, ERQ-CA, CAT-R) were scored according to instructions for each instrument. Individual scores as well as descriptive statistics were generated for each instrument. Individual and group scores were also compared with published norms on each instrument, to provide a first look at self-reported mindfulness abilities in children who stutter relative to typically-developing children.

#### **Correlations of Self-Rated Mindfulness Measures**

Next, correlations between scores on the self-rated mindfulness measures were computed to determine the extent to which metacognitive awareness, emotional regulation and acceptance comprise independent mindfulness constructs in children who stutter. Spearman-rank correlations (rather than Pearson's-r correlations) were computed, as these are more appropriate for small sample sizes. Statistically significant correlations were noted along with their direction (positive or negative). The alpha value necessary to report a statistically significant correlation was set at  $p < .05$ . It should be noted that although an exploratory factor analysis might have been more appropriate (e.g., Gorsuch, 1983), a small sample size would likely have produced unstable EFA results (Schmitt, 2011).

#### **Correlations of Self-Rated Mindfulness Measures with Stuttering Frequency at Each Stage of Intervention**

Finally, correlations between a) scores on each of the self-rated mindfulness measures and b) frequency of each stuttering behavior at each stage of intervention, were computed. Here again, Spearman-rank correlations (rather than Pearson's-r correlations) were computed.

Statistically significant correlations were noted along with their direction (positive or negative). The alpha value necessary to report a statistically significant correlation was set at  $p < .05$ . Separately, OASES scores were also correlated with stuttering frequency at each stage of intervention. This was to explore whether self-reported quality-of-life impact of stuttering in children was also predictive of treatment outcomes at each stage of intervention. All correlations were computed using IBM SPSS software (Version 22).

### **Self-Rated Mindfulness Measures: Individual and Descriptive Statistics**

Results on the different self-rated mindfulness measures were compared to the normative data means and standard deviations. Individual scores on the CAMM, ERQ (CR and ES), the CAT-R and the OASES-S are reported in Table 4 along with the normative data means and standard deviations. The Jr. MAI reported means for each grade level, which are compared to participant scores in Table 5. Subject 1 scored within one standard deviation above the mean on the OASES-S. Scores on the CAMM, ERQ-ES and the CAT-R were below the mean but fell within one standard deviation. Scores on the Jr. MAI and the ERQ-CR were more than one standard deviation below the mean for Subject 1. Subject 2 scored within one standard deviation above the mean on the CAMM, the ERQ-CR, the ERQ-ES and the CAT-R. On the OASES-S Subject 2 yielded a score more than one standard deviation below the mean, and on the Jr. MAI a score more than one standard deviation above the mean. Scores on the CAMM, ERQ-ES and CAT-R were within one standard deviation above the mean for Subject 3. Subject 3 scored within one standard deviation below the mean on the ERQ-CR, and more than one standard deviation below the mean on the OASES-S. Scores for Subject 3 on the Jr. MAI fell within one standard deviation above the mean. Subject 4 received scores on the CAMM, JR-MAI, ERQ-CR and OASES-S that fell within one standard deviation below the mean. The ERQ-ES score for Subject 4 fell within one standard deviation above the mean, and the CAT-R score was more than one standard deviation above the mean. Subject 5 received a CAT-R score that fell within one standard deviation above the mean. Scores on the CAMM and ERQ-ES were

both more than one standard deviation above the mean for Subject 5. The Jr. MAI score for Subject 5 fell within one standard deviation below the mean, and the OASES-S score fell more than one standard deviation below the mean. Scoring on the ERQ-CR for Subject 5 was more than three standard deviations below the mean.

Table 4  
*Pretreatment Mindfulness Scale Scores*

<u>Subjects</u>					
	<u>CAMM</u>	<u>ERQ-CR</u>	<u>ERQ-ES</u>	<u>CAT-R</u>	<u>OASES-S</u>
Subject 1	20	17	10	6	2.5
Subject 2	26	23	13	12	1.42
Subject 3	24	19	12	9	1.48
Subject 4	20	18	12	13	1.76
Subject 5	32	8	16	12	1.1
Normative Data Mean	22.73	21.53	10.49	8.24	2.15
Normative Data SD	7.33	3.86	2.91	4.71	0.53

Table 5  
*Pretreatment Jr.MAI Scores*

<u>Subjects</u>				
	<u>Grade*</u>	<u>Jr. MAI Score</u>	<u>Normative Data Mean</u>	<u>Normative Data SD</u>
Subject 1	3	26	29.18	2.25
Subject 2	5	32	27.89	3.00
Subject 3	4	29	27.04	3.32
Subject 4	6	57	62.33	8.77
Subject 5	3	28	29.18	2.25

\*Grade most recently completed

## Correlations of Mindfulness Measures

Pretreatment scores on the self-rated mindfulness measures were analyzed using a Spearman-rank correlation to determine the extent to which metacognitive awareness, emotional regulation and acceptance comprise independent mindfulness constructs in children who stutter (Table 5). Three significant correlations were found amongst the data ( $p \leq 0.05$ ). Pretreatment scores on the OASES negatively correlated with the pretreatment CAMM scores ( $r = -.975$ ). Analysis also revealed a significant negative correlation between the OASES and the ERQ-ES ( $r = -.975$ ). A negative correlation between the CAMM and ERQ-ES was also present ( $r = -.921$ ).

Table 6  
*Spearman's-Rank Correlations between Pretreatment Self-Report Scales*

			OASES	CAMM	ERQ_CR	ERQ_ES	Jr_MAI	CAT_R
Spearman's rho	OASES	Correlation Coefficient	1.000	-.975**	.000	-.975**	-.100	-.359
		Sig. (2-tailed)	.	.005	1.000	.005	.873	.553
		N	5	5	5	5	5	5
CAMM		Correlation Coefficient	-.975**	1.000	-.051	.921*	-.103	.158
		Sig. (2-tailed)	.005	.	.935	.026	.870	.800
		N	5	5	5	5	5	5
ERQ_CR		Correlation Coefficient	.000	-.051	1.000	-.051	.600	.103
		Sig. (2-tailed)	1.000	.935	.	.935	.285	.870
		N	5	5	5	5	5	5
ERQ_ES		Correlation Coefficient	-.975**	.921*	-.051	1.000	.205	.526
		Sig. (2-tailed)	.005	.026	.935	.	.741	.362
		N	5	5	5	5	5	5
Jr_MAI		Correlation Coefficient	-.100	-.103	.600	.205	1.000	.821
		Sig. (2-tailed)	.873	.870	.285	.741	.	.089
		N	5	5	5	5	5	5
CAT_R		Correlation Coefficient	-.359	.158	.103	.526	.821	1.000
		Sig. (2-tailed)	.553	.800	.870	.362	.089	.
		N	5	5	5	5	5	5

\*\* . Correlation is significant at the 0.01 level (2-tailed).

\* . Correlation is significant at the 0.05 level (2-tailed).

A trending positive correlation between the Jr. MAI and the CAT-R was observed, but not found to be significant ( $r = .821$ ). No relationships were found between the Jr. MAI or the ERQ-CR and any of the other mindfulness measures. All correlations, significant and nonsignificant, between each measure are displayed above in Table 6.

## **Correlations of Self-Rated Mindfulness Scores Pre-Intervention with Stuttering**

### **Frequency at Each Stage of Intervention**

As shown in Tables 7-12, relationships between self-reported pretreatment mindfulness and stuttering symptoms exist. Spearman-rank analysis revealed significant correlations between different mindfulness scale scores and specific LBDL descriptors ( $p \leq 0.05$ ). The majority of these correlations were observed in the reading modality following the last treatment session (Friday), indicating a possible relationship between pretreatment mindfulness and post-treatment outcomes. Interestingly, most of the negative correlations from Friday's measures were between the CAMM and stuttering symptoms as well as the ERQ-ES and stuttering symptoms, the only two mindfulness measures found to be strongly correlated with one another. The CAMM negatively correlated with overall disfluencies ( $r = -0.98$ ) and prolongations with audible airflow ( $r = -0.95$ , see Table 7). Shown in Table 10, the ERQ-ES negatively correlated with incomplete syllable repetitions ( $r = -0.92$ ) and prolongations without audible airflow ( $r = -0.95$ ).

One negative correlation was found in the reading modality on Friday between the Jr. MAI and syllable repetitions ( $r = -0.95$ ), which can be seen in Table 8. Inversely, positive correlations were observed between the CAT-R and stuttering symptoms in Friday during the reading task (see Table 11). Overall disfluencies correlated positively with the CAT-R ( $r = 0.90$ ), along with incomplete syllable repetitions ( $r = 0.89$ ) and prolongations without audible airflow ( $r = 0.97$ ).

Stuttering symptoms during the reading task on Friday appear to be highly related to the pretreatment mindfulness measures, but other correlations with the reading task were found throughout the week. A negative correlation was present between the ERQ-ES and verbal

superfluous behaviors during the reading task completed prior to treatment ( $r = -0.89$ ) (Table 10). Stuttering measures taken in the reading modality following the first treatment session (Monday) correlated only with the OASES-S, as shown in Table 12. Specifically, the OASES-S negatively correlated with overall disfluencies ( $r = -0.98$ ) and prolongations with audible airflow ( $r = -0.89$ ). The only relationship observed Wednesday during the reading task was between the ERQ-CR and incomplete syllable repetitions ( $r = 0.95$ ) found in Table 9.

Relationships between stuttering symptoms and mindfulness in the narrative task were also present. The CAMM correlated positively with multisyllabic repetitions ( $r = 0.89$ ) and negatively with inaudible prolongations ( $r = -0.89$ ) on Monday during the narrative task (see Table 7). There was a negative correlation between syllable repetitions and ERQ-ES ( $r = -0.92$ ) in the Wednesday narrative task, shown in Table 10. The final, and strongest, correlation found between pretreatment measures and stuttering symptoms was a positive correlation between the OASES-S and syllable repetitions on Friday ( $r = 1$ ). This means higher self-reports of stuttering impact correlated with higher frequency of syllable repetitions on Friday during the narrative task (see Table 12). No significant relationships between pretreatment mindfulness and nonverbal superfluous behaviors or effortfulness during the treatment were discovered.

Table 7  
*Statistically Significant Correlations between CAMM and LBDL Descriptors*

Disfluency Types	Speaking Modality	
	<u>Reading</u>	<u>Narrative</u>
Overall Disfluencies	Friday $r = -0.98$	
Syllable Repetition		
Incomplete Syllable Repetition		
Multisyllabic Repetition		Monday $r = 0.89$
Prolongation-Audible Airflow		
Prolongation No Audible Airflow	Friday $r = -0.95$	Monday $r = -0.89$
Verbal Superfluous	Friday $r = 0.89$	
Nonverbal Superfluous		
Effortfulness		

Table 8

*Statistically Significant Correlations between Jr. MAI and LBDL Descriptors*

Disfluency Types	Speaking Modality	
	<u>Reading</u>	<u>Narrative</u>
Overall Disfluencies		
Syllable Repetition	Friday	$r = -0.95$
Incomplete Syllable Repetition		
Multisyllabic Repetition		
Prolongation-Audible Airflow		
Prolongation No Audible Airflow		
Verbal Superfluous		
Nonverbal Superfluous		
Effortfulness		

Table 9

*Statistically Significant Correlations between ERQ-CR and LBDL Descriptors*

Disfluency Types	Speaking Modality	
	<u>Reading</u>	<u>Narrative</u>
Overall Disfluencies		
Syllable Repetition		
Incomplete Syllable Repetition	Wednesday	$r = 0.95$
Multisyllabic Repetition		
Prolongation-Audible Airflow		
Prolongation No Audible Airflow		
Verbal Superfluous		
Nonverbal Superfluous		
Effortfulness		

Table 10

*Statistically Significant Correlations between ERQ-ES and LBDL Descriptors*

Disfluency Types	Speaking Modality	
	<u>Reading</u>	<u>Narrative</u>
Overall Disfluencies		
Syllable Repetition		Wednesday $r = -0.92$
Incomplete Syllable Repetition	Friday	$r = -0.92$
Multisyllabic Repetition		

Table 10, Continued

*Statistically Significant Correlations between ERQ-ES and LBDL Descriptors*

Disfluency Types	Speaking Modality
Prolongation-Audible Airflow	
Prolongation No Audible Airflow	Friday $r = -0.95$
Verbal Superfluous	Pre $r = -0.89$
Nonverbal Superfluous	
Effortfulness	

Table 11

*Statistically Significant Correlations between CAT-R and LBDL Descriptors*

Disfluency Types	Speaking Modality	
	<u>Reading</u>	<u>Narrative</u>
Overall Disfluencies	Friday $r = 0.90$	
Syllable Repetition		
Incomplete Syllable Repetition	Friday $r = 0.89$	
Multisyllabic Repetition		
Prolongation-Audible Airflow		
Prolongation No Audible Airflow	Friday $r = 0.97$	
Verbal Superfluous		
Nonverbal Superfluous		
Effortfulness		

Table 12

*Statistically Significant Correlations between OASES-S and LBDL Descriptors*

Disfluency Types	Speaking Modality	
	<u>Reading</u>	<u>Narrative</u>
Overall Disfluencies	Monday $r = -0.98$	
Syllable Repetition		Friday $r = 1$
Incomplete Syllable Repetition		
Multisyllabic Repetition		
Prolongation-Audible Airflow	Monday $r = -0.89$	
Prolongation No Audible Airflow		
Verbal Superfluous		
Nonverbal Superfluous		
Effortfulness		

## Post-treatment Results

### Post-treatment Mindfulness Scales

Post-treatment mindfulness scores were reviewed for any noteworthy patterns (see Tables 13 and 14). Scores on the CAMM for three of the five children were noted to decrease but remained within normal limits. Four of the five participants scored within normal limits on the Jr. MAI. Scores on the Jr. MAI increased for two of the participants, Subjects 3 and 4. Scores on the Jr. MAI for Subject 2 did not change, and decreased for Subjects 5 and 1. Post-treatment scores on the ERQ-CR improved, with every score falling within normal limits. Only one of the participants decreased their score on the ERQ-CR (Subject 2), and Subject 5 considerably increased by more than three standard deviations. Scores on the ERQ-ES decreased for four of the five students, placing them within normal limits and indicating lower expressive suppression. Subject 1 received a higher score post-treatment that was not within normal limits. Similar to the ERQ-ES, the CAT-R uses reverse scoring. Four subjects fell within normal limits on the post-treatment CAT-R. Of those students, Subject 4 improved to within normal limits from pre-treatment scores. Subject 3 was the only participant who did not score within normal limits on the post-treatment CAT-R. The OASES-S was not administered post-treatment. Overall, Subject 1 appeared to make the least improvement of the five students, and Subject 4 was improved scores on all surveys from pretreatment to post-treatment.

Table 13  
*Post-Treatment Mindfulness Scale Scores*

Subjects	<u>CAMM</u>	<u>ERQ-CR</u>	<u>ERQ-ES</u>	<u>CAT-R</u>
Subject 1	18	20	14	7
Subject 2	23	21	10	7
Subject 3	30	19	11	14
Subject 4	30	24	11	10
Subject 5	25	26	12	5
Normative Data Mean	22.73	21.53	10.49	8.24
Normative Data SD	7.33	3.86	2.91	4.71

Table 14  
*Post-Treatment Jr.MAI Scores*

<u>Subjects</u>				
	<u>Grade*</u>	<u>Jr. MAI Score</u>	<u>Normative Data Mean</u>	<u>Normative Data SD</u>
Subject 1	3	20	29.18	2.25
Subject 2	5	32	27.89	3.00
Subject 3	4	30	27.04	3.32
Subject 4	6	61	62.33	8.77
Subject 5	3	27	29.18	2.25

\*Grade most recently completed

### Correlations of Mindfulness Measures

In efforts to further delineate the constructs of mindfulness and their relationships to stuttering, post-treatment correlations were considered. Comparable to the exploration of pretreatment mindfulness measures, correlations between each of the post-treatment scales and associations between the measures and stuttering symptoms were analyzed. As displayed in Table 15, no significant correlations between any of the post-treatment mindfulness measures were present. The only trending value found was between the ERQ-ES and the Jr. MAI ( $r = -.821$ ).

Table 15  
*Spearman's-Rank Correlations between Post-treatment Self-Report Scales*

			CAMM	ERQ_CR	ERQ_ES	Jr_MAI	CAT_R
Spearman's rho	CAMM	Correlation Coefficient	1.000	.000	-.205	.200	.359
		Sig. (2-tailed)	.	1.000	.741	.747	.553
		N	5	5	5	5	5
ERQ_CR		Correlation Coefficient	.000	1.000	.051	.200	-.667
		Sig. (2-tailed)	1.000	.	.935	.747	.219
		N	5	5	5	5	5
ERQ_ES		Correlation Coefficient	-.205	.051	1.000	-.821	-.368
		Sig. (2-tailed)	.741	.935	.	.089	.542
		N	5	5	5	5	5
Jr_MAI		Correlation Coefficient	.200	.200	-.821	1.000	.462

Table 15, Continued

*Spearman's-Rank Correlations between Post-treatment Self-Report Scales*

Spearman's rho		CAMM	ERQ_CR	ERQ_ES	Jr_MAI	CAT_R
	Sig. (2-tailed)	.747	.747	.089	.	.434
	N	5	5	5	5	5
CAT_R	Correlation Coefficient	.359	-.667	-.368	.462	1.000
	Sig. (2-tailed)	.553	.219	.542	.434	.
	N	5	5	5	5	5

**Correlations of Self-Rated Mindfulness Scores Post-Intervention with Stuttering****Frequency at Post-Intervention**

Self-reported scales completed after the treatment on Friday were correlated with frequency of stuttering post-treatment (Table 16). Contrary to the pretreatment findings, the majority of correlations between post-treatment mindfulness scales and stuttering symptoms were observed in the narrative task. Five significant negative correlations were found between post-treatment mindfulness measures and stuttering symptoms, three of which were during the narrative task. The CAMM negatively correlated with inaudible prolongations ( $r = -0.87$ ) and nonverbal superfluous behaviors ( $r = -0.87$ ). There was also a negative correlation between the ERQ-CR and incomplete syllable repetitions ( $r = -0.87$ ). The Jr. MAI ( $r = -0.95$ ) and the ERQ-ES ( $r = -0.89$ ) negatively correlated with syllable repetitions during the reading task.

Table 16

*Significant Correlations between Self-Reported Scales and LBDL Descriptors Post Treatment*

Self-Reported Scales	Speaking Modality	
	<u>Reading</u>	<u>Narrative</u>
CAMM		Prolongation No Audible Airflow $r = -0.87$ Nonverbal Superfluous $r = -0.87$
Jr. MAI	Syllable Repetitions $r = -0.95$	
ERQ-CR		Incomplete Syllable Repetitions $r = -0.87$
ERQ-ES	Syllable Repetitions $r = -0.89$	

## **Discussion**

Five school-age children who stutter completed a week-long intensive speech therapy program augmented with mindfulness training. Measures of mindfulness were taken via self-reported scales assessing metacognitive awareness, emotional regulation and communication attitudes. Analysis sought to determine whether children who stutter scored within normal limits on the self-reported mindfulness scales, whether these elements truly comprise independent constructs of mindfulness, and whether mindfulness can predict fluency treatment outcomes in school-aged children.

### **Structure of Pretreatment Mindfulness**

The driving force for selection of the self-reported scales used was based on the proposed construct of mindfulness discussed by Boyle in 2011. It was theorized that mindfulness is composed of metacognitive awareness, emotional regulation and acceptance. Boyle also suggested that these specific elements of mindfulness are parallel to tribulations often experienced by those who stutter.

Participants were administered four self-reported mindfulness scales in addition to the OASES-S prior to the start of treatment. Of the five children, there were two that received a score within normal limits on all five measures pretreatment (Subjects 2 and 3). All five participants self-rated within normal limits on the CAMM and OASES-S. However, the OASES-S is not a measure of mindfulness, rather a measure of the impact of stuttering. Additionally, the OASES-S is normed with children who stutter, whereas normative data from the four mindfulness scales uses the scores of typically developing children. All but one participant scored within normal limits on the JR. MAI, the ERQ-ES and the CAT-R. Three of the five students scored within normal limits on the ERQ-CR. Majority of scores falling within normal

limits may be explained by the theory that the impact of stuttering has been shown to increase with age, especially in the teenage years (Craig, Hancock, Tran & Craig, 2003). However, with the exception of the CAMM and the OASES-S, scores that were within normal limits on the scales fell away from the mean in an unfavorable direction (with consideration given to the use of reverse scoring).

Analysis revealed relationships between the mindfulness measures when administered pretreatment. The CAMM significantly correlated with the ERQ-ES in a negative way, meaning greater mindfulness related to lower expressive suppression. This association between the two measures implies a similarity in the assessment items. From a mental health standpoint, expressive suppression may have a negative connotation (Gullone & Taffe, 2011) and a goal of psychological intervention may even be to decrease expressive suppression. In fluency intervention, expressive suppression may be considered a form of stuttering management, and a goal in speech therapy may be to improve one's control of external behavioral reactions.

The similarity of the expressive suppression measure with the general mindfulness assessment adds to Boyle's original theory. With emotional regulation being one of the main elements discussed, research further divides this element into the two subcategories of cognitive reappraisal and expressive suppression. The strong correlation between the ERQ-ES and the CAMM suggests that the CAMM may be a measure of expressive suppression rather than overall mindfulness. The OASES-S, while not a mindfulness measure, also strongly correlated with the ERQ-ES. This relationship shows that assessment of expressive suppression may be beneficial to assessing the impact of stuttering in children. Inversely, this association indicates the inclusion of expressive suppression items within the OASES-S scale.

The remaining self-reported scales (ERQ-CR, Jr. MAI and CAT-R) did not correlate with one another. The lack of a relationship between these measures suggest that cognitive reappraisal, metacognitive awareness and acceptance are each independent elements of mindfulness. A trending correlation between the Jr. MAI and the CAT-R was observed. There is

no research linking metacognitive awareness to communication attitude to date, but perhaps the use of self-monitoring strategies could contribute to the control and alteration of internal responses towards communicative experiences. Again, this relationship was not found to be statistically significant.

### **Prognostic Indications**

As outlined in the Introduction, there are several predictive factors that have been examined with adults who stutter. These factors included attitudes, stuttering severity, mental health status, genealogy, and brain activity. Most of these factors were not found to be relevant; however, the current information from the results adds to the literature in reference to attitudes. Attitude has been found to predict treatment performance in adults (Guitar, 1978), specifically avoidance. Present results show that in school-age children a worse communication attitude was predictive of poorer treatment performance. Poorer treatment performance was indicated by stuttering frequency measures that included secondary, or avoidance, behaviors. A negative relationship between communication attitudes and stuttering not only exists in the adult population, but also with children who stutter.

Correlations between the self-reported measures and post-treatment stuttering frequency provide further information describing the association of mindfulness with stuttering treatment outcomes, specifically, in the reading modality following the last treatment session. CAMM correlations imply that the more mindful a subject was (based on self-report), the less they stuttered during their final reading task. The correlations found with the ERQ-ES (similar to the CAMM), are indicative of lower expressive suppression relating to more stuttering during the final reading task. The less one suppressed their expression, the more they stuttered. This may be credited to the increase of avoidance reduction emphasized during the treatment. One last negative correlation between the Jr. MAI and syllable repetitions suggests higher metacognitive awareness related to less stuttering. Positive correlations between the CAT-R and stuttering

symptoms during the reading task on Friday imply a worse communication attitude being associated with a higher frequency of stuttering.

Other correlations between reading and stuttering symptoms were observed throughout the week during the reading task. A positive correlation between the ERQ-ES and verbal superfluous behaviors pretreatment was found. This translates to more expressive suppression being related to more use of verbal superfluous behaviors prior to the start of treatment. In efforts to suppress expression, students may have used verbal superfluous behaviors to avoid moments of stuttering. On Monday during the reading task, a lower quality-of-life impact as measured by the OASES-S was associated with increased stuttering. This can be explained by the schedule of the treatment program. At this point, students were focused on stuttering openly. Those that were more willing to experience moments of stuttering, were likely to be less impacted by these experiences. By Wednesday, the use of stuttering modification techniques were being implemented. A positive correlation between cognitive reappraisal and incomplete syllable repetitions was found. A justification for this relationship could be the potential cognitive demand increasing during the tasks as students attempted to implement learned stuttering modification techniques.

Reasoning behind the many correlations found within the reading task may be attributed to the use of working memory. Reading primarily requires the domains of sustained attention and updating. Sustained attention is necessary to remain focused and track your place in the passage. Updating is essential to correctly changing reading rate and prosody based on punctuation and context. Inhibition is necessary to not become distracted in either task. In this case, students were trying to speak fluently and inhibit their secondary behaviors as well as stuttering behaviors (Magimairaj & Montgomery, 2013). While working memory is required for both the reading and narrative tasks, reading a passage is much less cognitively demanding in comparison to creating a narrative. This probably left greater attentional resources available for

self-monitoring and cognitive control, resulting in some detectable correlations between the mindfulness scales and stuttering frequencies in the reading tasks.

For the narrative task, students were to view a story depicted through illustrations only, and then retell that story in their own words. Similar to reading, sustained attention is required to remain focused on the task at hand. Updating is also needed to continue to change rate, prosody and wording throughout the story. However, the demanding sub-task of sentence formulation is in the narrative, not the reading task. This requires more use of resources for appropriate sentence formulation in order to provide a correct account of chronological events in the story and a cohesive narrative structure. This probably left fewer attentional resources available for self-monitoring and cognitive control, resulting in few if any detectable correlations between mindfulness scales and stuttering frequencies in the narrative tasks.

### **Post-Intervention Mindfulness Abilities**

Increasing curiosity regarding the relation of post-treatment mindfulness to post-treatment stuttering frequency was satisfied through further analysis. Fascinatingly, changes were observed amongst the relationships between mindfulness measures as well as the relationship between the post-treatment mindfulness measures and stuttering symptoms.

First, there were a few changes in scores on the mindfulness measures. Although most of the students scored within normal limits prior to treatment, the majority of the students improved their scores by the end of the week. Of the total 25 mindfulness scores (pre and post), only two did not fall within normal limits by the end of the week. Correlations between post-treatment scores on the mindfulness scales were also examined. While pretreatment correlations showed significant relation between the CAMM and ERQ-ES and between the OASES-S and ERQ-ES, these scores differentiated following the treatment. The distinguishing of these elements reinforces the idea that metacognitive awareness, cognitive reappraisal, expressive suppression and communication attitudes/acceptance are all separate mindfulness entities. The separation of these scores may also be indicative of a change in mindfulness

during the week. Additionally, post-treatment stuttering frequency correlations may also be suggestive of an alteration in mindfulness skills.

Relationships between post-treatment mindfulness scale scores and post-treatment stuttering frequency were reviewed as well. As opposed to the pretreatment results, most of the correlations between post-treatment mindfulness scales and stuttering symptoms were observed in the narrative task. The CAMM negatively correlated with stuttering frequency twice, meaning that more mindfulness post-treatment was associated with less stuttering during the Friday narrative task. There was also a negative correlation between the ERQ-CR and incomplete syllable repetitions. This means that higher cognitive reappraisal correlated with less stuttering. Negative correlations between the Jr. MAI and syllable repetitions and the ERQ-ES and syllable repetitions were observed Friday during reading. Higher scores of metacognitive awareness and expressive suppression were associated with more syllable repetitions.

### **Clinical Implications**

Results from this investigation can be beneficial to speech-language pathologists working with the school-age fluency population, particularly with assessment and treatment decisions. The self-reported mindfulness scales have all been validated, deeming them appropriate measures. Pretreatment correlations between the ERQ-ES and CAMM suggest that the CAMM may not be necessary to comprehensively assess the elements of mindfulness. However, no correlations between the measures were found post-treatment, suggesting that they may in fact all measure different constructs. Using these self-reports pretreatment can help a clinician learn about their client and their mindfulness specific to the researched elements. Knowing the profile of a client relative to their mindfulness may assist a clinician in deciding how and when to implement mindfulness treatment into fluency therapy as a cognitive-behavioral component.

The correlations between pretreatment mindfulness scales and stuttering frequency in the reading modality can be clinically useful. It is known that reading is less cognitively

demanding than story retell. This may be a good starting point for those who have not received prior therapy, and also for those who may be more severe. By practicing stuttering modification techniques through reading aloud, clients may have more cognitive resources to devote to implementing mindfulness-based techniques of self-monitoring, emotional regulation and/or positive attitude maintenance. Post-treatment correlations between mindfulness measures and stuttering frequency also provide implications for treatment direction. In contrast to the reading task, the narrative task strongly correlated negatively with mindfulness surveys. Through practicing the reading and narrative tasks while attempting to decrease stuttering frequency, clients made improvement by the end of the treatment program.

### **Study Limitations and Future Directions**

Few limitations have arisen upon evaluation of the study. Primarily, this study would have benefitted from a larger sample size. Larger sample size would result in more reliable results, and opportunity for different or further statistical analysis. Type 1 error correction was not controlled in the data set. This may potentially be a limitation when considering false positives. Timing of treatment may also be a limiting factor. As previously mentioned by Bothe et al. (2006), an intensive style treatment is successful with the school-age fluency population. The cause of these limitations may be due to limited resources. Another potential limitation could be the lack of cueing/reminding during the speech tasks. There were no cues or reminders to use stuttering modification techniques provided during the reading or narrative tasks.

Options for future research have become apparent. First would be further analysis of the mindfulness elements. Item analysis on all of the assessments for similarities could be valuable. Factor analysis of the mindfulness assessments may also be helpful, given an adequate sample size. Second would be altering the frequency of language sampling as well as the tasks used to acquire the language samples.

## **Summary and Conclusions**

Motivation behind this study drew primarily from the limited amount of research regarding predictors of school-age fluency treatment outcomes. Recent research in mindfulness as well as the similarities between mindfulness and challenges faced by those who stutter also provided a foundation for this investigation. In summation, all proposed research questions were answered upon analysis of the results. After correlating the self-report mindfulness scale scores with each other pretreatment as well as post-treatment, the elements mentioned by Boyle (2011) comprise mindfulness as a whole. In addition, emotional regulation can be further divided into cognitive reappraisal and suppressive expression. Inherent level/skills in the realm of each of these four elements related to stuttering frequency, primarily in the reading task. Changes in mindfulness with respect to these elements were apparent when the post-treatment correlations were examined. Improvements as demonstrated by negative correlations were mainly present in the narrative task, suggesting that the students normalized stuttering frequency in the narrative task to the amount of stuttering in the reading task. A decrease in stuttering correlated with the increase in mindfulness elements. While our questions have been answered from this investigation, further research in school-age fluency intervention is still warranted. Continued exploration of a mindfulness supplement would be advantageous in order to accurately describe the benefits and provide clinicians with evidence-base for implementation. Prognostic indicators should also be scrutinized in order to optimize treatment for fluency clients when choosing treatment direction and level of cognitive-behavioral support. Mindfulness has helped many people in broad spectrum of health disciplines, and further research will continue to prove its numerous advantages.

## References

- Ahadi, S. A., & Rothbart, M. K. (1994). Temperament, development, and the Big Five. In G. A. Kohnstamm, & C. F., Halverson, Jr., (Eds.). *The developing structure of temperament and personality from infancy to adulthood* (pp. 189–207). Hillsdale, NJ: Erlbaum.
- American Speech-Language-Hearing Association. (2007). *Scope of Practice in Speech-Language Pathology [Scope of Practice]*. Available from [www.asha.org/policy](http://www.asha.org/policy)
- Anderson, J. D., Pellowski, M. W., Conture, E. G., & Kelly, E. M. (2003). Temperamental characteristics of young children who stutter. *Journal of Speech, Language, and Hearing Research, 46*(5), 1221-1233.
- Andrews, G., & Harris, M. (1964). *The syndrome of stuttering*. London: Heinemann Medical Books.
- Aron, M. L. (1962). The nature and incidence of stuttering among a Bantu group of school-going children. *Journal of Speech and Hearing Disorders, 27*, 116-128.
- Bennett, E. M. (2006). *Working with people who stutter: A lifespan approach*. Upper Saddle River, NJ: Prentice Hall.
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson, N. D., Carmody, J., ... & Devins, G. (2004). Mindfulness: A proposed operational definition. *Clinical psychology: Science and practice, 11*(3), 230-241.
- Blomgren, M. (2013). Behavioral treatments for children and adults who stutter: a review. *Psychology research and behavior management, 6*, 9-19.
- Blood, G. W., & Blood, I. M. (2004). Bullying in adolescents who stutter: Communicative competence and self-esteem. *Contemporary Issues in Communication Science and Disorders, 31*, 69-79.

- Blood, G. W., Blood, I., Kreiger, J., O'Connor, S., & Qualls, C. D. (2009). Double Jeopardy for Children Who Stutter Race and Coexisting Disorders. *Communication Disorders Quarterly, 30*(3), 131-141.
- Bloodstein, O. (1995). A handbook on stuttering. San Diego: Singular.
- Bodhi, B. (2011). What does mindfulness really mean? A canonical perspective. *Contemporary Buddhism, 12*(01), 19-39.
- Bothe, A. K., Davidow, J. H., Bramlett, R. E., & Ingham, R. J. (2006). Stuttering treatment research 1970–2005: I. Systematic review incorporating trial quality assessment of behavioral, cognitive, and related approaches. *American Journal of Speech-Language Pathology, 15*(4), 321-341.
- Boyle, C., Boulet, S., Schieve, L., Cohen, R., Blumberg, S., Yeargin-Allsopp, M., et al. (2011). Trends in the prevalence of developmental disabilities in US children, 1997–2008. *Pediatrics, 34*, 385–395.
- Boyle, M. P. (2011). Mindfulness training in stuttering therapy: A tutorial for speech-language pathologists. *Journal of fluency disorders, 36*(2), 122-129.
- Brown, A. L. (1978). Knowing when, where, and how to remember: A problem of metacognition. *Advances in Instructional Psychology, 1*, 77–165.
- Brutten, G. J., & Dunham, S. L. (1989). The Communication Attitude Test: A normative study of grade school children. *Journal of Fluency Disorders, 14*(5), 371-377.
- Burke, C. A. (2010). Mindfulness-based approaches with children and adolescents: A preliminary review of current research in an emergent field. *Journal of Child and Family Studies, 19*(2), 133-144.
- Centers for Disease Control. (2014). Prevalence of Autism Spectrum Disorder Among Children Aged 8 Years—Autism and Developmental Disabilities Monitoring Network, 11 Sites, United States, 2010. *Morbidity and Mortality Weekly Report, 64*(SS02), 1-21

- Chun, R. Y. S., Mendes, C. D., Yaruss, J. S., & Quesal, R. W. (2010). The impact of stuttering on quality of life of children and adolescents. *Pró-Fono Revista de Atualização Científica*, 22(4), 567-570.
- Cook, S., Donlan, C., & Howell, P. (2013). Stuttering severity, psychosocial impact and lexical diversity as predictors of outcome for treatment of stuttering. *Journal of fluency disorders*, 38(2), 124-133.
- Craig, A., Hancock, K., Chang, E., McCreedy, C., Shepley, A., McCaul, A., ... & Reilly, K. (1996). A controlled clinical trial for stuttering in persons aged 9 to 14 years. *Journal of Speech, Language, and Hearing Research*, 39(4), 808-826.
- Craig, A., Hancock, K., Tran, Y., & Craig, M. (2003). Anxiety levels in people who stutter: A randomized population study. *Journal of Speech, Language, and Hearing Research*, 46, 1197–1206.
- Craig, A., Hancock, K., Tran, Y., Craig, M., & Peters, K. (2002). Epidemiology of stuttering in the community across the entire life span. *Journal of Speech, Language, and Hearing Research*, 45(6), 1097-1105.
- Dworzynski, K., Remington, A., Rijdsdijk, F., Howell, P., & Plomin, R. (2007). Genetic etiology in cases of recovered and persistent stuttering in an unselected longitudinal sample of young twins. *American Journal of Speech and Language Pathology*, 16, 169–178.
- Eberth, J., & Sedlmeier, P. (2012). The effects of mindfulness meditation: a meta-analysis. *Mindfulness*, 3(3), 174-189.
- Espin, C. A., & Foegen, A. (1996). Validity of general outcome measures for predicting secondary students' performance on content-area tasks. *Exceptional Children*, 62(6), 497-514.
- Gillespie, S. K., & Cooper, E. B. (1973). Prevalence of speech problems in junior and senior high schools. *Journal of Speech and Hearing Research*, 16, 739-743.

- Goldin, P. R., & Gross, J. J. (2010). Effects of mindfulness-based stress reduction (MBSR) on emotion regulation in social anxiety disorder. *Emotion, 10*(1), 83-91.
- Greco, L. A., Baer, R. A., & Smith, G. T. (2011). Assessing mindfulness in children and adolescents: development and validation of the Child and Adolescent Mindfulness Measure (CAMM). *Psychological assessment, 23*(3), 606-614.
- Gross, J. J. (1998). The emerging field of emotion regulation: An integrative review. *Review of General Psychology, 2*, 271–299. doi:10.1037/1089-2680.2.3.271
- Guitar, B. (1976). Pretreatment factors associated with the outcome of stuttering therapy. *Journal of Speech, Language, and Hearing Research, 19*(3), 590-600.
- Guitar, B., & Bass, C. (1978). Stuttering therapy: The relation between attitude change and long-term outcome. *Journal of Speech and Hearing Disorders, 43*(3), 392-400.
- Guitar B, Conture EG. *The Child Who Stutters: To the Pediatrician*. (2007). Retrieved from <http://www.stutteringhelp.org/Portals/english/0023tped.pdf>.
- Gullone, E., & Taffe, J. (2012). The Emotion Regulation Questionnaire for Children and Adolescents (ERQ–CA): A psychometric evaluation. *Psychological assessment, 24*(2), 409-417.
- Howell, P., Davis, S., & Williams, R. (2008). Late childhood stuttering. *Journal of Speech, Language, & Hearing Research, 51*, 669–684.
- Howell, P., Davis, S., & Williams, R. (2009). The effects of bilingualism on stuttering during late childhood. *Archives of Disease in Childhood, 94*, 42-46.
- Ingham, R. J., Wang, Y., Ingham, J. C., Bothe, A. K., & Grafton, S. T. (2013). Regional brain activity change predicts responsiveness to treatment for stuttering in adults. *Brain and language, 127*(3), 510-519.
- Iverach, L., Jones, M., O'Brian, S., Block, S., Lincoln, M., Harrison, E., ... & Onslow, M. (2009). The relationship between mental health disorders and treatment outcomes among adults who stutter. *Journal of fluency disorders, 34*(1), 29-43.

- Johannsen, H. S. (2001). Der Einfluss von Alter, Geschlecht, Symptomatologie, Heredität und Händigkeit auf den Verlauf des Stotterns im Kindesalter. *Sprache Stimme Gehör*, 25, 14–19.
- Kabat-Zinn, J. (1994). *Wherever you go, there you are: Mindfulness meditation in everyday life*. New York, NY: Hyperion.
- Kaminski, R., Cummings, K. D., Powell-Smith, K. A., & Good, R. H. (2008). Best practices in using dynamic indicators of basic early literacy skills for formative assessment and evaluation. *Best practices in school psychology V*, 4, 1181-1204.
- Karrass J, Walden TA, Conture EG, et al. (2006). Relation of emotional reactivity and regulation to childhood stuttering. *J Commun Disord*. 39(6), 402-423.
- Keating, D., Keating, D., Turrell, G., & Ozanne, A. (2001). Childhood speech disorders: Reported prevalence, co-morbidity and socioeconomic profile. *Journal of Pediatrics and Child Health*, 37, 431-436.
- Koushik, S., Shenker, R., & Onslow, M. (2009). Follow-up of 6–10-year-old stuttering children after Lidcombe Program treatment: A Phase I trial. *Journal of Fluency Disorders*, 34(4), 279-290.
- Luc, F., & Brutten, G. J. (1991). Speech-associated attitudes of stuttering and nonstuttering children. *Journal of Speech, Language, and Hearing Research*, 34(1), 60-66.
- Magimairaj, B. M., & Montgomery, J. W. (2013). Examining the relative contribution of memory updating, attention focus switching, and sustained attention to children's verbal working memory span. *Child Development Research*, 2013(2013), 1-12.
- Månsson, H. (2000). Childhood stuttering: Incidence and development. *Journal of Fluency Disorders*, 25, 47–57.
- Månsson, H. (2005). Stammens kompleksitet og diversitet. *Dansk Audiologopædi*, 41, 13–33.
- Mayer, M. (2003) *A Boy, a Dog, and a Frog*. New York, NY: Dial Books.
- Mayer, M., & Mayer, M. (2003) *One Frog Too Many*. New York, NY: Dial Books.

- Mayer, M. (2003) *Frog, Where Are You?*. New York, NY: Dial Books.
- Mayer, M. (2003) *Frog Goes to Dinner*. New York, NY: Dial Books.
- McKinnon, D., McLeod, S., & Reilly, S. (2007). The prevalence of stuttering, voice, and speech-sound disorders in primary school students in Australia. *Language, Speech, and Hearing Services in Schools, 38*, 5–15.
- McLeod, S., & Harrison, L. (2009). Epidemiology of speech and language impairment in a nationally representative sample of 4- to 5-year-old children. *Journal of Speech, Language, and Hearing Research, 52*, 113–129.
- Moreau, M., & Fidrych-Puzzo, H. (1994). The story grammar marker. MindWing Concepts Inc., Springfield, MA.
- National Institute on Deafness and other Communication Disorders, National Institutes of Health (2010). *NIDCD Fact Sheet Stuttering*. Retrieved from <https://www.nidcd.nih.gov/staticresources/health/voice/StutteringFactSheet.pdf>
- Nippold, M. (2011). Stuttering in school-age children: A call for treatment research. *Language, Speech, and Hearing Services in Schools, Volume 42*, 99–101.
- Nye, C., Vanryckeghem, M., Schwartz, J. B., Herder, C., Turner, H. M., & Howard, C. (2013). Behavioral stuttering interventions for children and adolescents: A systematic review and meta-analysis. *Journal of Speech, Language, and Hearing Research, 56*(3), 921-932.
- Onslow, M., Costa, L., Andrews, C., Harrison, E., & Packman, A. (1996). Speech outcomes of a prolonged-speech treatment for stuttering. *Journal of Speech, Language, and Hearing Research, 39*(4), 734-749.
- Perkins, W. H., Rudas, J., Johnson, L., Michael, W. B., & Curlee, R. F. (1974). Replacement of stuttering with normal speech: III. Clinical effectiveness. *Journal of Speech and Hearing Disorders, 39*(4), 416-428.
- Poulos, M. G., & Webster, W. G. (1991). Family history as a basis for subgrouping people who stutter. *Journal of Speech, Language, and Hearing Research, 34*(1), 5-10.

- Proctor, A., Yairi, E., & Duff, M. (2008). Prevalence of stuttering in African American preschool children. *Journal of Speech, Language, and Hearing Research*, 50, 1465–1474.
- Reardon-Reeves, N. A., & Yaruss, J. S. (2004). *The Source for Stuttering: Ages 7-18*. *LinguiSystems, East Moline, IL*.
- Reilly, S., Onslow, M., Packman, A., Wake, M., Bavin, E. L., Prior, M., & Ukoumunne, O. C. (2009). Predicting stuttering onset by the age of 3 years: a prospective, community cohort study. *Pediatrics*, 123(1), 270-277.
- Ryan, B. (1974). *Programmed therapy for children and adults who stutter* Springfield, IL: Charles C. Thomas.
- Ryan, B. P., & Ryan, B. V. K. (1983). Programmed stuttering therapy for children: Comparison of four establishment programs. *Journal of Fluency Disorders*, 8(4), 291-321.
- Schmitt, T. A. (2011). Current methodological considerations in exploratory and confirmatory factor analysis. *Journal of Psychoeducational Assessment*, 29(4), 304-321.
- Sperling, R., Howard, B., Miller, L., & Murphy, C. (2002). Measures of Children's Knowledge and Regulation of Cognition. *Contemporary Educational Psychology*, Volume 27, 51-79. doi:10.1006/ceps.2001.1091
- Teesson, K., Packman, A., & Onslow, M. (2003). The Lidcombe behavioral data language of stuttering. *Journal of Speech, Language, and Hearing Research*, 46(4), 1009-1015.
- The Hawn Foundation (2011). *The MindUP Curriculum: Grades 3-5: Brain-Focused Strategies for Learning—and Living*. New York, NY: Scholastic.
- Thompson, R. A. (1994). Emotion regulation: A theme in search of definition. *Monographs of the Society for Research in Child Development*, 59, 25–52 (2–3, Serial No. 240).
- Vanryckeghem, M., Hylebos, C., Bruten, G. J., & Peleman, M. (2001). The relationship between communication attitude and emotion of children who stutter. *Journal of Fluency Disorders*, 26(1), 1-15.

- Veenman, M. V., Van Hout-Wolters, B. H., & Afflerbach, P. (2006). Metacognition and learning: Conceptual and methodological considerations. *Metacognition and learning*, 1(1), 3-14.
- Veenman, M. V. J., Wilhelm, P., & Beishuizen, J. J. (2004). The relation between intellectual and metacognitive skills from a developmental perspective. *Learning and Instruction*, 14, 89–109.
- Yairi, E., & Ambrose, N. (1999). Early childhood stuttering. I. Persistency and recovery rates. *Journal of Speech, Language, and Hearing Research*, 42, 1097–1112.
- Yairi, E., & Ambrose, N. (2005). *Early childhood stuttering*. Austin, TX: Pro-Ed.
- Yairi, E., & Ambrose, N. (2013). Epidemiology of stuttering: 21st century advances. *Journal of fluency disorders*, 38(2), 66-87.
- Yaruss, J., Coleman, C., & Quesal, R. (2010). *Overall Assessment of the Speaker's Experience of Stuttering [Measurement instrument]*. Pearson Education.
- Yaruss, J., Coleman, C., & Quesal, R. (2012). Letter to the Editor-Stuttering in School-Age Children: A comprehensive Approach to Treatment. *Language, Speech, and Hearing Services in Schools*, Volume 43, 536-548.
- Yaruss, J. S., & Quesal, R. W. (2006). Overall Assessment of the Speaker's Experience of Stuttering (OASES): Documenting multiple outcomes in stuttering treatment. *Journal of fluency disorders*, 31(2), 90-115.
- Zebrowski, P. (2007). Treatment factors that influence therapy outcomes of children who stutter. In *Stuttering and related disorders of fluency* (3rd ed., pp. 23-38). New York, NY: Thieme.

## Appendices

### Appendix A: IRB Letter of Determination



RESEARCH INTEGRITY AND COMPLIANCE  
Institutional Review Boards, FWA No. 00001669  
12901 Bruce B. Downs Blvd., MDC035 • Tampa, FL 33612-4799  
(813) 974-5638 • FAX (813) 974-7091

June 17, 2015

Nathan Maxfield, PhD  
Communication Sciences and Disorders  
4202 East Fowler Avenue, PCD1017 Tampa, FL  
33620

RE: **Expedited Approval for Initial Review**

IRB#: Pro00022118

Title: Predictors and Treatment Outcomes of a Combined Stuttering and Mindfulness Intervention in Children

**Study Approval Period: 6/17/2015 to 6/17/2016**

Dear Dr. Maxfield:

On 6/17/2015, the Institutional Review Board (IRB) reviewed and **APPROVED** the above application and all documents outlined below.

**Approved Item(s):**

**Protocol Document(s):**

[Stuttering and Mindfulness Protocol Version #1\\_5-26-15.docx](#)

This study involving data pertaining to children falls under 45 CFR 46.404 – Research not involving greater than minimal risk.

**Consent/Assent Document(s)\*:**

Waiver of process granted

It was the determination of the IRB that your study qualified for expedited review which includes activities that (1) present no more than minimal risk to human subjects, and (2) involve only procedures listed in one or more of the categories outlined below. The IRB may review research through the expedited review procedure authorized by 45CFR46.110 and 21 CFR 56.110. The research proposed in this study is categorized under the following expedited review category:

(5) Research involving materials (data, documents, records, or specimens) that have been collected, or will be collected solely for nonresearch purposes (such as medical treatment or diagnosis).

Your study qualifies for a waiver of the requirements for the informed consent process as outlined in the federal regulations at 45CFR46.116 (d) which states that an IRB may approve a consent procedure which does not include, or which alters, some or all of the elements of informed consent, or waive the requirements to obtain informed consent provided the IRB finds and documents that (1) the research involves no more than minimal risk to the subjects; (2) the waiver or alteration will not adversely affect the rights and welfare of the subjects; (3) the research could not practicably be carried out without the waiver or alteration; and (4) whenever appropriate, the subjects will be provided with additional pertinent information after participation.

Your study qualifies for a waiver of the requirement for signed authorization as outlined in the HIPAA Privacy Rule regulations at 45CFR164.512(i) which states that an IRB may approve a waiver or alteration of the authorization requirement provided that the following criteria are met (1) the PHI use or disclosure involves no more than a minimal risk to the privacy of individuals; (2) the research could not practicably be conducted without the requested waiver or alteration; and (3) the research could not practicably be conducted without access to and use of the PHI.

A waiver of HIPAA Authorization is granted for this retrospective chart review of children who stutter who were treated at the University of South Florida Speech-Language-Hearing Clinic (USF-SLH Clinic) between January 1, 2012 and June 15, 2015. This waiver allows the study team or its honest broker to obtain PHI from the medical records of children in this cohort.

As the principal investigator of this study, it is your responsibility to conduct this study in accordance with IRB policies and procedures and as approved by the IRB. Any changes to the approved research must be submitted to the IRB for review and approval by an amendment.

We appreciate your dedication to the ethical conduct of human subject research at the University of South Florida and your continued commitment to human research protections. If you have any questions regarding this matter, please call 813-974-5638.

Sincerely,



Kristen Salomon, Ph.D., Vice Chairperson  
USF Institutional Review Board

**Appendix B: Letter for Authorized Use of Material**

To Whom It May Concern,

I hereby authorize the use of Nathan Maxfield's Program for the Advanced Treatment of Stuttering as well as its reference in the theses written by Jenna Graepel and Jennifer Kordell.

Nathan D. Maxfield, PhD, CCC-SLP  
University of South Florida  
4202 E. Fowler Avenue, PCD 4015  
Tampa, FL, 33620  
(813) 974-6190

**Appendix C: Treatment Plan**

**Monday June 16, 2014**

<b>Objectives:</b>	<b>Activities:</b>
<p>1. The clients will demonstrate the ability to stutter openly and freely in spontaneous conversation with unfamiliar listeners.</p> <p>Activity Time: 20 Minutes</p>	<p>1a. The clinician will have a prepared introduction to the program, introducing themselves. The introduction will include interesting facts and mention famous people who stutter.</p> <p>1b. The clients will toss a beach ball with “getting to know you” questions. Upon catching the ball, the client will answer one of the questions and introduce themselves, stuttering freely. (Groups of 3).</p>
<p>2. The clients will learn the anatomy and physiology of the speech mechanism for deeper understanding (contributing to overall transfer of skills).</p> <p>Activity Time: 20 Minutes</p>	<p>2a. The clinicians will introduce and explain the structures of speech production and their functions. (PATS Manual)</p> <p>2c. The clients will learn the major physiological mechanisms they use when talking and will be provided with the “whale mouth” example.</p>
<p>3. The clients will identify the various places of articulation for English sounds, using learned terminology of the speech mechanism.</p> <p>Activity Time: 20 minutes</p>	<p>3a. The clinicians will provide a ‘sound grab bag’, and each client with a Speech Helper Checklist.</p> <p>3b. Each client will take turns grabbing a sound out of the bag. They must identify what parts of the speech mechanism are used to produce that sound, and will fill in their checklist accordingly. (Bennett, pg 324-325)</p>
<p>4. The clients will define mindfulness awareness and compare examples of mindful and unmindful thoughts with 80% accuracy when given occasional, minimal cues.</p> <p>Activity Time: 45 minutes</p>	<p>4a. The clinician will teach MU Lesson 2: Mindfulness Awareness. The clinician will provide various mystery sounds and instruct the clients to guess what is making each sound. The clients will complete ‘Mystery Sounds’ worksheet (p. 154). (20 minutes)</p> <p>4b. The clients will determine ‘mindful vs. unmindful’ situations using “Mindful or Unmindful” worksheet (p. 155). (10 minutes)</p>

	<p>4c. The clinician will engage the clients in a discussion of their feelings when they were in unmindful and mindful situations. (10 minutes)</p> <p>4d. The clinician will review mindful vs. 'unmindful' thoughts and actions and explain the homework assignment. (5 minutes)</p>
<p>5. The clients will identify the 3 major areas of the brain (the amygdala, hippocampus, and prefrontal cortex) and their functions with 80% accuracy when given occasional, minimal cues.</p> <p>Activity Time: 45 minutes</p>	<p>5a. The clinician will teach MU Lesson 1: Getting Focused (Areas of the Brain). The clinician will teach the three areas of the brain (amygdala, hippocampus, and PFC) and their functions. (15 minutes)</p> <p>5b. The clients will identify the amygdala, hippocampus, and PFC on a diagram. The clinician will use the MU Poster "Getting to Know your Brain." Clients will use the "Brain Power" activity sheet to label the brain. (10 minutes)</p> <p>5c. The clients will participate in the "Amygdala on the Move" activity (p. 32). (15 minutes)</p> <p>5d. The clinician will review the areas of the brain with the clients and explain the homework assignment. (5 minutes)</p>

Homework- Journal Entry:

- Write a short story using the amygdala, hippocampus, and PFC as the main characters. Read your story aloud to a family member while stuttering openly.

Materials: MU Poster "Getting to Know Your Brain", "Brain Power" activity sheet, (Taking Your Time Counts relay race materials TBD), journal, pencils, Speech Helper Worksheet, Place of Articulation Checklist, Sound Grab Bag

## Tuesday, June 17, 2014

Objectives:	Activities:
<p>1. The clients will demonstrate use of the core practice breathing exercise.</p> <p>Activity Time: 1 hour</p>	<p>1a. The clinician will review the concept of mindful awareness and the areas of the brain from Monday's session. The clients will share their journal entries that they completed as homework. (10 minutes)</p> <p>1b. The clinician will teach the core practice, a mindfulness breathing exercise (MU Lesson 3). (15 minutes)</p> <p>1c. The clinician will engage the clients in a discussion about focusing on their breath and what they noticed during the activity. (10 minutes)</p> <p>1d. The clinician will facilitate the "Taking Your Time Counts" activity. (20 minutes)</p> <p>1e. The clinician will review the mindfulness breathing exercises and explain the homework assignment. (5 minutes)</p>
<p>2. The clients will identify various parts of the speech mechanism in order to review learned material.</p> <p>Activity Time: 30 minutes</p>	<p>2a. The clients will play a game of "Speech Jeopardy!"</p> <p>2b. The clients will take turns choosing a tile. There will either be a description of a speech sound, and the client will identify it.</p>
<p>3. The clients will demonstrate the ability to use pseudo-stuttering when prompted.</p> <p>Activity Time: 30 minutes</p>	<p>3a. The clinicians will explain open stuttering and model for the clients.</p> <p>3b. They will be provided with the "Voluntary Stuttering" worksheet (Reeves pg 176).</p> <p>3c. The clients will play a game of "Simon says", taking turns using their open/voluntary stuttering on their name or instruction.</p>
<p>4. The clients will eliminate the secondary behaviors judged to be most prominent (1-2 symptoms).</p>	<p>4a. The clinician will explain what a secondary behavior is, and steps to reduce or eliminate them (via posture, eye contact, etc.) (Charts in PATS manual, pg. 13-15).</p>

Activity Time: 30 minutes	4b. The clients will break up into groups, practicing with each other. Everyone will take turns, exaggerating/playing, then modifying behaviors.
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Homework- Journal Entry:

- Choose a quiet place at home to breathe mindfully. Describe where that place is. What makes it a good place to practice your breathing?
- When might be the most helpful time for you to practice mindful breathing in your day? Why is that?
- Practice your 'speech stance', openly stuttering in front of a family member.

Materials: Mystery sound containers/water bottles, "Mystery Sounds" worksheet, "Mindful or Unmindful" worksheet, Sound Checklist, Jeopardy Cards,

### Wednesday, June 18, 2014

Objectives:	Activities:
<p>1. The clients will apply open-minded perspective taking to social situations with occasional, rare cues.</p> <p>Activity Time: 1 hour</p>	<p>1a. The clinician will review the core practice and the client's journal entry that was completed as homework. (5 minutes)</p> <p>1b. The clinician will teach MU Lesson 10: Perspective Taking. (15 minutes)</p> <p>1b. The clinician will provide various scenarios for the clients to consider taking an open-mind perspective taking. The clients will share how they would respond in each situation. The clients will brainstorm other perspectives that might also be taken in each situation. (15 minutes)</p> <p>1c. The clinician will engage the clients in a discussion about too-quick judgment. (10 minutes)</p> <p>1d. The clinician will provide pictures for the clients to complete the "Reading Expressions" activity. (10 minutes)</p> <p>1e. The clinician will review perspective taking and explain the homework assignment. (5 minutes)</p>
<p>2. The clients will learn how to identify and dissect their moments of stuttering in order to deepen understanding of stuttering moments and increase self-monitoring skills.</p> <p>Activity: 30 minutes</p>	<p>2a. The clinicians will review learned skills with the clients, having them identify speech mechanisms and practicing open stuttering.</p> <p>2b. The clinicians will also take turns with voluntary stuttering, and will model identification and dissection of stuttering moments. (PATS)</p> <p>2c. The clients will then each take turns identifying and dissecting their own stuttering moments, using their "clue books."</p>
<p>4. The clients will learn and practice the post-block modification technique in order to practice the newly learned skill.</p> <p>Activity Time: 30 minutes</p>	<p>4a. The clinicians will discuss and model a post-block modification for the clients. They will provide a student-friendly rationale. (Reeves)</p>

	<p>4b. The clients will play a game of “hot potato.” When it is their turn, they will practice “Playing with their speech”, using the post-block modification with open stuttering, followed by identification and dissection.</p>
<p>5. The clients will learn and apply the in-block modification technique in order to practice their new skills.</p> <p>Activity Time: 30 minutes</p>	<p>5a. The clinicians will introduce in-block modifications. They will provide a similar Nina Reeves’ worksheet to explain the rationale.</p> <p>5b. The clients will practice in-block stuttering while reading limericks, starting at the word level and working up to sentence level.</p> <p>5c. The clients will take turns choosing to use either an in-block or post-block modification (must use each 1x)</p>

Homework- Journal Entry:

- Make two columns in your journal. At the top of one, write, “My thoughts.” At the top of the other, write, “Their thoughts.” Think of a recent disagreement in which you’ve taken part. Describe the thoughts for each side.
- The clients will complete the “Characters Perspective” worksheet (p. 156).
- Practice using your post-block and in-block modifications with a family member, using your “clue books” to identify/dissect moments of stuttering

Materials: “Clue Books”, hot potato, Reeve’s worksheets on Post-Block and In-Block modifications

## Thursday, June 19, 2014

Weekly Objectives:	Activities:
<p>1. The clients will define the terms optimism and pessimism and develop strategies that will utilize optimistic thinking when given occasional, minimal cues.</p> <p>Activity Time: 45 minutes</p>	<p>1a. The clinician will review the perspective taking lesson and the journal entry that was completed as homework (5 minutes)</p> <p>1b. The clinician will teach MU Lesson 11: Choosing Optimism. 15 minutes)</p> <p>1c. The clinician will instruct the clients to brainstorm words that would be considered optimistic and pessimistic. The clients will create an optimistic collage using pictures from magazines and newspapers. (20 minutes)</p> <p>1d. The clinician will review optimistic thoughts and explain the homework assignment. (5 minutes)</p>
<p>2. The clients will demonstrate use of the learned fluency strategies in order to reinforce and apply skills.</p> <p>Activity Time: 55 Minutes</p>	<p>2a. The clinicians and clients will review and practice the post-block and in-block modifications</p>
<p>3. The clients will learn and apply the pre-block stuttering modification.</p> <p>Activity Time: 1 Hour</p>	<p>2b. The clinicians will introduce the pre-block modification. They will model and explain the rationale.</p> <p>2c. The clients will take turns using their pre-block modifications while playing Pictionary.</p>

### Homework- Journal Entry:

- Create an "Optimistic Playlist" of their favorite "good-feeling" songs.
- Think about a character in a book or TV show that showed optimism. Write a paragraph from that character's point of view to describe his or her outlook on an experience.
- Write about a time when they acted optimistically. The clients may also write about a time when they acted pessimistically and what they would do next time to act optimistically. Complete the "Optimistic/Pessimistic Thoughts" worksheet (p.157).
- Try to use your pre-block technique during a moment of stuttering.

Materials: various pictures from magazines and newspapers, paper, glue

## Friday, June 20, 2014

Weekly Objectives:	Activities:
<p>1. The clients will develop a Mindfulness Action Plan to implement use of stuttering modification techniques and mindfulness when given occasional, minimal cues.</p> <p>Activity Time: 45 minutes</p>	<p>1a. The clients will review the lessons that they learned this week. They will share their journal entries that were completed as homework. (10 minutes)</p> <p>1b. The clinician will teach MU Lesson 15: Taking Mindful Action in the World. (10 minutes)</p> <p>1c. The clinician will instruct the clients to create their own mindfulness motto. The clients will be given the opportunity to write down their motto on a sign that they will decorate and display at home. (10 minutes)</p> <p>1d. The clinician will instruct the clients to create a "Mindful Action Planner" (p. 158). (10 minutes)</p> <p>1e. The clinician will facilitate a discussion about the clients' Mindful Action Plans and ask other clients to provide tips and feedback to the other clients. (5 minutes)</p>
<p>2. The clients will learn naturalness and highlighting techniques to achieve more natural sounding speech.</p> <p>Activity Time: 30 minutes</p>	<p>2a. The clinicians will quickly review the pre-block modification. They will then introduce naturalness and highlighting, explaining and modeling it for the clients. (PATS)</p> <p>2b. The clients will use negative practice to learn the importance and proper use of naturalness and highlighting, taking turns telling the group their favorite part of the program/summer.</p>
<p>3. The clients will use learned skills from the previous sessions for review and application.</p> <p>Activity Time: 40 minutes</p>	<p>3a. The clients will participate in "Centers." Each center will have an activity using either post-block, in-block, and pre-block modifications. There will be a fourth center to review anatomy.</p>
<p>4. The clients will learn about positive thinking, in order to improve attitudes towards speech.</p> <p>Activity Time: 35 minutes</p>	<p>4a. The clients will have an open discussion/ interview about negative reactions, easy/hard situations, and acceptance. (Reeves worksheets, Bennett Activities, PATS manual)</p>

	4b. There will be wrap-up, bringing the program to a close.
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Homework:

- Implement your Mindful Action Plan.
- Use your modification skills.

Materials: "Mindful Action Planner" worksheet, paper, various activities for centers, Reeves' Worksheets for positive attitude

<b>NOMS Frequency of cueing</b>	
<b>Consistent</b>	Required 80-100% of the time
<b>Usually</b>	50-70% of the time
<b>Occasionally</b>	20-49% of the time
<b>Rarely</b>	Less than 20% of the time

<b>NOMS Intensity of Cueing</b>	
<b>Maximal:</b>	Multiple obvious cues; multi-modality cues
<b>Moderate:</b>	Combination of cueing types; some may be intrusive
<b>Minimal:</b>	Subtle and only one type of cueing