



Social anxiety disorder and stuttering: Current status and future directions



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ABSTRACT

Anxiety is one of the most widely observed and extensively studied psychological concomitants of stuttering. Research conducted prior to the turn of the century produced evidence of heightened anxiety in people who stutter, yet findings were inconsistent and ambiguous. Failure to detect a clear and systematic relationship between anxiety and stuttering was attributed to methodological flaws, including use of small sample sizes and unidimensional measures of anxiety. More recent research, however, has generated far less equivocal findings when using social anxiety questionnaires and psychiatric diagnostic assessments in larger samples of people who stutter. In particular, a growing body of research has demonstrated an alarmingly high rate of social anxiety disorder among adults who stutter. Social anxiety disorder is a prevalent and chronic anxiety disorder characterised by significant fear of humiliation, embarrassment, and negative evaluation in social or performance-based situations. In light of the debilitating nature of social anxiety disorder, and the impact of stuttering on quality of life and personal functioning, collaboration between speech pathologists and psychologists is required to develop and implement comprehensive assessment and treatment programmes for social anxiety among people who stutter. This comprehensive approach has the potential to improve quality of life and engagement in everyday activities for people who stutter. Determining the prevalence of social anxiety disorder among children and adolescents who stutter is a critical line of future research. Further studies are also required to confirm the efficacy of Cognitive Behaviour Therapy in treating social anxiety disorder in stuttering.

Educational Objectives: The reader will be able to: (a) describe the nature and course of social anxiety disorder; (b) outline previous research regarding anxiety and stuttering, including features of social anxiety disorder; (c) summarise research findings regarding the diagnostic assessment of social anxiety disorder among people who stutter; (d) describe approaches for the assessment and treatment of social anxiety in stuttering, including the efficacy of Cognitive Behaviour Therapy; and (e) outline clinical implications and future directions associated with heightened social anxiety in stuttering.

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1. Introduction

Social anxiety disorder (also known as social phobia) is a highly prevalent anxiety disorder (Ruscio et al., 2008; Slade et al., 2009). According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5; American Psychiatric Association, 2013a), social anxiety disorder is characterised by marked or intense fear of social or performance-based situations where scrutiny or evaluation by others may occur. Feared situations often include speaking in public, meeting new people, and talking with authority figures, to name a few (Ballenger et al., 1998). Physical and motor symptoms associated with the disorder include blushing, trembling, sweating, and speech block, and many individuals with social anxiety disorder fear these symptoms being observable to others (Bogels et al., 2010). As a result, exposure to feared situations is typically accompanied by anxious anticipation, distress, and avoidance.

Social anxiety disorder affects a significant proportion of the general community, with a lifetime prevalence of approximately 8–13% (Kessler et al., 2005; Ruscio et al., 2008; Somers, Goldner, Waraich, & Hsu, 2006). The disorder typically develops in childhood or adolescence, with a mean age of onset between 14 and 16 years (Kessler et al., 2005; Schneier, Johnson, Hornig, Liebowitz, & Weissman, 1992). This corresponds with the increased importance of social and peer relationships, and heightened vulnerability to social embarrassment, as children transition through childhood and adolescence (Ollendick & Hirshfeld-Becker, 2002). Development of social anxiety disorder is influenced by a host of factors, including biological and psychological vulnerabilities, genetics, temperament, cognitive styles, and parental and peer influences (Ollendick & Hirshfeld-Becker, 2002; Rapee & Spence, 2004). Hence, multiple pathways to the acquisition of social anxiety disorder exist.

Social anxiety disorder impedes normal social development, and is associated with significant functional impairment (Lipsitz & Schneier, 2000; Schneier, Heckelman, & Garfinkel, 1994). Individuals with social anxiety disorder typically avoid social, educational, and occupational situations that are perceived as threatening (Cuthbert, 2002). This avoidance can severely hamper educational achievement, occupational performance, social interaction, relationships, and quality of life (Stein & Kean, 2000). Not surprisingly, social anxiety disorder is associated with low self-esteem, suicidal ideation, lower education and socioeconomic status, unemployment, financial dependency, and being single (Stein & Kean, 2000). The disorder is also highly comorbid with other mental disorders, especially the anxiety disorders and major depression, which may increase symptom severity and impairment (Ballenger et al., 1998). However, even without the presence of comorbid disorders, social anxiety disorder remains a serious and disabling condition (Stein & Kean, 2000).

1.1. Stuttering and social anxiety

Stuttering is a speech disorder characterised by involuntary disruptions to speech which impede the capacity to communicate effectively. The lifetime incidence of stuttering is estimated at approximately 4–5%, with a 1% point prevalence (Bloodstein & Bernstein Ratner, 2008). Onset typically occurs between 2 and 5 years of age when children are developing speech and language skills (Yairi, Ambrose, & Cox, 1996). Stuttering is most amenable to treatment during the preschool years when neuronal plasticity is greatest. The disorder typically becomes less tractable and far less responsive to treatment during the school years, and by adulthood stuttering is often a long-term problem.

There are several reasons to expect that stuttering may be associated with social anxiety disorder. To begin with, stuttering is accompanied by numerous negative consequences across the lifespan which may increase vulnerability to social and psychological difficulties (Schneier, Wexler, & Liebowitz, 1997). These negative consequences can begin early, with evidence of preschool children who stutter experiencing bullying, teasing, exclusion, and negative peer reactions (Langevin, Packman, & Onslow, 2009; Packman, Onslow, & Attanasio, 2003). These consequences are intensified during the school years when children become more involved in social and speaking situations. As a result, children and adolescents who stutter frequently experience peer victimisation, social isolation and rejection, and they may also be less popular than their non-stuttering peers (Blood et al., 2011; Davis, Howell, & Cooke, 2002; Hearne, Packman, Onslow, & Quine, 2008). These negative consequences have the potential to result in shame and embarrassment, low self-esteem, withdrawal, and lowered school performance (Langevin & Prasad, 2012). Similar factors have been associated with social anxiety (Hudson & Rapee, 2009).

Not surprisingly, adults who stutter have retrospectively reported that stuttering had extremely detrimental effects on school life and long-term effects on social and emotional functioning (Hayhow, Cray, & Enderby, 2002; Hugh-Jones & Smith, 1999). Stuttering in adulthood is also associated with adverse listener reactions, negative stereotypes, and significant occupational and educational disadvantages (Blumgart, Tran, & Craig, 2010a; Klein & Hood, 2004). Consequently, the disorder can affect quality of life as adversely as life threatening conditions such as neurotrauma and coronary heart disease (Craig, Blumgart, & Tran, 2009), and suicidal thoughts and suicides have been documented with adult stuttering patients (Corcoran & Stewart, 1998).

The numerous negative consequences associated with stuttering are thought to give rise to the development of anxiety (Blood & Blood, 2007; Ollendick & Hirshfeld-Becker, 2002). Prior to the turn of the century, however, findings regarding the relationship between stuttering and anxiety were inconsistent, ambiguous, and difficult to interpret (Ingham, 1984; Menzies, Onslow, & Packman, 1999). The equivocal nature of these findings was attributed to a number of methodological flaws, including small sample sizes, insufficient power to detect differences between groups, recruitment of adults seeking treatment for stuttering rather than adults who stutter from the general community, and application of physiological and

unidimensional measures of anxiety rather than measures designed to specifically evaluate social anxiety (Ingham, 1984; Menzies et al., 1999).

Despite some remaining ambiguities, research published in the last two decades has provided far more convincing evidence of a relationship between stuttering and anxiety. In particular, a large body of research has confirmed the presence of heightened anxiety in people who stutter, with growing evidence that this anxiety may be restricted to social or performance-based situations (Menzies et al., 1999). These findings have been driven by greater research focus on social anxiety, fear of negative evaluation, and expectancies of social harm (Craig & Tran, 2006; Iverach, Menzies, O'Brian, et al., 2011; Menzies et al., 1999).

1.2. The present review

In light of the potential for stuttering to be associated with an increased risk for the development of social anxiety disorder, the purpose of the present review is to: (1) evaluate features of social anxiety disorder in stuttering (e.g., fear of negative evaluation), (2) review research evidence regarding diagnostic assessments of social anxiety disorder and application of social anxiety questionnaires among people who stutter; (3) evaluate clinical implications of these findings for the development and provision of treatment programmes for people who stutter with social anxiety disorder; and (4) provide recommendations for future research.

2. Features of social anxiety disorder in stuttering

Social anxiety disorder is often associated with fear of negative evaluation, expectancies of social harm, negative cognitions, attentional biases, avoidance, and safety behaviours (Clark & Wells, 1995; Cuthbert, 2002; Rapee & Heimberg, 1997; Rapee & Spence, 2004). There is growing evidence that these features of social anxiety disorder may play a central role in the experience of stuttering, and may also serve to maintain the presence of social anxiety (Kraaimaat, Vanryckeghem, & Van Dam-Baggen, 2002; Lowe et al., 2012; Menzies et al., 1999). For instance, people who stutter are known to avoid socially threatening situations in order to reduce anxiety and embarrassment (Mahr & Torosian, 1999), and they frequently experience expectancies of social harm (Cream, Onslow, Packman, & Llewellyn, 2003; Plexico, Manning, & Levitt, 2009). Moreover, research regarding fear of negative evaluation, attentional biases, and safety behaviours, has enhanced our understanding of the relationship between social anxiety disorder and stuttering. Hence, cognitive-behavioural models of social anxiety disorder are particularly relevant to this research, as outlined below.

2.1. Cognitive-behavioural models of social anxiety disorder

Clark and Wells (1995) and Rapee and Heimberg (1997) have provided two preeminent cognitive-behavioural models regarding the experience of anxiety in social anxiety disorder. Both models propose that attentional processes play a central role in the development and maintenance of social anxiety. In particular, Clark and Wells argue that self-focussed attention in social situations is a critical factor in generating anxiety and impairing social performance. Namely, when a socially anxious person enters a social encounter, fear of an undesirable outcome (e.g., fear of negative evaluation) causes attention to be drawn away from external social information and towards internal cues (e.g., negative thoughts, physiological arousal). This bias in attention then impedes awareness of information that may be inconsistent with social fears, and may elicit negative evaluation from others.

In a similar manner, Rapee and Heimberg (1997) also propose that information processing biases and distortions in social/evaluative situations produce anxiety and contribute to the maintenance of social anxiety disorder. However, in contrast to Clark and Wells (1995), Rapee and Heimberg argue that, when engaged in social encounters, the socially anxious individual attends both to internal cues and potential environmental threats. In particular, the individual scans the environment for information regarding the likelihood of feared outcomes occurring, and is vigilant in detecting negative cues which confirm social fears. The individual then attends to numerous sources of information regarding the proximity of feared outcomes, including additional external cues, a mental representation of the self as seen by the audience, and internal cues relating to the cognitive, behavioural, and emotional experience of anxiety (Schultz & Heimberg, 2008). This focus on internal and external cues typically exacerbates and maintains social anxiety. An updated version of this model was recently proposed (Heimberg, Brozovich, & Rapee, 2010; Morrison & Heimberg, 2013).

Overall, these models highlight the propensity for fear of negative evaluation and information processing biases in socially anxious individuals to generate negative views of social situations, and to result in avoidance and safety behaviours which maintain social anxiety (Schultz & Heimberg, 2008). These cognitive-behavioural models are also pertinent to the study of social anxiety among individuals who stutter, particularly given the tendency for stuttering to be associated with many of the core features of social anxiety disorder (e.g., fear of negative evaluation, attentional biases, and negative cognitions).

According to Rapee and Heimberg's (1997) model, an individual who stutters may fear negative evaluation in social situations, and may focus on internal cues (e.g., presence of stuttering, fear of being rejected or ignored) and external threats (e.g., signs of listener disinterest or rejection). Information processing biases then cause the individual to detect negative cues (e.g., stuttered syllables/words, signs of listener disinterest or rejection) and neglect positive cues (e.g., fluent syllables/words, signs of listener interest). Hence, the individual's social fears are confirmed, anxiety is exacerbated, information processing

biases or distortions are compounded, and the individual behaves in ways (e.g., avoidance of speaking, lack of eye contact) that elicit feared responses from others (e.g., rejection and disinterest). Thus, the cycle is renewed (Rapee & Heimberg, 1997).

2.2. Fear of negative evaluation

Fear of negative evaluation is one of the hallmarks of social anxiety disorder (Rodebaugh et al., 2004), and is thought to play a significant role in triggering information processing biases (Clark & Wells, 1995). Fear of negative evaluation is also one of the most widely studied features of social anxiety among people who stutter (Iverach, Menzies, O'Brian, et al., 2011; Menzies et al., 1999). In particular, adults who stutter have been found to demonstrate significantly elevated fear of negative evaluation and heightened anxiety in socially evaluative situations (Blumgart, Tran, & Craig, 2010b; Iverach, O'Brian, et al., 2009; Messenger, Onslow, Packman, & Menzies, 2004). Similar results have also been reported for adolescents and older adults who stutter, indicating that fear of negative evaluation may commence early, and continue to be present later in life, for many people who stutter (Bricker-Katz, Lincoln, & McCabe, 2009; Mulcahy, Hennessey, Beilby, & Byrnes, 2008). There are, however, some indications that fear of negative evaluation among people who stutter may not be as high as levels reported by clinically anxious or socially phobic samples (Iverach, O'Brian, et al., 2009; Mahr & Torosian, 1999). In addition, a recent study by Lowe et al. (2012) reported no difference in fear of negative evaluation among adults who stutter when compared to controls, despite higher social anxiety scores in the stuttering group.

The inconsistent nature of these findings may be explained by several factors. To begin with, all studies cited above utilised the Fear of Negative Evaluation scale (FNE; Watson & Friend, 1969) to evaluate fear of negative evaluation in people who stutter. Although the FNE scale has been used extensively in social anxiety research (Stopa & Clark, 2001), a number of criticisms have been drawn against it (Rodebaugh et al., 2004; Weeks et al., 2005). In particular, the forced-choice (true–false) response format of the FNE scale does not allow scores to be placed along a continuum of severity or intensity, and the reverse-worded items have been found to impede the validity and accuracy of scores (Rodebaugh et al., 2004; Woods & Rodebaugh, 2005). Consequently, more recent research has demonstrated the viability of an analogue research design whereby respondents who score high and low on the FNE scale are compared (Stopa & Clark, 2001). In addition, a number of revised versions of the FNE have been developed to include multiple-response formats and straightforwardly worded items only, in order to discriminate between varying degrees of severity (Carleton, Collimore, & Asmundson, 2007). It is not yet known whether use of these revised versions of the FNE scale among people who stutter may yield a clearer and more consistent pattern of findings.

Despite the ambiguous nature of previous findings, however, the large majority of studies suggest that the negative social experiences associated with stuttering may contribute to the presence of fear of negative evaluation across the lifespan for those who stutter (Menzies, Onslow, Packman, & O'Brian, 2009). It is also plausible that fear of negative evaluation in stuttering may be associated with, or driven by, negative cognitions regarding threat of social harm, embarrassment, and rejection. In particular, adults who stutter who are socially anxious have been found to report significantly more negative thoughts and beliefs about stuttering than adults who stutter who are not socially anxious (Iverach, Menzies, Jones, et al., 2011). These negative cognitions can include such thoughts and beliefs as, “People focus on every word I say”, “Everyone in the room will hear me stutter”, and “No one will like me if I stutter” (St Clare et al., 2009). These self-focussed, negative cognitions may play a considerable role in maintaining fear of negative evaluation and associated social anxiety (Clark & Wells, 1995; Rapee & Heimberg, 1997).

2.3. Attentional biases and safety behaviours

As outlined above, individuals with social anxiety disorder place excessive attention upon potentially threatening stimuli, internal negative thoughts, physiological arousal, and projected self-image (Clark & McManus, 2002; Clark & Wells, 1995; Rapee & Heimberg, 1997; Stopa & Clark, 2001). They also have a tendency to interpret ambiguous or neutral social events in a negative manner, and to evaluate mildly negative social events in a catastrophic fashion (Clark & McManus, 2002; Stopa & Clark, 2000). As a result, attention is drawn away from positive external social cues or information which may serve to discredit negative thoughts and beliefs, thereby perpetuating social fears (Clark & Wells, 1995; Rapee & Heimberg, 1997).

Over the last few decades, a substantial number of studies have investigated attentional biases in both anxious and non-anxious individuals, using experimental tasks such as Stroop and dot probe tasks, eye-tracking procedures, questionnaires, fMRI, and memory studies (Bar-Haim, Lamy, Pergamin, Bakermans-Kranenburg, & van IJzendoorn, 2007; Cisler & Koster, 2010; Clark & McManus, 2002). Findings from these studies confirm that socially anxious individuals take longer to recognise happy faces (Silvia, Allan, Beauchamp, Maschauer, & Workman, 2006), demonstrate enhanced vigilance and greater brain activation to angry faces than happy or neutral faces (Mogg, Philippot, & Bradley, 2004; Straube, Kolassa, Glauer, Mentzel, & Miltner, 2004), and show attentional biases away from emotional (positive or negative) faces when under threat of social evaluation (Mansell, Clark, Ehlers, & Chen, 1999). Socially anxious individuals also have difficulty disengaging from socially threatening information (Cisler & Koster, 2010; Amir, Elias, Klumpp, & Przeworski, 2003), have poorer memory recall for details of recent social events (Mellings & Alden, 2000), and demonstrate enhanced self-focussed attention and self-consciousness in social situations (Clark & McManus, 2002; Mellings & Alden, 2000). These findings support the view that socially anxious individuals scan the environment to determine the likelihood of negative outcomes (Schultz & Heimberg, 2008).

Individuals with social anxiety disorder also frequently engage in cognitive and behavioural strategies (safety behaviours) in order to reduce anxiety and minimise the likelihood of feared events occurring (Clark & McManus, 2002; Clark & Wells, 1995). Common safety behaviours include avoidance, lack of eye contact, and self-monitoring in social situations. Although safety behaviours temporarily reduce anxiety in social situations, these behaviours contribute to the long-term persistence of fears (Clark & McManus, 2002). For instance, avoidance of eye contact may be perceived by others as disinterest, and may generate negative reactions which confirm social fears (Alden & Beiling, 1998; Clark & Wells, 1995; Plasencia, Alden, & Taylor, 2011). Hence, individuals with social anxiety disorder often behave in ways that maintain anxiety (Rapee & Heimberg, 1997).

Attentional biases and safety behaviours are common in stuttering. In particular, adults who stutter often avoid eye contact or social situations perceived as threatening, thereby limiting exposure to positive listener reactions and reducing the likelihood of disconfirming negative thoughts and fears about speaking (Lowe et al., 2012; Plexico et al., 2009). In order to investigate attentional biases in stuttering, Lowe et al. (2012) evaluated gaze behaviours among 16 adults who stutter and 16 controls whilst giving a speech. Audience members were trained to display positive, neutral, and negative expressions, and an eye-tracker was used to record participants' eye movements. In comparison with controls, adults who stutter were found to look at positive audience members for a significantly shorter amount of time than neutral or negative audience members. These results confirm that adults who stutter may neglect positive social cues in social situations, thereby confirming negative cognitions and social fears. These biases and behaviours may contribute substantially to the development or maintenance of associated social anxiety disorder.

However, little is known about whether people who stutter demonstrate the same information processing biases as socially anxious individuals when responding to a range of experimental tasks commonly used in anxiety research (for example, Stroop and dot probe tasks). If adults who stutter do indeed exhibit attentional biases towards negative cues and away from positive cues in social situations, it will be necessary to determine whether these attentional biases are attributable to stuttering or social anxiety, or both (Lowe et al., 2012). Likewise, evidence regarding use and experimental manipulation of safety behaviours in social encounters for people who stutter is lacking.

3. Social anxiety and stuttering research

In addition to investigating features of social anxiety, several studies have utilised diagnostic assessments and interviews to determine the clinical presence of social anxiety disorder, and/or self-report or clinician-administered questionnaires to evaluate the presence and severity of social anxiety.

3.1. Diagnostic assessments of social anxiety disorder in stuttering

Diagnostic assessments and interviews are necessary to evaluate the clinical presence and prevalence of social anxiety disorder among people who stutter. However, the diagnosis of social anxiety disorder among people who stutter has previously been restricted by the exclusion criterion specified by the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV-TR; American Psychiatric Association, 2000). In particular, the DSM-IV prohibited the diagnosis of social anxiety disorder in cases where social anxiety and avoidance were related to a general medical condition such as stuttering. Numerous researchers argued that the DSM-IV exclusion criterion was without empirical basis (Oberlander, Schneier, & Liebowitz, 1993), and was at odds with growing evidence of clinically significant levels of social anxiety among adults who stutter (Blumgart et al., 2010b; Stein, Baird, & Walker, 1996). Hence, the DSM-IV exclusion criterion was thought to result in clinical confusion and limited treatment opportunities for people who stutter (Blumgart et al., 2010b; Craig & Tran, 2006; Schneier et al., 1997; Stein et al., 1996).

In light of support for a revision of the DSM-IV exclusion criteria to allow for a diagnosis of social anxiety disorder in cases where social anxiety is excessive (Blumgart et al., 2010b; Bogels et al., 2010; Iverach, Menzies, O'Brian, et al., 2011; Stein et al., 1996), the American Psychiatric Association (APA; 2013a) recently released changes to the diagnostic criteria for the DSM-5. Specifically, the American Psychiatric Association (2013b) state that, "If the person suffers from another medical condition—for instance, stuttering or obesity—the fear or anxiety experienced must be unrelated to the other condition or out of proportion to what would normally be felt". According to the American Psychiatric Association, this revision was developed in response to evidence that stuttering may be associated with excessive social anxiety and accompanying disability. It was also based on evidence that social anxiety in relation to a medical condition is treatable. This proposed revision is a considerable advance in improving treatment options and quality of life for people who stutter with social anxiety disorder.

3.1.1. Diagnosis of social anxiety disorder among adults who stutter

Nearly two decades ago, research regarding the presence of social anxiety disorder among adults who stutter was lacking (George & Lydiard, 1994). Based on evidence that adults who stutter frequently experience anxiety, embarrassment, and avoidance in social situations, George and Lydiard (1994) recommended the future inclusion of diagnostic assessments of social anxiety disorder in stuttering patients. In the same year, Poulton and Andrews (1994) reported on the first study to conduct diagnostic assessments of social anxiety disorder among adults who stutter in comparison with social anxiety disorder patients. Although no adults in the stuttering group were found to meet criteria for social anxiety disorder, all participants completed a three-week intensive Cognitive Behaviour Therapy (CBT) programme for the treatment of anxiety.

Since the original study by [Poulton and Andrews \(1994\)](#), no further studies have reported the complete absence of social anxiety disorder among adults who stutter when using diagnostic assessments. In fact, [Stein et al. \(1996\)](#) conducted clinical assessments of social anxiety disorder among 16 adults seeking treatment for stuttering, and reported very different results. In this study, the DSM-IV exclusion criterion was modified to allow a diagnosis of social anxiety disorder in cases where social anxiety exceeded stuttering severity. Based on this modification, seven participants (44%) met criteria for a diagnosis of social anxiety disorder with significant role impairment. Despite the small sample size employed by Stein et al., this was the first study to report an inflated prevalence of social anxiety disorder among adults seeking treatment for stuttering. These findings were the catalyst for further research, and indicated the need for diagnostic assessments of social anxiety disorder among larger samples of adults who stutter.

Subsequent studies have reported similar rates of social anxiety disorder among adults who stutter as those reported by [Stein et al. \(1996\)](#). For instance, in the first randomised controlled trial of Cognitive Behaviour Therapy (CBT) for anxiety in stuttering, [Menzies et al. \(2008\)](#) reported that approximately two-thirds of their sample of adults who stutter met criteria for a diagnosis of social anxiety disorder. Similarly, [Iverach, Menzies, Jones, et al. \(2011\)](#) reported on the validation of a measure designed to evaluate negative cognitions associated with stuttering, and found that nearly one-quarter of their sample of 140 adults who stutter (23.5%) met criteria for a diagnosis of social anxiety disorder.

In addition, two studies have investigated the presence of social anxiety disorder among adults who stutter in comparison with matched controls. Firstly, [Iverach, O'Brian, et al. \(2009\)](#) investigated the presence of DSM-IV anxiety disorders among 92 adults seeking treatment for stuttering and 920 age- and gender-matched controls. In comparison to controls, the stuttering group demonstrated 6-fold increased odds for any anxiety disorder, and 16-fold increased odds for social phobia. Of particular note, the 12-month prevalence rate for social phobia was 21.7% for the stuttering group, compared to only 1.2% for matched controls. In addition, 18.5% of the stuttering group met criteria for a current diagnosis of social phobia, compared to only 1.0% of matched controls. However, these findings were obtained with adults seeking treatment for stuttering, and it is plausible that social anxiety disorder may be higher among adults seeking treatment for stuttering than those who are not seeking treatment.

Secondly, [Blumgart et al. \(2010b\)](#) investigated the presence of social anxiety disorder and generalised anxiety disorder among 50 adults who stutter and 50 controls, using a psychiatric diagnostic screening questionnaire. Compared to controls, the stuttering group was significantly more likely to meet screening criteria for social anxiety disorder. In particular, 46% of the stuttering group met screening criteria for social anxiety disorder, compared to only 4% of controls. Furthermore, 85% of the stuttering group who met screening criteria for social anxiety disorder also met screening criteria for generalised social anxiety disorder, compared to only 50% of controls. Generalised social anxiety disorder is characterised by anxiety across a broad range of social situations, and is more severe and disabling than specific social anxiety ([Ballenger et al., 1998](#); [Moutier & Stein, 1999](#)). However, this study utilised a screening instrument to evaluate the presence of social anxiety disorder rather than a full diagnostic assessment, thereby yielding screening estimates rather than full diagnoses. Further research with full diagnostic assessments is required to determine accurate rates of prevalence.

In addition to studies investigating the prevalence of social anxiety disorder among adults who stutter, longitudinal research has also been conducted to determine the relationship between early childhood speech disorders and anxiety disorders in young adulthood ([Beitchman et al., 2001](#); [Voci, Beitchman, Brownlie, & Wilson, 2006](#)). In this research, participants with early speech impairment at age 5 years, including stuttering, were no more likely than controls to meet criteria for an anxiety disorder at 19 years of age ([Beitchman et al., 2001](#)). In addition, participants with speech impairment at 5 years of age were found to demonstrate a 13.2% rate of social anxiety disorder at 19 years of age ([Voci et al., 2006](#)). Although findings from these studies suggest a possible link between early speech disorders and later development of social anxiety disorder, both studies included children with a variety of early speech impairments including stuttering, and neither study provided details of how many participants were diagnosed with stuttering. Further longitudinal research is clearly required to determine the relationship between early childhood stuttering and later mental health in stuttering populations only.

Finally, adults who stutter have also been found to demonstrate significantly increased odds of meeting first-stage screening criteria for a diagnosis of anxious (or avoidant) personality disorder when compared to controls ([Iverach et al., 2009a](#)). Anxious personality disorder is diagnostically similar to, yet more severe than, social anxiety disorder ([Reich, 2000](#)). It is characterised by feelings of inferiority and insecurity, hypersensitivity to criticism and rejection, restricted personal attachments, and avoidance of everyday situations ([World Health Organisation, 1993](#)). Negative childhood events are thought to contribute to the development of personality disorders ([Weston & Riolo, 2007](#)). Therefore, the first-stage screening presence of anxious personality disorder found among adults who stutter may be the result of repeated negative social experiences across the lifespan. However, further research is required to determine the prevalence of anxious personality disorder among adults who stutter using full diagnostic interviews rather than screening instruments.

In sum, two major studies have utilised moderate to large samples of adults who stutter and controls to investigate the prevalence of social anxiety disorder, and have reported significant differences between groups ([Blumgart et al., 2010b](#); [Iverach, O'Brian, et al., 2009](#)). A number of other studies with smaller sample sizes have also reported inflated rates of social anxiety disorder (e.g., [Menzies et al., 2008](#); [Stein et al., 1996](#)). Despite this, there remains a significant need for future research to employ larger samples of adults who stutter in order to facilitate sufficient power to detect differences between groups ([Craig & Tran, 2006](#); [Menzies et al., 1999](#)). However, when attempting to recruit large samples of adults who stutter, it can be difficult to access individuals who have never received stuttering treatment ([Menzies et al., 1999](#)). For instance, [Blumgart et al. \(2010b\)](#) reported that only 6% of their total sample of 200 adults who stutter had never received treatment for stuttering

in the past. Although there is scant evidence regarding the impact of treatment status on rates of social anxiety disorder among adults who stutter, it has been suggested that speech treatment may reduce anxiety and negative expectancies (Craig, 1990; Craig, Hancock, Tran, & Craig, 2003; Craig & Tran, 2006). Research has also shown that assessments of trait anxiety among adults who stutter may be influenced by whether participants are currently seeking treatment or have received stuttering treatment in the past (Craig et al., 2003). Therefore, future research would benefit from dividing stuttering groups into those who have received treatment in the past, those who are currently seeking treatment, and those who have never received treatment (Menzies et al., 1999), in order to determine the impact of treatment status on the presence of social anxiety disorder.

3.1.2. Diagnosis of social anxiety disorder among children and adolescents who stutter

To date, no studies have comprehensively evaluated the presence of DSM-IV social anxiety disorder among children and adolescents who stutter. Over twenty years ago, however, Cantwell and Baker (1987) investigated the presence of DSM-III anxiety disorders in a large sample of 600 children with communication disorders, including a small percentage of children who stutter (7%). Ten percent of children in this study met criteria for a DSM-III anxiety disorder, with avoidant disorder (very similar to social anxiety disorder) and separation anxiety disorder the most prevalent diagnoses. However, this 10% prevalence rate does not exceed rates reported in many large, national studies (Kessler et al., 2005; Ruscio et al., 2008; Somers et al., 2006). In addition, it is not clear how many children who stutter specifically were diagnosed with a DSM-III anxiety disorder or avoidant disorder.

Further research regarding the assessment of social anxiety disorder among children who stutter is clearly needed. Research with non-stuttering children has shown that the reliability of children's self-reported symptoms via structured interviews tends to vary widely, influenced by such factors as the child's age, gender, cognitive ability, and need to report in a socially desirable manner (Fallon & Schwab-Stone, 1994; Schniering, Hudson, & Rapee, 2000). Despite the potential for these developmental issues to impact diagnosis, overall evidence suggests that structured interviews provide reasonably accurate and reliable information about the primary features of anxiety in children and adolescents (Schniering et al., 2000). In the case of children and adolescents who stutter, it may prove useful for structured interviews to be supplemented with information from multiple informants (e.g., parents and teachers) and other self-report questionnaires, in order to obtain a comprehensive understanding of the child or adolescent's psychological status.

3.2. Social anxiety questionnaires and stuttering

In addition to diagnostic assessments of social anxiety disorder, a small number of studies have investigated social anxiety among people who stutter using social anxiety questionnaires. For instance, Kraaimaat, Janssen, and Van Dam-Baggen (1991) utilised a social anxiety likert scale to evaluate social anxiety in a sample of 110 adults who stutter, 110 social phobia patients, and 110 controls. Social anxiety for the stuttering group was significantly higher than controls, but significantly lower than the social phobia group. In a similar study, Kraaimaat et al. (2002) investigated social anxiety among 89 adults who stutter and 131 controls, using the Inventory of Interpersonal Situations (IIS; Van Dam-Baggen & Kraaimaat, 1999). For the stuttering group, emotional discomfort in social situations was significantly higher than controls, lower than psychiatric social phobia patients, and comparable to psychiatric patients. These studies provide preliminary evidence that social anxiety for some adults who stutter may be higher than controls but less severe than social anxiety experienced by social phobia patients.

However, Schneier et al. (1997) also investigated social anxiety among 22 adults participating in a self-help stuttering symposium, using the Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987). Nearly 60% of participants ($n = 13$) demonstrated social anxiety scores similar to a comparison group of 26 social phobia patients from an anxiety disorders clinic. Furthermore, in a study investigating avoidance of eye gaze, Lowe et al. (2012) administered the Social Phobia and Anxiety Inventory (SPAI; Turner, Beidel, & Dancu, 1996) to 16 adults who stutter and 16 controls. The stuttering group demonstrated significantly higher social phobia scores than controls, even though no significant differences in fear of negative evaluation were found between groups.

Overall, these studies indicate the potential for stuttering to be associated with increased social anxiety, and highlight the clinical relevance of routinely assessing social anxiety among adults who stutter (Kraaimaat et al., 1991). Although formal clinical diagnoses are important, many individuals with heightened levels of social anxiety may not necessarily meet full criteria for social anxiety disorder. Therefore, social anxiety questionnaires may be utilised to compliment diagnostic evidence by conceptualising social anxiety along a general continuum. However, further research is required to corroborate results obtained with a range of different social anxiety questionnaires.

4. Treatment approaches and clinical implications

The potential for stuttering to be associated with increased rates of social anxiety disorder highlights the importance of developing anxiolytic treatment strategies for these individuals. Although treatments designed to reduce stuttering may also decrease anxiety (Blomgren, Roy, Callister, & Merrill, 2005; Craig, 1990), standard speech treatment for stuttering is often regarded as having limited impact on speech-related fears and social anxiety (Craig & Tran, 2006; Menzies et al., 2008). Therefore, the incorporation of psychological assessment and treatment practices into standard speech treatment is required to address the unique fears and anxieties experienced by children, adolescents, and adults who stutter (Craig &

Tran, 2006; Menzies et al., 2008). A large proportion of speech pathologists use anxiolytic treatment procedures with clients engaged in stuttering treatment (Lincoln, Onslow, & Menzies, 1996), yet speech pathologists often have large caseloads and may benefit from involvement by psychologists and psychiatrists with extensive training in the assessment and treatment of social anxiety disorder (Nippold, 2012). This collaboration may assist in reducing social anxiety before it becomes a chronic, lifelong problem, and may also contribute to the improvement of treatment outcomes for people who stutter. This is particularly relevant when considering the potential for self-efficacy, social support, and healthy social functioning in adults who stutter to protect against the development of psychopathology (Craig, Blumgart, & Tran, 2011).

An important consideration for the treatment of social anxiety among people who stutter is when treatment should occur. Individuals who present with clinically relevant levels of anxiety, or who meet criteria for an anxiety disorder, are likely to require immediate treatment for presenting fears, particularly in cases where anxiety-related impairment and distress are significant. However, not all individuals who stutter experience clinically relevant anxiety. In particular, evidence suggests that social anxiety and fear of negative evaluation for some individuals who stutter may be higher than community controls but less severe than clinically anxious patients (Iverach, O'Brian, et al., 2009; Kraaimaat et al., 1991; Mahr & Torosian, 1999). Given the potential for subclinical fears and anxious associations to contribute to the development of anxiety disorders (Balazs et al., 2013; de Hullu, de Jong, Sportel, & Nauta, 2011; Glashouwer, de Jong, & Penninx, 2011), it would appear relevant to consider early psychological intervention in such cases. Addressing subclinical fears before they become clinically elevated may also play a role in curtailing some of the negative consequences associated with stuttering. This may be especially relevant for adolescents who stutter as they move towards the challenges faced in adulthood.

4.1. Cognitive Behaviour Therapy (CBT) for adults who stutter

Cognitive-behaviour therapy (CBT) is the most comprehensively researched non-pharmacological treatment for social anxiety disorder, with many studies confirming its efficacy (Heimberg, 2002). A number of recent studies have investigated the efficacy of CBT in treating social anxiety among adults who stutter, and have reported significant improvements in avoidance, social anxiety, and overall functioning (Craig, 2003; Kawai, 2010; Menzies et al., 2009; Nielson, 1999; St Clare et al., 2009; Stein et al., 1996). Of particular note, both clinician- and computer-delivered CBT programmes have been found to effectively reduce social phobia diagnoses among adults who stutter (Helgadottir, Menzies, Onslow, Packman, & O'Brian, 2009; Menzies et al., 2008).

For instance, Helgadottir et al. (2009) reported on the efficacy of a web-based CBT programme in treating social anxiety in two adults who stutter diagnosed with social anxiety disorder. Stein et al. (1996) also investigated outcomes of a group CBT programme for three adults who stutter with social anxiety disorder. Marked reductions in social anxiety, avoidance, and overall disability were reported post-treatment, even though no improvement in stuttering occurred. Similarly, in the first randomised controlled trial of Cognitive Behaviour Therapy (CBT) for anxiety in stuttering, Menzies et al. (2008) reported that CBT resulted in significant reductions in anxiety and avoidance, significant improvements in global functioning, and elimination of social phobia diagnoses at 12-month follow-up, despite no improvement in stuttering. In contrast, 50% of control participants still met criteria for social phobia at 12-month follow-up. Furthermore, there are indications that fear of negative evaluation in adults who stutter may be reduced following CBT for social anxiety (Helgadottir et al., 2009; Menzies et al., 2008).

Although these studies were conducted with small samples of adults who stutter, results highlight the efficacy of CBT in significantly improving social anxiety symptoms and overall functioning for adults who stutter, despite having no impact on stuttering. This suggests that adults who stutter who have completed a CBT treatment programme may feel less anxious in social situations, even though they continue to stutter. In light of this evidence, a number of researchers and clinicians have proposed treatment programmes for the management of social anxiety which incorporate CBT approaches. Principal among these, Menzies et al. (2009) recently published comprehensive CBT treatment guidelines and worksheets for use by speech pathologists during speech therapy. Craig and Tran (2006) also proposed a comprehensive treatment programme for adults who stutter comprised of clinical assessment of social anxiety, evaluation of social skills in speaking situations, speech treatment, CBT for social anxiety, and possible inclusion of pharmacological anxiolytic treatments. Overall, these treatment programmes can be applied in numerous speech pathology settings, in collaboration with clinical psychologists as required.

Finally, numerous researchers have recommended pharmacological approaches for the treatment of social anxiety among adults who stutter in combination with psychological treatments such as CBT (De Carle, Pato, & Providence, 1996; Heimberg, 2002; Oberlander et al., 1993; Schneier et al., 1997). However, placebo controlled trials of pharmacological agents to treat anxiety in adults who stutter are required (Iverach, O'Brian, et al., 2009).

4.2. Cognitive Behaviour Therapy (CBT) for children and adolescents who stutter

Preliminary evidence suggests that CBT may be useful in reducing the social and emotional burden of stuttering in children (Boey, 2009). To date, however, no clinical trials have been conducted to determine the efficacy of CBT in treating social anxiety disorder among children and adolescents who stutter. This is possibly due to the lack of research evidence regarding the presence of social anxiety disorder in this age group. If children and adolescents who stutter do indeed report significantly inflated rates of social anxiety disorder, then development and provision of CBT interventions is critical. In order

to address this need, [Murphy, Yaruss, & Quesal \(2007\)](#) have proposed treatment strategies for use by speech pathologists to target negative emotional, behavioural, and cognitive reactions to stuttering in school-age children who stutter. This treatment approach is based on evidence that CBT can successfully reduce social phobia diagnoses in children ([Barrett, Dadds, & Rapee, 1996](#); [Rapee, Schniering, & Hudson, 2009](#)).

4.3. Implications for maintenance of social anxiety in stuttering

Many of the features of social anxiety disorder, such as fear of negative evaluation, negative cognitions, safety behaviours, and attentional biases, also contribute to maintenance of the disorder ([Clark & Wells, 1995](#); [Rapee & Heimberg, 1997](#)). Several components of CBT treatment, including social skills training, attentional training, and cognitive restructuring, have the potential to reduce the presence and severity of these features of social anxiety disorder, which in turn may moderate maintenance of the disorder. In particular, individuals with social anxiety disorder sometimes demonstrate social skills deficits, including poor conversational skills and eye contact, which inadvertently elicit negative listener reactions and confirm social fears ([Heimberg, 2002](#)). Attentional and social skills training are often delivered as part of CBT treatment to address these deficits. Therefore, social skills training for people who stutter may target discomfort and lack of engagement in social situations ([Kraaimaat et al., 2002](#)), which may subsequently elicit positive listener reactions and disconfirm social fears. Attentional training may also assist adults who stutter to focus on the social task at hand rather than on negative social cues or perceived threats ([Lowe et al., 2012](#); [Menzies et al., 2009](#); [Rapee & Heimberg, 1997](#)). People who stutter may also engage in a range of subtle safety behaviours, which are likely to be key to maintaining social anxiety ([Cuming et al., 2009](#)). Directly addressing these behaviours in treatment has been shown to increase efficacy ([Rapee, Gaston, & Abbott, 2009](#)).

Adults who stutter with social anxiety have also been found to report increased negative cognitions about stuttering ([Iverach, Menzies, Jones, et al., 2011](#); [St Clare et al., 2009](#)), which may drive fear of negative evaluation and reduce engagement in social situations. Cognitive restructuring, as part of CBT treatment, may assist adults who stutter to refute cognitive distortions and faulty thinking, which in turn may diminish fear of social harm and lack of social engagement. Overall, by addressing the negative cognitions and behaviours that maintain social anxiety, the above treatment approaches may improve the prognosis for adults who stutter with social anxiety. Further research is required, however, to determine how these features and maintaining factors of social anxiety disorder develop throughout childhood and adolescence for those who stutter. If the negative cognitions and behaviours associated with stuttering can be successfully treated in childhood or adolescence, it is possible that the development of social anxiety disorder may be curtailed.

4.4. Implications for treatment outcome and relapse

Treatment of social anxiety among adults who stutter also has considerable implications for the prevention of relapse following speech treatment. Research has shown that reductions in stuttering are often achievable in the short-term but less assured in the long-term, with approximately two-thirds of adults who stutter relapsing following speech treatment ([Block, Onslow, Packman, & Dacakis, 2006](#); [Craig & Hancock, 1995](#)). In the first study to investigate the relationship between mental disorders and speech treatment outcomes among adults who stutter, [Iverach et al. \(2009b\)](#) found that the only subgroup of participants to maintain speech treatment benefits for six months was the one-third without a mental disorder. In addition, the presence of anxiety disorders was associated with situational avoidance in the short- and medium-term following treatment.

These findings indicate that the high rate of relapse often found for adults who stutter may be associated with the presence of anxiety and other mental disorders. In particular, mental disorders such as social anxiety disorder may be associated with avoidance of speech practice and social encounters, which in turn may contribute to reduced maintenance of speech treatment gains and increased maintenance of social anxiety. This highlights the need for psychological assessment and treatment strategies prior to, or in combination with, standard speech treatment in order to address social anxiety, and to improve speech practice and social engagement.

5. Discussion

Although previous research was unable to provide clear, consistent evidence of a relationship between anxiety and stuttering ([Ingham, 1984](#); [Menzies et al., 1999](#)), a number of methodological improvements have facilitated a much stronger understanding of the role that social anxiety plays in the lives of those who stutter. In particular, diagnostic assessments have shown that social anxiety disorder may be a disabling experience for many adults who stutter. In addition, features of social anxiety disorder, such as fear of negative evaluation and safety behaviours, have been found to feature prominently in stuttering, and may also serve to maintain social anxiety and exacerbate stuttering. It is likely that the communication difficulties and negative consequences faced over the lifespan for those who stutter may contribute significantly to the development of social anxiety disorder. It is also plausible that the presence of social anxiety disorder in stuttering may exacerbate existing behavioural deficits in social situations and reduce opportunities for social interaction, which in turn may increase functional impairment ([Craig et al., 2009](#); [Iverach, O'Brian, et al., 2009](#)). Therefore, these findings have significant clinical implications and indicate numerous directions for future research.

One of the most obvious gaps in the literature to date is the lack of research regarding social anxiety disorder among children and adolescents who stutter. Although children and adolescents who stutter have been found to report significantly higher anxiety than non-stuttering controls when using self-report questionnaires (Blood & Blood, 2007; Blood, Blood, Maloney, Meyer, & Qualls, 2007; Mulcahy et al., 2008), no studies have investigated the presence of social anxiety disorder among children and adolescents who stutter using a comprehensive diagnostic interview. Consequently, the assessment of social anxiety among children and adolescents who stutter is a pressing issue, especially when considering that social anxiety disorder in childhood and adolescence is of substantial magnitude and consequence (Ollendick & Hirshfeld-Becker, 2002). In particular, children with social anxiety disorder often exhibit difficulties with school work, premature withdrawal from school, and disinterest in peer or social situations, and this may have significant implications for social and occupational functioning later in life (Van Ameringen, Mancini, & Farvolden, 2003). It is not surprising, then, that children and adolescents who stutter often experience social and academic difficulties, and are at a considerably higher risk of being bullied than their fluent peers (Blood & Blood, 2007; Davis et al., 2002). In fact, children and adolescents who stutter may be the targets of bullying, not only as a result of their stuttering, but also in response to their displays of anxiety and nervousness (Blood & Blood, 2007).

Therefore, longitudinal studies are required to understand the development and maintenance of social anxiety disorder as children who stutter progress from early childhood into adolescence. This research will enhance knowledge regarding the relationship between stuttering and anxiety, and will have significant implications for the provision of effective treatment strategies and support services to curtail the development of social anxiety disorder before it becomes chronic in adulthood (Blood et al., 2007). In particular, there is preliminary evidence that CBT may reduce the social and emotional burden of stuttering in childhood (Boey, 2009), yet no clinical trials have been conducted to determine the efficacy of CBT in treating social anxiety disorder among children and adolescents who stutter. Hence, the development and provision of CBT interventions for children and adolescents who stutter is critical, especially when considering that CBT interventions for childhood anxiety are capable of changing the deleterious course of the disorder into adolescence (Manassis, Avery, Butalia, & Mendlowitz, 2004).

Finally, further research is necessary to understand more fully the assessment and treatment of social anxiety disorder among adults who stutter. For instance, the use of diagnostic interviews and social anxiety questionnaires among large samples of adults who stutter in comparison with matched controls is needed to confirm and extend previous evidence. Further research attention should also be paid to determining the most ideal social anxiety questionnaires to be used with adults who stutter, not only to understand the features of social anxiety disorder in stuttering, but also to evaluate changes in the severity of social anxiety following speech and/or psychological treatment. In addition, more research is required to confirm the efficacy of various components of CBT in reducing social anxiety among people who stutter. This includes focus on treatment approaches which address factors that contribute to maintenance of social anxiety disorder in order to improve short- and long-term outcomes. Added to this, research is required to determine when treatment should be implemented to improve outcomes most effectively. It is possible that treatment of subclinical fears may prevent the development of a more severe and entrenched social anxiety disorder, which may in turn improve functioning and quality of life. Further research is required to confirm this.

In conclusion, the presence of social anxiety disorder among people who stutter has the potential to lower quality of life, increase behavioural deficits in social situations, and significantly impede social, academic, and occupational functioning (Craig et al., 2009; Iverach, O'Brian, et al., 2009; Schneier et al., 1997). Therefore, assessment and treatment of social anxiety disorder in stuttering is critical. In particular, comprehensive treatment approaches are urgently required to address the "whole person" who stutters rather than the speech impediment alone (Menzies et al., 2008, p. 1462). It is clear that collaboration between speech pathologists, clinical psychologists, and psychiatrists is necessary to address the unique fears, experiences, and cognitions associated with social anxiety among those who stutter. This comprehensive approach to the management of children, adolescents, and adults who stutter has the potential to significantly improve engagement in social, educational, and occupational activities, which in turn may increase quality of life and the ability to create meaningful and fulfilling relationships.

CONTINUING EDUCATION

QUESTIONS

1. According to the Diagnostic and Statistical Manual of Mental Disorders (DSM-5), social anxiety disorder is characterised by:
 - a. Humiliation, embarrassment, and negative evaluation in social situations
 - b. Persistent, excessive, and unreasonable fear of authority figures and public speaking
 - c. Intense fear of social or performance-based situations where scrutiny or evaluation by others may occur
 - d. Blushing, trembling, and sweating in performance-based situations
2. Failure of past research to detect a clear and systematic relationship between anxiety and stuttering has been attributed to a number of methodological flaws, including:
 - a. Small sample sizes, insufficient power, use of unidimensional anxiety measures, and recruitment of adults who stutter from the general community

- b. Small sample sizes, insufficient power, use of unidimensional anxiety measures, and recruitment of adults seeking treatment for stuttering
 - c. Small sample sizes, insufficient power, use of multidimensional anxiety measures, and recruitment of adults seeking treatment for stuttering
 - d. Small sample sizes, insufficient power, use of diagnostic psychiatric assessments, and recruitment of adults seeking treatment for stuttering
3. There is growing evidence that stuttering is associated with several features of social anxiety disorder, including:
 - a. Fear of negative evaluation, expectancies of social harm, negative cognitions, attentional biases, avoidance, and safety behaviours
 - b. Fear of negative evaluation during public speaking
 - c. Fear of negative evaluation, reduced quality of life, and social withdrawal
 - d. Fear of negative evaluation, expectancies of social harm, and biased attention when observing the facial expressions of authority figures
 4. A growing body of research has demonstrated an alarmingly high rate of social anxiety disorder among:
 - a. Adults who stutter, in comparison with non-stuttering controls
 - b. Adults who stutter, in comparison with adults who stutter from the general community
 - c. Adults who stutter, in comparison with psychiatric outpatients
 - d. Children and adolescents who stutter, in comparison with non-stuttering controls
 5. Research investigating Cognitive Behaviour Therapy (CBT) for the treatment of social anxiety associated with stuttering has found that:
 - a. Computer-administered CBT is more effective than clinician-administered CBT in reducing social anxiety among adults who stutter
 - b. Clinician-administered CBT is more effective than computer-administered CBT in reducing social anxiety among adults who stutter
 - c. CBT can improve social anxiety for children and adolescents who stutter
 - d. CBT can improve social anxiety for adults who stutter

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