ADDRESSING THE PRESENCE OF ANXIETY IN STUTTERING TREATMENT

by

Alyssa Bovard, B.A.

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Mentor: Gerard H. Poll, Ph. D., CCC-SLP

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Abstract

Based on previous studies, there is a clear connection between the presence of stuttering and co-occurring anxiety. However, it is unclear whether anxiety begins to develop as a result of a pre-existing stuttering disorder, or if anxiety exists at a young age and causes characteristics of a stuttering disorder to become evident. The following literature review examines the complex relationship between stuttering and anxiety in order to determine the effect that anxiety reducing treatment has on both the anxiety and the fluency of the client, when it is beneficial for anxiety to be addressed during stuttering treatment, as well as if it can become counterproductive, and the methods that should be used to assess anxiety in order to determine if treatment is necessary. It was found that treatment for anxiety not only reduces the severity of the person’s anxiety, but also may improve their fluency. However, there is limited information on the possible detrimental effects that anxiety reducing treatment may have on a person who stutters. Research has identified many methods that can be used to assess the severity and nature of a person’s anxiety, as well as additional methods which are commonly used specifically to assess the feelings and attitudes of people who stutter. Each of these assessments measure the person’s feelings and attitudes about themselves, about communication, and about stuttering, all of which can yield information important for determining if anxiety should be addressed in conjunction with stuttering treatment. Results suggest that although there has been much research conducted regarding the intricate relationship between stuttering and anxiety, there is still future research that needs to be explored in order to close the gaps in the current research.

Keywords: Stuttering, Anxiety, Relationship, Assessment, Treatment
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**Introduction**

Although fluency disorders do not occur frequently, the research surrounding this area, specifically regarding the causes and treatment of the disorder, is very intricate. Concomitant to the speech characteristics displayed by people who stutter, it has been suggested that they also experience feelings of suffering, helplessness, and shame, which can make them more susceptible to anxiety, as well as other negative emotional responses, including poor self-esteem (Blood, Blood, Maloney, Meyer, & Qualls, 2007). The claim that people who stutter have higher levels of anxiety compared to their fluent counterparts raises questions regarding the temporal precedence of the connection between stuttering and anxiety. It is unknown whether people develop anxiety as a result of their stuttering disorder, or if their stuttering disorder is a result of their anxiety (Kefalianos, Onslow, Block, Menzies, & Reilly, 2012).

There is research supporting two different hypotheses concerning the relationship between stuttering and anxiety. The first hypothesis is that certain innate temperament characteristics are contributing factors in the development of stuttering. The second hypothesis is that these anxious temperaments do not cause stuttering, but the anxiety that develops later in life is a result of the feelings of shame, fear, and social anxiety that often co-occur with fluency disorders. Since there is research supporting both hypotheses, the issue of ambiguous temporal precedence remains pertinent (Kefalianos, Onslow, Block, Menzies, & Reilly, 2012).

The evolution of anxiety across the lifetime in individuals who stutter is also an interesting concept to examine. There are two different types of anxiety, state anxiety and trait anxiety. The type of anxiety that is more likely to occur is dependent on the person’s stage of life. State anxiety is an unpleasant emotion that occurs when faced with a high stress situation,
whereas trait anxiety is a permanent personality characteristic that some people possess (Davis, Shisca, & Howell, 2007). It has been proven that preschool children who stutter do not show significant differences in either state or trait anxiety from their peers who do not stutter (van der Merwe, Robb, Lewis, & Ormond, 2011). Although the anxiety levels of young children who stutter are equivalent to the anxiety levels of their fluent counterparts, there are differences in the levels of state anxiety and trait anxiety when it comes to adolescents and adults who stutter. According to Davis, Shisca, & Howell (2007), adolescents who stutter were found to have higher state anxiety in certain situations, but did not display higher levels of trait anxiety than adolescents who do not stutter (Blood, Blood, Maloney, Meyer, & Qualls, 2007). However, adults who stutter are more likely to have higher levels of trait anxiety than fluent adults. This gradual evolution in the type of anxiety among individuals who stutter provides further evidence for the notion that anxiety and stuttering are interrelated (Kefalianos, Onslow, Ukoumunne, Block, & Reilly, 2014).

**Aims**

The primary aim of this study is to examine the complex relationship between stuttering and anxiety by exploring the effect of anxiety reducing treatment on the anxiety and fluency of people who stutter, compared to people who have co-occurring stuttering and anxiety disorders who do not receive anxiety reducing treatment.

*Aim 1: to establish the relationship between stuttering and anxiety, including determining the effect that anxiety reducing treatment has on both the anxiety and fluency of the client.*

Currently, there is much contradicting evidence on the complex relationship between anxiety and fluency disorders. It has been established through many prior studies that the two are
interrelated; however, the temporal precedence is still heavily debated (Kefalianos, Onslow, Block, Menzies, & Reilly, 2012). Therefore, the effect of anxiety reducing treatment on a person’s fluency is still unknown. A variety of sources will be examined to determine the correlation between anxiety and stuttering and the subsequent results of treatment.

Aim 2: to determine when it is beneficial for anxiety to be addressed during stuttering treatment and when it may become counterproductive. Since there is a clear connection between the occurrence of anxiety in individuals who stutter, it can be deduced that the treatment of one disorder would have a positive influence on the other disorder. With this being said, it is possible that there may also be negative consequences that come from closing the gap between the two different types of treatment methods (Menzies, O’ Brian, Onslow, Packman, St Clare, & Block, 2008). By comparing various studies regarding the results of both types of treatments, the appropriate comprehensive treatment can be established, without creating adverse effects.

Aim 3: to identify methods that can be used to accurately assess anxiety in order to determine if it is necessary for it to be addressed in conjunction with stuttering treatment. Before a comprehensive treatment can be established and implemented, the anxiety level of the individual who stutters would need to be assessed and analyzed in order to determine if their anxiety was severe enough to interfere with their ability to communicate effectively in their daily life (Ginsburg, Keeton, Drazdowski, & Riddle, 2011). Throughout this assessment, the speech-language pathologist needs to consider the extent of their scope of practice. Dependent on the initial results, the client may need to be referred to a professional in the mental health field for the appropriate assessment and treatment procedures. Appropriate methods of assessment of the severity of anxiety, and concomitant adverse effects on communication, will be investigated through various sources.
Background

Information regarding the characteristics, developmental course, prevalence, theories of cause, and treatment methods of both stuttering and anxiety will be discussed. This comprehensive information will be used to further develop the link between stuttering and anxiety, as well as thoroughly investigate the possible effects of treatment of one domain on the other.

Stuttering

Characteristics. There are many aspects that constitute speech production, such as articulation, phonology, voice, and fluency. Fluency is the aspect that encompasses continuity, smoothness, rate, and effort of speech. Stuttering, which is an interruption in the flow of speech, is the most common type of fluency disorder. Stuttering inhibits the cohesive flow of speech from occurring (Yaruss, 2004). Stuttering is often characterized by repetitions of sounds, syllables, words, or phrases, prolongation of sounds, and blocks during the production of speech. These primary characteristics of stuttering, along with interjections and revisions, may affect the flow, rate, and rhythm of speech. In addition to these different types of disfluencies, the disorder may be accompanied by secondary characteristics, such as avoidance or accessory behaviors. Avoidance behaviors include sound or word avoidances while speaking, reduced verbal output, and avoidance of social situations. Accessory behaviors include distracting sounds, such as throat clearing; facial grimaces, such as eye blinking or jaw tightening; and movements of the head or extremities, such as head nodding, leg tapping, or fist clenching (Yaruss, 1998). Along with primary and secondary characteristics, the third essential component that constitutes the diagnosis of stuttering is the person’s feelings and attitudes. In order to be considered a true
fluency disorder, there needs to be an emotional reaction to the stuttering moment. These emotional reactions often consist of feelings of fear, anxiety, shame, and embarrassment, and they often help perpetuate stuttering (Guitar, 2014).

**Onset.** Stuttering is most likely to occur in early childhood, between the ages of 2 and 6 years old (Yairi & Ambrose, 2013). However, onset can occur as early as 18 months old (Yairi, 1983), but is not likely to occur after the age of 9 years old (Ohashi, 1977). The mean age of onset is reported to be 42 months, or 3 ½ years old, according to 11 previously conducted studies (Yairi, 1997). At a very young age, stuttering is twice as likely to occur in boys as it is in girls (Yairi & Ambrose, 1999). By the time stuttering becomes more persistent around school age, the difference between boys and girls is more pronounced, resulting in boys being three to four times more likely to stutter than girls. This suggests that girls are more likely to recover from stuttering than boys are (Craig, Hancock, Tran, Craig, & Peters, 2002).

**Prevalence.** The prevalence of stuttering is low, affecting only about 1% of the general population (Craig, Hancock, Tran, Craig, & Peters, 2002). Additionally, the incidence of the disorder is about 5%, which indicates the percentage of people who have ever stuttered throughout their lifetime (Mansson, 2000). The prevalence of the disorder varies based on age. Typically, fewer cases of stuttering are found as age increases, with the exception of the period between 2 and 6 years of age when stuttering onset is most likely to occur. These statistics signify the recovery rate of people who have fluency disorders, which has been reported to be 88.3%. The prevalence decreases as age increases due to natural recovery, meaning recovery without the implementation of treatment, which occurs 68-96% of the time (Yairi & Ambrose, 2013). Natural recovery typically occurs within three to four years post-onset. While the greatest degree of recovery is likely to occur before the age of 7, some recovery also occurs
during early elementary school and even beyond (Yairi & Ambrose, 2005). Also, fewer new onsets of the disorder occur as the person reaches late childhood and adulthood, which contributes to the lower prevalence rate in older individuals (Preus, 1981).

**Theories of Cause.** The cause of stuttering is multifaceted. A number of factors, such as genetic, neurophysiological, and environmental factors, can contribute to or increase the likelihood of the occurrence of disfluencies in an individual. Different, unique combinations of these factors may cause stuttering to occur in each individual who stutters (Yairi & Ambrose, 2013). A common belief is that emotional problems and parenting styles cause stuttering. Evidence does not support this notion; however, emotional problems may affect the individual’s ability to cope with disfluencies (Choi, Conture, Walden, Lambert, & Tumanova, 2013). Although environmental factors are not considered a cause of stuttering, these factors, such as family dynamics, lifestyle, and speaking demands, exacerbate stuttering. Therefore, genetic and neurophysiological factors are related to the underlying causes of stuttering, but environmental factors may influence the individual’s reactions to stuttering, which may worsen or increase their disfluencies (Anderson, Pellowski, Conture, & Kelly, 2003).

While not the only cause, genetics have been shown to be a factor in the emergence of stuttering. While there have been many studies conducted regarding the genetic link in stuttering, specific chromosomes or genes responsible for the disorder have not been identified (Kraft & Yairi, 2011). However, there have been studies that have identified gene mutations on three genes, GNPTAB, GNPTG, and NAGPA, which are likely to be linked to stuttering. Although stuttering is associated with mutations on these genes, cases of stuttering which run in families can still occur without these mutations. Gene mutations were present in only about 10% of familial cases of stuttering (Drayna & Kang, 2011). Since multiple genes have been found to
be related to the underlying cause of stuttering, the complex interactions of these genes are difficult to understand (Yairi & Ambrose, 2013). As with stuttering, genetics is also one of the causes of anxiety. While there is no specified genes that cause anxiety identified in the study, Rapee, Schniering, & Hudson (2009) report that children with anxiety disorders are considerably more likely to have a parent with an anxiety disorder. There are stronger links to heritability and weaker links to environmental influence when it comes to anxiety. Since both stuttering and anxiety have a genetic component, it is possible that both disorders can be passed on from one generation to another and may occur in offspring co-morbidly (Iverach, Menzies, O’Brien, Packman, & Onslow, 2011).

Another factor in the emergence of stuttering in an individual is neurophysiological factors, including both structural and functional neurological differences (Chang, 2014). Individuals who stutter have differences in grey and white matter, neural network connectivity, lateralization of hemispheric functions, and white matter connections. Neurological differences between children and adults who stutter are also considered to examine the role of neuroplasticity of the brain on the emergence and recovery of stuttering. Compared to their fluent counterparts, children who stutter show deficiencies in gray matter volume in the left hemisphere, as well as white matter integrity. Adults who stutter show increases in white matter tracts in the right hemisphere (Chang, Erickson, Ambrose, Hasegawa-Johnson, & Ludlow, 2008). In terms of neural network connectivity in areas that support the timing of movement control, children who stutter have reduced connectivity. This may affect fluency due to deficiencies in speech planning (Chang & Zhu, 2013). Findings related to event-related brain potentials used to measure language processing suggest that people who stutter present with atypical lateralization of speech and language functions. These differences are present in
children near the onset of stuttering, as well as in adults who stutter (Weber-Fox, Wray, & Arnold, 2013). It was found that adults who stutter have an increased amount of white matter connections in the right hemisphere compared to fluent adults (Watkins, Smith, Davis, & Howell, 2008).

**Treatment**

**Treatment Across the Lifetime.** Due to the various primary and secondary characteristics which interfere with everyday communication, fluency disorders can be very frustrating and difficult for individuals to deal with. Fortunately, there are many different types of treatment techniques that speech-language pathologists can use with clients to reduce the severity and frequency of their stuttering. Treatment methods differ depending on the age of the client. The majority of studies have indicated that there are no significant differences in either trait or state anxiety between young children who stutter and those who do not. However, while not initially obvious, it has been concluded that there may be some association between temperament and stuttering during the preschool years. Some remaining longitudinal studies indicated that children with certain temperaments are more prone to developing anxiety later in life (Kefalianos, Onslow, Block, Menzies, & Reilly, 2012). While feelings of anxiety, fear, and shame related to stuttering are often not manifested in preschool aged children, signs of anxiety often become present in adolescence and adulthood, which may be a response to negative social conditioning resulting from stuttering (Kefalianos, Onslow, Ukoumunne, Block, & Reilly, 2014).

Since feelings of anxiety are not usually present in young children who stutter, anxiety reducing treatment is not generally introduced at this age. Instead, the treatment techniques focus solely on reducing disfluencies in speech. The three main types of treatment methods for
preschool aged clients include direct, indirect, and operant treatment. Direct treatment focuses on achieving fluency by changing the child’s speech. Speech modification and stuttering modification strategies can be used to directly reduce disfluencies, tension, and accessory behaviors (Hill, 2003). Indirect treatment focuses on encouraging and counseling the child’s family on how to make changes in their own speech and in their child’s environment, which can increase the child’s fluency. Strategies that are used to facilitate fluency include reducing speech rate, avoiding direct questions, and rephrasing the child’s speech in a way that models fluent speech (Millard, Nicholas, & Cook, 2008). Operant treatment is a system in which the child is reinforced for fluent speech and redirected when they display disfluencies. Parents are to provide verbal responses based on whether the child’s speech was fluent or disfluent. This reinforcement is used to increase fluency during speech (Onslow, Packman, & Harrison, 2003).

As young children who stutter transition into adolescence, signs of anxiety, shame, and fear may now become present. Due to repeated negative experiences while speaking, adolescents who stutter are found to demonstrate higher state anxiety in certain situations, but not higher trait anxiety than their peers who do not stutter. While adolescents who stutter have high state anxiety, adults who stutter have been found to have higher levels of trait anxiety than adults who are fluent, meaning that they are more likely to consistently exhibit anxiety as a personality trait. These results explain that people with fluency disorders develop anxiety over time (Blood, Blood, Maloney, Meyer, & Qualls, 2007).

Since anxiety is more prevalent as children reach adolescence, treatment approaches for school-age children and adolescents are more comprehensive and include techniques to reduce anxiety, while consequently increasing fluency. The treatment approaches used for this age group encompasses a variety of more specific goals, which differ based on the individual client’s
needs. These goals may include increasing fluency, increasing acceptance of stuttering, reducing secondary behaviors, minimizing avoidance behaviors, improving communication skills, and increasing self-confidence. Ultimately, the main goal of stuttering treatment approaches is to minimize the adverse effects of stuttering on the individual’s life, primarily the feelings of anxiety, fear, and shame that are often associated with fluency disorders. These negative effects of stuttering can be reduced using many different types of strategies, such as strategies for reducing impairment in body function, negative reactions, and activity limitations and participation restrictions. Each of these strategies can be used with clients who stutter to increase their quality of life. For optimal outcomes, these treatment options should be used in combination, depending on the individual child (Yaruss, Coleman, & Quesal, 2012).

**Treatment Framework for Stuttering and Anxiety.** For treatment of both stuttering and anxiety, the International Classification of Functioning, Disability, and Health (ICF) which was developed by the World Health Organization (WHO) in 2001 should be considered. According to WHO, this framework should be used during treatment in order to consider not only the disease or disorder that the individual presents with, but also any additional physical, mental, and social effects that result from the disorder. Therefore, a person’s level of activity and participation in daily social activities should be considered when determining the need and extent of treatment, along with their body functions and structures. The absence of disease, or disorder, does not constitute health. There are also many other factors that contribute to the individual’s well-being (American Speech-Language-Hearing Association, 2016).

**Association between Stuttering and Anxiety.** In congruence with the notion that people who stutter display more disfluencies when they are in high-stress situations and situations that require a higher cognitive load, they are also more fluent when their environment contains less
stressors (Guitar, 2014). As a result of the indirect relationship between fluency and anxiety, fluency inducing techniques can be used to reduce the severity and frequency of disfluencies, as well as the concomitant anxiety that may occur. While there are many techniques used in stuttering treatment that are aimed at increasing fluency, they can indirectly also decrease anxiety levels, as anxiety is often associated with the fear of exhibiting primary and secondary characteristics of stuttering while speaking. Therefore, as fluency increases, anxiety will consequently reduce (Samochis, Lazar, & Iftene, 2011).

**Stuttering Treatment that Indirectly Addresses Anxiety.** In terms of stuttering treatment, which may in turn reduce anxiety levels, strategies for reducing impairment in body function include two different categories, speech modification and stuttering modification. These strategies do not have to be mutually exclusive. Speech-language pathologists may choose to incorporate both of these strategies into a client’s treatment plan. Speech modification, or fluency shaping, includes using various techniques in order to make changes to the timing or tension of speech production and also to alter the timing of pauses between syllables and words during speech production. These techniques and modifications of speech are used consistently, regardless of whether the client anticipates that they will stutter during production of the specific word or phrase. Speech modification strategies include techniques to modify the timing of speech, such as rate control and prolonged syllables, and techniques to modify the tension of speech, such as continuous phonation, easy onset, and light articulatory contact. Some other strategies, such as using appropriate pausing, can be used to increase the fluency of speech and control the rate of speech, as well as improve overall communication skills, such as intelligibility and clarity (Bothe, 2002). It is important for speech-language pathologists to be aware that although speech modification techniques are used to help increase fluency and create a positive
impact on the individual’s speech, the client may experience negative feelings while using these strategies since their speech may sound unnatural (Ingham & Onslow, 1985).

Stuttering modification strategies are used to reduce the physical tension that is often associated with stuttering. Physical tension during speech production often increases the likelihood of the occurrence of disfluencies. Therefore, stuttering modification strategies are used to reduce the physical tension that is associated with stuttering. This can be done by identifying common stuttering behaviors, recognizing associated physical behaviors, locating the point of tension during disfluencies, and reducing physical tension. By learning about how the articulators operate during both fluent and disfluent speech, individuals who stutter can modify their speech when disfluencies occur. Self-awareness and self-monitoring skills can be used to help reduce disfluent behaviors and allow stuttering to be less tense and less disruptive during communication. Stuttering modification strategies include preparatory set, pull-out, and cancellation. Each of these strategies requires the person who stutters to identify their disfluencies, either before, during, or after it occurs, and make adjustments to their speech in order to reduce tension. The strategy that the person uses will depend on when they identify the disfluency. If the disfluency is identified before it occurs, preparatory set can be used to work through all of the sounds slowly in order to reduce the likelihood of stuttering. If the disfluency is identified while it is occurring, pull-out can be used. This consists of identifying when stuttering begins to occur and then saying the rest of the word with ease. If the disfluency is identified after it occurs, cancellation can be used in order to say the word a second time, more fluently and with less tension (Van Riper, 1973).

In addition to reducing the physical tension that is often associated with stuttering, speech efficiency can be increased by reducing the word avoidance that often occurs as a result of
attempting to speak fluently. Oftentimes people who stutter develop habits in order to avoid stuttering, which includes using interjections, such as “um” or “uh”, and changing their wording. This allows the person to speak fluently; however, it inhibits their ability to say exactly what they want to say. This lack of freedom during communication can be very difficult to deal with. Treatment strategies that focus on improving speech efficiency, reducing word avoidance, and increasing spontaneity during communication may be beneficial. While some stuttering may occur while using these strategies, it will help the person develop a sense of comfort and positive attitude regarding speaking. It will also help them accept and manage their disfluencies when they do occur (Murphy, Quesal, & Gulker, 2007).

**Stuttering Treatment that Focuses on Anxiety Reduction.** As a child who stutters gets older and becomes more aware of their fluency disorder, they face many additional challenges. These school-age children and adolescents may experience anxiety and shame which stems from fear or avoidance of speaking due to their difficulty with communication. Therefore, when necessary, treatment may include reducing both the child’s and other people’s negative reactions to stuttering. This will help reduce the child’s anxiety, shame, or fear associated with communication and will help increase the child’s communication skills and self-confidence, which may increase fluency. These strategies for reducing negative reactions, include desensitization, cognitive restructuring, self-disclosure, and support (Yaruss, Coleman, & Quesal, 2012).

Desensitization and cognitive restructuring are both strategies that reduce negative reactions by altering the way the person who stutters thinks about their disfluencies. These strategies may also be used in combination with one another. Desensitization is a strategy that can be used to help people who stutter desensitize themselves to the fears and negative emotions
that they feel regarding their fluency disorder. Desensitization can help reduce these negative emotions by allowing the person to face their fears in a structured environment. One example of an activity that may be done during the desensitization process is voluntary stuttering, also known as “pseudostuttering”. During the process of desensitization through voluntary stuttering, the person will voluntarily stutter in different situations in which they fear that stuttering may occur. These situations will become increasingly more difficult as the process continues (Reardon-Reeves & Yaruss, 2013). Cognitive restructuring is a strategy that helps people who stutter alter the way that they perceive themselves, specifically during situations in which they are communicating. Through this process, they learn to identify their underlying thoughts related to their negative attitudes and emotional reactions. They also explore the connection between their thoughts, attitudes, and emotions and their speech. Through the process of identifying their underlying thoughts, they can evaluate the validity of their thoughts. Most importantly, their thoughts that are judged to be invalid will be altered and replaced by more positive thoughts (Murphy, Yaruss, & Quesal, 2007).

Self-disclosure and support are strategies that are used to communicate information and thoughts to others, as well as receive support from others regarding the information and thoughts. Through these processes, positive emotions replace the negative emotions that many people who stutter often feel. Self-disclosure is the process in which identity revealing information is shared amongst people. For example, a person who stutters may discuss their fluency disorder with others as a component of self-disclosure. This can include directly revealing their identity as a person who stutters, explaining their disorder and its treatment, and sharing thoughts about how to respond to a person who stutters. Self-disclosure can help the person who stutters build personal and emotional connections with others as well as feel more comfortable discussing their
disorder. This will reduce the amount of fear and shame that they may associate with stuttering, and therefore, feel more positively about themselves (Murphy, Yaruss, & Quesal, 2007). Receiving support from others, such as after self-disclosing information or thoughts, is very beneficial and can improve the attitudes, emotions, and self-confidence of a person who stutters. Completing support activities during treatment allows clients to practice the strategies that they have learned in a structured environment, which can promote generalization. Hopefully this will encourage the use of these strategies outside of therapy. The use of support activities are best incorporated in group therapy (Yaruss, Quesal, & Reeves, 2007).

Due to their fear and anxiety regarding communication, people who stutter often will avoid situations in which they are encouraged to be social and communicate with others. This avoidance stems from the fact that their stuttering is often unpredictable, which creates anxiety while speaking. In order to allow people who stutter to live their lives as normally as possible, without avoiding social situations in fear that they may display disfluencies, strategies for reducing activity limitations and participation restrictions are used. Although many speech modification strategies are learned during therapy, it is often very difficult for clients to apply these strategies in a natural environment. This inability to consistently and efficiently use communication strategies which promote fluency is due to time pressure and negative emotions that are associated with certain situations, which may trigger feelings of fear and anxiety. In order for people who stutter to be able to effectively use their communication strategies in their natural environments, generalization of skills needs to occur. The clinician can promote generalization by helping the client use their therapeutic strategies outside of treatment. This can be done in a variety of ways, such as planning to use strategies at a specific time outside of the treatment room or bringing peers into the treatment room. These generalization activities should
follow a hierarchy and therefore begin in a low-pressure situation with adequate supports and then evolve into more challenging and more realistic situations (Coleman & Yaruss, 2014).

**Stuttering Treatment that Impacts Educational Achievement.** Accommodations for the classroom environment, as well as the community, may be given to students with special needs, including those with speech-language disorders such as stuttering, who qualify based on their Individualized Education Plan (IEP). Accommodations often include using audio or video recording, receiving increased time for reading or a presentation, and being provided with an alternative assignment. Accommodations, such as these, often increase the amount of activities that a child who stutters can participate in throughout their school and community. Therefore, accommodations and modifications are also considered strategies which reduce activity limitations and participation restrictions. The reduction of activity limitations and participation restrictions consequently reduces feelings of anxiety in people who stutter (Murphy, Yaruss, & Quesal, 2007).

**Cognitive Behavior Therapy.** Another widely used treatment that is often used with people who stutter is cognitive behavior therapy. Cognitive behavior therapy is based on the idea that thoughts, emotions, and behaviors are all related and interact with each other. The therapy consists of changing the person’s thoughts and emotions, which will in turn change their behaviors as well. Cognitive behavior therapy is often combined with fluency shaping techniques, such as smooth speech which promotes fluency by emphasizing continuous airflow during speech production. This treatment regimen was found to have both short and long term effects on stuttering for older children and adolescents. Stuttering was reduced by 90% for the short term, which was about one week, and 70-80% for the long term, which was about four to six years after treatment. This treatment was also found to significantly increase speech rate and
decrease fears related to communication. The overall goal of this treatment is to improve the quality of life of people who stutter. This is done by teaching them a large range of skills to help them control their disfluencies. The use and success of these strategies will improve their ability to socially interact with others and also improve their attitudes and emotions regarding communication with others (Guitar & McCauley, 2010).

**Relationship between Stuttering and Anxiety.** It is evident that the primary characteristics of fluency disorders, such as repetitions, prolongations, and blocks, often times cause the person who stutters to experience emotions of shame and fear related to speaking. Therefore, a component of many treatment approaches includes ways to reduce these negative emotions. Although it is obvious that there is a link between the feelings of anxiety towards speaking and stuttering, the causation between the two concepts is controversial. There are inconsistent findings related to whether the fluency disorder causes the person to experience feelings of anxiety, fear, and shame, or if the person is inclined to feelings of anxiety which causes them to display disfluencies in their speech (Kefalianos, Onslow, Block, Menzies, & Reilly, 2012).

Stuttering consists of the presence of a combination of primary characteristics, secondary characteristics, and feelings and attitudes. Each of these three components is present in people who stutter. Since emotional reactions to stuttering moments are essential to the diagnosis of the disorder, feelings regarding stuttering, which may include anxiety, are often present in people who stutter. It has been suggested that around the age of 4 children begin to become aware of their disfluencies and develop a sense of self-consciousness, which can lead to feelings of anxiety or incompetency. However, the severity of the anxiety and the degree to which the anxious feelings affect the person’s everyday life, including their participation in social
situations, varies greatly amongst people who stutter (Guitar, 2014). This degree of variation regarding the severity and adverse effects of anxiety on each individual person can make it difficult to determine when it is beneficial for anxiety to be addressed in people who stutter and when it may be counterproductive (Iverach, Menzies, O’Brian, Packman, & Onslow, 2011).

**Anxiety Assessment**

**Methods to Measure Anxiety.** Many methods can be used to assess anxiety of people who stutter to determine if it would be beneficial for the anxiety to be addressed during treatment of stuttering. These various methods measure both the severity and nature of the person’s anxiety, which are components in determining the need for the anxiety to be addressed. Many of these methods consist of self-report measures and questionnaires, since the presence of anxiety is largely determined by the feelings, attitudes, experiences, and limitations of the person who stutters (Iverach, Menzies, O’Brian, Packman, & Onslow, 2011).

Since feelings and attitudes are one of the major components that are present in stuttering, it is within a speech-language pathologist’s scope of practice to incorporate treatment of anxiety into the treatment of the fluency disorder (Guitar, 2014). Often times during speech-language intervention, there are moments that arise that require the speech-language pathologist to use counseling techniques to help support and guide the client. Counseling is a listening process which creates an interpersonal relationship between the clinician and the client. The goal of counseling is to help clients and their families live their life as well as they possibly can, despite the challenges of the communication disorder that they are dealing with. This can be done by supporting clients and their families as they deal with emotional stress caused by a communication disorder (Holland & Nelson, 2014).
However, according to Principle of Ethics II, Rule A of the American Speech-Language-Hearing Association (ASHA) Code of Ethics (2016), “Individuals who hold the Certificate of Clinical Competence shall engage in only those aspects of the profession that are within the scope of their professional practice and competence, considering their certification status, education, training, and experience.” Therefore, if a speech-language pathologist encounters a clinical situation that they do not feel they are competent to manage, they are obligated to refer the client to another professional who has been trained to serve the client and adequately meet their needs. For example, if a client is experiencing feelings of anxiety that go beyond speaking, it is considered to be clinical anxiety and becomes beyond the speech-language pathologist’s scope of practice. In this situation, other professionals, such as a psychologist or psychiatrist, would need to be consulted for collaboration in order to provide the client with adequate intervention to alleviate their anxiety (ASHA, 2016).

While there are many instruments that can be used, the following are a few common methods that are used when clinically assessing and diagnosing anxiety. The Revised Children’s Manifest Anxiety Scale (RCMAS), subtitled “What I Think and Feel,” is one of the most widely used self-report measures of anxiety. This questionnaire is designed to assess the level and nature of anxiety in children, ages 6-19, by evaluating how the child thinks and feels. It consists of statements that can be answered using a yes/no format and that can be classified into one of three subscales, including Physiological Anxiety, Worry/Oversensitivity, and Social Concerns/Concentration. This assessment has been standardized and normed. Therefore, the results are accurate in determining the severity and nature of anxiety in children. The results will be a factor in determining if the level of severity and the nature of anxiety warrants treatment (Seligman, Ollendick, Langley, & Balducci, 2004; White & Farrell, 2001). Specifically, higher
scores indicate higher levels of anxiety. Scores that fall beyond two standard deviations from the mean suggest the need for further information, consultation, and follow-up (Reynolds & Richmond, 2002).

The Endler Multidimensional Anxiety Scales (EMAS) consists of self-report measures of multidimensional trait anxiety, state anxiety, and perception of situations that can be used to assess anxiety and distinguish between state and trait anxiety in both children and adults. It is based off an interactional model of personality that suggests that anxiety is a function of the interaction between a person and their situational variables. It is designed to provide a multidimensional measure by assessing four scales of anxiety, which include transitory anxiety response, situational anxiety, perception of immediate threat, and social anxiety (Endler, Edwards, Vitelli, & Parker, 1989).

The State-Trait Anxiety Inventory (STAI) is a common method that is used to measure both trait and state anxiety levels in adolescents and adults. It is used in order to diagnose anxiety and distinguish it from depressive symptoms. This self-report questionnaire consists of 20 items that assess trait anxiety, including “I am tense,” “I am worried,” and “I feel calm,” and 20 items that assess state anxiety, including “I worry too much over something that really doesn’t matter,” “I am content,” and “I am a steady person.” The assessment is comprised of 20 items and each item is rated on a four-point scale, from “almost never” to “almost always.” Therefore, scores can range from 20-80, with higher scores indicating greater levels of anxiety. Low scores (20-40) suggest mild anxiety, median scores (40-60) suggest moderate anxiety, and high scores (60-80) suggest severe anxiety (Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983).
The Fear of Negative Evaluation (FNE) is an instrument that is used to measure the level of social anxiety, or discomfort and distress that is present during interpersonal interactions, in adults. This self-report questionnaire consists of true-false statements, such as “I rarely worry about seeming foolish to others,” “I worry about what people will think of me even when I know it doesn’t make any difference,” and “I become tense and jittery if I know someone is sizing me up.” The scoring scale ranges from 0 (low FNE) to 30 (high FNE), suggesting that a high score is associated with a greater level of social anxiety (Watson & Friend, 1969).

Methods to Measure Feelings and Attitudes of People Who Stutter. In addition to the previously mentioned instruments which are commonly used to assess the severity and type of anxiety, there are various protocols which are used to specifically assess the feelings and attitudes of people who stutter. These assessments measure the person’s feelings and attitudes about themselves, about communication, and about stuttering. There are different assessments designed to measure the feelings and attitudes of people who stutter dependent on the client’s age, ranging from preschool to adulthood. These measures gather information either by self-report or parent-reports. Informal measures can also be used to supplement these formal measures of assessment (Guitar, 2014).

The KiddyCat is an assessment that is designed to measure the feelings and attitudes of preschool children who stutter regarding their communication abilities. It consists of 12 questions asked in a yes/no format. An example of an assessment item is “Do you think that Mom and Dad like the way you talk?” The questions are often asked in a play-based environment to facilitate a comfortable and natural atmosphere. The results of this measure indicate qualitative information regarding the speech attitudes of young children who stutter. Lower scores (mean of 1.79) signify more positive attitudes about speech and higher scores
(mean of 4.35) signify more negative attitudes about speech (Vanryckeghem, Brutten, & Hernandez, 2005).

Another measure that can be used to assess the feelings and attitudes of preschool children who stutter is The Impact of Stuttering on Preschoolers and Parents (ISSP). Compared to the KiddyCat, this tool takes a more indirect approach by surveying parents about the impact of stuttering on their child, as well as on themselves. The survey consists of 20 questions, which include child-related questions (e.g., “Has your child ever been frustrated when stuttering?”), questions about playmates (e.g., “Has your child ever been teased by other children about his stuttering?”), and parent-related questions (e.g., “Has your child’s stuttering ever affected you emotionally?”). One of the stated purposes of this tool is to help determine if the child should begin treatment based on the child’s attitudes and the social impacts that the child is experiencing regarding their disfluency (Langevin, Packman, & Onslow, 2010).

The Behavior Assessment Battery for School-Age Children Who Stutter is a comprehensive assessment used to assess feelings and attitudes of children who stutter. It consists of multiple assessments, which measure various aspects of communication attitudes (Brutten & Vanryckeghem, 2007). The Communication Attitude Test (CAT) is included within these assessments. The CAT is a tool that can be used to reliably measure the attitudes of school-age children who stutter by asking them to evaluate each of the 35 true/false assessment items (Brutten, 1985). There are also two checklists which are included in the Behavior Assessment Battery for School-Age Children Who Stutter. The Speech Situation Checklist evaluates a child’s reaction to a range of situations in terms of emotional response and speech disruption. The Behavioral Checklist measures a child’s coping responses to their disfluencies (Brutten & Vanryckeghem, 2007).
The Overall Assessment of the Speaker’s Experience of Stuttering (OASES) is designed to measure the impact of stuttering on a person’s life. This questionnaire focuses on the child’s feelings about stuttering, reactions to stuttering, communication in daily situations, as well as the extent to which stuttering interferes with the situations in the child’s daily life. The adult version of the assessment consists of a paper and pencil questionnaire, which takes about 20 minutes to complete. An “impact score” can be calculated from the results of each of the sections, as well as a “total impact score” in order to assess how severely stuttering is impacting the person’s life. There is also a version of the questionnaire which was adapted to use with children between ages 7-12 for the same purposes (Yaruss & Quesal, 2006).

Similar to the measures designed for preschool and school-age children, there are a variety of questionnaires that can be used to measure various aspects of feelings and attitudes in the adolescent and adult stuttering population. The Modified Erickson Scale of Communication Attitudes (S-24) is generally used to obtain information about a client’s communication attitudes via self-report measures (Andrews & Cutler, 1974). The Stutterer’s Self-Rating of Reactions to Speech Situations (SSRSS) consists of multiple subscales, including avoidance, reaction, and stuttering, which are used to measure the client’s tendency to avoid speaking situations, their reactions to these situations, and the frequency in which they encounter them (Johnson, Darley, & Spriestersbach, 1952). The Perceptions of Stuttering Inventory (PSI) can be used to measure the client’s perception of their own struggle, avoidance, and expectancy of stuttering, which can indicate their level of awareness (Woolf, 1967).

The Unhelpful Thoughts and Beliefs About Stuttering (UTBAS) scales is a tool used to evaluate the frequency of negative thoughts and beliefs as well as anxiety associated with stuttering in adults. This self-report assessment contains a variety of statements in which the
person who stutters rates themselves on a scale of 1-5, ranging from “never or not at all” to “always or totally,” in three different categories, including “How Frequently I Have These Thoughts,” “How Much I Believe These Thoughts,” and “How Anxious These Thoughts Make Me Feel.” Scores indicate the frequency, the degree of belief, and the anxiety related to negative thoughts that the person has, all of which directly reflect a person’s anxiety related to their stuttering disorder. Therefore, higher scores are related to more severe levels of anxiety (Iverach, Menzies, Jones, O’Brian, Packman, & Onslow, 2010).

**Addressing Anxiety during Stuttering Treatment**

Based on the results obtained from the diagnostic instrument used to evaluate the severity, nature, and type of anxiety that is present and the relation of the anxiety to stuttering, a treatment plan including anxiety-reducing strategies may be implemented. If the person’s anxiety is found to be severe and interferes with their daily functioning, it is recommended that they receive treatment. Typically, concerns regarding anxiety are raised by the person experiencing it themselves, in which they seek treatment. However, some people, especially young children, are unlikely to present for help independently. In this case, it is common for parents to raise their concerns regarding their child’s level of anxiety (Creswell, Waite, & Cooper, 2014).

Concerns regarding anxiety in people who stutter are likely to arise during treatment for their fluency disorder, since one of the main components of stuttering is the concomitant feelings and attitudes. Emotions and disfluency are interrelated, meaning that feelings may perpetuate disfluencies and disfluencies may create negative feelings regarding communication. Therefore, an improvement in one is likely to have a positive effect on the other. If the feelings and
attitudes associated with stuttering are strong enough that they create negative self-perceptions, the feelings of anxiety, fear, shame, and embarrassment should be addressed during treatment. Addressing a person’s negative feelings regarding their stuttering is beneficial in order to alleviate them, as well as to reduce the frequency and severity of the person’s disfluencies (Guitar, 2014).

Guitar (2014) presents a stage model regarding the development/treatment levels of stuttering. Each stage of stuttering consists of different types and severities of primary and secondary behaviors, as well as different types of associated feelings and levels of awareness. The stages, in order of increasing severity, include normal disfluency, borderline stuttering, beginning stuttering, intermediate stuttering, and advanced stuttering. Negative feelings and attitudes, which often include anxiety, fear, shame, and embarrassment and increase with each stage as the person becomes more aware of their stuttering disorder (Guitar, 2014).

Young children often display disfluencies in their speech, which are typically considered to be normal. Normal disfluency is present in children ages 1 ½ to 6 years old, with frequency of disfluencies declining after age 3. However, a small amount of normal disfluency continues in mature, adult speech. Speech is considered normal if the number of disfluencies does not exceed 10 disfluencies per 100 words. Normal disfluency typically consists of one-unit repetitions, interjections, and revisions. There are no secondary behaviors present in normal disfluency and also no awareness or concern regarding the disfluencies (Guitar, 2014).

If normal disfluency does not resolve with age and maturity, the child’s stuttering may develop into borderline stuttering. Borderline stuttering occurs in young preschool children about 1 ½ to 3 ½ years old. The frequency, severity, and type of disfluencies differ from the
normal disfluency stage. A child exhibiting 11 or more disfluencies per 100 words would be considered to be in the borderline stuttering stage. Borderline stutterers often display repetitions of more than two units and are more likely to exhibit repetitions and prolongations rather than revisions or interjections. Secondary characteristics are not present in this stage. Children in the borderline stuttering stage are often not aware of their disfluencies. However, they may occasionally display a moment of surprise or mild frustration when the disfluencies occur (Guitar, 2014).

In older preschool children, ages 3 ½ to 6, stuttering may progress from borderline stuttering into the beginning stuttering stage. Beginning stuttering consists of rapid, irregular, and tense repetitions. Blocks which have fixed articulatory posture may also be present. A notable characteristic that is commonly present in beginning stuttering is tension. Secondary behaviors begin to emerge in this stage of stuttering. Escape behaviors, such as eye blinks or increases in pitch or loudness, commonly characterize beginning stuttering. Also, since children around this age begin to develop self-consciousness, the child often becomes aware of their disfluency at this stage. Therefore, they may express frustration regarding their stuttering moments (Guitar, 2014).

The next stage of stuttering, which is commonly present in school-age children between ages 6-13, is intermediate stuttering. While repetitions and prolongations persist in intermediate stutterers, the most prominent primary behavior is blocks in which sound and airflow are shut off. Similar to beginning stuttering, escape behaviors, which are used to stop a stuttering moment once it has begun, also occur in intermediate stuttering. However, escape behaviors are often more complex than they are in beginning stuttering. A child in the intermediate stuttering stage may blink their eyes or nod their head in an effort to escape a block. In addition to escape
behaviors, avoidance behaviors, such as word avoidances and situation avoidances, also begin to present themselves at this stage. These avoidance behaviors may include starters, substitutions, circumlocutions, postponements, and antiexpectancy devices. During this stage, feelings and attitudes are much more prominent. The child no longer experiences brief frustration or mild embarrassment regarding their disfluency. Now the child may feel helplessness due to the fear of being caught in a block and the pressure to use an escape or avoidance behavior. The anticipation of a block is often accompanied by feelings of anxiety, fear, frustration, embarrassment, and shame in children in the intermediate stuttering stage (Guitar, 2014).

The most severe stage of stuttering is advanced stuttering, which occurs when stuttering has persisted into the late teenage years and adulthood. Core behaviors of advanced stuttering continue to include repetitions and prolongations. However, advanced stuttering is often distinguishable from previous stages by the struggle and tension that occurs during blocks, some of which include tremor of the lips, tongue, or jaw. Secondary characteristics, such as escape and avoidance behaviors, are often involved in advanced stuttering. However, they are more extensive and severe than the escape and avoidance behaviors present in intermediate stuttering. The escape and avoidance behaviors become habitual to the point where the child or adult does not notice they are exhibiting these behaviors. The same negative feelings that were mentioned to be present during the intermediate stage of stuttering, one of which is anxiety, are prominent in the advanced stage. The person who stutters also often develops a negative self-concept related to their disfluency (Guitar, 2014).

As demonstrated through the details of each stage of Guitar’s (2014) stuttering model, the frequency and severity of the primary and secondary characteristics increase with the stage of stuttering. Also, there is a direct relationship between the frequency and severity of the primary
and secondary characteristics of stuttering and severity and impact of the concomitant feelings and attitudes that the person who stutters experiences. More frequent and severe core and secondary behaviors are associated with more severe feelings of anxiety due to the anticipation of disfluencies during speech. Reducing the frequency and severity of the core and secondary behaviors would reduce the anticipation of disfluencies, consequently reducing feelings of anxiety. Therefore, when feelings of anxiety are present, most often in the intermediate and advanced stages of stuttering, it can be suggested that treatment of stuttering and treatment of anxiety should co-occur. The results of each treatment can positively impact the other since stuttering behaviors and presence of anxiety are closely associated (Guitar, 2014).

**Clinical Implications**

Based on the research reviewed and examined throughout the entirety of this literature review, it has been concluded that although there is a clear indication of the presence of anxiety in people who stutter, the relationship between the two is not definitive. The ambiguous details regarding the temporal precedence of the connection between stuttering and anxiety creates a controversy as to if anxiety should be treated in conjunction with disfluency (Kefalianos, Onslow, Block, Menzies, & Reilly, 2012). The stage model of the development/treatment levels of stuttering presented by Guitar (2014) confirms the increasingly present negative feelings, such as fear, frustration, embarrassment, and shame, in people who stutter as they progress through the various stages. The stage of stuttering, and the associated level of awareness and severity of anxiety, is important to note when assessing and treating a person who stutters. Their stuttering stage, level of awareness, and severity of anxiety will inform how treatment is executed, including the decision to address anxiety or not (Guitar, 2014).
Another significant discussion was in reference to how best to assess anxiety in people who stutter, as well as how to determine if the person’s anxiety is considered severe enough to treat during stuttering intervention. There are a multitude of assessment tools that can be used to determine the type and severity of anxiety in general, as well as tools that are specifically designed to assess the feelings and attitudes of people who stutter regarding their speech and communication. The results of these various protocols include the person’s own perception of their stuttering and the associated feelings and attitudes that they experience. Therefore, an analysis of the client’s scores in reference to the normative data will inform the clinician if it is favorable to treat anxiety in addition to the primary and secondary speech characteristics that are present in people who stutter. The treatment of primary and secondary characteristics is often perceived to be the main focus of stuttering intervention. However, the assessment of feelings and attitudes regarding communication in those who stutter is actually just as fundamental, and should therefore be included in the intervention plan and implemented promptly for optimal results (Guitar, 2014).

**Future Research**

While there is an abundance of valuable information available in current research which explains the common co-occurrence of stuttering and anxiety, the specific connection between the two, as well as the causation of one on the other, is still unclear. Future research in this area of speech-language pathology should include more thorough research regarding temporal precedence, which would help indicate if anxiety is the result of a person’s disfluency or if the feeling of anxiety is present initially which causes stuttering to occur (Kefalianos, Onslow, Block, Menzies, & Reilly, 2012). Since feelings and attitudes, including the presence of anxiety, is one of the prominent features of stuttering, much research suggests that addressing and
attempting to alleviate anxiety throughout stuttering treatment would be beneficial by both reducing anxiety and possibly improving fluency (Yaruss, Coleman, & Quesal, 2012). However, there is limited information on the possible detrimental effects that addressing anxiety can have on the person who stutters. Therefore, future research should indicate what, if any, adverse effects can arise from addressing anxiety in people who stutter. Lastly, there are many assessment tools that can be used to assess the type and severity of anxiety, as well as the social and emotional impacts that stuttering has on a person who stutters. Prior research has found each of these commonly used assessments to be reliable in terms of accurately assessing anxiety in people who stutter (Guitar, 2014). However, the research did not indicate if there are certain assessments that are more helpful to clinical decision making regarding the decision to include treatment of anxiety in the treatment plan of people who stutter. These gaps in the current research will help inform clinicians of the causal relationship between stuttering and anxiety which will help improve the course of treatment, the possible adverse effects of addressing anxiety in people who stutter, and the assessment protocols which are best designed to aid in clinical decision making.
References


