Doctoral Thesis

Modifying interpretation bias in adolescents with clinical levels of social phobia: An explorative case design series using Cognitive Bias Modification.

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Abstract

Cognitive Bias Modification for interpretation bias (CBM-I) is a procedure which has been found to successfully modify interpretation bias and anxiety symptoms. To date, very few studies have investigated the efficacy of CBM-I with adolescents. This research investigated the application of a multi-session CBM-I programme in a clinical adolescent population. Eight adolescents (14 to 17 years old) with clinical levels of social phobia symptoms completed a seven session CBM-I programme at home via the internet. The programme trained adolescents to interpret ambiguous situations in a positive manner. Imagery of oneself in the scenarios was also encouraged in an attempt to enhance the potential effects. Participants completed a battery of self-report measures to identify changes in interpretation biases and symptomology. Four participants made improvements on social phobia symptoms after the CBM-I training, which were maintained at follow-up. Six participants experienced reduced negative interpretation biases post-CBM-I, with three participants moving from a negative interpretation bias pre-CBM-I, to a positive interpretation bias post-CBM-I. Participants and their parents completed questionnaires to investigate their opinions of the CBM-I procedure. Interestingly, participants who reported enjoying the task were more likely to have a reduction in symptomology. The participants also reported that the scenarios would benefit from being tailored to their specific interests and presentations. Parents noted that the procedure was practical and easy to use, but felt that the training did not significantly impact upon their child's presentation. Overall, the results indicate the potential value of CBM-I in modifying negative interpretative biases and symptomology in adolescents with social phobia. However, the findings were not absolute, with variability amongst participants making it difficult to draw strong conclusions. Further research is therefore needed to confirm and add weight to the current findings.

Acknowledgements

Firstly, I would like to thank the young people and their parents who took part in this research; you were all extremely dedicated and the project would not have been possible without your hard work. I wish the young people all the very best in their recovery. Thanks also to the CAMHS professionals across NSFT who worked so hard to make this project possible at a time when services are filled with challenges and uncertainty.

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Contents

List of Tables

List of Figures

Chapter 1: Cognition and Social Phobia

1.1. Chapter Introduction

This chapter describes a number of cognitive models (e.g., Beck, 1976; Williams, Watts, MacLeod, & Mathews, 1997) which are critiqued with particular interest being placed on the models' explanation and understanding of interpretation bias. The chapter then moves on to look at social phobia, the key features of the disorder and epidemiology. The cognitive models that have been developed in an attempt to explore and understand the disorder are then presented, focusing on how they build upon one another and develop current knowledge. These theoretical models are then explored in the context of adolescents and their applicability to this population. The current recommended treatment options for social phobia, including cognitive behavioural therapy (CBT) and imagery restructuring, are outlined and evaluated. The final section of this chapter looks at Cognitive Bias Modification (CBM) and its efficacy and applicability to social phobia and adolescents.

1.2. Key Features of Cognition and Emotion: The Cognitive Movement

In the late 1960's there was a rise in cognitive psychology in favour of radical behaviourism (Hatfield, 2002). This development led to a large scale philosophical and scientific debate regarding the relationship between cognition and emotion. At the start of the cognitive revolution in the 1980's, this debate became more prominent. At this time, Zajonc (1984) believed in what is known as the 'exposure effect', which states that emotion is a result of unconscious processing and subcortical activity in the brain. Lazarus's appraisal theory (1982) criticises this position and proposed that emotion is determined solely by the specific appraisal activated by the situation the individual finds themselves in, meaning that cognition typically precedes and

determines emotions (Lazarus, 1982). Mathews and MacLeod (1994) argued that much of the cognition and emotion debate was a consequence of the confusion at this time about the meaning of the terms and whether emotions were viewed as conscious or unconscious. More recently, Wells (1997), described cognition as a range of mental processes that support thinking and therefore help us to gain knowledge and comprehension (e.g., thinking, learning, the acquisition of knowledge, problem-solving and remembering). Despite there being no universal definition, emotion has been described as automatic, short-term and subjective experiences, which influence physiological states (Bower, 1992).

Over the past two decades, Lazarus' (1982) position has dominated, with research supporting the notion that cognition and emotion are interacting factors which work together to influence behaviour (Duncan & Barrett, 2007). In essence, cognitive theory suggests that dysfunctional processing is influenced by an individual's appraisal of events and that these cognitive processes play a crucial role in the formation of emotions (Myers, 2004). Specifically, it is believed that anxiety disorders arise and are maintained through a series of cognitive processing biases such as memory, attention, and interpretation biases (e.g., Beck & Clark, 1997; Mathews & Wells, 1999; Riskind & Alloy, 2006). In light of this supporting evidence, it is now widely accepted that emotions and cognition are interconnected, with the cognitive approach being the most dominant model in psychological theory and practice at the current time (McLeod, 1998).

1.3. Key Cognitive Models

There are a number of different cognitive models, which attempt to explain the acquisition, development, and maintenance of emotional disorders (e.g., Beck, 1976;

Beck, Emery & Greenberg, 1985; Williams et al., 1997). These models have been developed based on cognitive theory (e.g., Beck, 1967) and make the assumption that cognitive processes mediate all emotional and behavioural responses (Beck & Clark, 1988).

1.3.1. Beck's schema model (1976).

Beck's cognitive theory of emotional disorders (Beck, 1976) has been extremely influential in the fields of both research and clinical psychology. Despite the original schema model being based on depression (Beck, Rush, Shaw, & Emery, 1979), the model developed over time and was promptly applied to anxiety disorders (Beck et al., 1985). Beck's schema model (1976) proposes that there are three levels of cognitive processing; negative automatic thoughts about the self, others, and the world, dysfunctional thinking errors, and schemas. The model proposes that these cognitive processes influence information processing and consequently our emotional reactions to events. Dysfunctional processing can manifest at a surface level, which is conscious and easily accessible in the form of negative automatic thoughts (NATs). NATs reflect the operations of underlying beliefs and deep-rooted assumptions stored in our memory as schemas. The term schema refers to a cognitive pattern "imposed on reality or experience to help individuals explain it, to mediate perception, and to guide their responses" (Young, Klosko, & Weishaar, 2003, p. 6). Young, Klosko, and Weishaar (2003) argued that schemas can also be thought of as abstract cognitive plans that guide us when interpreting information and solving problems. It is proposed that maladaptive schemas, which develop as a result of negative early childhood experiences, result in some individuals having greater vulnerability to developing emotional disorders than others (Beck, 1976). It is thought that difficult

life experiences activate maladaptive schemas, which result in individuals engaging in faulty cognitive processing (Wells, 1997).

In support of this model, research has found that individuals with emotional disorders were more likely to interpret ambiguous information in a negative way (e.g., Rude, Wenzlaff, Gibbs, Vane, & Whitney, 2002) and focus their attention on negative thoughts (e.g., Hollon, Kendall, & Lumry, 1986). Despite significant empirical support, Cohen (1993) criticised the model stating that the term schema is vague and does not differ significantly from the term belief. In addition, Eysenck (1997) indicated that there is limited independent evidence to support the existence of specific schema and stated that Beck (1976) does not clearly outline how schemas develop and directly influence cognitive processes.

1.3.2. Information processing models.

Information processing theory (Miller, 1956) proposes that humans process information much like computers. Ingram and Kendall (1986) expanded on this idea stating that information is selected, taken in from the environment via our senses, transformed, and encoded before being stored and later retrieved for future use. Hertel (2002) believed that the inputted information from the environment is processed through the cognitive functions of perceiving, assimilating, accommodating and elaborating. Information processing theory (Miller, 1956) argues that individuals do not solely respond to the environment, but also respond to cognitive representations of the environment, which are formed through a complex system of processing information (Mahoney, 1977). It is acknowledged that, as with all systems, the cognitive system has a limited storage capacity meaning that selectivity in processing is vital to protect the system from becoming overwhelmed resulting in

an inability to function. As a result of this limited storage capacity, it is proposed that the cognitive system is set to process information selectively, resulting in certain representations being processed in preference to others (Mathews & Mackintosh, 1998).

Williams, Watts, MacLeod, and Mathews (1988, 1997) built upon Beck's Schema Model (1976) using information processing theory and developed a model which specifically attempts to explain the development and maintenance of emotional disorders through the process of activation and allocation of attentional resources. This model identifies two separate information processing stages known as the affective decision mechanism (ADM) and the resource allocation mechanism (RAM). According to the model, when faced with a stimulus, the ADM is activated and encodes the level of threat. If the ADM perceives the associated threat to be greater than the individual's threat threshold, determined by the individual's state anxiety, then the RAM is activated. The RAM then allocates attentional resources based on an individual's trait anxiety levels, the higher the levels of trait anxiety the more attentional resources are allocated to the perceived threatening stimuli. In essence, this model proposes that anxiety is developed and maintained by an attentional bias to threat cues.

The validity of the model has been criticised as its development was largely based on studies which used words as threatening stimuli as opposed to more ecologically valid threatening situations (Mogg et al., 2000). In support, research has found that individuals with high trait anxiety were more likely to engage in environmental scanning, which would widen prior to detecting threat and narrow following the identification of threat (Berggren & Derakshan, 2012). The model has been viewed as superior to Beck's Schema Model (1976), as it provides a detailed

account of the mechanisms that underlie vulnerability and maintain emotional disorders (Mogg et al., 2000). It also provides a theoretical framework from which treatment options can be developed (Mogg et al., 2000).

1.4. The Cognitive Approach to Anxiety Disorders

According to the cognitive models outlined above (Beck, 1976; Williams et al., 1997), an individual's experience of the world, themselves and others helps to explain what causes them to select particular information to be processed, whilst ignoring other competing representations. Cognitive approaches suggest that it is the type of information selected from the environment and the way that the information is processed which influences the development and maintenance of anxiety disorders (e.g., Beck & Clark, 1988). Beck (2005) stated that individuals with symptoms of anxiety have a bias in their interpretation of information from the environment which then leads to the construction of unhelpful meaning resulting in further cognitive errors and dysfunctional emotions. Faulty cognitive processing, such as bias interpretations of stimuli, have been extensively linked to emotional distress and the development of anxiety (e.g., Spokas, Rodebaugh, & Heimberg, 2007).

1.4.1. Interpretation bias in anxiety disorders.

A common feature of anxiety is a preoccupation with threat and danger combined with a perceived inability to cope and remain safe (Beck et al., 1985). Mathews and Mackintosh (2000) defined interpretation bias as the tendency to interpret ambiguous situations as negative and threatening. Musa and Lépine (2000) expanded on this by stating that interpretation bias is when anxious individuals make false negative interpretations of ambiguous information and interpret ambiguous cues as predictive of threat and danger. There is a wealth of evidence to suggest that interpretation bias is a key mediating factor in anxiety disorders (see MacLeod, 1999).

Specifically, research has found that anxiety disorders in adult populations are closely linked with the existence of interpretation bias favouring threatening words and self-relevant information (Spokas et al., 2007). Hadwin and Field (2010) conducted a literature review on cognitive processing biases and anxiety in children and young people and found a clear link between information processing bias, namely interpretation bias, and the acquisition and maintenance of child and adolescent anxiety disorders. Interpretation bias has been found to be particularly prevalent in individuals with symptoms of social phobia (Mobini, Reynolds, & Mackintosh, 2013).

1.5. Social Phobia

Social phobia, the clinical form of social anxiety, is a disorder which has been described in the Diagnostic and Statistical Manual of Mental Disorders, 4th edition, text revision (DSM-IV-TR) as "a marked or persistent fear of one or more social or performance situations" combined with "an excessive fear of negative evaluation" (American Psychiatric Association; APA, 2000a, p.417). Unlike other anxiety disorders, individuals diagnosed with social phobia are less able to avoid their fear due to the social nature of modern day society. It is therefore, acknowledged within the DSM-IV-TR that the feared situation must be either endured with high levels of distress or avoided. This avoidance or distress must then lead to a significant disruption in a person's everyday functioning, routine, social activities or relationships for the symptoms to be classified as social phobia (APA, 2000a). Social phobia is only diagnosed in a person under the age of 18 if they have been experiencing these symptoms for 6 months or more. According to the DSM-IV-TR, social phobia can be divided into two subtypes: generalised type and specific type. The manual states that generalised type is indicative if an individual avoids and/or fears a broad range of social situations that include performance situations (e.g.,

public speaking) and interactional situations (e.g., speaking to someone unfamiliar). Specific type is indicative when an individual fears one or a few identifiable circumstances (e.g., meeting new people).

The development of DSM-IV-TR (APA, 2000a) also resulted in significant changes to the way social phobia is classified in children and adolescents. The social phobia symptomology criterion now includes features previously included in avoidant disorder criteria due to the high overlap of avoidant disorder and social phobia in young people (Francis, Last, & Strauss, 1992). DSM-IV-TR also stipulates that a diagnosis of social phobia should only be given to children or adolescents who show social anxiety in settings where they are exposed to peers as opposed to just adults. Unlike adult criteria, children and adolescents do not have to be able to acknowledge that their fear is excessive or unreasonable.

1.5.1. Epidemiology.

Social phobia is the most common anxiety disorder experienced by both adults (Kessler, Berglund, Demler, Jin, & Walters, 2005) and adolescents (Nauta, Scholing, Emmelkamp, & Minderaa, 2003) and is the third most common of all mental health disorders (Clark & Beck, 2010). The average age of onset for social phobia is between 10 and 17 years old, with clinical diagnoses rarely being made after the age of 25 years old (Wittchen & Fehm, 2003). Kashdan and Herbert (2001) supported this finding stating that social phobia has a clear developmental trend whereby the condition rarely emerges prior to 10 years old, with a sharp increase in prevalence rates in middle to late adolescence. This increase is linked to cognitive advances and a perceived increase in social pressures and encounters (Kashdan & Herbert, 2001). A recent meta-analysis has revealed that 11% of adolescents aged between 13 and 18

years old have an anxiety disorder, and that 5% of these adolescents can be classified as having social phobia (Costello, Egger, Copeland, Erkanli, & Angold, 2011). This has been found to be as high as 15% in clinical populations (Kessler, Stein, & Berglund, 1998).

Social phobia has a lifetime prevalence rate of approximately 12% (Kessler et al., 2005). According to the National Institute for Health and Clinical Excellence (NICE, 2012), this is much higher than the prevalence rate of other anxiety disorders such as, generalised anxiety disorder (5.7%), panic disorder (4.7%), and obsessive compulsive disorder (1.6%). Beidel, Turner, and Morris (1999) found that young people with social phobia often have a second concurrent disorder such as a secondary anxiety disorder (36%), attention deficit hyperactivity disorder (10%), or selective mutism (8%). In comparison to individuals diagnosed with other anxiety disorders, those diagnosed with social phobia are more likely to go on to develop early onset major depression (Wittchen, Stein, & Kessler, 1999).

According to Davidson et al. (2004), only approximately 50% of individuals diagnosed with social phobia are classified as treatment responders when given a form of recommended treatment such as CBT. This emphasises the complexity of the disorder and the need to develop pre-existing treatment options. In addition to this, individuals diagnosed with social phobia have been found to regularly fail to access empirically supported treatments (Olfson et al., 2000). Coles, Turk, Jindra and Heimberg (2004) reported that factors associated with this failure to access treatment were unclear and identified the need for more accessible treatments to be developed in an attempt to increase the amount of individuals receiving appropriate treatment. Due to the chronicity of the disorder, it has been found that if left untreated, social phobia will lead to significant disruptions in normative social development due to distress

and avoidance of social interactions (Beidel & Turner, 1998). Research has also found a link between anxiety disorders in young people with academic underperformance (Owens, Stevenson, Norgate, & Hadwin, 2008) and impaired peer relationships (Erath, Flanagan, & Bierman, 2007). In light of this, there is a clear need for the identification and treatment of social phobia to be targeted and implemented as early as possible in the trajectory of the condition.

1.6. Cognitive Models of Social Phobia

Generic cognitive models of emotional disorders (e.g., Beck, 1976; Williams et al., 1997) contribute to our understanding of the development and maintenance of social phobia, but are not able to fully explain certain characteristics of the disorder. For example, when faced with exposure to their fears, individuals with social phobia do not go through a process of de-sensitisation resulting in decreased anxiety as with many other anxiety disorders (Wells, 1997). In light of this, individualised approaches are needed to fully understand the different anxiety disorders (Wells, 1997). Specific cognitive models have been developed to help explain the aetiology and maintenance of social phobia (Clark & Beck, 2010; Clark & Wells, 1995; Rapee & Heimberg, 1997). The key models in this area will now be discussed.

1.6.1. Clark and Wells' model of social phobia (1995).

Clark and Wells (1995) developed a cognitive model to explain the aetiology and maintenance of social phobia. This is the dominant model used to inform CBT for social phobia (Wells, 1997). A diagrammatical representation of this model is presented in Figure 1.1. This model describes how a number of cognitive-behavioural mechanisms including; negative social cognitions, safety behaviours, self-focused attention, and pre-and post-event processing, all act to maintain social phobia.

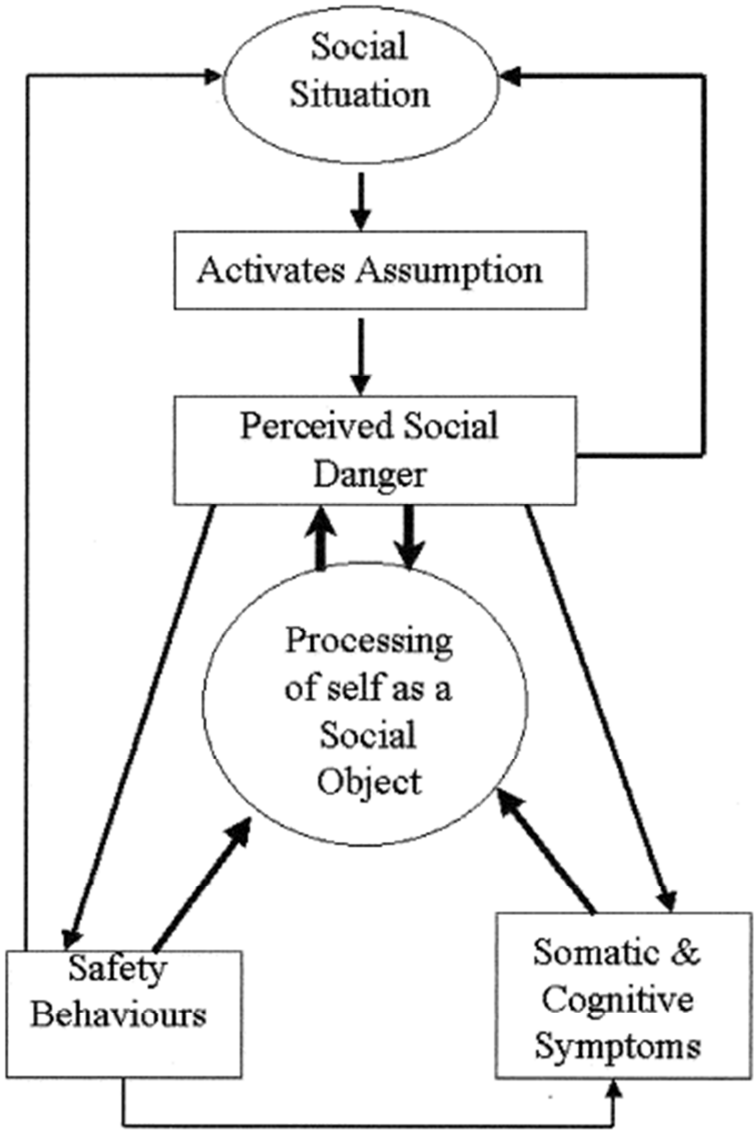

Figure 1.1. Clark and Wells' Model of Social Phobia (1995).

Individuals diagnosed with social phobia have a strong desire to be perceived positively by others, despite themselves having a belief that they are unable to come across in a favourable manner (Wells, 1997). Despite regularly experiencing social encounters, the ambiguous nature of these encounters result in individuals diagnosed with social phobia prioritising bias processing and engaging in unhelpful safety behaviours (i.e., avoidance of eye contact). These behaviours result in an increase in negative beliefs and maintain or escalate negative self-appraisal and fear of social encounters (Wells, 1997). The model proposes that when an individual enters into a

social situation, certain assumptions about performance failure and the implications of showing anxiety symptoms are activated (e.g., *If I talk to others then they will know that I am uninteresting*). As well as unhelpful assumptions, negative beliefs (e.g., *I am boring)* and unhelpful rules (e.g., *I must always act cool to be popular*) are also activated. These faulty beliefs and assumptions result in the individual perceiving social danger in the form of NATs (e.g., *I did not make eye contact with that person. People will think I am weird*). Clark and Wells (1995) propose that NATs, which occur following the activation of negative assumptions, are associated with anxiety activation in the form of somatic and cognitive symptoms. Possible somatic symptoms include an increase in heart rate and breathing, feeling hot, feeling unable to move, and feeling shaky. Possible cognitive symptoms include, being unable to concentrate, feeling that the mind is racing, and experiencing a mind blank. These symptoms are often negatively appraised and misinterpreted in an individual with social phobia as evidence of failure or social embarrassment. Novel to the Clark and Wells' model is the view that appraisal of danger, results in individuals engaging in detailed self-observation and monitoring of sensations, images, and sense of self. The information gained from the faulty self-processing is used to make inferences about how they are perceived and evaluated by others (Wells, 1997).

In an attempt to reduce the distress caused by the heightened self-observation and monitoring, individuals engage in a range of safety behaviours in order to reduce the uncomfortable anxiety feelings. Unfortunately, these behaviours are self-defeating and result in the level of anxiety being maintained as an individual's attention is drawn away from disconfirming evidence. Misattributions are also made causing individuals to reconceptualise safe situations, where the fear is disconfirmed, as dangerous. Safety behaviours, therefore, result in anxiety being re-experienced

when in future social situations. Clark and Wells (1995) also state that pre- and post-worrying before and after a social event can lead to negative cognitive processing which also act to maintain the anxiety. Excessive worry prior to a social event primes negative self-processing, which makes bias processing more likely in the actual encounter. Analysing the social encounter post-event can also lead to preoccupation and distorted self-images which are used as additional evidence of poor social performance.

Vassilopoulos (2008) criticised this model for not focusing more heavily on anticipatory and post-event rumination despite there being strong evidence supporting the existence of these processes (Abbott & Rapee, 2004; Mellings & Alden, 2000; Vassilopoulos, 2008). Despite this criticism, research has indicated that self-focused attention, as detailed in this model, is an important factor in maintaining fear, anxiety and avoidance in individuals with social phobia (Brown & Stopa, 2007; Rapee & Lim, 1992) therefore providing support for this model.

1.6.2 Rapee and Heimberg's model of social phobia (1997).

Rapee and Heimberg's (1997) model of social phobia is based upon the assumption that individuals diagnosed with the disorder perceive others (the audience) to be instinctively critical and likely to perceive them in a critical or rejecting way. This is distressing for the individual with social phobia as they view being approved of by others as crucially important to their sense of self. A diagrammatical representation of this model is presented in Figure 1.2.

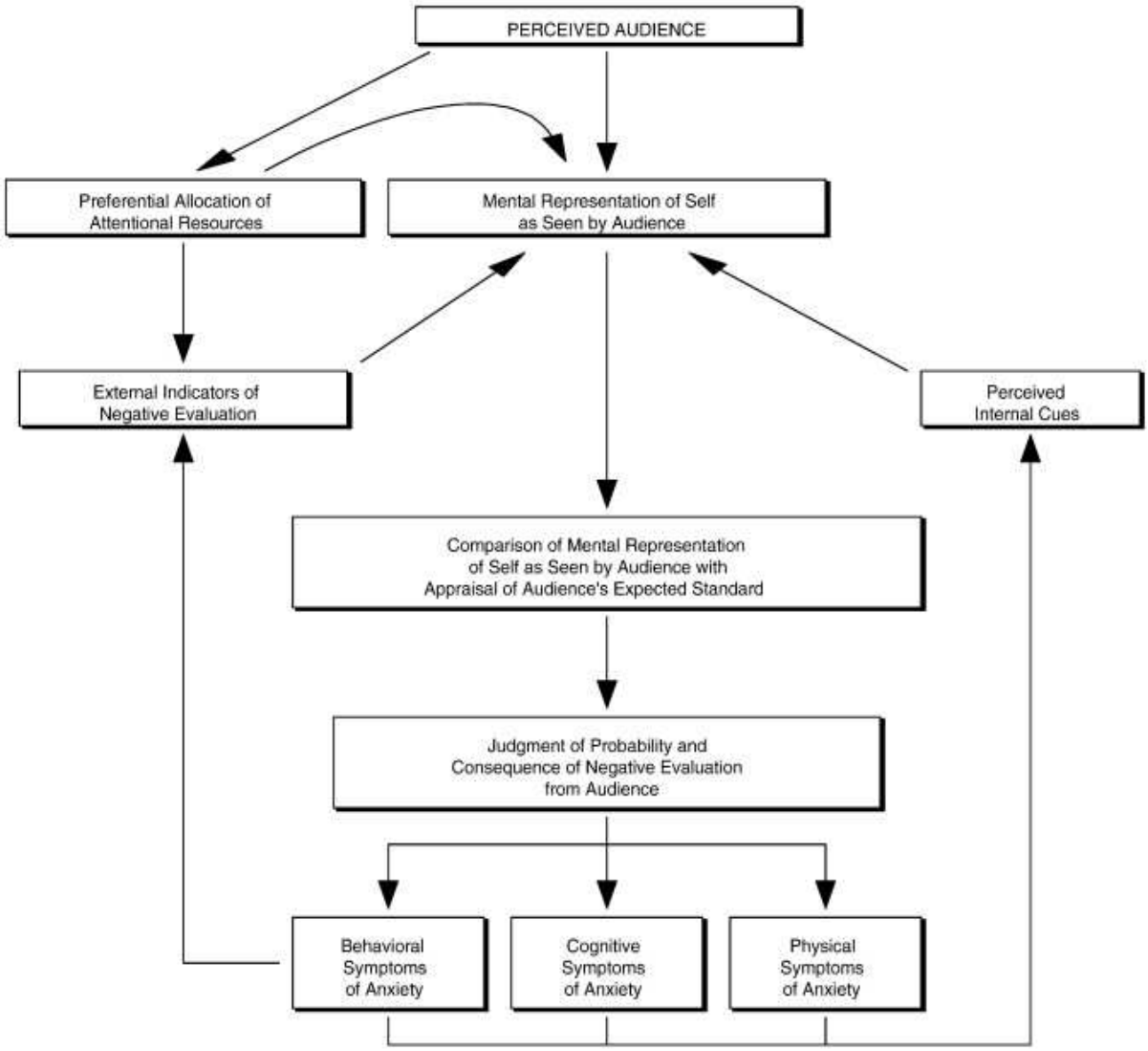

Figure 1.2. Rapee and Heimberg's Model of Social Phobia (1997)

Following a social encounter, this model states that individuals with social phobia develop a mental representation of themselves, their appearance and their behaviour as viewed through the eyes of others (observed perspective). As an individual focuses their available attention onto the observed perspective and any perceived danger in the environment, they have less processing capacity available to attend to and receive accurate external feedback. According to this model, the mental representation the individual develops is an amalgam based on several sources, namely; long-term memory, internal cues, and external cues. Long-term memory,

which forms the baseline image when alternative information is not available, is made up of pre-existing images of oneself built from actual images of the self as seen by photographs and mirrors, feedback which is received from others, and information from prior experiences based on previous social encounters. Internal and external cues influence the mental representation of oneself in the moment. Internal cues are based on information such as facial expressions, blushing, sweating, and external cues based on the responses of the audience to the individual's presence including verbal and non-verbal signs (e.g., laughing, yawning, and facial frowns). The model states that individuals with social phobia are hardwired to pay specific attention to cues which provide evidence of inadequacy. They then engage in a cognitive process whereby they evaluate to what extent their self-image is meeting the perceived audience's expectations. The individual is likely to perceive that they do not meet the audience's expectations. There is therefore a discrepancy between perceived expectations and perceived audience evaluation of their performance. The individual therefore believes that the audience has formed a negative evaluation of them which will result in negative social consequences. The individual's perceived failure in the social environment results in increased anxiety in the form of physiological, behavioural and cognitive symptoms. This in turn influences the individual's mental representation of their performance, which acts to maintain the cycle.

Rapee and Heimberg's (1997) model is therefore stating that negative life events and learning experiences contribute to the acquisition and maintenance of social phobia. This idea is supported by research by Kendler, Neale, Kessler, Heath, and Eaves (1992) who stated that only 30% of disease liability in social phobia can be explained by genetic factors, meaning that 70% of the factors influencing the development of social phobia are a result of environmental and psychological factors

(e.g., early childhood experiences and social skills). Similar to the Clark and Wells model (1995), this model sees developing an image of oneself in social situations as an important factor in the maintenance of social phobia. Both models state that the image an individual develops is based on their negative self-beliefs and perceived criticism from others, which results in the individual seeing themselves as inferior to others. In criticism of both models, Holmes and Mathews (2005) stated that the assumption that imagery is a central component to the maintenance of social phobia was supported by little empirical evidence at the time the models were developed. The research to date investigating the relationship between anxiety and imagery will be discussed later in Section 1.9.2.

1.6.3. Clark and Beck's model of social phobia (2010).

Clark and Beck (2010) developed a more detailed model to explain social phobia and the maintenance of the condition. The authors acknowledge that their model draws heavily on the work of Clark and Wells (1995) and Rapee and Heimberg (1997) but describe their three phase model as the "refined and elaborated cognitive model of social phobia" (Clark and Beck, 2010, p. 348). The model draws on the theoretical position of Beck et al. (1985) who state that social phobia has three features which occur in conjunction with one another and are unique to this disorder. The first of these features is the feelings of embarrassment and shame that follow a social encounter. The second is an automatic process of engaging in behavioural inhibition (e.g., withdrawal and avoidance) and activities to conceal the individual's feelings of anxiety when in a social situation. These behaviours result in disruptions in social performance which causes the individual to fear negative evaluation from others as a result of their behaviour. Thirdly, the anxiety becomes a secondary threat as the individual is focused on concealing their anxiety in order to protect themselves

from negative evaluation from others. The model suggests that there are three phases to social anxiety; the anticipatory phase, situational exposure, and post-event processing. Each of these phases will now be discussed in turn. A diagrammatical representation of the Clark and Beck model (2010) is presented in Figure 1.3.

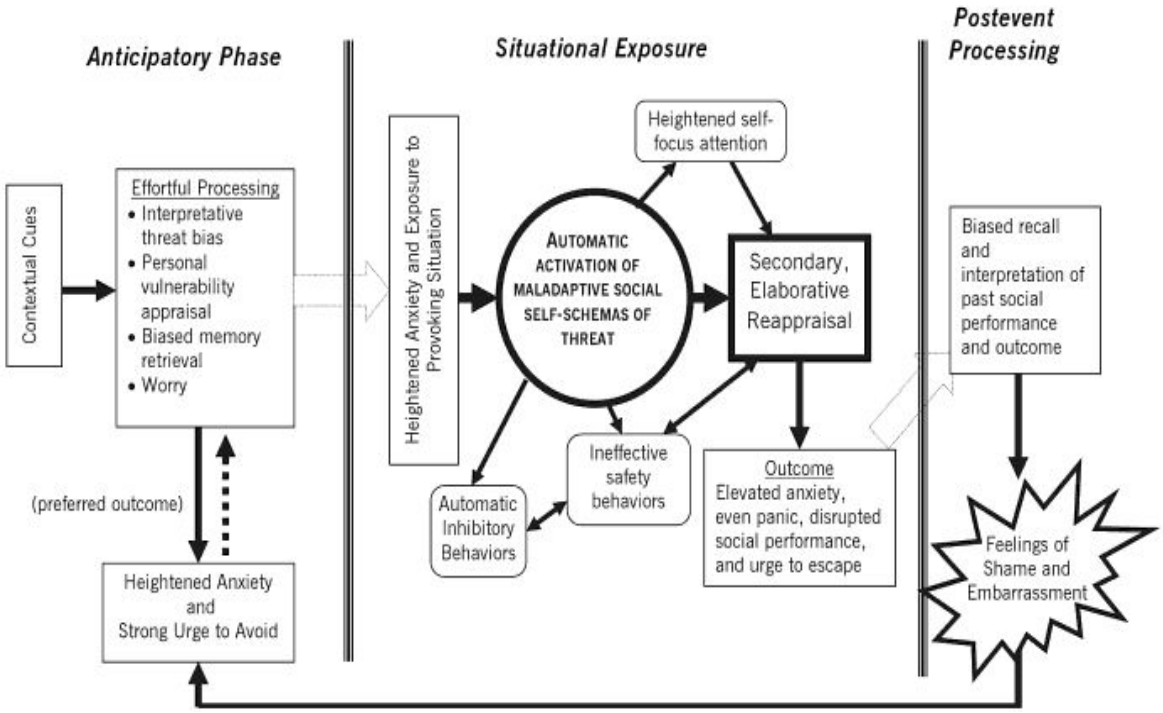

Figure 1.3. Clark and Beck's Model of Social Phobia (2010)

The anticipatory phase occurs prior to the social encounter and results in a series of negative cognitive processes. The anticipatory phase is triggered by contextual cues such as being told about a pending social encounter or being in a location where a social encounter usually takes place. They state that at this stage, pre-existing maladaptive schemas and bias memories about previous social encounters, which have led to anxiety and embarrassment, are activated causing increased negative feelings and anticipatory thoughts of being evaluated and seen as inadequate. Bias retrieval of information is likely to lead to exaggerated feelings of

threat and vulnerability, which will trigger intense feelings of worry and preoccupation with negative thoughts about the social situation to follow. This anxiety is linked with a desire to avoid the impending social encounter.

The situational exposure phase is activated when an individual finds themselves in a social encounter which has become unavoidable. The individual enters the social encounter with heightened anxiety as a result of the cognitive processes which occurred within the anticipatory phase. This anxiety then increases, resulting in the activation of maladaptive social self-schemas such as; *"I do not fit in"* and "*Others are critical of shy people"*. Negative core beliefs, dysfunctional assumptions, and rules of social performance are all possible cognitive process that can occur at this stage of the encounter (Clark & Beck, 2010). The activation of these schemas triggers an attention shift towards information which provides evidence of social threat and danger meaning that there is less capacity for contradictory evidence to be taken on board (e.g., a smile from another).

The activation of maladaptive schemas results in heightened self-focused attention whereby individuals intensely focus on themselves and any behavioural and emotional symptoms which they experience. The individual then interprets these symptoms and internal experiences as anxiety and evidence of poor performance. This self-focus leads the individual to believe that others are also observing what the individual feels about themselves, which leads to the exaggerated belief that others are viewing them in a negative light. As a result of these threatening cognitions, the individual engages in a number of involuntary inhibitory behaviours and safety behaviours to minimise and escape the perceived threat. Despite the intended outcome, these strategies usually lead to increased feelings of failure and poor performance. Post-event processing occurs after the social encounter. As with the in-

the-moment processing, this is susceptible to cognitive bias and the individual is likely to engage in a process of rumination whereby specific details of the encounter are reviewed and evaluated. The negative social experience is then stored in memory and provides additional evidence in support of maladaptive schemas, resulting in feelings of embarrassment and shame.

As stated by the authors themselves, this model is comprehensive and combines a number of aspects presented by previous models (Clark & Beck, 2010). It also identifies a link between the anticipatory anxiety and post-event processing in the absence of an actual social encounter. This is important as research has indicated that a social encounter does not need to happen in order for anxiety to occur and be maintained (Gangemi, Mancini, & van den Hoot, 2012).

1.7. Applying Social Phobia Theoretical Models to Adolescents

It has been noted, that to date, there have been no specific theoretical models developed to explain social phobia in child and adolescent populations (Hodson, McManus, Clark, & Doll, 2008). In light of this, much work has been conducted in an attempt to explore whether the adult models outlined above can be successfully applied to an adolescent population (see Cartwright-Hatton, Reynolds, & Wilson, 2011). According to Kendall's (1985) theory of child and adolescent anxiety, cognitive factors are central to the development and maintenance of anxiety disorders, such as social phobia, in this population. Specifically, Kendall states that the activation of negative schemas, which are based on themes of danger, result in young people experiencing symptoms of anxiety. As with the adult focused cognitive models (e.g., Clark & Beck, 2010; Clark & Wells, 1995; Rapee & Heimberg, 1997), Kendall notes that bias processing and cognitive distortions, which result in cognitive

processing resources being focused on negative information in the social environment, result in maladaptive thoughts and behaviours associated with the maintenance of anxiety disorders.

Blote, Miers, Heyne, Clark and Westenberg (2013) examined whether the Clark and Wells (1995) model of social anxiety could be related to adolescents aged 14 to 18 years old. In line with the model, it was found that adolescents had distorted perceptions of the responses of other people, negative performance expectations, and higher self-focused attention in comparison to their less anxious counterparts in a speech giving task. It was found that these perceptions were the result of negative thoughts and feelings.

The existence of cognitive factors, and the pivotal role which they play in the development and maintenance of childhood anxiety, has also been supported (see Daleiden & Vasey, 1997). Miers, Blote, Bögels, and Westenberg (2008) conducted the first piece of published research investigating the existence of interpretation bias in adolescents with social anxiety symptoms and found that participants were more likely to form negative interpretations in social situations compared to a non-anxious control group. They also found that interpretation bias was context specific and not evident in non-social situations. Although this research used a non-clinical population, and did not use an objective measure of social anxiety employing only participant self-reports, the study provides evidence of the existence of interpretation bias in adolescents with social phobia symptoms. Roy et al. (2008), also supported Kendall's (1985) theory, by finding that adolescents with social anxiety, and other anxiety disorders, were significantly more likely to show attentional bias towards threatening environmental information in comparison to non-anxious controls. The existence of cognitive factors associated with adult cognitive models of anxiety goes

some way to support the applicability of adult models to younger populations (Ahrens-Eipper & Hoyer, 2006).

Muris, Merckelbach and Damsma (2000) provided further support for the applicability of adult social phobia models to children and adolescent populations. They investigated whether young people with social anxiety, as determined by well validated clinical measures, displayed threat perception bias when exposed to ambiguous stories depicting social situations. The results from this study revealed that children with social anxiety had increased levels of negative feelings and cognitions, were more likely to perceive threat, and had a lower threat threshold in comparison to the control group. Despite being criticised for using a non-clinical population and for priming participants that some of the experimental stimuli would be frightening (Muris, Merckelbach, & Damsma, 2000), the results from this study provided support for Kendall's (1985) theory of childhood anxiety.

Although the Clark and Wells model (1995) was developed based on research from adult populations (e.g., Salkovskis, 1991), Hodson, McManus, Clark, and Doll (2008) found the model to be equally applicable to younger people. They recruited 171 young people aged between 11 and 14 years old who were required to complete a battery of questionnaires to measure social phobia, depression and other variables which the Clark and Wells' model suggest play a role in maintaining social phobia. These variables were; safety behaviours, negative social cognition, post-event processing, pre-event processing and self-focused attention. Their analysis revealed that each of the five variables outlined above were predictive of social anxiety in adolescents. The research did not utilise a clinical population but instead grouped participants into a high, middle, or low social anxiety group based on their scores on the Social Phobia and Anxiety Inventory for Children (SPAI-C; Beidel, Turner, &

Morris, 1995). Despite the studies reliability being lower than if a clinical population was used (Hallion & Ruscio, 2011), there were significant differences found between the three groups on all five predictive variables. In conclusion, the authors felt that the study provides strong initial support for the applicability of this model to an adolescent population.

Rapee and Heimberg's (1997) model of social phobia states that following a social encounter, individuals develop a mental representation of themselves, their appearance and their behaviour as viewed through the eyes of others (observed perspective). Research conducted by Hignett and Cartwright- Hatton (2008) investigated the presence of observer perspective in a sample of 124 non-clinical adolescents aged between 12 and 18 years old. Participants were required to report levels of social anxiety after engaging in an anxiety provoking social task of giving an unprepared speech. Adolescents were then asked to rate whether they had an observer perspective or a field perspective (viewing the scene through their own eyes). Results indicated that there was a significant association between increased levels of social anxiety and seeing the situation from an observed perspective. These findings, therefore, provide support for the existence of observer perspective in adolescents with increased levels of social anxiety. Despite the methodological flaws, including an inability to conclude cause and effect from the data analysis (Coolican, 2004), the study does provide some support for the applicability of Rapee and Heimberg social phobia model to an adolescent population.

One study which did utilise a clinical population was conducted by Simonian, Beidel, Turner, Berkes, and Long (2001) who investigated adolescent interpretation of facial affect. Findings revealed that adolescents with social phobia had significantly poorer facial affect recognition skills and greater social anxiety post-task compared to

a control group. Although this study has a small sample size, therefore having low levels of statistical power, Cartwright-Hatton, Reynolds, and Wilson (2011) suggested that these results indicated that adolescents with social phobia have a bias towards negative interpretation of ambiguous social information. These findings therefore provide tentative support for the applicability of adult cognitive models of social phobia to adolescents, as interpretation bias has been found to be a key factor in the onset and maintenance of social phobia (Spokas et al., 2007).

Despite the positive links found between factors identified in adult cognitive models and their existence in adolescent populations, the research is still in its infancy and should be interpreted cautiously. Reasons for this include the limited amount of research in this field conducted with adolescents with symptoms of social phobia and the low statistical power of some of the studies. In addition, Cartwright-Hatton, et al. (2011) highlighted the existence of a publication bias in favour of research studies which have significant findings. They therefore suggested that the support for the applicability of adult cognitive models of social phobia to adolescent populations as highlighted above could be open to bias.

1.8. Interpretation Bias in Social Phobia

Over the last decade, it has been found that individuals diagnosed with social phobia show biases towards processing socially threatening information at several levels within the information-processing system (D'Argembeau, Van der linder, Etienne, & Comblain, 2003). Cognitive models (e.g., Beck, 1976; Williams et al., 1997) suggest that interpretation biases are a result of individuals with symptoms of social phobia relying on pre-existing negative beliefs to resolve ambiguous social cues (Beard & Amir, 2009). Research has supported this view, indicating that individuals

diagnosed with social phobia interpret ambiguous social situations in a more extreme and catastrophic manner than non-anxious controls, or those with other anxiety disorders such as obsessive compulsive disorder, which acts to intensify anxiety and distress (Amir, Foa, & Coles, 1998). Specifically, research found that adults diagnosed with social phobia were more likely to remember and interpret ambiguous situations as threatening in comparison to individuals with other anxiety disorders and non-anxious controls (Eysenck, Mogg, May, Richards, & Mathews, 1991; Stopa & Clark, 2000). Mobini, Reynolds, and Mackintosh's (2013) literature review of interpretation biases in social anxiety, acknowledged the presence of interpretation bias in social phobia and the role which these biases play in the onset and maintenance of the disorder. They therefore suggested that interpretation biases need to be targeted in the treatment of individuals with social phobia.

1.9. Interventions Targeting Social Phobia

Clinical practice guidelines for the treatment of children and adolescents with social phobia are currently being devised by NICE. The draft document names possible psychological interventions for children and adolescents suffering from social phobia as, CBT, systemic therapy, parenting interventions, and psychodynamic psychotherapy (NICE, 2012). Pharmacological interventions are not recommended as a first line intervention for young people with social phobia due to the negative side effects caused by selective serotonin re-uptake inhibitors (SSRIs). The current evidence base for treating social phobia will be discussed in more detail below.

1.9.1. Cognitive Behavioural Therapy for social phobia.

A number of meta-analyses have provided evidence to support the effectiveness of CBT in the treatment of anxiety disorders in young people (e.g.,

Flannery-Schroeder, Choudhury, & Kendall, 2005; Hudson et al., 2009; Muñoz-Solomando, Kendall, & Whittington, 2008). Evans (2007) stated that CBT is an active, time limited, and goal orientated therapy which gives therapy structure and focus. Despite being developed for use in individual therapy, CBT has been found to be equally effective in group settings (Manassis et al., 2002). Cognitive behavioural interventions aimed at reducing social phobia include; exposure, systematic desensitisation, cognitive restructuring, and imagery restructuring (Wells, 1997).

1.9.1.1. Group Cognitive Behavioural Therapy.

Albano, Marten, Holt, Heimberg, and Barlow (1995) conducted one of the first studies investigating the effectiveness of group CBT (GCBT) for the treatment of social phobia in adolescents. The results demonstrated that a 16-session group treatment programme resulted in significant improvements on self-report anxiety measures post-treatment and at a 1 year follow-up. A criticism of this study was that the impact of engaging in a group was not explored or controlled for. Taube-Schiff, Suvak, Antony, Bieling, and McCabe (2007) found that group cohesion increased after GCBT for individuals diagnosed with social phobia, which significantly impacted upon social anxiety symptoms. Despite this, the study provided initial support for the continued application and evaluation of GCBT for adolescents with social phobia symptoms. Hudson et al. (2009) conducted a randomised trial whereby 112 young people (aged 7 to 16 years old) with anxiety disorders (51 with social phobia) were randomly allocated to GCBT or a control group, which they named 'group support and attention' (GSA). Results from child and parent report measures and diagnostic interviews indicated that GCBT was significantly more effective in reducing anxiety symptoms post-treatment and at 6-month follow-up in all disorders

compared to the GSA. These results indicate that GCBT is more effective at treating social phobia, and other anxiety disorders, compared to a non-specific group therapy.

1.9.1.2. Individual Cognitive Behavioural Therapy.

One criticism of GCBT is that treatment is not able to be individualised (Mortberg, Clark, Sundin, & Wistedt, 2007). Mortberg, Clark, Sundin, and Wistedt (2007) compared the effectiveness of group cognitive therapy (GCT), individual cognitive therapy (ICT), and treatment as usual (TAU) with 100 adults with social phobia. Despite significant improvements being observed with both GCT and ICT treatments, ICT was found to be most effective in reducing social phobia symptoms on a combination of standardised self-report measures post-treatment and at a 1 year follow-up.

Melfsen et al. (2011) investigated the application of a newly developed CBT programme for children with social phobia (aged 8 to 14 years old) which focused on cognitions in line with the Clark and Wells' (1995) model. A total of 20 individual sessions and four parent sessions were delivered to children with social phobia. Following the intervention, it was found that there was a significant difference in social phobia symptoms between children who had engaged in the CBT programme compared to those in the control group, with those in the CBT group having fewer social phobia symptoms. This research has a number of sources of bias including experimental bias as the individuals who completed the pre-and post-assessments also administered the intervention. It is therefore possible that the participants wished to please the investigators which may have affected the results (Nichols & Maner, 2008). Despite this, the research demonstrates links between theoretical models and

treatment and shows promising preliminary findings for individual CBT with this population.

Despite promising findings, to date several review papers have concluded that there is still considerable room for improvement in the efficacy of treatments being offered to young people with social phobia (Davis, 2012). A meta-analysis by Cartwright-Hatton, Roberts, Chitsabesan, Fothergill, and Harrington (2004) concluded that although CBT has been found to be effective in treating social phobia, and other anxiety disorders, approximately one-third of young people (aged between 6 and 19 years old) continued to meet diagnostic criteria following CBT treatment. These findings, therefore, illustrate that although CBT is effective in treating young people with anxiety disorders, including social phobia, there is still significant room for improvement in the treatments currently offered to this population.

1.9.2. Imagery restructuring.

Individuals diagnosed with social phobia commonly experience mental imagery when they are, anticipating, engaging in, or evaluating social situations (Clark & Wells; 1995; Rapee & Heimberg, 1997). Images play a pivotal role in the maintenance of social phobia as individuals commonly believe that the images which they experience are accurate reflections of how others see them, for example, having a bright red face (Clark & Wells, 1995). Based on the evidence which links negative self-imagery with social phobia symptoms, NICE guidelines recommend that distorted images are assessed and modified within CBT for young people (NICE, 2012).

Hackman, Surawy, and Clark (1999) assessed the frequency and the characteristics of spontaneous imagery created in those with social phobia and found

that 77% of individuals diagnosed with social phobia, compared to only 10% of controls, reported experiencing negative, observer-perspective images. Interestingly, when encouraged to reflect on these images, the majority of individuals felt that their image was at least partially distorted.

Hirsch, Mathews, and Clark (2007) hypothesised that variations in self-imagery could influence the emotional interpretations that people make about social situations. They found that inducing a negative interpretation bias in non-anxious individuals resulted in a greater number of generated negative self-images, greater anticipatory anxiety for future social situations, and poorer self-predictions of social performance. It is possible to predict based on these findings that treatments focusing on negative interpretation bias and negative imagery have the potential to impact positively on levels of social phobia (Hirsch, Mathews, & Clark, 2007). One such treatment is imagery restructuring.

Imagery restructuring is a combination of therapeutic techniques which aim to change distressing memories which are stored in the format of images (Stopa, 2009). Wild, Hackmann, and Clark (2008) conducted an experimental study with 11 individuals who were on a waiting list to receive treatment for their social phobia. The study compared a single session of imagery restructuring with a control session where images associated with social anxiety were explored but not modified. Scores on pre-and post-standardised measures revealed that those in the imagery restructuring condition experienced significantly fewer negative beliefs including fear of negative evaluation, as well as a reduction in images and memory distress and vividness, compared to those in the control condition. Based on these preliminary findings, the authors suggested that rescripting traumatic memories could be linked to a reduction in negative self-images and consequently social anxiety symptoms.

Despite negative images being present in adolescents with social phobia (Alfano, Beidel, & Turner, 2008), this technique has not yet been applied to young people with social phobia independently from CBT. Based on the adult evidence base, and the existence of negative images in young people with social phobia, future research should be conducted to examine the effectiveness of imagery interventions in child and adolescent populations.

1.9.3. Treatment of social phobia summary.

Based on the above research, it can be concluded that the current evidence base for the treatment of adolescents with social phobia is still in its infancy. NICE guidelines (2012) make some informed recommendations based on the evidence to date, but are clear that continued research needs to be conducted to strengthen the current findings. To date, there have been far fewer research studies investigating the efficacy of treatment options for children and adolescents with social phobia compared to their adult counterparts (NICE, 2012). It should also be considered that the current evidence base provides less support for the effective treatment of young people with social phobia when examining outcomes by diagnoses in comparison to other anxiety disorders (Hudson, Rapee, Lyneham, Wuthrich, & Schneiring, 2010). This therefore highlights the need for future research to be conducted to find effective interventions for social phobia with this population. One such area for future research is the treatment of social phobia with a computer technique known as cognitive bias modification (CBM). This technique and the evidence for and against this approach will be discussed in more detail below.

1.10. Cognitive Bias Modification (CBM)

1.10.1. Rationale for CBM.

As documented above, adolescents with social phobia have been found to experience negative biases in the way in which they process and interpret information from social encounters (Cartwright-Hatton, et al., 2011). Experimental research has confirmed the link between information processing biases and the acquisition and maintenance of adolescent anxiety disorders (see Hallion & Ruscio, 2011). Specifically, Eysenck, Mogg, May, Richards, and Mathews (1991) found that individuals diagnosed with social phobia are more likely to interpret ambiguous information as threatening compared to non-anxious individuals. This provided support for the selective processing model documented by Mathews and Mackintosh (1998) which states that there are two competing processing systems which operate alongside one another and compete for attentional resources. The two systems are the threat evaluation system (TES), which seeks out information associated with threat, and the positive evaluation system (PES), which prioritises the activation of non-threat stimuli and associated meaning. Based on previous experiences, one store dominates resulting in an inability for the other system to work (usually the TES for individuals diagnosed with social phobia). The authors acknowledge that the bias interpretations can be modified if the settings activating the systems are reversed.

A procedure known as CBM has been developed in recent years in an attempt to modify the selective processing found in individuals diagnosed with social phobia and to test the causal hypothesis that cognitive biases can cause emotional disorders such as social phobia. Research has attempted to test this hypothesis by manipulating individual's cognitive biases and assessing the emotional consequences (Beard, 2011).

Koster, Fox, and MacLeod (2009) stated that CBM has two distinct features. Firstly, it attempts to change a cognitive bias which is associated with a clinical disorder. Secondly, CBM requires participants to practice a cognitive task which attempts to encourage and facilitate cognitive change rather than attempting to change the target cognition through instruction. During tasks, CBM procedures expose individuals to an experimentally established contingency, which is designed to encourage the acquisition or attenuation of the selective processing bias (Koster, Fox, & MacLeod, 2009). Research has attempted to establish whether CBM is able to experimentally manipulate a variety of information processing biases associated with both anxiety and mood disorders (e.g., Murphy, Hirsch, Mathews, Smith, & Clark, 2007; Yiend, Mackintosh, & Mathews, 2005). In order to do this, a number of CBM paradigms have been developed. One such paradigm is CBM for interpretation bias (CBM-I; Mathews & Mackintosh, 2000).

1.10.2. Cognitive Bias Modification for interpretation bias (CBM-I).

The CBM-I paradigm has been developed in an attempt to modify interpretation bias. Within the CBM-I paradigm, participants are presented with an ambiguous scenario, which they are constrained to repeatedly and consistently interpret in either a positive or negative way in order to solve an incomplete word stem (Mathews & Mackintosh, 2000). For example, '*It is the first day at a new job. Your boss asks everyone to stand up and introduce themselves. After you have finished, you guess the others thought you sounded...*' followed by a word fragment *'cl-v-r'* (clever). Completing the word fragment ensures that participants draw a positive or negative interpretation from the ambiguous scenario. A comprehension question then follows, which is designed to emphasise the emotional meaning of the situation (e.g., '*Do you feel unhappy with your introduction?*'). Within the CBM-I

paradigm, participants are given immediate feedback, which is designed to generate positive or negative emotional meaning in the face of emotional ambiguity. Research findings have showed that once trained, individuals are able to transfer this learning to new ambiguous scenarios (Murphy et al., 2007).

A number of standardised tests have been designed in order to assess interpretation biases including; the Scrambled Sentences Test (SST; Wenzlaff, 1993), the Word-Sentence Association Paradigm (WSAP; Beard & Amir, 2009) and the recognition test based upon Mathews and Mackintosh original paradigm (2000). The SST is a standardised measure which requires participants to make coherent phrases out of 20 scrambled sentences (e.g., *'winner born I am loser a'*) under a cognitive load (remembering a six digit number). This test measures an individual's tendency to interpret ambiguous information either positively (*'I am a born winner'*) or negatively ('*I am a born loser'*). A negativity score is produced by calculating the number of sentences completed with a negative interpretation (Blackwell & Holmes, 2010). The WSAP requires participants to decide whether two words representing a negative interpretation (e.g., *'embarrassing'*) and a positive interpretation (e.g., *'funny'*) relate to an ambiguous sentence (e.g., *'people laugh after something you said'*). An interpretation bias score is devised by assessing whether the participant indicates that the word and sentence are related (Beard, 2011). The recognition test presents individuals with 10 emotionally ambiguous scenarios consisting of three lines of text. The final word of each scenario is missing to preserve the ambiguity. Following this, each scenario title is presented followed by four sentences. These consist of a negative and neutral disambiguation of the original scenario (target sentences), and a negative and neutral sentence which does not disambiguate the scenario (foil sentences). Individuals are then required to rate how similar each

sentence is to the original scenario. Scores are generated by subtracting the mean similarity rating for the negative targets from the mean similarity ratings for the positive target.

Given the successful development of CBM-I procedures, research has now begun to evaluate the use of CBM-I as an alternative or complementary clinical intervention in the treatment of anxiety and mood disorders (e.g., Beard & Amir, 2008; Beard, Weisberg, & Amir, 2011; Blackwell & Holmes, 2010). To date, there has been more focus on the application of CBM-I to anxiety disorders (MacLeod & Mathews, 2012).

1.10.3. CBM-I and anxiety.

There is extensive evidence documenting the existence of interpretation bias in anxiety disorders (e.g., Beard & Amir, 2008; Huppert, Foa, Furr, Filip, & Mathews, 2003; Lange et al., 2010; Voncken, Bögels, & Vries, 2003). This section focuses on the key research studies which have led to the development of CBM-I procedures in this area. Computerised databases, PsycINFO, MEDLINE and EMBASE were searched to identify relevant studies in this area. Key terms and synonyms included; 'cognitive bias modification', 'cognitive biases, 'positive interpretation training', 'cognitive errors', and 'interpretation bias. These terms were cross referenced with the terms 'social anxiety' and 'social phobia'. In addition, lists of publications from three key authors in this area (i.e., Holmes, Mackintosh and Salemink) were reviewed. Further studies were also obtained by manual reference examination of published reports and hand searching of reference lists in key papers. These searches were combined and abstracts of all relevant articles were retrieved and assessed for

suitability. The search produced an initial pool of 63 articles, which was reduced using a stepwise approach to screen the studies for relevance to the current study.

Mathews and Mackintosh (2000) pioneered CBM-I research and conducted the original study in the area of interpretation bias and anxiety. Healthy individuals were recruited and randomly allocated to a positive or negative training condition. Participants were then required to read descriptions of social scenarios with an ambiguous emotional meaning whilst imagining that they were the central person in the scenarios. Participants were constrained to repeatedly and consistently interpret each ambiguous scenario in either a positive or negative way in order to solve an incomplete word stem. Due to the constraints of the task, participants in the positive training condition were trained to generate positive emotional meaning in the face of emotional ambiguity. Their study found that a single session of positive CBM-I training was able to reduce self-reported levels of state anxiety compared to those receiving negative training. Individuals in the negative training condition reported feeling more anxious, and made more negative interpretations on test items following training.

Mathews, Ridgeway, Cook, and Yiend (2007) supported this original study, investigating whether induced changes in interpretation bias could lead to a reduction in anxiety symptoms. The authors took a sample of high anxious participants, as measured by the State-Trait Anxiety Inventory (STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983), and randomly allocated them to a four session CBM-I or a test-retest condition. No imagery component was present in this study. Interpretation bias was measured using a version of Mathews and Mackintosh's recognition test (2000). Consistent with other research (Salemink, van den Hout, & Kindt, 2009), it was found that four sessions of CBM-I training over two weeks was

able to reduce trait anxiety in participants with high levels of anxiety compared to controls. As participants were blind to the purpose of the tasks, it is likely that changes in interpretation bias were a result of the training rather than experimenter bias. It should however, be noted that those in the control condition only attended two sessions to complete standardised outcome measures and did not receive any form of intervention. It is therefore possible that repeated exposure or perceived demand through training resulted in the differences found between the two groups (Mathews, Ridgeway, Cook, & Yiend, 2007).

Hirsch, Hayes, and Mathews (2009) investigated the effectiveness of CBM-I with a group of 40 volunteer participants presenting with high levels of generalised worry. Participants were randomly allocated to either a positive training or neutral control condition (positive feedback received 50% of the time) and completed a single session of CBM-I training whereby participants were exposed to ambiguous scenarios covering a variety of worry domains. The results revealed that those in the positive training condition had fewer negative thought intrusions, based on both self-report and assessor ratings, and reported feeling less anxious post-training compared to pre-training. These findings are however limited with regards to the clinical utility of the CBM-I as the study was conducted with a non-clinical sample.

Rectify this methodological weakness, Hayes, Hirsch, Kerbs, and Mathews (2010) conducted a similar study utilising a clinical sample of individuals with GAD who had been referred to NHS services for treatment. A total of 40 participants were randomly allocated to either a single CBM-I training session, whereby they were repeatedly exposed to benign interpretations of ambiguous scenarios or to a control condition where threat and benign meanings were inferred in equal quantities. Interpretation bias was measured using a sentence completion task previously used by

Huppert, Pasupuleti, Foa and Mathews (2007). Analysis revealed that those in the benign condition made significantly fewer negative interpretations and negative intrusions compared to those in the control condition. The authors concluded that the results infer that it is possible to induce a benign interpretive bias in individuals with generalised anxiety symptoms through a single CBM-I procedure. Despite these positive findings, no imagery instructions were used and the negative intrusions were recorded based on self-report and assessor observation making conclusions regarding negative intrusions less valid (Coolican, 2004). All other measures were however, well validated and therefore appropriate for use in the study (Hayes et al., 2010).

Despite initial research showing that CBM-I procedures are effective in influencing anxiety levels and interpretation bias, these findings cannot be generalised to all anxiety disorders. For example, Teachman and Addison (2008) randomly allocated an analogue spider phobic sample to a positive, neutral, or no training CBM-I condition. The positive training condition was a modified version of Mathews and Mackintosh's (2000) CBM-I training paradigm. Findings revealed that a single session of positive training did not have a strong effect on levels of fear or avoidance related to a live spider. Positive training did however lead to more positive interpretations of new spider scenarios. This suggests that further research into the effects of CBM-I on specific anxiety disorders is necessary. It also highlights the difficulties of generalising CBM-I research findings across disorders.

1.10.3.1. CBM-I and social anxiety/phobia.

To date, a total of eight published studies have investigated the impact of CBM-I on individuals with high levels of social anxiety or social phobia (see Table 1.1 for a summary of the studies). The first published study was conducted by

Murphy et al. (2007) who recruited an analogue population of 66 participants with high levels of social anxiety as defined by a score of 17 or above on the Fear of Negative Evaluation scale (FNE; Watson & Friend, 1969). Participants were split into three conditions; positive CBM-I training, non-negative training, or a control condition, and were administered a single session of an auditory CBM-I training based on the Mathews and Mackintosh (2000) paradigm. All participants then completed the Mathews and Mackintosh (2000) recognition test to measure interpretation bias. Results indicated that participants in the positive CBM-I condition made fewer negative interpretations on the ambiguous test scenarios compared to controls. There were no differences found between the positive and non-negative condition suggesting that the absence of negative feedback may have been important. Participants in the positive and non-negative training conditions also reported that they felt that they would be significantly less anxious in future social situations providing evidence that CBM-I can be linked to a reduction in anticipatory anxiety. It should however be considered that as only an anticipated reduction in anxiety and performance beliefs was measured, it is not clear whether anxiety would actually be reduced in real social situations as a result of the CBM-I training (Murphy et al., 2007).

Beard and Amir (2008) sought to expand upon the aforementioned study by using CBM-I training in an attempt to reduce social anxiety symptoms and state anxiety. Students with high levels of social anxiety were recruited, and a cut off score of 92, which is equivalent to the 75th percentile, on the Social Phobia and Anxiety Inventory (SPAI; Turner, Beidel, Dancu, & Stanley, 1989) was used. A total of 27 participants were randomly allocated to a positive training condition or a control condition whereby they received positive feedback only 50% of the time. CBM-I

training took place twice a week and all participants were exposed to a total of eight sessions and the WSAP interpretation bias measure. The authors found that positive CBM-I training led to a decrease in threat interpretations and reduced social anxiety symptoms compared to controls and baseline measures. This was the first study to demonstrate that CBM-I training could result in a reduction in social anxiety symptoms as well as a reduction in negative interpretations. It should be considered that 93% of participants in this study were female meaning that the results cannot confidently be applied to males. Interestingly, the authors criticised the study for not using self-imagery and suggest that all future CBM-I research should add self-imagery instructions in an attempt to enhance the effects of the training.

A research study by Lange et al. (2010) investigated whether CBM-I could influence avoidance behaviours common in social phobia (Rapee & Heimberg, 1997). A sample of undergraduate psychology students with an average score on the STAI were randomly allocated to either a single session of positive or negative CBM-I training. Participants also engaged in an approach-avoidance computer task whereby they were required to push and pull crowds of either neutral-angry or happy-angry faces closer or further away from them. Reaction times were recorded to generate an approach-avoidance score for threatening faces. Analysis revealed that CBM-I was able to induce or reduce interpretation bias relative to the CBM-I training condition they were allocated. The authors also found that those in the negative CBM-I training had a faster avoidance response to the neutral-angry crowd when the number of angry faces in the crowd increased. A second study using the same training, but a modified approach-avoidance task, was not able to replicate the initial findings relating to avoidance and negative CBM-I training. This study provides mixed findings regarding the ability of CBM-I to produce changes in behaviours associated with

social phobia such as avoidance (Lange et al., 2010). When reviewing these findings, it should be considered that this study utilised a non-clinical sample and was conducted in a laboratory environment using a computer to replicate exposure to a range of faces. The study therefore lacks ecological validity and is not generalisable to real life social encounters or those with a diagnosis of social phobia (Coolican, 2004). It was however, one of the first studies to implement a behavioural task, as opposed to a psychometric measure, in an attempt to measure changes in symptoms associated with social phobia.

The first randomised control trial (RCT) investigating the efficacy of CBM-I on social phobia symptoms was conducted by Beard, Weisberg, and Amir (2011). A total of 20 participants meeting DSM-IV-TR (APA, 2000a) criteria for social phobia completed eight, twice weekly sessions of CBM training. Unlike other studies, this trial utilised both CBM-I and cognitive bias modification for attentional bias (CBM-A). The CBM-I component of the training required participants to complete a word-sentence association paradigm (Beard & Amir, 2008). Positive feedback was given when participants made a neutral association and negative feedback was given when a negative association was made. The CBM-A task required participants to complete a dot-probe task whereby their attention were drawn to a neutral face when paired with a disgust face, thereby directing their attention away from threat. A control group of 12 participants was also exposed to a similar computer task where the tasks were unrelated to social situations. No imagery instructions were given throughout the training. Following statistical analysis, it was found that those in the training condition reported significantly fewer social phobia symptoms as rated by the Liebowitz Social Anxiety Scale (LSAS; Liebowitz, 1987) compared to baseline and those in the control condition. Participants also made significant improvements post-

intervention compared to the control group on a behavioural assessment of social phobia whereby blind research assistants rated performance on an impromptu speech. Although no specific test of interpretation bias was conducted and no attempts to distinguish between the effects of CBM-A and CBM-I were made, participants reported that they felt that the CBM-I was more helpful than the CBM-A component of the training. This study therefore provides positive findings to support the efficacy of CBM training with individuals diagnosed with social phobia (Beard et al., 2011). The study has some methodological strengths which increase the reliability of the findings. For example, double-blind procedures were utilised to reduce bias (Lewis & Warlow, 2004).

Brosan, Hoppitt, Shelfer, Sillence, and Mackintosh (2011) utilised a single-case series design to evaluate a combination of CBM-I and CBM-A training with 12 individuals with social phobia and GAD. A total of four sessions, combining both CBM-I followed by CBM-A training, were carried out at weekly intervals. Interpretation bias was measured pre-and post-training using the WSAP and anxiety symptoms using the STAI. Statistical analysis revealed that the four sessions of CBM training resulted in reductions across state and trait anxiety in individuals diagnosed with social phobia and GAD. Analysis was conducted to ascertain the specific influence of the CBM-I training, and it was found that this training significantly reduced negative interpretation bias post-intervention in 10 out of the 12 participants. Despite these positive findings, the conclusions which can be drawn from this study are limited due to several methodological limitations. These include; a lack of control group, a small sample size, and the absence of formal diagnostic assessments. In addition, the authors do not differentiate between those with social phobia and those with GAD.

Turner et al. (2011) also employed a single-case series design to assess the efficacy of a positive CBM-I training session with a clinical population. The authors recruited eight participants from an early intervention service for psychosis. All participants were considered to be recovered from their psychosis but were experiencing clinically significant levels of social phobia as assessed by the Structured Clinical Interview for DSM-IV-TR Axis I Disorders (SCID; First, Spitzer, Gibbon & Williams, 2002). Following a single session of CBM-I training, whereby participants were required to imagine themselves in the scenarios, all participants showed improvements in positive mood post-training as rated by non-standardised VASs. Three of the six participants who completed a modified version of Mathews and Mackintosh's (2000) recognition test showed a decrease in interpretation bias following the CBM-I training. Unfortunately, no analyses were conducted to determine whether these changes were clinically and reliably significant. In addition, the social phobia measure was not repeated post-intervention meaning that only limited conclusions can be formed based on these results (Turner et al., 2011). Despite these weaknesses, the study does demonstrate that CBM-I can be of some benefit in clinical settings and demonstrates the feasibility of this type of intervention with individuals with social phobia symptoms.

Amir and Taylor (2012) conducted an RCT study with strict experimental controls to investigate the efficacy of a multisession CBM-I programme (12 sessions) for individuals with DSM-IV-TR (APA, 2000) diagnosed social phobia. A total of 49 participants were randomly allocated to a treatment condition or a placebo training condition, both of which utilised imagery instructions. Both training conditions involved participants completing word-sentence association tasks whereby they were required to interpret whether a word implying a threatening or benign meaning was

related to an ambiguous social situation. Participants in the treatment condition were reinforced for making positive, non-threatening interpretations, whereas those in the placebo training condition were reinforced for interpreting ambiguous social information in either a threatening or benign manner. The authors found that those in the treatment condition experienced significant post-treatment reductions in the number of threat interpretations made, clinician-rated social anxiety symptoms, and self-reported levels of trait anxiety. In addition, 65% of participants in the treatment condition no longer met diagnostic criteria post-training compared to only 13% in the control condition. Despite reductions in clinician rated social anxiety symptoms, there were no group differences between self-reported social phobia symptoms post-intervention. As a result of this self-perception of progress, it is likely that participants would continue to hold negative views about their ability to cope in future social situations, making gains in real life social situations difficult (Amir & Taylor, 2012).

Bowler et al. (2012) sought to compare the efficacy of CBM-I in comparison to computerised CBT (CCBT) which has already been found to be effective with individuals with social phobia (Carlbring, Nordgren, Furmack, & Andersson, 2009). This was achieved by randomly allocating 71 students to CBM-I training, CCBT, or a no-treatment control condition. The CBM-I training consisted of four sessions based on the original paradigm by Mathews and Mackintosh (2000) and was delivered in laboratory conditions. Participants were required to imagine themselves in each scenario and were instructed to use their image to complete the ambiguous sentence. Those in the CCBT condition also completed four sessions of treatment which were undertaken in laboratory conditions. Statistical analysis revealed that both CBM-I and CCBT interventions resulted in significantly reduced levels of social anxiety, trait

anxiety, and depression compared to those in the control condition. Despite similar levels of efficacy, those in the CBM-I condition made significantly fewer negative interpretations when under mental load (completing a memory task). The authors criticised the study for relying on self-report symptoms and attentional control outcomes rather than utilising clinician administered or behavioural assessment of clinical change. In addition, they suggested that the study was underpowered and that the initial findings will need to be replicated in a large scale RCT before further conclusions can be drawn. In sum, despite the above criticisms, this research is able to indicate that CBM-I is an effective short-course intervention for social phobia that has comparable outcomes to other therapies including CCBT.

Table 1.1.

Summary of Studies Investigating Cognitive Bias Modification and its Application to Social Anxiety/Phobia

Reference	Sample	Method	Main Findings
Murphy et al. (2007)	Student Sample High social anxiety *N* = 66	Conditions: Positive, non-negative, or control condition Sessions: Single session Outcome measures: STAI, FNE	Fewer negative interpretations following positive CBM-I training session. Participants predicted that they would feel less anxious in a future social situation.
Beard and Amir (2008)	Student Sample High social anxiety i.e., 75th percentile on SPAI *N* = 27	Conditions: Positive or control condition (50% positive feedback) Sessions: Eight sessions Outcome measures: STAI, SPAI, BDI-II	Decreases in threat interpretations and reduced social anxiety symptoms in the positive CBM-I training condition. Significant difference between the positive training and control condition. Imagery should be utilised in future research.
Lange et al. (2010)	Student Sample Mean range state and trait anxiety levels *N* = 68	Conditions: Positive or negative training condition Sessions: Single session Outcome measures: LSAS, STAI	Experiment 1: CBM-I training induced negative and positive interpretation. Those in the negative training were then faster to avoid a social behavioural task. Experiment 2: No reflexive behaviour impulses were found as a result of induced negative interpretation biases.

Beard, Weisberg, and Amir (2011)	Community Sample All reached DSM-IV criteria *N* = 32	Conditions: Positive training or control condition (non-training computer programme) Sessions: Eight sessions of CBM-I combined with CBM-A Outcome measures: LSAS, PRS	Significant reduction on social anxiety symptoms post-training. Significant improvements on a behavioural assessment of social anxiety post-intervention compared to controls. Participants rated CBM-I tasks more helpful.
Brosan, Hoppitt, Shelfer, Sillence, and Mackintosh (2011)	Clinical sample Standard clinical assessment for social phobia or generalised anxiety *N* = 12	Conditions: Single CBM-I and CBM-A condition no control group Sessions: Four sessions Outcome measures: STAI, dot-probe test	Training significantly reduced negative interpretation bias post-intervention in 10 out of the 12 participants. CBM training resulted in reductions across state and trait anxiety.
Turner et al. (2011)	Clinical sample All reached DSM-IV criteria *N* = 8	Conditions: Single positive CBM-I condition Sessions: Single session Outcome measures: VAS, Interpretation recognition test	Self-reported improvements in positive mood post-training across all participants. Three of the six participants who completed the recognition test showed a decrease in interpretation bias.

Amir and Taylor (2012)	Clinical Sample All reached DSM-IV criteria *N* = 49	Conditions: Positive training or control condition (50% positive feedback) Sessions: 12 sessions Outcome measures: LSAS, SPAI, SDS, STAI, SCID, WSAP	CBM-I training resulted in a significant reduction in the number of threat interpretations, clinician rate social anxiety symptoms, and levels of self-reported trait anxiety.
Bowler et al. (2012)	Student sample High social anxiety *N* = 71	Conditions: CBM-I, CCBT and no training control condition Sessions: Four sessions Outcome measures: FNE, SPIN, ASC, STAI, ASSIQ, SST	Both CBM-I and CCBT resulted in significantly reduced levels of social anxiety, trait anxiety, and depression. CBM-I produced fewer negative interpretations when participants were under a cognitive load.

Note. ASC = Attentional Control Scale (Derryberry & Reed, 2002); ASSIQ = Ambiguous Social Situations Interpretation Questionnaire (Stopa & Clark, 2000); BDI-II = Beck Depression Inventory-II (Beck, Steer, & Brown, 1996); BFNE = Brief Fear of Negative Evaluation (Leary, 1983a). FNE = Fear of Negative Evaluation Scale (Watson & Friend, 1969); Interpretation recognition task (Mathews & Mackintosh, 2000); LSAS = Liebowitz Social Anxiety Scale (Liebowitz, 1987); PRS = Performance rating scale (Rapee 1992); SDS = Sheehan Disability Scale (Leon, Olfson, Portera, Faber, & Sheehan, 1997); SIAS = Social Interaction Anxiety Scale (Mattick & Clarke, 1998); SPAI = The Social Phobia and Anxiety Inventory (Turner et al., 1989); SPIN = Social Phobia Inventory (Connor et al., 2000); SPS = Social Phobia Scale (Mattick & Clarke, 1998); SST = Scrambled Sentences Test (Rude et al., 2002); STAI = State-Trait Anxiety Inventory (Spielberger et al., 1983); WSAP = Word-sentence association paradigm (Beard & Amir, 2009); VASs = Visual Analogue Scales (Wewers & Lowe, 1990).

1.10.4. CBM-I with adolescents.

As evident from the review of the literature conducted above, the majority of the current evidence base provides initial support for the efficacy of CBM-I in reducing bias and symptoms of social anxiety within clinical and non-clinical adult populations. However, the literature indicates that an interpretation bias also exists in adolescents with social anxiety (e.g., Miers, Blote, Bogels, & Westenberg, 2008) as well as adults (e.g., Beard & Amir, 2009). In light of this, CBM-I studies with this population are starting to emerge. To date, there have only been seven published studies applying CBM-I procedures within adolescent populations, only two of which have specifically investigated social phobia symptoms (Fu, Du, Au, & Lau, 2012; Salemink & Wiers, 2011). This section describes and critiques these studies, a summary is provided in Table 1.2.

Lothmann, Holmes, Chan, and Lau (2011) published the first piece of research examining the application of CBM-I with an adolescent population. The study aimed to investigate the effects of positive and negative CBM-I on levels of affect in healthy adolescents (13 to 17 years old). A total of 82 healthy adolescents were randomly allocated to a single session of either positive or negative CBM-I training. Imagery instructions were presented at the beginning and during the procedure to optimise the effectiveness of the training. VASs were used to assess mood and a modified version of Mathews and Mackintosh's (2000) recognition task was utilised to measure interpretation bias. Statistical analysis revealed that a single session of negative training led to fewer positive interpretations compared to those in the positive condition. Positive training also resulted in a significant decrease in negative affect compared to baseline measures. This study demonstrated initial support for the application of CBM-I in adolescents. However, the research was conducted with a

non-clinical population therefore, the findings cannot be generalised to a clinical population. The authors acknowledged this criticism and suggested that future research should be conducted with a clinical population. They also stated that a lack of a baseline measure of interpretation bias meant that it was not possible to conclude that positive training induced the identified differences. Despite these criticisms, the study was ecologically valid as Mathews and Mackintosh's (2000) original CBM paradigm was modified to increase its relevance to adolescents.

Lau, Molyneaux, Telman, and Belli (2011) conducted a similar study with 36 students (aged 13 to 18 years old) whose anxiety and mood symptoms were classified as being in the 'normal range'. These participants were then randomly allocated to a single session of either positive or negative CBM-I training consisting of 60 training tasks. Participants were required to read and imagine each training scenario as if it was happening to them. To further increase the use of imagery, participants completed two imagery exercises prior to the training. Following the training, participants completed a filler task followed by the recognition interpretation bias test (Mathews & Mackintosh, 2000). Statistical analysis found that negative and positive interpretation biases were induced in adolescents following a single session of CBM-I. Despite significant changes in interpretation biases, there were no statistical changes in mood following either positive or negative training. The research therefore provides support to the similar study conducted by Lothmann et al. (2011) and supports the use of imagery in modifying interpretation bias. However, as no baseline measure of interpretation bias was taken and a non-standardised measure of mood was used, the authors felt that these results needed to be replicated by further research, preferably with a clinical sample, before any firm conclusions could be made (Lau, Molyneaux, Telman, & Belli, 2011).

Salemink and Wiers (2011) conducted a piece of research with a non-clinical adolescent population to investigate the use of CBM-I in reducing interpretation bias and symptoms in line with social anxiety. The aim of the study was to explore whether CBM-I could have similar positive effects in adolescents as has been found with adult populations (e.g., Beard & Amir, 2008). The sample consisted of 170 adolescents (aged 14 to 16 years old) recruited from a secondary school in the Netherlands. According to the researchers, no inclusion or exclusion criteria were applied with all students from the class level being invited to engage in the study. The adolescents were then randomly allocated to either a positive interpretation training (n =88) or a placebo-control condition (n=82). The research found that a single positive CBM-I training session was able to successfully modify interpretations, but no significant effects were observed on levels of state anxiety. Further analysis revealed that training was most successful in those with higher threat-related interpretation bias prior to testing. These findings demonstrate positive initial findings in the application of CBM-I with adolescents. With regards to limitations, the authors suggested that using a specific social anxiety questionnaire such as the Social Anxiety Scales for Adolescents (SAS-A) may have been more appropriate as the training aimed to modify social anxiety symptoms. In addition, imagery was not used in this study, despite being a key component in CBM-I procedures (Beard & Amir, 2008). Like many other studies conducted with non-clinical populations, the authors recommended that future research should be conducted with individuals with clinical symptoms and that multiple CBM-I sessions should be tested.

Salemink and Wiers (2012) attempted to expand on their findings by taking a sub-group from the original study to examine the impact of regulatory control on

anxiety and threat-related interpretation bias. A total of 67 participants were asked to complete the colour interference Stroop test (MacLeod, 1991) prior to either a single positive CBM-I training session or a placebo computerised task. It was hypothesised that this would assess whether regulatory control was able to moderate the influence of anxiety on threat-related interpretive bias. Results revealed that those with low regulatory control and high state anxiety benefited most from positive CBM-I training. This study therefore indicated that CBM-I may be most effective with those adolescents who already demonstrate a threat-related interpretation bias. However, as the study used the same participants from the original Salemink and Weir (2011) study, the identified limitations such as, use of a non-clinical population, use of a single CBM-I session, and the absence of a specific anxiety symptom measure should be taken into consideration when reviewing the findings of the study.

More recently, Lau, Belli, and Chopra (2012) conducted a study with 40 non-clinical adolescent participants to examine whether positive CBM-I training was able to modify anxious responses to a laboratory stressor. Participants were randomly assigned to either a single session of positive or negative CBM-I training and taught to vividly imagine themselves in social scenarios with the aid of visual cues to enhance the effects of CBM-I. The training consisted of 60 scenarios and was based on Mathews and Mackintosh's (2000) original paradigm. Following a filler task, participants completed a recognition interpretation test, followed by a mental arithmetic stressor task and a final assessment of mood using VASs and the STAI. Findings revealed that those in the positive CBM-I training endorsed more positive and fewer negative interpretations of new ambiguous situations than those adolescents in the negative CBM-I condition. In addition, after the stress task those in the positive CBM-I condition showed significantly lower anxiety than those in the negative CBM-

I condition. Although this study used a stress task as a way of assessing the ability of CBM-I to make changes to real life situations, a baseline measure of interpretation bias was not utilised. It is therefore not possible to ascertain whether the group differences in interpretation bias post-CBM-I training were present pre-CBM-I training (Lau, Belli, & Chopra, 2012).

Fu, Du, Au, and Lau (2012) are the only authors to have conducted a study utilising a clinical sample of Chinese adolescents. The authors recruited 28 adolescents with a clinical diagnosis of either GAD or social phobia. Participants were randomly allocated to a positive or neutral training condition where they completed a single session of CBM-I training consisting of 60 written scenarios. The training was based on the scenarios used by Lothmann et al. (2011). No imagery instructions were given. Statistical analysis revealed that the single training session was not able to produce changes in self-reported mood or interpretation bias. The authors acknowledged the potential flaws of not employing a well-recognised validated measure to assess interpretation bias and social phobia. The study is however the first published study to utilise a clinical population. Further research would need to be conducted before any conclusions could be drawn from this study due to the methodological limitations (e.g., lack of validated measures).

In conclusion, the current research indicates that CBM-I procedures with adolescents can help reduce negative interpretation bias and positively impact upon mood and anxiety symptoms in adolescent populations (Salemink & Wiers, 2012). Despite these findings, there is still much work to be done (Lothmann et al., 2011). There are several limitations to the current, limited CBM-I research with adolescents. Firstly, all but one of the CBM-I studies have used analogue samples, future CBM-I research should therefore be piloted with clinical populations to investigate the

clinical utility of the procedure (Salemink et al., 2009). Secondly, based on the current research findings (e.g., Holmes, Lang, & Shah, 2009), it has been suggested that imagery should be implemented in all CBM-I research in light of its ability to increase the effectiveness of CBM-I interventions. This was not the case in many of the studies conducted with adolescents, with several of the papers noting the lack of detailed imagery instructions and practice as a criticism of their work (Lothmann et al., 2011; Salemink & Weir, 2012). Thirdly, all of the studies in this area have utilised a single training session. It has been highlighted that single sessions of CBM-I are not as effective in creating change in interpretation bias as multiple sessions (Hallion & Ruscio, 2011). Therefore, future research should trial multiple sessions to help identify the optimal number of sessions needed to create significant and lasting change in adolescents.

Table 1.2.

Summary of Studies Investigating Cognitive Bias Modification for Interpretation Bias with Adolescents

Reference	Sample	Method	Main Findings
Lothmann, Holmes, Chan, and Lau (2011)	Student Sample 13-17 years old *N* = 82	Conditions: Positive or negative training condition Sessions: Single session Outcome measures: VASs, interpretation recognition test	Those in the negative condition drew more negative and fewer positive interpretations than adolescents in the positive condition. Positive training resulted in a significant decrease in negative effect.
Lau, Molyneaux, Telman, and Belli (2011)	Student Sample 13-18 years old Mean range state and trait anxiety levels *N* = 36	Conditions: Positive or negative training condition Sessions: Single session Outcome measures: STAI-C, SEQ-C, VASs based on the PANAS-C	Negative training resulted in a decline in positive affect in low self-efficacious adolescents only. Findings suggested that cognitive biases influence affect in vulnerable adolescents.
Salemink and Wiers (2011)	Student Sample 14 -16 years old *N* = 170	Conditions: Positive or placebo control condition Sessions: Single session Outcome measures: ZBV-K, interpretation recognition test	Positive training was able to successfully modify interpretations. Most effective on those with high threat-related interpretation biases. No significant effects were observed on levels of state anxiety.

Salemink and Wiers (2012)	Student Sample 14-16 years old *N* = 67	Conditions: Positive or placebo control condition Sessions: Single session Outcome measures: ZBV-K, STAI-C, Stroop test, interpretation recognition test	CBM-I was more effective with adolescents who have low regulatory control and high state anxiety.
Fu, Du, Au, and Lau (2012)	Clinical Chinese Sample 12-17 years old *N* = 28	Conditions: Positive or neutral training condition (50% positive) Sessions: Single session Outcome measures: SCARED – Chinese version, VASs, and interpretation recognition questionnaire	No differences were found between the two conditions on levels of interpretation bias or self-assessed anxiety.
Lau, Belli, and Chopra (2012)	Student Sample 12-18 years old *N* = 40	Conditions: Positive or negative training condition Sessions: Single session Outcome measures: STAI-C, VASs, and interpretation recognition test	Fewer negative interpretations made post-CBM-I in the positive training condition compared to the negative training condition. Those in the positive CBM-I condition showed significantly lower anxiety than those in the negative CBM-I condition following a stress test.

Note. Interpretation recognition task (Modified from Mathews & Mackintosh, 2000); Interpretation recognition questionnaire (Modified from Stopa & Clark, 2000); PANAS-C = Positive and Negative Affect Scale for Children (Laurent et al., 1999); SCARED = Screen for Childhood Anxiety Related Emotional Disorders – Chinese version (Wang, 2005); SEQ-C = Self-Efficacy Questionnaire for Children (Muris, 2001); STAI-C = Trait scale of the State Trait Anxiety Inventory for Children (Spielberger, 1973); Stroop test (Ridley, 1935); ZBV-K = Dutch version of the State Trait Anxiety Inventory for Children (Bakker, van Wieringen, Van der Ploeg, & Speielberger, 1989); VASs = Visual Analogue Scales (Wewers & Lowe, 1990).

1.10.5. CBM summary and future directions.

As CBM-I research is in its infancy, research is still being conducted, with both adult and adolescent populations, using single sessions of CBM-I. This is despite reviews indicating that multiple sessions of CBM-I produce greater changes in cognitive biases and anxiety symptoms (e.g., Hallion & Ruscio, 2011). The findings from the above literature review do however suggest that single sessions of CBM-I training can result in successful modification of interpretation bias in non-clinical adult (e.g., Mathews et al., 2007) and adolescent populations (e.g., Salemink & Wiers, 2011). With regards to clinical populations, the adult literature suggests that CBM-I training has most successfully modified social phobia/social anxiety symptoms and interpretation bias using multiple sessions of CBM-I (Beard et al., 2011) compared to a single session (e.g., Turner et al., 2011). Due to the effectiveness of multiple CBM-I trials to date using adult populations with social phobia symptoms (e.g., Beard & Amir, 2008), multiple sessions of CBM-I training should be trialled with adolescent populations.

Of further interest, Holmes, Mathews, Dalgleish, & Mackintosh (2006) found that CBM-I training, where participants were trained to generate positive interpretations as well as positive imagery, resulted in a reduction in state anxiety and a decrease in interpretation bias. This finding has been supported by more recent research into the effects of imagery in CBM procedures (e.g., Holmes et al., 2009) and suggests that imagery is a vital component that should be included in all CBM-I training programmes. McLeod and Mathews (2012) supported this, stating that imagery makes a powerful and functional contribution to emotional experience and that CBM procedures can be optimised by the use of imagery.

Despite the expanding literature on CBM-I and its application to anxiety disorders, there is a need for more research to be conducted in this area in order to strengthen the current research findings (MacLeod & Mathews, 2012). Much of the research to date has been conducted using non-clinical or sub-clinical populations, which limits the generalisability of the findings to a clinical population. It would therefore, be beneficial to focus on investigating the use of CBM-I with clinical populations, which will allow for the clinical implications of CBM-I to be more rigorously assessed.

In addition, only seven CBM-I studies have been conducted using adolescent populations. The significant developmental differences between adolescents and adults mean that it is not possible to generalise findings from adult to adolescent populations (Narra, Mathews, & Sneha, 2012). As the CBM-I research with adolescents is currently limited, further research should be conducted with this population to examine the application and efficacy of CBM-I procedures within this population.

1.11. Research Questions

This preliminary study aimed to investigate the efficacy of a CBM-I intervention with adolescents with social phobia symptoms. The research questions were developed based on the theoretical and research background reviewed in this chapter. The research questions for the current study are:

1. Is a seven session positive imagery CBM-I programme able to modify interpretation biases in adolescents with clinical levels of social phobia symptoms?

2. Is a seven session positive imagery CBM-I programme able to reduce levels of social phobia in adolescents with clinical levels of social phobia symptoms?

3. Are any changes in levels of social phobia identified after the final session of CBM-I maintained at a two week follow-up assessment?

4. What are the participants' and their parents' views of the CBM-I programme and its impact upon their social phobia symptoms?

Chapter 2: Methodology

2.1. Chapter Introduction

This chapter outlines the research methods used in order to conduct the current study. A single-case series design was utilised as CBM-I interventions with adolescents are at the early stage of clinical testing. A total of 11 young people were recruited to take part in the study and were assessed as having symptoms of social phobia. The recruitment process and inclusion and exclusion criteria that were applied to identify these participants are discussed. The measures used to assess social phobia and interpretation bias are detailed with specific focus on how they are applicable to the adolescent population. The procedure, including the specific details of the CBM-I programme and how it was administered, is outlined. The ethical considerations of conducting research with a non-adult population are then discussed.

2.2. Design

To investigate the efficacy of the CBM-I intervention a single-case series using a multiple baseline across participants A-B design with follow-up was utilised (Underwood, 1957). The independent variable was the CBM-I intervention and the dependent variables were levels of interpretation bias and social phobia symptoms. The study adopted three baselines as suggested by Kazdin (2010). The length of the baseline period varied in duration (1, 2, or 3 weeks) across participants. Participants were randomly allocated to a baseline using a block randomisation sequence. The sequence was generated using a pre-determined algorithm and was performed by an experienced researcher who had additional qualifications in statistics.

Once allocated, participants completed a 1, 2, or 3 week baseline phase. During the baseline period, participants completed daily measures of social anxiety. These measures were the Social Anxiety Scale for Adolescents (SAS-A; La Greca & Lopez, 1998) and nine visual analogue scales (VASs). Following the baseline period, participants then entered the intervention phase which lasted 1 week. Participants completed a follow-up battery of questionnaires 2 weeks after the completion of the training (see Figure 2.1).

<table>
<tr><td>2 Participants</td><td>Pre-measures administered</td><td>Baseline period
1 week
Daily measures completed</td><td>Training period
1 week
CBM-I</td><td>Follow-up
2 weeks later</td><td></td><td></td></tr>
<tr><td>3 Participants</td><td>Pre - measures administered</td><td colspan="2">Baseline period
2 weeks
Daily measures completed</td><td>Training period
1 week
CBM-I</td><td>Follow-up
2 weeks later</td><td></td></tr>
<tr><td>3 Participants</td><td>Pre - measures administered</td><td colspan="3">Baseline period
3 weeks
Daily measures completed</td><td>Training period
1 week
CBM-I</td><td>Follow –up
2 weeks later</td></tr>
</table>

*Figure 2.1.*Multiple baseline design

2.2.1. Rationale for design.

A multiple baseline design across participants is considered an appropriate method to evaluate interventions that are at an early stage of clinical testing such as CBM-I (Kazdin, 2010). It also has the advantage of providing experimental control alongside the flexibility and individualisation of a single-case series (Gunning & Espie, 2003). In this case, utilising this research design meant that all participants were first observed for their levels of social anxiety with no intervention. Introducing the intervention at different baselines meant that if the levels of social anxiety

symptoms changed when the intervention was introduced, and only then, the effects could be more confidently attributed to the intervention rather than extraneous variables (Kazdin, 2010). In essence, the multiple baseline design allowed the research to control for the effects of time. Participant's individual baselines acted as a control period and each participant as their own control. According to Barlow and Hersen (1984), this design is also considered superior ethically to a withdrawal or reversal case series design as no return to baseline levels are required to assess change. Despite these benefits, it should still be considered that any changes observed could be related to factors external to the intervention (Morley, 1996). An example of a possible error variable in this study is a change in the level of social support experienced by the adolescents (e.g., increased contact with the researcher).

2.2.2. Randomisation.

Participants were randomised to a baseline using a Microsoft Excel package. Firstly, Excel was used to create a series of random numbers. The first digits of these numbers were then used to allocate participants to a baseline length. The first digits of random number sequences were allocated to baselines as follows: 0-2 to baseline one, 3-5 to baseline two, and 6-8 to baseline three. Numbers beginning with the number nine were ignored and the second number was used. If all three baselines were allocated, the first number was ignored and the next number considered.

2.3. Participants

Participants were recruited from Tier 2 and 3 Child and Adolescent Mental Health Services (CAMHS) across Norfolk and Suffolk NHS Foundation Trust (NSFT). A total of four sites were involved in the research with each having a named qualified practitioner responsible for the co-ordination of the recruitment. Potential

participants were identified following a generic service assessment and were on a waiting-list for treatment.

2.3.1. Inclusion and exclusion criteria.

Participants were only eligible for inclusion in the study if they were aged between 13-17 years old. They had to be presenting at CAMHS centres in NSFT following a referral from a health professional for social anxiety difficulties. In order to ensure that the potential participants were experiencing clinical levels of social phobia, they were required to complete the SAS-A and the Development and Wellbeing Assessment (DAWBA; Goodman, Ford, Richards, Gatward, & Meltzer, 2000). If adolescents scored over 50, indicative of clinical level of social phobia, on the SAS-A and were assessed as having 'High' chances of having a DSM-IV diagnosis of social phobia on the DAWBA they were considered eligible for the study.

As the CBM-I training scenarios were written at a maximum reading level of 12 years old, those with literacy difficulties, as assessed at initial service assessment, were excluded from the study. The reading level of the test material was assessed by the website Gunning Fox Index (Bond, 2012). Participants who did not have English as a first language were also unable to take part in the study. This was because it was likely that they would have difficulties understanding the CBM-I programme and the outcome measures. This was assessed by the CAMHS practitioner based on the CAMHS demographic screening forms. Any urgent referrals (i.e., those that need immediate treatment and/or risk management) were also excluded as these clients have to be seen within 2 weeks of referral and were therefore not appropriate for a waiting list intervention. If adolescents were participating in another form of

treatment, including medication, or were involved in another piece of research, they too were not eligible for inclusion in the study.

Despite social phobia having a high co-morbidity with other psychiatric conditions, such as other phobias and major depression disorder (Ohayon & Schatzberg, 2010), adolescents with severe levels of depression were ruled out of the study. This was to ensure that the primary presenting problem was social phobia. The DAWBA was administered at the initial research appointment to rule out severe levels of depression and suicidal ideation. Those scoring 'High' on the depression and deliberate self-harm sub-scales were excluded and CAMHS were informed so that the risk could be managed appropriately. Adolescents were also excluded from the study if they were suffering from psychosis or substance misuse. Psychotic symptoms were highlighted by the Brief Symptom Inventory (BSI; Derogatis, 1993) and substance misuse from the initial CAMHS assessment. It was important to rule out these factors as they may have impacted upon an individual's level of social phobia, therefore making it difficult to attribute any changes in symptoms to the CBM-I.

2.3.2. Recruitment.

A clinical psychologist from CAMHS Norwich was initially approached to consider the design and feasibility of the study. Following consultation with the clinical psychologist, senior management for CAMHS services were contacted to ask for their initial support, which they provided. The team leader responsible for recruitment in Norwich was then also invited to engage in the research development. Following protocol development and ethical approval, the principle researcher then attended CAMHS referral meetings across NSFT to discuss the research with the

practitioners who were responsible for completing initial assessments within the services. At this stage, the research protocol was shared in detail and their specific role and requirements clarified, including how to identify the inclusion and exclusion criteria. All individuals who were approached to engage in the recruitment process were skilled in discussing research and seeking consent as all sites had previous been involved in recruiting for nationwide randomised controlled trials (e.g., Reynolds et al., in press).

The practitioners who conducted assessments were asked to identify any potential participants based on their referral documentation and their generic CAMHS initial assessments. If appropriate, they then introduced the study to the individual and their family, if present, at the end of the assessment. This was done by sharing and discussing the participant information sheet. Potential participants were also informed at this stage that the study would take place whilst they were on the waiting list for treatment and would therefore not affect their treatment with CAMHS. If the potential participants said that they would like further information, they were asked to give their initial consent, alongside their parent if under 16 years old, to agree to their details being passed onto the principle researcher (see Appendix A).

2.3.3. Sample.

A total of eight participants completed the study. This number is considered acceptable in single-case research and allows for statistical analysis which examines variability and trend within the different phases of the design to take place (Kazdin, 2010). In addition, previous feasibility studies investigating CBM-I have considered six to nine participants to be adequate (Blackwell & Holmes, 2010; Turner et al., 2011). In total, 20 adolescents were approached to take part in the study, although

only 15 gave their consent for the researcher to contact them. Of those 15, three were not eligible due to involvement in other research or a lack of desire to take part. A total of 12 potential participants consented to enter phase 1 of the research. A further four participants were then excluded or withdrew. Figure 2.2 depicts the flow of participants through the study.

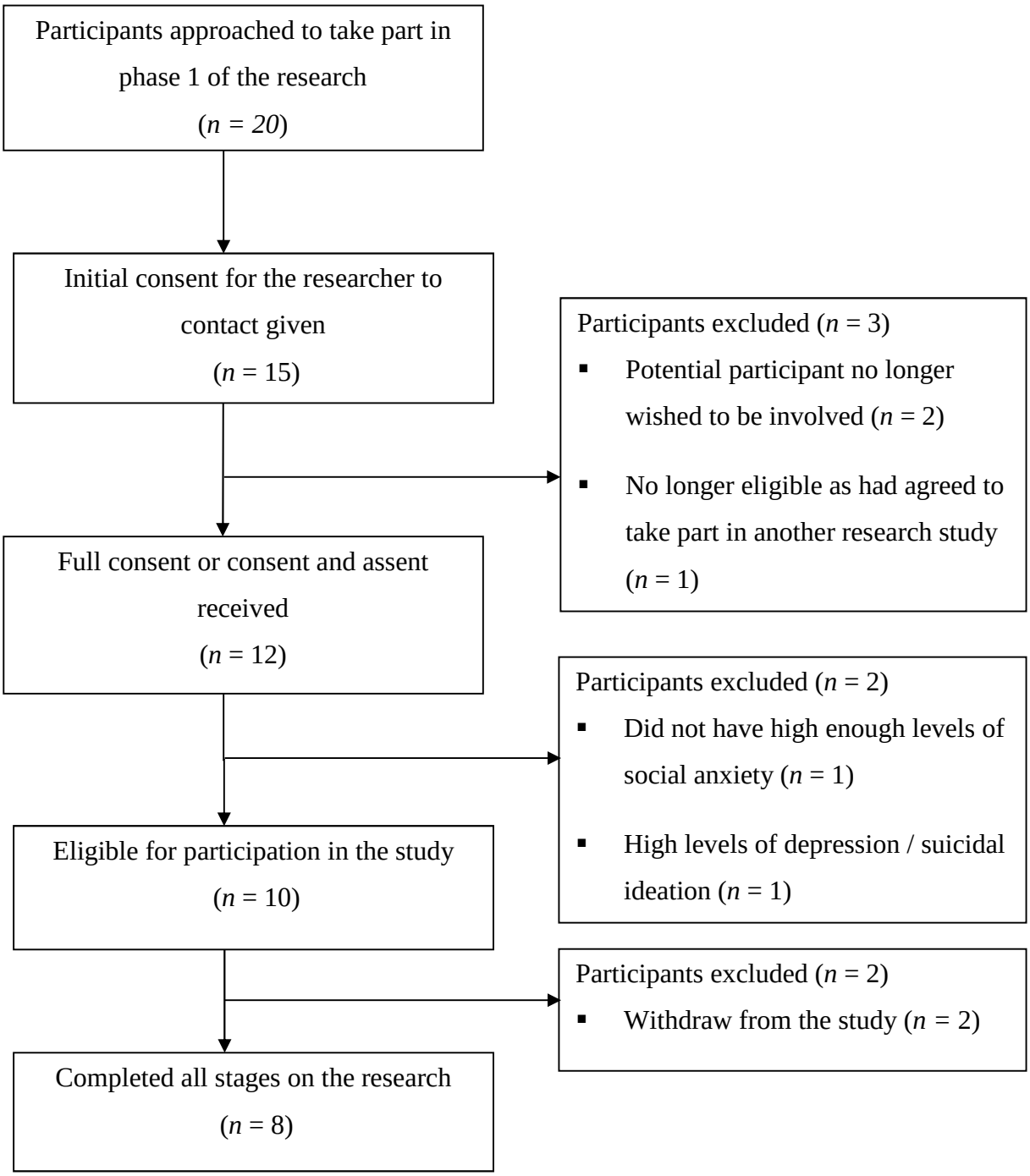

Figure 2.2 Diagram of the flow of participants

The age range of the participants was 14-17 years old, with a mean age of 15.5 (*SD* = 1.04). The study classified an adolescent as somebody aged between 13-17 years old and therefore only those aged within this age bracket were invited to take part in the study. The World Health Organisation (2005) define an adolescent as somebody aged between the ages of 10 and 19 years, however, the measures which were used in this study had been validated for adolescents aged between 13-17 years old (see Section 2.4). In addition, CAMHS only accept referrals for individuals up to the age of 17 years old.

2.3.4. Participant characteristics.

Of the 10 participants that consented and began phase two of the research, only eight completed both the baseline and intervention phases. The first participant who withdrew (female, aged 16) did so due to technical problems with her internet at home. She reported that it would be too demanding to go to the library every day to complete the training alongside her school work. This participant had completed the baseline phase when she withdrew from the research. The second participant (male, aged 15) withdrew from the research during the intervention phase (day 3 of training) as he felt that the computer programme was not for him and that he wanted to wait to see somebody in person. He also reported that he was finding the training difficult to fit into his daily life as he was studying for exams and had coursework to complete. The remaining eight participants met all of the assessment criteria and their circumstances did not change throughout the study (e.g., began another treatment). The personal characteristics of the participants are described below.

2.3.4.1. Participant 1.

Participant 1 is a 16 year old white British male. He was referred to Tier 3 CAMHS by his GP for assessment and treatment of his social phobia and had been assessed to be suitable for the service. He was therefore placed on the CAMHS waiting list for intervention. He was at sixth form studying for his A-Levels but was having difficulties functioning in this environment due to his anxieties.

2.3.4.2. Participant 2.

Participant 2 is a 14 year old white British female. She was re-referred to Tier 3 CAMHS by her GP for increasing social phobia symptoms. She had previously been seen by CAMHS in 2011 with similar difficulties and had undergone some individual and family therapy work. This young woman had few friends and did not spend time with anybody outside of the family network. She does however attend school and is doing well academically according to her mother.

2.3.4.3. Participant 3.

Participant 3 is a 15 year old white British female who was referred to Tier 3 CAMHS with social phobia symptoms in 2012. She had received treatment for her social phobia at this time but was re-referred due to a reoccurrence of symptoms. She is at high school and is studying for her GCSEs, several of which she was due to take early as a result of her high academic abilities. This young person described having one close friend.

2.3.4.4. Participant 4.

Participant 4 is a 14 year old white British female who had been referred to Tier 3 CAMHS by her GP for treatment of her social anxieties. She was assessed by a

CAMHS practitioner and put on a waiting list for CBT to address her social phobia symptoms. Despite being a bright and ambitious young woman, she described feeling extremely nervous when with other people and felt that others would regularly make negative interpretations of her. She is attending a local high school but does not engage in any out of school activities due to her anxieties.

2.3.4.5. Participant 5.

Participant 5 is a 16 year old white British female who was referred to Tier 3 CAMHS by her GP for social phobia and low mood. Following initial assessment she was placed on the waiting list for CBT intervention and given the option of engaging in the research study. She is attending sixth form to study for her A-levels but despite having several close friends finds it difficult to engage with new people. She reported feeling self-conscious when with others, especially people of a similar age to her.

2.3.4.6. Participant 6.

Participant 6 is a 15 year old white British female who was referred to Tier 3 CAMHS for assessment by her GP. Due to her levels of anxieties, the initial assessment had to be conducted at her home where the young person had to be encouraged to enter the room with the practitioner. She was assessed as suitable by the CAMHS practitioner and placed on a waiting list for therapeutic intervention. The young woman had recently stopped attending school due to her increasing social phobia symptoms. She reported being unhappy about this and was keen to reduce her anxieties and return to school.

2.3.4.7. Participant 7.

Participant 7 is a 17 year old white British female who was referred to Tier 2 CAMHS services by her GP in light of her increasing social phobia symptoms. She was placed on the waiting list for 1:1 psychological intervention. She is currently studying for her A-Levels and works voluntarily at the weekends. Despite having several close friends, she described feeling 'awkward' at times in their company and unable to ask them to engage in recreational activities with her. She was highly motivated to change.

2.3.4.8. Participant 8.

Participant 8 is a 14 year old white British male. He was referred to the Youth Service for assessment and case management. He was experiencing social phobia symptoms and had consequently not attended school since 2011. He had previously struggled to engage in therapeutic interventions but was on the waiting list for psychological therapy. He felt that spending time with others was too difficult and therefore preferred to spend time alone playing computer games in his room.

2.4. Measures

Levels of social phobia were assessed pre-CBM-I using the SAS-A, the DAWBA and the BSI. These measures were administered to ensure that participants had clinically significant levels of social phobia and were therefore suitable for the study. They were also used to screen for severe depression, suicidal ideation, and psychosis which were the exclusion criteria. In addition, the SAS-A and the BSI were also administered at various stages of the study to assess changes in levels of social

phobia. The psychometric properties of each of the measures and the details of when they were administered are described below.

2.4.1. Screening measures.

2.4.1.1. Social Anxiety Scale for Adolescents (SAS-A).

The SAS-A (La Greca & Lopez, 1998) is a self-report questionnaire which was developed to assess adolescents' feelings of social anxiety in the context of their relationships with others. The conceptual basis for the SAS-A was derived from two sources. Firstly, the instrument was developed with Leary's (1983b) theoretical framework in mind. This work stated that the subjective experience and behavioural consequences of anxiety such as avoidance and behavioural inhibition are self-contained constructs and should therefore be assessed separately when measuring social anxiety. Secondly, Watson and Friend's (1969) research states that social anxiety is both a fear of negative evaluation and social avoidance and distress. The measure was designed to measure the two aspects of social anxiety. In light of this, the SAS-A contains three subscales: fear of negative evaluation, social avoidance and distress that is specific to new situations or unfamiliar peers, and social avoidance and distress that is experienced more generally when in the company of others.

The SAS-A contains a total of 22 items and is made up of 18 anxiety related items (e.g., "I'm afraid to invite others to do things with me because they might say no") and four filler items reflecting activity preferences (e.g., "I like to play sports"). The SAS-A is a self-report measure which takes 5 minutes to complete and is suitable for young people aged 13-17 years of age. Respondents are required to use a 5-point Likert scale (*1 = Definitely not true*; 5 = *Definitely true*) to rate how relevant each item is for them.

The measure yields a total score as well as three social anxiety subscales. Scores are obtained by summing the ratings for the items comprising each subscale and can range from 8 to 40 for fear of negative evaluation, 6 to 30 for new social avoidance and distress, and 4 to 40 for general social avoidance and distress. The total score is obtained by summing all anxiety related items and this score can range from 18 to 90. A total score of 50 or above (approximately one standard deviation above the mean score as reported by La Greca & Lopez, 1998) is recommended as a marker for clinically significant levels of social anxiety amongst adolescents.

The measure demonstrates good internal consistency, with a Cronbach's alpha of .93, with a school population and .94 with a clinical population (La Greca & Lopez, 1998). It also has a satisfactory test re-test reliability of r = .60 (Storch, Masia-Warner, Dent, Roberti, & Fisher, 2004). In addition, Ginsburg, La Greca, and Silverman (1998) reported that inter-scale correlation is at its highest amongst a clinical population, with a range from .74 to .81 for adolescents with anxiety disorders (see Appendix B).

2.4.1.2. Development and Well-being Assessment (DAWBA).

The DAWBA (Goodman et al., 2000) is a package of detailed interviews, questionnaires and rating techniques designed to generate ICD-10 and DSM-IV psychiatric diagnoses on 5 -17 year olds. The authors claim that the assessment can diagnose a wide range of disorders including social phobia, depression, self-harm, and generalised anxiety. Interviewers can collect information from up to three sources; the parent of the young person, the young person themselves if they are aged between 11-17 years old, and the teacher of the young person. Only the adolescent version of the measure was utilised in this study as it has been found that adults are often poor

informants for adolescents' internalised problems and because the subjective experience of the adolescent was of interest (Seiffge-Krenke & Kollmar, 1998; Stranger & Lewis, 1993).

The DAWBA self-report interview involves a mixture of closed questions such as "*Do you ever worry*?" and open-ended questions such as "*Please describe in your own words what it is you worry about?*" Verbatim accounts of reported problems are also recorded. The measure takes approximately 35 minutes to administer. The answers to the structured questions are fed into a computerised diagnostic algorithm. This algorithm predicts how likely it is that a rater would assign the adolescent an operationalized ICD-10 or DSM-IV diagnosis. The individual is assigned to one of six probability bands, ranging from less than 0.1% likely ('Very Low') to more than 70% likely ('High') for each disorder (see Appendix C). The DAWBA has high inter-rater reliability (Goodman et al., 2012).

2.4.1.3. Brief Symptom Inventory (BSI; Derogatis, 1993).

The BSI (Derogatis, 1993) was used as a general mental health screening tool to assist in the application of study criteria, specifically identifying phobic anxiety and psychoticism. The BSI is a self-report questionnaire which identifies and classifies mental health symptoms and the intensity of these symptoms. The measure has been validated for use with adolescents aged 13 years old and over and takes approximately 10 minutes to complete (Derogatis, 1993). The measure consists of 53 items relating to general symptoms of mental health across nine dimensions. The nine dimensions are: Somatization, Obsession-Compulsion, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic anxiety, Paranoid ideation and Psychoticism. Respondents are asked to report how much they have been distressed by various symptoms in the

preceding week. Participants are required to rate each item using a 4-point Likert scale (*1= Not at all, 4 = Extremely*).

The measure yields three sub-scale scores as well as total scores for the nine dimensions. The three sub-scales scores are; the Global Severity Index (GSI), the Positive Symptom Distress Index (PSDI), and the Positive Symptom Total (PST). . In addition to the sub-scale scores, there are nine primary symptoms dimensions which include; Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobia Anxiety, Paranoid Ideation, and Psychoticism. A GSI score or two subscales that are greater or equal to a T-score of 63 is considered to be clinically significant (Derogatis, 1993). The BSI has good psychometric properties with good test-retest reliability and a stability co-efficient of .90 on the GSI (APA, 2000b). The author reports good internal consistency reliability for the nine dimensions, ranging from .73 on Psychoticism and Paranoia to .88 on Anxiety (see Appendix D).

2.4.2. Daily measures.

Participants were required to complete both the SAS-A and VASs on a daily basis during the baseline and treatment phases. The participants were presented with these measures on the computer programme in a random order each day in an attempt to control for practice effects. The author of the SAS-A gave consent for the measure to be presented in this format (see Appendix E).

2.4.2.1. Visual Analogue Scales (VASs).

A total of eight VASs were presented to participants daily during the baseline and training periods as a rating scale to measure levels of social anxiety, worry and mood (see Appendix F). Numerical rating scales, which were horizontal lines 10cm

in length with check marks dividing the lines into equal segments labelled from 0 to 10, were utilised. The lines were anchored at each end with the extremes of the variable being measured (e.g., 0 = *Not nervous at all*, 10 = *Very nervous*). A 10-point scale was used rather than a 0-100 continuous measure to make the task more concrete and in line with an adolescent's stage of cognitive development. Participants were required to identify a rating using the numbers on their computer keyboard for each of the VASs to depict how much each statement applied to them on that day.

This form of measurement has been validated as a way of measuring anxiety in clinical populations (e.g., Bernstein & Garfinkel, 1992). VASs are quick to complete helping to ensure a high rate of compliance in clinical samples and making them suitable for daily use. They have also been found to be both a reliable and valid way of collecting quantifiable information about a person's moods (Ahearn, 1997; Marsh-Richard, Hatzis, Mathias, Venditti, & Dougherty, 2009). VASs have been found to be valid and reliable with children as young as 7 years old, as those with average intelligence at this age where found to have the cognitive skills necessary to translate a subjective sensory experience into a linear format (Shields, Palermo, Powers, Grewe, & Smith, 2003).

2.4.3. Outcome measures.

The effects of the CBM-I programme (independent variable) on the social anxiety measures and the following measure of interpretation bias (dependent measures) were observed in order to identify if the CBM-I programme was able to modify interpretation bias and social phobia symptoms. The recognition test was administered pre- and post-CBM-I training. The SAS-A, VASs, and BSI were repeated at the pre-intervention, post-CBM-I training, and 2 week follow-up assessment.

2.4.3.1. Interpretation bias recognition test.

Interpretation bias was assessed using a script-based encoding task based on the original CBM paradigm by Mathews and Mackintosh (2000). Although there has been no published data outlining the psychometric properties of this test, it has been widely used in several studies investigating interpretation biases in social anxiety (e.g., Huppert et al., 2003; Mackintosh et al., 2006; Mathews & Mackintosh, 2000). In addition, this test has previously been adapted for use with adolescents (Lothmann, 2011).

In total, 20 social situation passages were used in the research. These were based on the original Mathews and Mackintosh (2000) scenarios and the adolescent appropriate version of the test developed and used by Lothmann et al. (2011). All of the scenarios were seen by a CAMHS specialist and were piloted by a convenience panel of four adolescents. The scenarios were modified according to the feedback provided by both the CAMHS specialist and the adolescent panel. Feedback included reducing the complexity of words (e.g., '*mentions'* to '*says*'), reducing the length of the scenarios, and making the scenarios more age appropriate (e.g., '*concert'* to '*gig*').

The 20 scenarios were then randomly allocated into a pre-and post-version of the test and were matched to include the same number of items relating to social performance and social interaction. Each of the two versions of the test included five items relating to performance in a social context where participants were asked to imagine that they were being observed and judged by others, items included speaking in public and giving personal opinions. The other five items required participants to imagine themselves in social situations where they were interacting with others; items included meeting new people and being assertive. The testing scenarios ended

ambiguously meaning that the participants were required to make their own interpretation of the situation.

Administration.

There were two phases to the testing phase. Firstly, participants were presented with the ambiguous social scenarios. After all of the scenarios had been presented, the participants were presented with the recognition phase of the test.

Presentation of the items.

Participants were initially told that they were going to be presented with 10 short descriptions of situations which they would need to read. They were informed that afterwards they would be asked about the situations but that this would not be a test of their memory. Following these instructions, the participants completed an imagery exercise to help them with the imagery process. The participants were then shown the title of a situation followed by a four line description of the situation and were asked to create a picture of themselves in the situation. After each one, participants rated how pleasant they found the scenarios on a scale of 1 to 9 (*1 = Very unpleasant, 9 = Very pleasant*) and how vividly they had imagined themselves in the scenario on a scale of 1 to 5 (*1 = Not at all strong, 5 = Very strong*). A comprehension question was then presented to ensure that the participants had read and understood the situation. Below is a sample scenario from phase one of the recognition scenarios:

Title: End of term prom

The end of term is coming up and your school decides to have a prom.

Your teacher asks the class to come up with ideas for the prom.

You have an idea and decide to share it with the class.

When you give your idea people stop talking and turn to look at you.

Comprehension question: Did you share your idea? (Yes or No)

Feedback: Yes "Correct" and No "Incorrect"

Recognition test.

After all 10 situations had been presented the participants entered the recognition phase of the test. At this point, participants were shown the title of a situation followed by four sentences. Two of the sentences were target sentences and represented a positive and negative interpretation of the scenario. The other two sentences were foils and conveyed a negative and neutral interpretation of the scenario, but included information that was not included in the original scenario. Participants were then required to rate the similarity of each of the four sentences to those presented in the original scenario on a scale of 1- 4 (1 = *Least similar*, 4 = *Most similar*). The sentences were presented in a random order for each item to control for practice effects. Below are the recognition statements for the "End of term prom" scenario presented above:

Title: End of term prom

(a) Everybody looks at you because they think your idea is good (positive target)

(b) Everybody looks at you because they think that your idea is not very exciting (negative foil)

(c) Everybody looks at you and you notice how happy they all look (positive foil)

(d) Everybody looks at you and you notice how bored they all look (negative foil)

The data was scored by calculating a mean score at pre-CBM-I assessment and a mean score as post-CBM-I assessment for each participant. Scores were generated by subtracting the mean similarity rating for the negative targets from the mean similarity ratings for the positive target. Interpretation bias scores could therefore

range from −3 to +3, with a negative score indicating a negative bias and a positive score indicating a positive bias. The greater the score was from zero, the greater the degree of bias (Turner et al., 2011).

2.5. Participant Feedback

As the application of CBM-I for adolescents with social phobia is in the early stages of testing, participant and parent feedback was seen an essential part of assessing the efficacy and clinical applicability of the intervention. In order to investigate the final research question, regarding the participants' views of the CBM-I programme and its impact upon their social phobia symptoms, the PAQ was administered (see Appendix G).

2.5.1. Participant Acceptability Questionnaire (PAQ).

The PAQ was administered post-CBM-I and was returned to the principle researcher in a sealed envelope to allow for confidentiality and to control for possible response biases, such as wanting to please the researcher (Cooke & Campbell, 1979). The PAQ was developed in line with other measures previously used in CBM research (e.g., Steel et al., 2010) and included questions on burden, beliefs about computerised intervention techniques, youth comprehension of the task and use of imagery. Each of the questions required participants to rate their response on a VAS with numerical anchors ranging from 0 (*very poor/hard/unacceptable*) to 10 (very *much/easy/acceptable*). In addition, there was a space for more detailed qualitative comments and thoughts regarding the intervention and its applicability to be recorded. Spontaneous comments throughout the study were also recorded and added to the qualitative material collected from the PAQ.

2.5.2. Parent questionnaire.

Parents were also asked for their opinions and for any observations made whilst their child was completing the CBM-I programme (see Appendix H). Questions within the end of research parent questionnaire included how much they had to encourage their child to complete the training, how challenging it was to fit the training into their daily lives, and whether they had noticed any changes with regards to their child's social interactions since the beginning of the programme. They too were given the opportunity to make any further qualitative comments and these were added to any spontaneous comments made throughout the research process.

2.6. Experimental Manipulation: CBM – I Training Materials

2.6.1. CBM-I Paradigm.

To modify interpretation biases, participants were given daily CBM-I training for seven consecutive days during the training phase. CBM-I training is a text-based computerised task which attempts to systematically train individuals to interpret emotionally ambiguous information in a positive way. A modified version of the original CBM paradigm (Mathews & Mackintosh, 2000) was used. This paradigm was selected as it had been widely tested and used in CBM research (Hallion & Ruscio, 2011).

2.6.1.1. Development of the scenarios.

The training paradigm included 50 new adolescent scenarios relating to peer and romantic relationships and education and recreational attainments. These were developed by Lothmann et al. (2011) and used within their published research study. The 50 adolescent appropriate scenarios were combined with an additional 160 training scenarios which were based on the original adult scenarios from Hoppitt et al.

(in press). These were adapted by the principle researcher to be relevant to an adolescent population and were then reviewed by a CAMHS specialist and adolescent panel (see Section 2.4.3.1). A sample of the scenarios is presented in Appendix I.

2.6.1.2. Number of scenarios.

To date, there have been no published studies assessing the optimal number of scenarios to be administered daily in CBM-I training. A total of 30 daily scenarios was therefore decided upon based on protocols from previous research studies with children and adolescents (e.g., Vassilopoulos, Banerjee, & Prantzalou, 2009). It was felt developmentally appropriate to reduce the number of daily scenarios used in CBM-I studies designed for adult populations. It was hoped that fewer daily scenarios would reduce the risk of causing fatigue and overloading the participants. In addition, the NHS ethics board reviewing the study deemed a total of 30 scenarios per day as the maximum number ethically viable for participants of this age.

2.6.2. Administration.

The CBM-I sessions were delivered at home via an online computer programme ran on the Cambridge Brain Sciences website. This is an internet based platform for running customised cognitive trials which have been programmed in Adobe Flex (Hampshire, Highfield, Parking, & Owen, 2012). The bespoke online programme enhanced the accessibility of the intervention as participants could complete the training tasks in their own homes at a time which fitted in with their daily schedules (Beard, 2011).

Each daily training session consisted of 30 scenarios, presented in blocks of 10 with optional rest periods. The first training session had an additional two practice trials presented prior to the 30 training items. The scenarios were all four lines in length, and were presented one sentence at a time until the full scenario was on the

screen. The presentation of each line was controlled by the participant pressing the downward arrow key on their computer keypad. This meant that each participant was able to read the scenario at their own pace.

The scenarios were designed to be emotionally ambiguous until the last word which was presented as a word fragment. Participants were required to complete the word fragment by typing in the first missing letter. This resolved the ambiguity of the situation in a positive way meaning that a positive interpretation had been forced. Once the participants had provided their answer, the final word was presented in full. Participants were then presented with a comprehension question which they were required to answer either *'yes'* or *'no'* to. The purpose of this question was to reinforce the emotional meaning of the scenario and to ensure that they had understood and had interpreted the scenario in a positive way. Participants were given immediate feedback on their answer to the comprehension question (i.e., *'correct'* or *'incorrect').* The participants were then directed to move onto the next scenario. The programme recorded the participant's responses and reaction times to each question.

An example of one of the training scenarios is:

'*It is your first week at college and you are in a room with lots of new starters. You are finding it difficult being with so many new people at once and wonder how everyone else is finding it. You look around and see somebody from your old school. You decide to go and sit with them and when they see you coming over they are...*' This was followed by the word fragment *'pl-ased'* (pleased). The comprehension question following this scenario was: '*Was this person also pleased to see someone*

they knew from school?' The correct answer was *'yes'*. Immediate feedback was then given to the participant about the accuracy of the response i.e., *'correct'*.

2.7. Imagery Instructions

Imagery has been found to be an important component in increasing the effectiveness of CBM-I training (Holmes, Mathews, Dalgleish, & Mackintosh, 2006). Holmes et al. (2006) recommended a practice task prior to CBM-I training as a way of increasing participant awareness of using mental imagery. In light of this, participants were required to complete a daily imagery task before they engaged in the CBM-I training. Participants spent time with the researcher on their first attempt of completing the imagery task to ensure that they had understood the instructions and could build an image in their mind. The imagery tasks were modified and adapted from the original task presented in the research conducted by Holmes et al. (2006). Each task required participants to listen to descriptions of two age appropriate situations and rate their ability to form images of the situations in their minds. The two situations were presented in both written and verbal format. Participants were required to rate how clear the image was in their heads using a 10-point Likert scale from 1 to 9 (1 = *I cannot image it*, 9 = *I can see it as if I were there*). These ratings were recorded and used as a subjective measure of their imagination skills. One of the situations involved imagining returning home after school and the other involved imagining that they were cutting a lemon (see Appendix J).

2.8. Ethical Considerations

Prior to the research commencing, approval was sought from the University of East Anglia's Research Enterprise and Engagement department to ensure that the research project had the appropriate indemnity insurance. Following this, ethical

approval was obtained from the North Wales Research Ethics Committee (see Appendix K). The study was then reviewed and approved by the Norfolk and Suffolk Research and Development committee (see Appendix L).

2.8.1. Consent.

If the adolescents indicated an interest in taking part in the research, they, and their parent if under 16 years old, were asked to sign an initial consent form to agree for their details to be passed from CAMHS to the principle researcher. At this stage, participants were given an age appropriate participant information sheet (see Appendix M and N). Parents were also given a parental information sheet (see Appendix O). Care was taken to ensure that potential participants were aware that their consent was voluntary and that they were not obliged to participate in the research. Potential participants were informed that deciding not to participate would not affect their routine clinical care. This was detailed in the participant information sheet along with other details about what the study would entail. Written consent was obtained from either, the parent (see Appendix P) or the adolescent if they were over 16 years old (see Appendix Q). Adolescents under the age of 16 years old were asked to give their assent if they were willing to participate by signing an assent form (see Appendix R). Consent was only given after the potential participant and their parent, if appropriate, had been in receipt of the participant information sheet for at least 72 hours. Participants were given the opportunity to ask questions face to face or via email prior to consent being given.

Prior to each interaction with the CBM-I materials online, participants were asked to confirm that they were happy with the previous consent given. This was done using an "*I agree*" or "*I do not agree*" consent tick box. If participants no longer

consented, they were unable to move on and were asked to contact the researcher via email.

2.8.2. Confidentiality.

Confidentiality was maintained throughout the study, with only those directly involved in the research having access to data as outlined by the Data Protection Act (2008). Data held in electronic format were put into a coded form and recorded using a unique participant information number (PIN). The PIN was only known by the researcher and was stored separately from the data. Data in paper form were anonymised, sealed, and stored in a locked cabinet. The anonymised data were inputted onto a statistical programme and saved on a password protected memory stick. Following completion of the study, data will be kept in conjunction with the University of East Anglia (UEA) protocol.

2.8.3. Intervention.

Treatment was not withheld from participants as they were on a waiting list at the time of recruitment. As the research involved being randomised to a variable baseline, participants were informed that they could be involved in the study for up to six weeks. Due to the length of the study, participants were informed that should they be offered routine clinical care whilst they were still participating in the research, they would be free to withdraw from the study. The decision as to whether the participant continued with the research or not was ultimately decided by the clinician involved in their care for ethical reasons. With permission, the participants' GPs were informed that they were taking part in the research (see Appendix S).

2.8.4. Distress and withdrawal.

A protocol was developed whereby in the unlikely event that the participants were to experience distress during the study, the study would stop and the team leader at CAMHS would be informed. Furthermore, as outlined in the participant information sheets, if the participant wished to terminate the procedure they were free to do so for whatever reason. Participants were informed via the information sheet that they could withdraw their data from the study at any point up until it had been analysed without penalty. All participants were given a written debrief on completion of the study (see Appendix T).

2.8.5. Adolescent participants.

The participant information sheets were written to ensure that they were suitable for those aged 13 years or above. There were two versions of the participant information sheet, one for those aged 13 to 15 years old and one for those aged 16 to 17 years old. The maximum reading age for all of the written material, including the CBM-I training materials, was 12 years old. Due to the age of the sample, care was taken when starting participants in the programme to ensure that it did not clash with the beginning of a new school term or examinations. Participants and their parent(s) were consulted at the first meeting with the principle researcher to find the best time for the programme to start in line with the requirements of the study.

2.8.6. Additional ethical considerations.

As the principle researcher was visiting participant homes alone, NSFT lone worker policy was adhered to. The principle researcher's supervisor or a named research associate acted as the lone worker 'Buddy'. In addition, the principle

researcher kept a written record of their expected movements for the day on their outlook calendar which could be accessed by named NSFT administrators.

2.9. Procedure

After ethical approval was granted, the principle researcher visited CAMHS team meetings in NSFT to explain the research, the recruitment procedure and answer any questions. Clinicians from CAMHS were asked to introduce the study and pass on a participant information sheet to potential participants and their parents (if under 16 years old) during their generic initial assessment. At this stage, potential participants were asked by the CAMHS practitioner if they would like to learn more about the research and were given an information sheet if they were interested. Those who expressed interest were asked to fill out an initial consent form giving permission to be contacted by the researcher. This form was then passed onto the researcher by the team leader in charge of recruitment at the site. The principle researcher then made telephone contact to arrange a suitable time to see the potential participant at their home or at the UEA.

In the initial meeting with the researcher, the adolescents were again given a participant information sheet and given the opportunity to ask any questions. It was made clear to the adolescents at this stage that they may not be suitable for participation in the main study and that this could only be checked by completing a series of questionnaires following consent to take part in the study. This was done sensitively and the reasons behind this were explained in full as to not cause upset to the adolescent. If consent, or parental consent and adolescent assent were given, participants entered stage one of the research. This entailed completing the SAS-A, DAWBA, and BSI to assess whether they met the inclusion criteria. If the

adolescents were eligible, stage two of the research then began and the participants were randomised, to a 1, 2, or 3 week baseline.

During the baseline period, participants completed the SAS-A and VASs daily. A daily text message or email (dependent on participant preference) was sent to remind them to do so. When the baseline period was complete, the researcher then visited participants to demonstrate how to use the internet CBM-I training programme, introduce the imagery tasks and complete the pre-CBM-I assessment battery (SAS-A, VASs, and BSI). The participants then began the training phase of the research. Participants received a daily text message and/or email to remind them to complete the training. Participants were presented with the daily imagination task prior to the CBM-I training sessions. For seven consecutive days, the participants then completed the CBM-I training sessions. Following each training session, participants completed the SAS-A and the VASs online. Adherence to the CBM-I intervention was checked via examining the internet programme database to ensure that participants had completed the training as instructed. If a participant had not completed the entire seven sessions, they were asked to complete the missed training day(s).

After the seven training sessions, the participant then completed the post-treatment assessment measures (SAS-A, VASs and BSI). Participants completed the same outcome measures 2 weeks after completing the CBM-I. In addition to this, participants and their parents were asked to complete the PAQ and parent questionnaire either online or in a paper version and return it to the principle researcher. The researcher then debriefed the participant and gave them a £10 Amazon gift voucher. The principle researcher then informed CAMHS that the adolescent had completed the research.

Chapter 3: Results

3.1. Chapter Introduction

This chapter outlines the results from the CBM-I training in line with the study's research questions. A total of eight adolescent participants completed the seven days of CBM-I training. Initially, participants' data are analysed to ensure that they had been compliant with the CBM-I instructions. Next, each individual's self-reported social phobia scores across the time points (assessment, baseline, pre-training, training, post-training, and follow-up) are visually inspected to identify those who had responded to the CBM-I training and non-responders. Following this, the outcome measures are assessed for reliable and clinically significant change at pre-training, post-training, and follow-up. Changes in group means are then analysed to identify group changes across the outcome measures at the time points. Finally, quantitative and qualitative feedback regarding the programme and the observed outcomes are reported from both the adolescents' and their parent/guardians' perspective.

3.2. Data Preparation

As outlined in the methodology (see Section 2.9.), participants who missed a day of CBM-I training were asked to complete it at the end of the training period (Participants 2 and 4). In addition, two participants (Participants 3 and 5) missed one day of their baseline measures as a result of either CBM-I programme failure, or levels of homework. In line with Arnold and Kronmal (2002), the missing baseline data were generated using mean substitution method where an average of their baseline measures were taken and inputted for the missing data point.

3.3. Compliance Monitoring

The data generated from the training sessions were analysed for accuracy in order to ensure that all of the participants were following the CBM-I training protocol. The outputs from the training sessions were assessed for the number of word fragments completed correctly and the number of correct responses given to the comprehension questions (Bowler et al., 2012). All participants' scores fell within two standard deviations of the mean accuracy count on the number of correct word fragments completed during the training (see Table 3.1). Participants completed between 89% - 99% of the word fragments correctly. All but one participant's scores fell within two standard deviations of the mean accuracy count on the comprehension question inputs during training. The percentage of correctly answered comprehension questions ranged from 76% - 99%. The decision was made to keep Participant 3 in the study as her accuracy increased as time went on. Taken together, compliance was good, illustrating that all participants engaged in the programme correctly to an appropriate level.

Table 3.1.

CBM-I Compliance Data

Participant	Question input accuracy (Number correct)	Word fragment accuracy (Number correct)	% correct		Within 2 *SD* of mean	
			Question input	Word fragment	Question input	Word fragment
1	195.00	208.00	92.86	99.05	Yes	Yes
2	186.00	187.00	88.57	89.04	Yes	Yes
3	160.00	196.00	76.19	93.00	No	Yes
4	208.00	199.00	99.05	94.76	Yes	Yes
5	202.00	208.00	96.19	90.04	Yes	Yes
6	201.00	199.00	95.71	94.76	Yes	Yes
7	199.00	199.00	94.76	94.76	Yes	Yes
8	195.00	190.00	92.85	90.47	Yes	Yes
Group *M*	193.25	198.25				
Group *SD*	14.88	7.47				

3.4. Visual Inspection of Data

In line with Barlow and Hersen's (1984) recommendations, graphical plots were used to visually analyse the data and identify the trend of change for the daily measures (SAS-A and VASs). Two graphical plots for each participant are presented indicating their level of social phobia symptoms as measured by the SAS-A sub-scales and VASs across the baseline, intervention, and follow-up time points. Based on the pattern of change in mean, level and slope from the baseline to intervention phase, on the SAS-A only, each participant was classified as either a responder or non-responder. In order to be classified as a responder, participants had to demonstrate a reduction in mean and level on the SAS-A following the completion of the CBM-I training. Level of change in symptoms on the SAS-A, had to remain

constant and indicative of a declining slope throughout the intervention to be considered as evidence of responding to the CBM-I (Kazdin, 2010). A non-responder refers to a participant whose pattern of scores on the SAS-A had not improved in mean, trend and slope following the completion of the CBM-I training. The VASs were used to add further weight to this conclusion but were not used to determine whether somebody was classified as a responder or a non-responder.

The stability of the baseline phase for each participant was calculated using the Kendall's *tau* test (Kendall, 1970). A significant result on Kendall's *tau* indicates a statistically significant relationship between time and scores, meaning that there was a change in the levels of symptoms prior to the intervention being introduced (see Appendix U for all Kendall's *tau* statistical outputs).

3.4.1. Visual inspection of data: Participant 1 (Non-responder).

The trend throughout the baseline is considered stable on both the SAS-A (*tau* = -.335, $p \geq .05$) and VASs. There is a reduction in the overall mean score on the SAS-A from 58.5 during the baseline period to 55.5 during the intervention phase. There was no change in the slope of the data from the end of the baseline to the end of the CBM-I training (see Figure 3.1). There is minimal positive change in slope and level for the VASs from the baseline to intervention phase (see Figure 3.2.). Post-CBM-I and follow-up data points are relatively stable on both the SAS-A and VASs. Participant 1 is therefore cautiously classified as a non-responder.

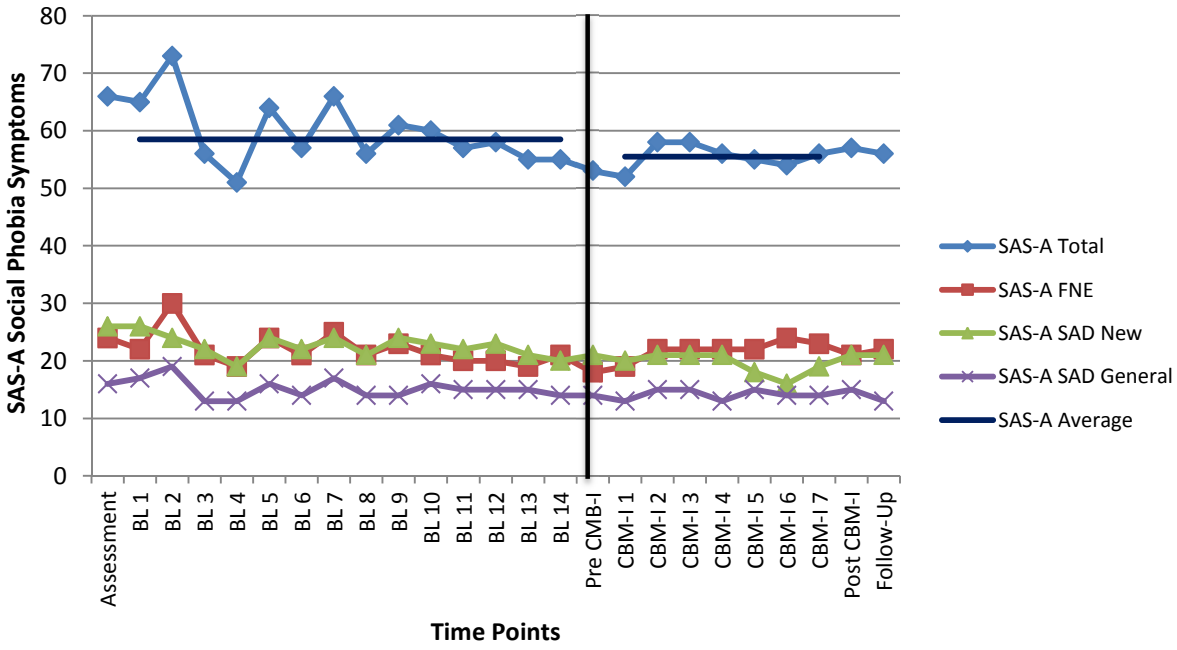

Figure 3.1. Social phobia scores (SAS-A) across time points for Participant 1 (Non-responder)

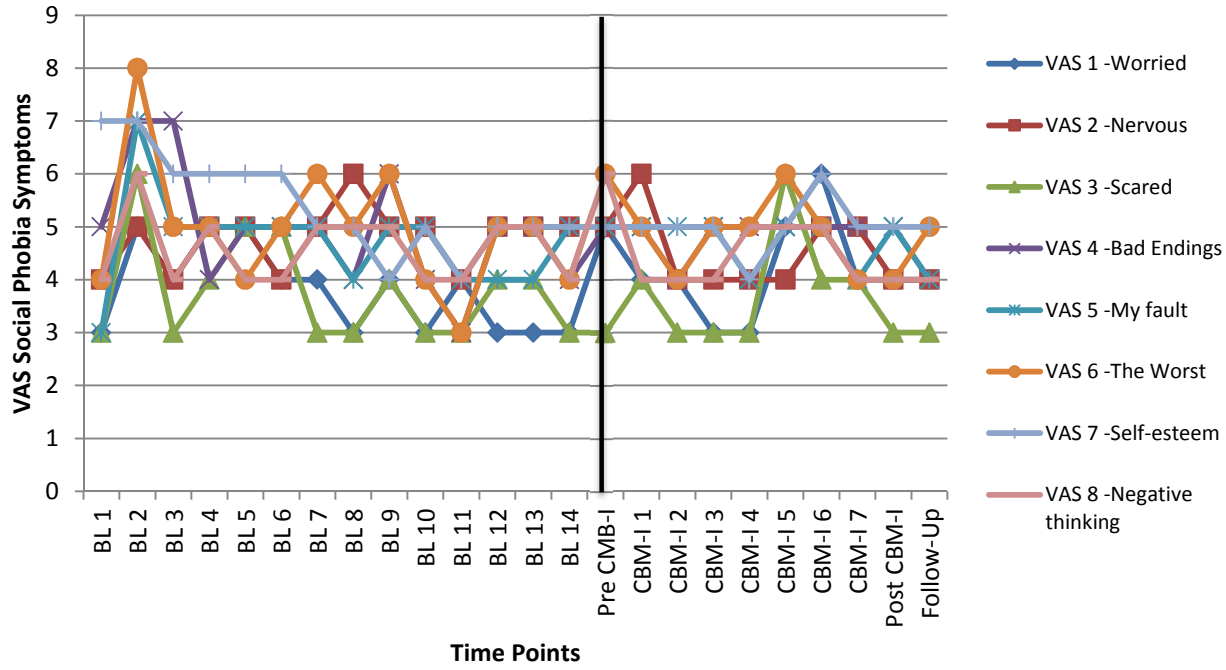

Figure 3.2. Social phobia scores (VASs) across time points for Participant 1 (Non-responder)

3.4.2. Visual inspection of data: Participant 2 (Non-responder).

The trend throughout the baseline is considered stable on both the SAS-A (*tau* = .916, $p \geq .05$) and VASs. There is a small increase in the level, and mean SAS-A score from the baseline to the intervention phase (see Figure 3.3.). This therefore indicates that Participant 2 did not respond to the CBM-I in the hypothesised direction. Interestingly, there is a visible reduction from CBM-I session seven to post CBM-I session, this reduction was not however sustained at follow-up. Participant 2 is therefore classified as a non-responder. Although there were changes on several of the VASs throughout the intervention phase, no conclusions can be drawn from these due to the unpredictable nature of the changes (see Figure 3.4.).

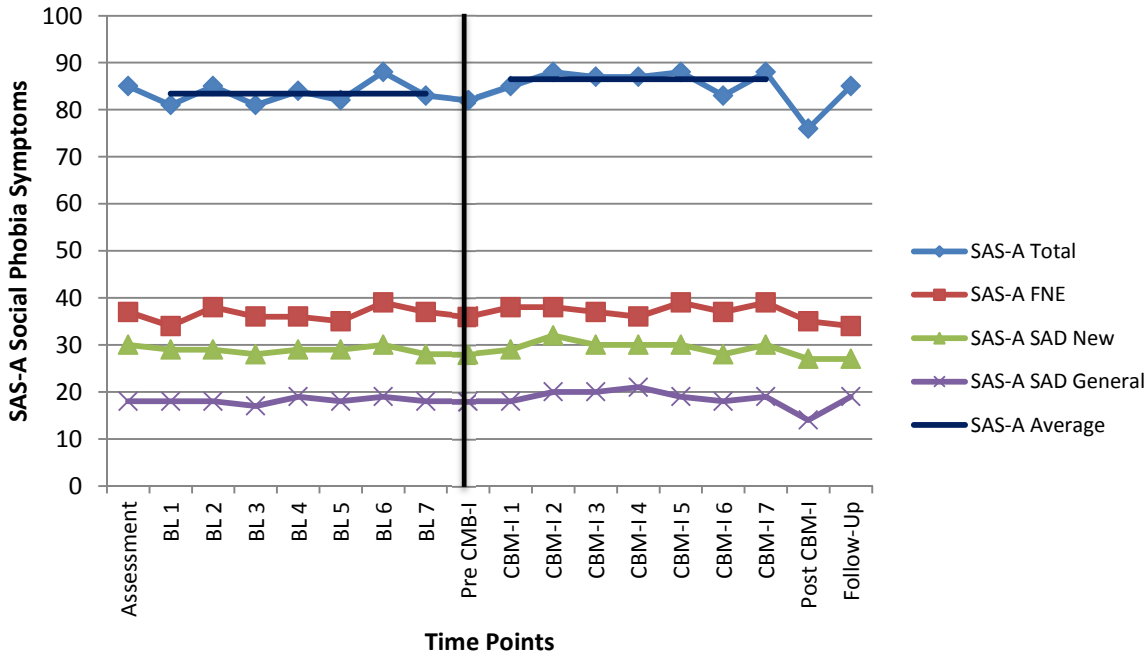

Figure 3.3. Social phobia scores (SAS-A) across time points for Participant 2 (Non-responder)

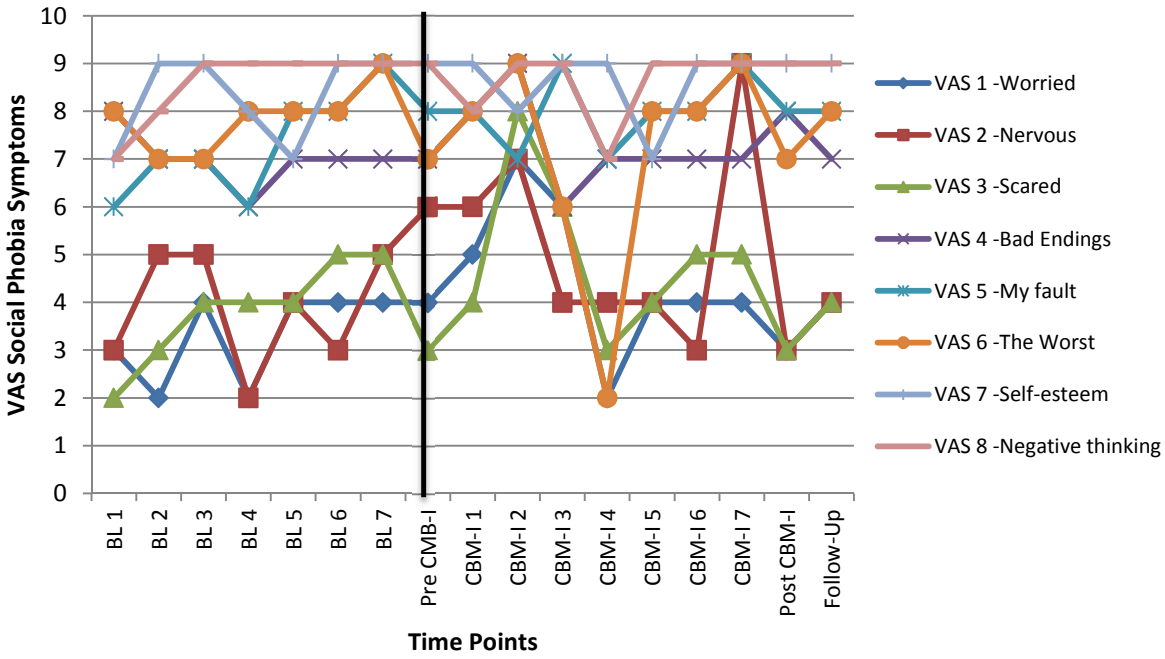

Figure 3.4. Social phobia scores (VASs) across time points for Participant 2 (Non-responder)

3.4.3. Visual inspection of data: Participant 3 (Responder).

Visual and statistical inspection indicate that the SAS-A is stable throughout the baseline period (*tau* = -.038, $p \geq .05$). All but two VASs at baseline (VAS 4 and 7) show variability meaning that Participant 3's scores decreased on seven VASs during the baseline period. Visual inspection does not indicate large variability but it is important that this is considered when drawing further conclusions. Upon introduction of the CBM-I training, there was a decrease in the level of SAS-A scores. During the baseline phase, Participant 3's mean total score was 82.1, which reduced to 74.1 during the intervention phase. There is also a clear systematic trend with SAS-A scores reducing over time (see Figure 3.5.). With regards to the VASs, visual inspection also indicates an overall change in level and slope during the intervention phase compared to the baseline phase, even with consideration of the lack of stability in the baseline phase. Taking the mean scores, levels and slopes into consideration, Participant 3 is considered a responder.

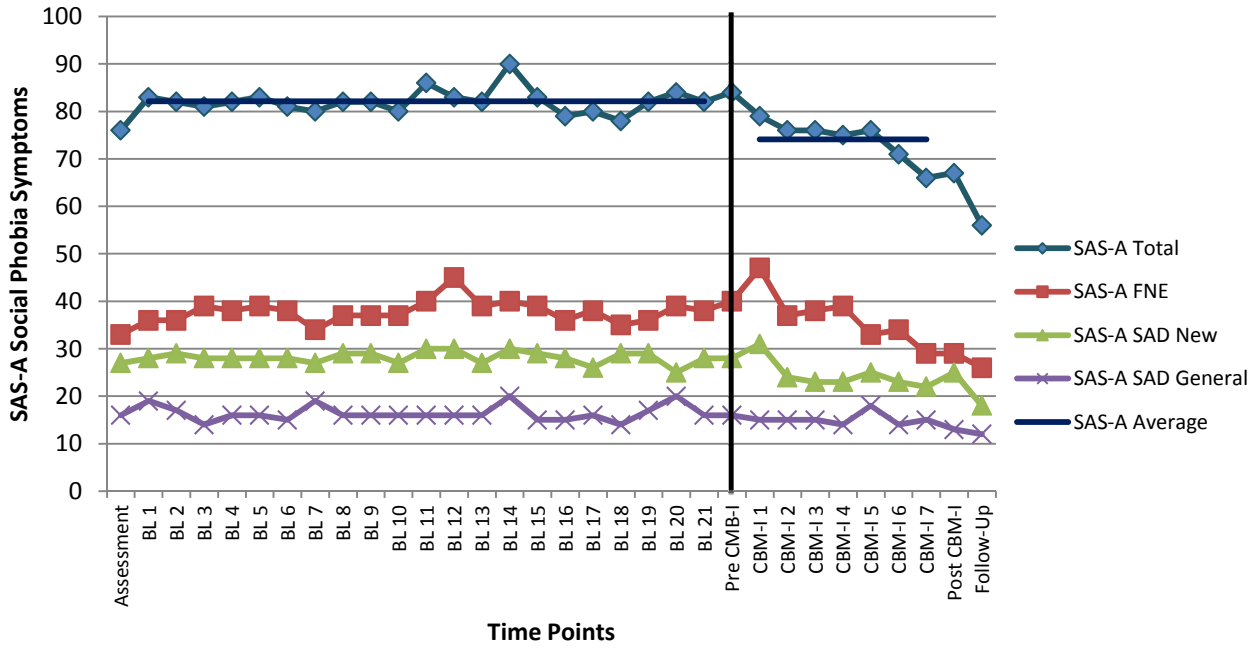

Figure 3.5. Social phobia scores (SAS-A) across time points for Participant 3 (Responder)

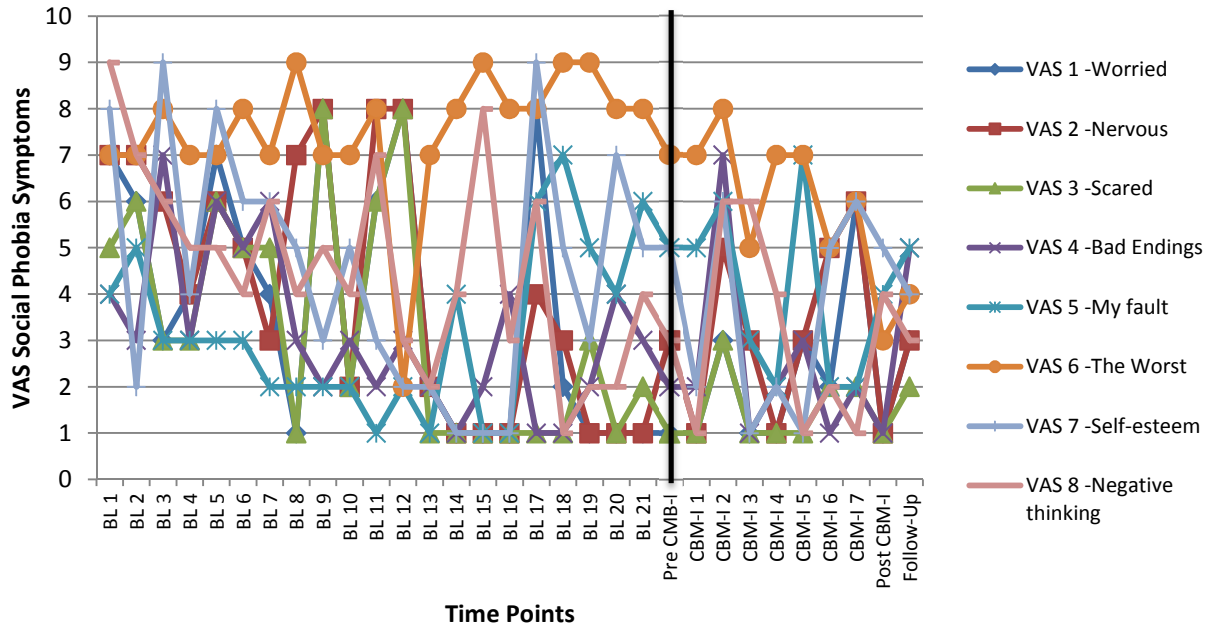

Figure 3.6. Social phobia scores (VASs) across time points for Participant 3 (Responder)

3.4.4. Visual inspection of data: Participant 4 (Responder).

The stability of the baseline phase for the SAS-A (*tau* = .686, $p < .05$) and the VASs are unstable based on visual and statistical inspection. However, the baseline scores do stabilise (i.e., no trend) during the second week which according to Kazdin (2010) is the appropriate time to introduce the intervention. There is a steep change in level during the CBM-I intervention phase paired with a systematic trend with scores improving over time. The total mean score for the SAS-A decreases from 87.2 during the baseline phase to 64.5 during the intervention phase. This improvement continues to the post-CBM-I and the follow-up time points indicating that the positive changes have remained stable (see Figure 3.7.). Similar improvements in level and trend can be seen in all nine of the VASs. Participant 4 is therefore classified as a responder.

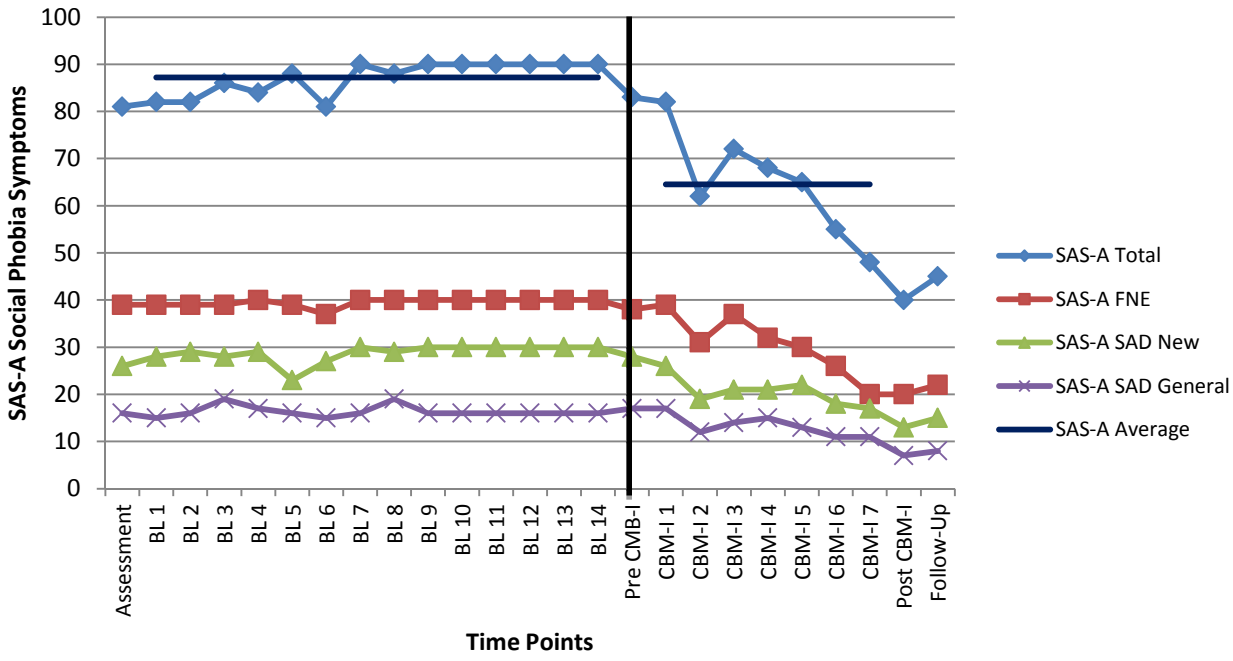

Figure 3.7. Social phobia scores (SAS-A) across time points for Participant 4 (Responder)

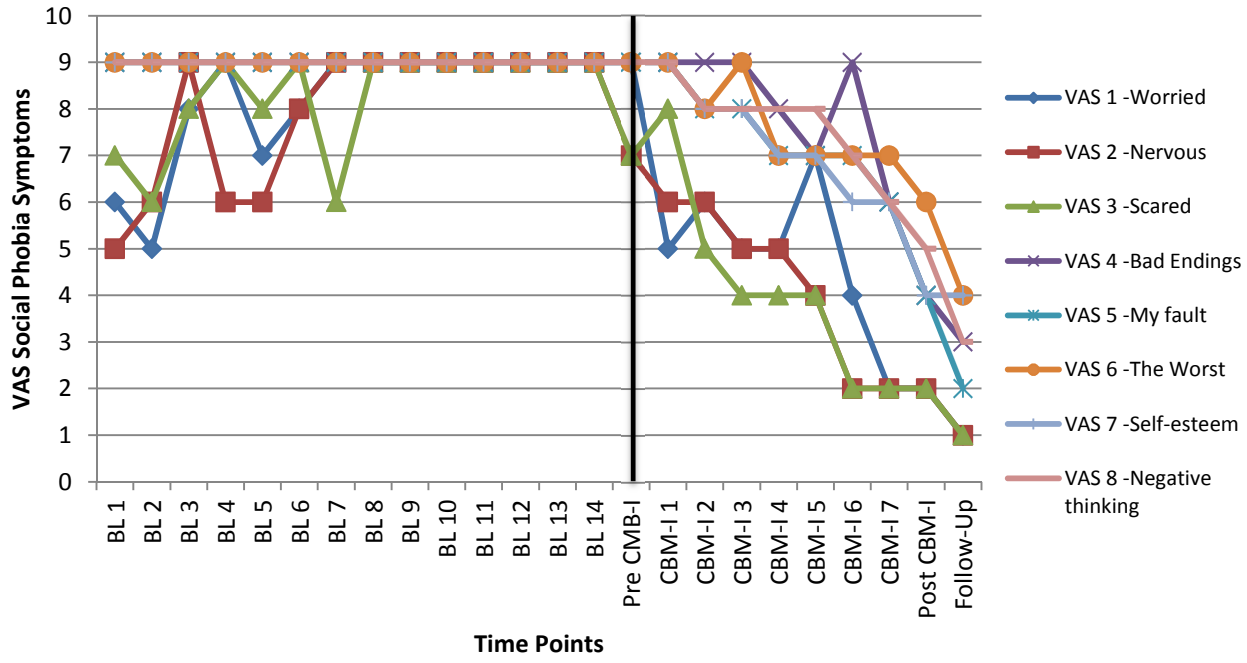

Figure 3.8. Social phobia scores (VASs) across time points for Participant 4 (Responder)

3.4.5. Visual inspection of data: Participant 5 (Responder).

Visual and statistical inspection indicate that the baseline for the SAS-A is unstable (*tau* = -.462, $p < .05$). Despite this, the baseline continues to satisfy criteria for multiple baseline single-case series design as the scores stabilise during the final six baseline measures (Kazdin, 2010). With the exception of VAS 2, the VASs are stable. The mean SAS-A total score reduces from 72.5 during the baseline phase to 67.7 during the intervention phase. In addition, there is a visible change in level and a systematic trend which indicates improvement overtime. These improvements continue to the post-CBM-I and follow-up time points with the follow-up SAS-A total score (63) representing Participant 5's lowest score during the study (see Figure 3.9.). Smaller improvements are seen on the VASs but there is a visible change in trend with scores reducing from CBM-I session 5 (see Figure 3.10.). Participant 5 is therefore considered a responder.

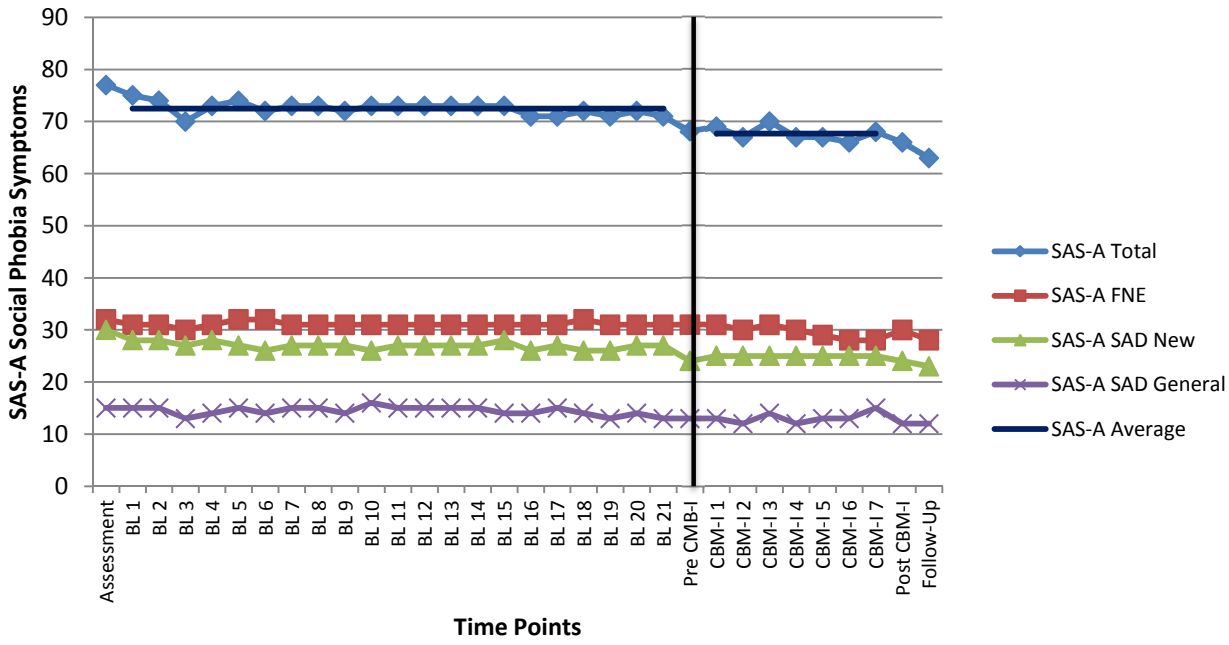

Figure 3.9. Social phobia scores (SAS-A) across time points for Participant 5 (Responder)

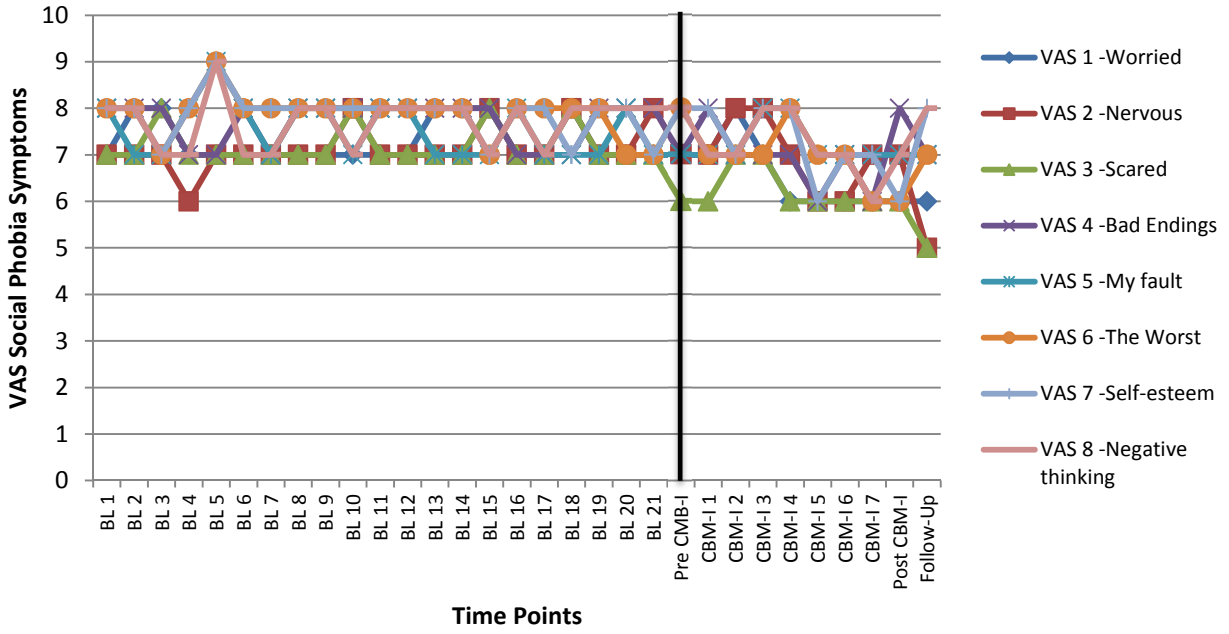

Figure 3.10. Social phobia scores (VASs) across time points for Participant 5 (Responder)

3.4.6. Visual inspection of data: Participant 6 (Non-responder).

Visual and statistical inspection indicate that the SAS-A scores are stable throughout the baseline period (*tau* = -.271, $p \geq .05$). Seven of the nine VASs are also considered stable. Despite VAS 4 and VAS 6 being considered statistically unstable, they increase during the baseline, meaning that they are of no concern as the participant is showing deterioration rather than improvement. There are minimal changes in mean scores, trend, and level during the intervention phase on the SAS-A. The mean SAS-A total scores increased from 63.4 during the baseline phase to 63.6 during the intervention phase. There were also minimal changes on the VAS from the baseline to the end of the CBM-I phase (see Figure 3.12.). Participant 6 is therefore considered a non-responder (see Figures 3.11.).

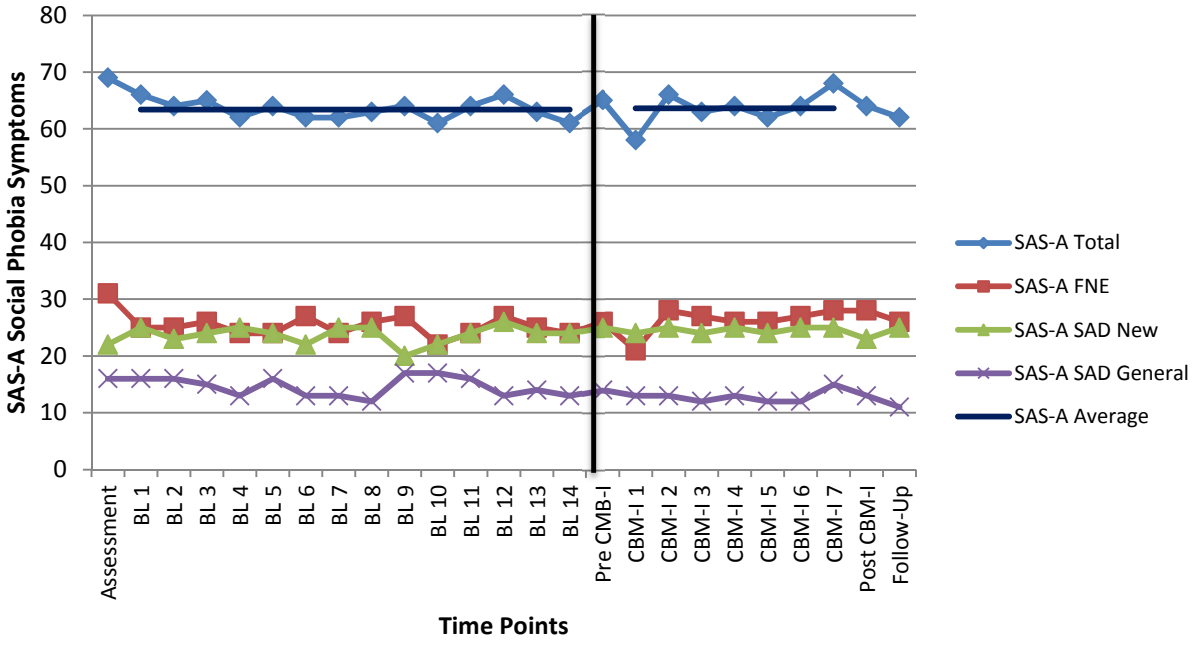

Figure 3.11. Social phobia scores (SAS-A) across time points for Participant 6 (Non-responder)

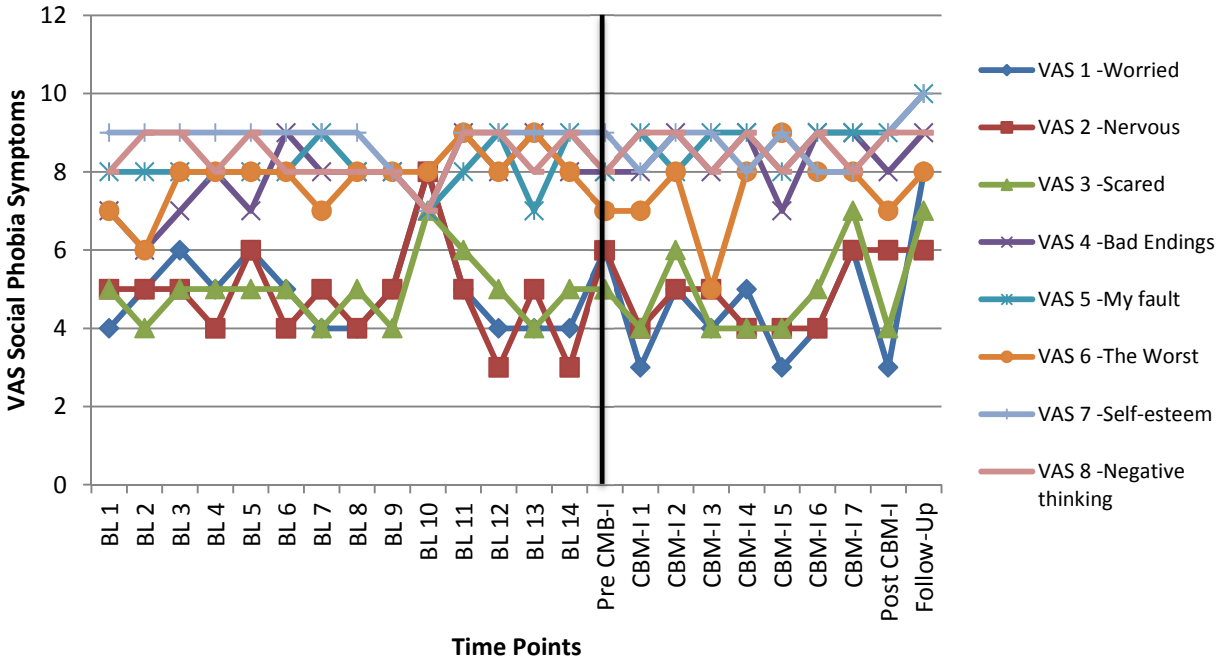

Figure 3.12. Social phobia scores (VASs) across time points for Participant 6 (Non-responder)

3.4.7. Visual inspection of data: Participant 7 (Responder).

Visual and statistical inspection of the SAS-A scores reveal an unstable baseline with evidence of a systematic trend where scores on the SAS-S reduce over time (*tau* = -.358, $p < .05$). Despite this, the baseline scores stabilise (increase in line with week one baseline measures) during the final four measurements before the intervention was introduced, therefore satisfying single-case multiple-baseline criteria (Kazdin, 2010). All VASs, with the exception of VAS 4, are considered statistically stability. Despite evidence of instability, the total mean score for the SAS-A reduces from 68.1 during the baseline phase to 62.5 during the intervention phase. There is also evidence of a further systematic trend with scores reducing over time during the intervention phase beyond the reduction, which is evident in the middle of the baseline phase (see Figure 3.13.). Although the VASs are more ambiguous, the total scores during the intervention phase for all eight of the VASs are reduced in comparison to the baseline phase, therefore, demonstrating overall improvement (see

Figure 3.14.). Taking all of the relevant evidence into account, Participant 7 is considered a responder.

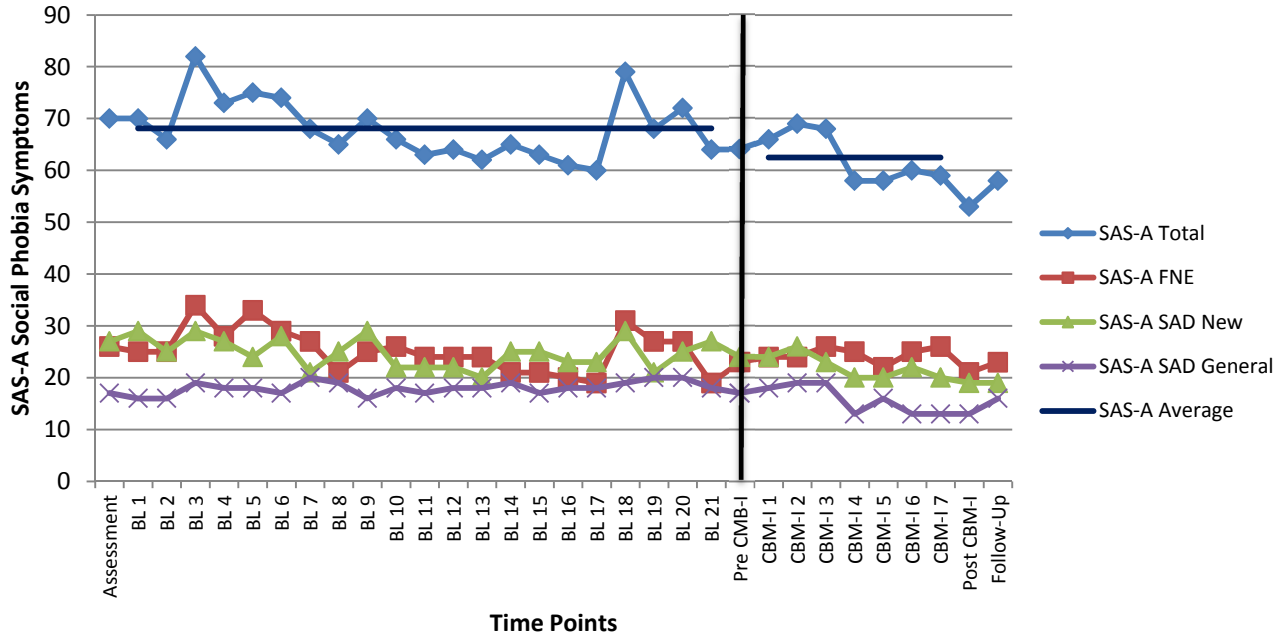

Figure 3.13. Social phobia scores (SAS-A) across time points for Participant 7 (Responder)

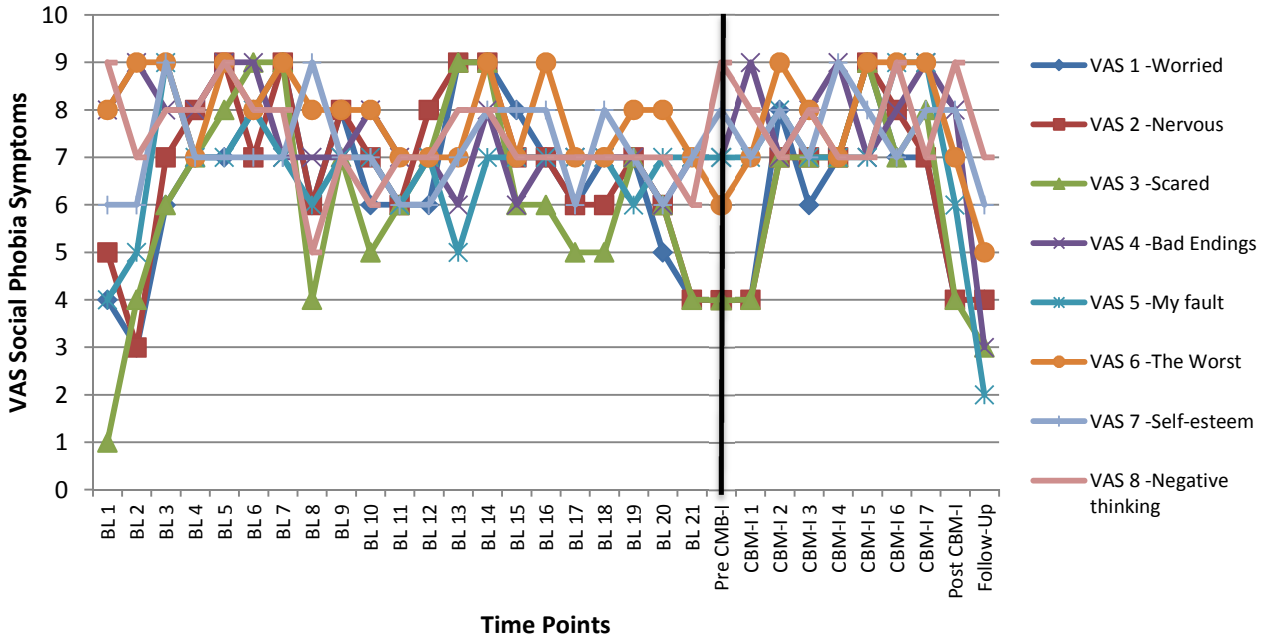

Figure 3.14. Social phobia scores (VASs) across time points for Participant 7 (Responder)

3.4.8. Visual inspection of data: Participant 8 (Non-responder).

Both the SAS-A (*tau* = -.390, $p \leq .05$) and VASs baselines for Participant 8 are considered stable. There is a small increase in the level, trend and total mean SAS-A score from the baseline (*M* = 60.3) to the intervention phase (*M* = 62.7). This therefore indicates that Participant 8 did not respond to the CBM-I in the hypothesised direction (see Figure 3.15). In conjunction with this, there is not a visible change in trend during the intervention phase for the eight VASs (see Figure 3.16.). Participant 8 is therefore considered a non-responder.

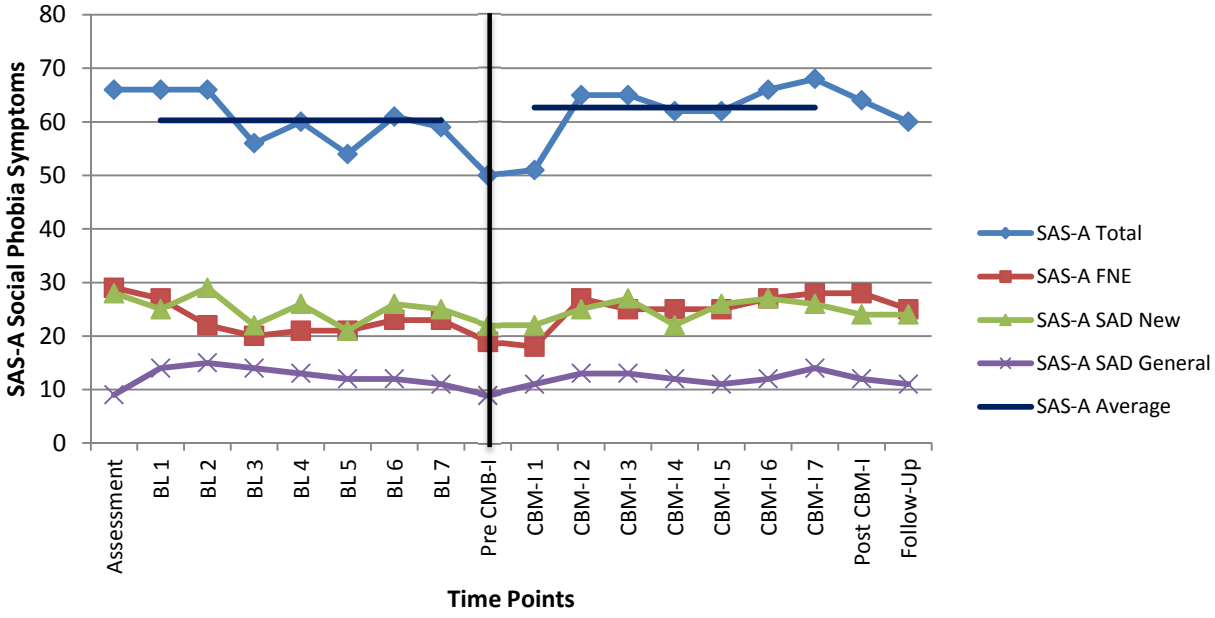

Figure 3.15. Social phobia scores (SAS-A) across time points for Participant 8 (Non-responder)

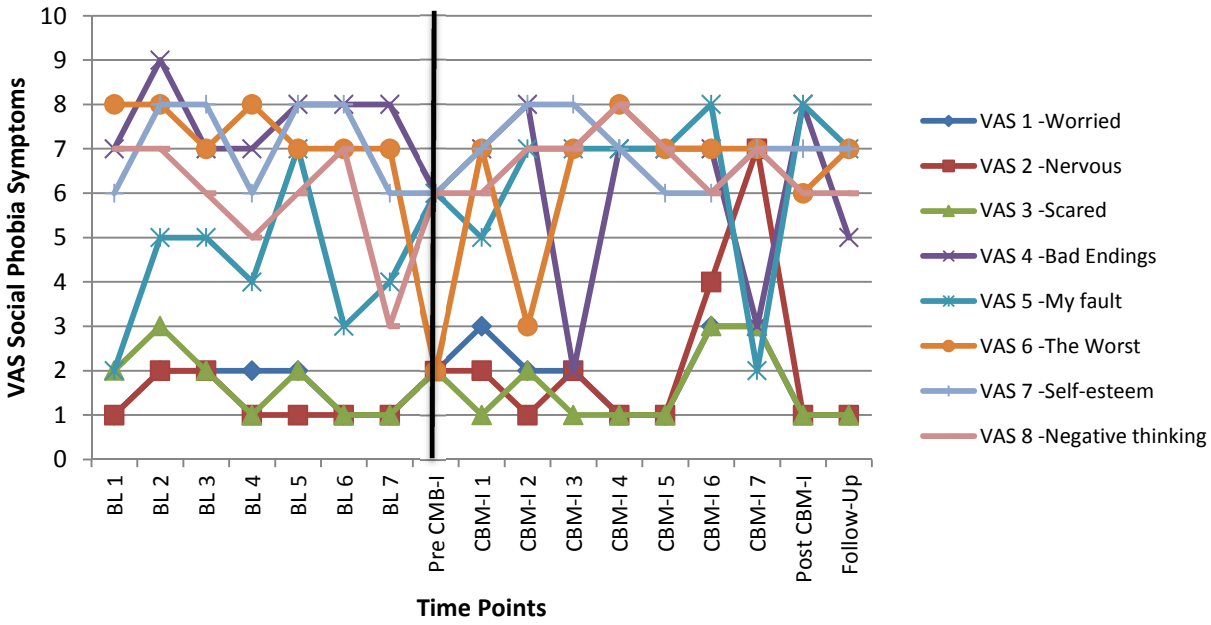

Figure 3.16. Social phobia scores (VASs) across time points for Participant 8 (Non-responder)

3.5. Reliable and Clinically Significant Change

Reliable Change Index (RCI; Jacobson & Truax, 1991) is calculated for the measures assessing social phobia (i.e., SAS-A and the Phobic Anxiety sub-scale on the BSI), and interpretation bias, to assess whether symptom change for each adolescent represents a reliable change between pre-and-post-intervention scores. Pre-and post-intervention scores are analysed to identify whether participant scores have reduced to a level which is considered to be indicative of a non-clinical population (Jacobson, Follette, & Revenstorf, 1984). Evans, Margison, and Barkham (1998) suggested that completing RCI calculations enables any observed changes to be more confidently associated with a real life reduction in symptoms rather than measurement error. In line with the recommendations made by Evans and colleagues, the Jacobson-Traux methodology (Jacobson & Traux, 1991) is used to assess RCI. This method uses the mean and standard deviation of a matched population sample, and the internal consistency coefficient for each of the measures, to calculate reliable

change at a 95% confidence interval. The statistical formula used to calculate RCI for each measure was therefore, 1.96 x SD1 x √ 2 x √ (1-r) (see Table 3.2.).

Table 3.2.

Reliable Change Index Calculations for Each of the Outcome Measures

Outcome Measure	*M* of Matched Population Sample	*SD* of Matched Sample	Reliability Co-efficient (α)	Reliable Change Index
SAS-A Total	51.3	18.6	.94	12.0
SAS-A - FNE	23.6	9.5	.94	6.0
SAS-A – SAD New	18.1	6.4	.87	6.0
SAS-A – SAD General	9.6	4.4	.80	5.0
BSI - PANX	1.22	1.39	.77	1.85
IBI	-1.60	.70	.81	.90

Note. α = reliability co-efficient alpha; BSI = Brief Symptom Inventory; IBI = Interpretation Bias Index; PANX = Phobic Anxiety; SAS-A = Social Anxiety Scale for Adolescents; SAS-A FNE = Social Anxiety Scale for Adolescents Fear of Negative Evaluation sub-scale; SAS-A SAD- New = Social Anxiety Scale for Adolescents Social Avoidance and Distress New sub-scale; SAS-A SAD- General = Social Anxiety Scale for Adolescents Social Avoidance and Distress General sub-scale.

In addition to RCI, Clinically Significant Change (CSC) was calculated using the Jacobson-Taux method (Jacobson & Traux, 1991). According to Evans et al. (1998), CSC assesses whether any change has taken the person from a score typical of a patient with a clinical diagnosis/problem to a score typical of the non-clinical population. Jacobson, Follette, and Revenstorf (1984), identify three criterions for identifying CSC, criterion C was selected for this study based on the recommendations of Jacobson and Truax (1991). The statistical formula used to

calculate CSC was therefore, [*SD* (normative) x *M* (patients)] + [*SD* (patients) x *M* (normative)] / *SD* (normative data) + *SD* (clinical). According to Wise (2004), criterion C assesses whether the participant is statistically more likely to be in the non-clinical than the clinical population at post-test (i.e., the post-test score is statistically more likely to be drawn from the non-clinical than the clinical distribution). Jacobson and Traux (1991) suggest using criterion C when norms are available, and when functional and dysfunctional populations overlap, which is the case in this study. A discussion of the decision to select criterion C can be found in Section 4.4.4. Table 3.3. outlines the data needed to calculate CSC.

Table 3.3.

Clinically Significant Change Calculations for the Social Phobia Measures

Outcome Measure	*M* of Normative Sample	*SD* of Normative Sample	*M* of Clinical Sample	*SD* of Clinical Sample	Criterion C CSC Index
SAS-A Total	43.2	12.8	68.6	13.4	56
SAS-A – FNE	19.7	7.0	28.9	8.6	24
SAS-A – SAD New	13.2	4.2	25.0	2.7	20
SAS-A – SAD General	10.2	3.8	14.7	2.9	13
BSI - PANX	.54	.64	2.7	0.54	1.7

Note. BSI = Brief Symptom Inventory; CSC = Clinically Significant Change; IBI = Interpretation Bias Index; PANX = Phobic Anxiety; SAS-A = Social Anxiety Scale for Adolescents; SAS-A FNE = Social Anxiety Scale for Adolescents Fear of Negative Evaluation sub-scale; SAS-A SAD- New = Social Anxiety Scale for Adolescents Social Avoidance and Distress New sub-scale; SAS-A SAD- General = Social Anxiety Scale for Adolescents Social Avoidance and Distress General sub-scale.

3.5.1. Social phobia measures.

3.5.1.1. *Reliable and clinical change on the SAS-A Total score (La Greca & Lopez, 1998).*

Standardised data from La Greca (1999) were used to calculate RCI and CSC for the SAS-A Total score. La Greca developed norms based on data collected from a clinical sample of adolescents aged 12 – 17 years old with social phobia. The RCI was calculated to be 12 and the CSC was calculated to be 56. Based on the RCI criteria, Participants 3 and 4 were found to have made reliable changes post-intervention. Both participants maintained these levels of change at the follow-up time point. Only Participant 4 was found to have made CSC on the SAS-A Total score post-intervention. Participants 3 and 4 made CSC at the follow-up time period. Overall, only two participants (Participants 2 and 4) were found to have made reliable and CSC at the follow-up period (see Table 3.4).

Table 3.4.

The Number of Participants Who Reached Reliable and Clinically Significant Change at Post-CBM-I and Follow-up on the SAS-A Total Score

Participant	Pre-score	Post-score	Follow-up score	Reliable change - post	Clinical change -	Reliable change – follow-up	Clinical change – follow-up
1	53	57	56	No	No	No	No
2	82	76	80	No	No	No	No
3	84	67	56	Yes	No	Yes	Yes
4	83	40	35	Yes	Yes	Yes	Yes
5	68	66	63	No	No	No	No
6	65	64	62	No	No	No	No
7	64	53	58	No	Yes	No	No
8	50	64	60	No	No	No	No

3.5.1.2. *Reliable and clinical change on the SAS-A Fear of Negative Evaluation (La Greca & Lopez, 1998).*

Using standardised data from La Greca (1999), RCI and CSC were calculated for the SAS-A FNE subscale. The RCI was calculated to be 6 and the CSC index was calculated to be 24. Based on this criteria, only two participants were found to have made reliable changes post-intervention (Participants 3 and 4). Participant 8 made reliable changes in the opposite direction to what was hypothesised, as his SAS-A FNE score increased post-intervention, which was maintained at follow-up. Both Participants 3 and 4 maintain reliable changes at the follow-up time point. Only Participant 4 was found to have made CSC post-intervention and at the follow-up time point (see Table 3.5).

Table 3.5.

The Number of Participants Who Reached Reliable and Clinically Significant Change at Post-CBM-I and Follow-up on the SAS-A FNE

Participant	Pre-score	Post-score	Follow-up score	Reliable change - post	Clinical change -	Reliable change – follow-up	Clinical change – follow-up
1	18	21	22	No	No	No	No
2	36	35	34	No	No	No	No
3	40	29	26	Yes	No	Yes	No
4	38	20	17	Yes	Yes	Yes	Yes
5	31	30	28	No	No	No	No
6	26	28	26	No	No	No	No
7	23	21	23	No	No	No	No
8	19	28	25	Yes*	No	No	No

Note. * = Change in the opposite direction

3.5.1.3. ***Reliable and clinical change on the SAS-A Social Avoidance and Distress -New Events (La Greca & Lopez, 1998).***

Using standardised data from La Greca (1999), RCI and CSC were calculated for the SAS-A SAD New. The RCI was calculated to be 6 and the CSC was calculated to be 20. Based on the RCI criteria, only Participant 4 was considered to have made a reliable change at post-intervention which was maintained at follow-up. Participant 3 made a reliable change at the follow-up time point which was not evident at post-intervention. A total of two participants (Participants 4 and 7) made CSC at post-intervention and these changes were maintained at the follow-up time point. In addition, Participant 3 made CSC at the follow-up time point (see Table 3.6).

Table 3.6.

The Number of Participants Who Reached Reliable and Clinically Significant Change at Post-CBM-I and Follow-up on the SAS-A SAD New Events

Participant	Pre-score	Post-score	Follow-up score	Reliable change - post	Clinical change -	Reliable change – follow-up	Clinical change – follow-up
1	21	21	21	No	No	No	No
2	28	27	27	No	No	No	No
3	28	25	18	No	No	Yes	Yes
4	28	13	12	Yes	Yes	Yes	Yes
5	24	24	23	No	No	No	No
6	25	23	25	No	No	No	No
7	24	19	19	No	Yes	No	Yes
8	22	24	24	No	No	No	No

3.5.1.4. *Reliable and clinical change on the SAS-A Social Avoidance and Distress - General (La Greca & Lopez, 1998).*

Using standardised data from La Greca (1999), RCI and CSC were calculated for the SAS-A SAD General. The RCI was calculated to be 5 and the CSC was calculated to be 13. A total of two participants (Participants 4 and 7) made reliable changes pre-to-post-intervention on this sub-scale; this was only maintained at follow-up for Participant 4. In addition to this, CSC was found in five of the eight participants at post-intervention (Participants 3, 4, 5, 6, and 7). These changes were maintained for Participants 3, 4, and 6 at the follow-up time point. Participant 1 was also considered to have made CSC at the follow-up time point (see Table 3.7).

Table 3.7.

The Number of Participants Who Reached Reliable and Clinically Significant Change at Post-CBM-I and Follow-up on SAS-A SAD General

Participant	Pre-score	Post-score	Follow-up score	Reliable change - post	Clinical change -	Reliable change – follow-up	Clinical change – follow-up
1	14	15	13	No	No	No	Yes
2	18	14	19	No	No	No	No
3	16	13	12	No	Yes	No	Yes
4	17	7	6	Yes	Yes	Yes	Yes
5	13	12	12	No	Yes	No	No
6	14	13	11	No	Yes	No	Yes
7	17	13	16	Yes	Yes	No	No
8	9	12	11	No	No	No	No

3.5.1.5. *Reliable and clinical change on the BSI Phobic Anxiety sub-scale* (Derogatis, 1993).

Of the eight participants, six had lower BSI Phobic Anxiety scores post-CBM-I training compared to pre-CBM-I training. Using standardised data from Derogatis (1993), RCI and CSC were calculated for the BSI Phobic Anxiety sub-scale. The RCI was calculated to be 1.85 and the CSC was calculated to be 1.70. Only Participant 3 made reliable changes from pre-to-post-intervention on the Phobic Anxiety sub-scale. At the follow-up time point, Participants 3 and 4 were both assessed to have made reliable changes. A total of three participants (Participants 3, 4, and 5) made CSCs at post-intervention, which were maintained at follow-up for all three participants in addition to Participants 1 and 7 (see Table 3.8).

Table 3.8.

The Number of Participants Who Reached Reliable and Clinically Significant Change at Post-CBM-I and Follow-up on the BSI Phobic Anxiety sub-scale

Participant	Pre-score	Post-score	Follow-up score	Reliable change - post	Clinical change -	Reliable change – follow-up	Clinical change – follow-up
1	1.8	1.8	1.0	No	No	No	Yes
2	2.6	2.4	2.4	No	No	No	No
3	3.0	0.6	0.4	Yes	Yes	Yes	Yes
4	3.0	1.4	0.4	No	Yes	Yes	Yes
5	2.0	0.8	1.4	No	Yes	No	Yes
6	2.8	2.8	2.2	No	No	No	No
7	3.0	2.6	1.4	No	No	No	Yes
8	3.4	3.2	3.2	No	No	No	No

3.6. Changes in Interpretation Bias

Due to the infancy of CBM-I research with this population, there are no published norms available for the interpretation bias recognition test with adolescents (Mathews & Mackintosh, 2000). As a result of this, psychometric data from an adult population reported by Perez-Olivas et al. (2012) was used to calculate reliable change calculations and is used cautiously to infer any findings. The RCI was calculated to be .90 for the interpretation bias measure. It was not possible to calculate CSC due to the lack of published data. Based on the RCI criteria three participants (Participants 3, 4, and 5) made reliable changes at post-intervention (see Table 3.9).

Table 3.9.

The Number of Participants Who Made Reliable Changes at Post-CBM-I on the Interpretation Bias Recognition Test

Participant	Pre-score	Post-score	Difference	Reliable change - Post
1	-0.8	-0.5	+ 0.3	No
2	-0.8	-0.5	+ 0.3	No
3	-1.3	1.8	+ 3.1	Yes
4	-1.2	2.0	+ 3.2	Yes
5	-1.0	1.1	+ 2.1	Yes
6	-0.6	-0.1	+ 0.5	No
7	-0.8	0.0	+ 0.8	No
8	-0.7	-1.1	-0.4	No

Visual inspection of each participant's scores on the interpretation bias measure pre-and post-CBM-I show that three participants (Participants 3, 4, and 5) moved from a negative to a positive interpretation bias (see Figure 3.17). These three participants also had the largest interpretation biases at the beginning of the pre-CBM-I phase (see Figure 3.16). A further four participants (Participants 1, 2, 6, and 7) made modest improvements in their interpretation bias scores post-CBM-I despite still having a negative interpretation bias.

Further analysis revealed a negative association between changes in interpretation bias scores and changes on the SAS-A Total scores. This association was found to be statistically significant ($tau = -.764$, $p < .05$), meaning that an increase in interpretation bias change is associated with greater reductions on the SAS-A Total score at the end of the training. A negative association was also found

between changes in scores on the BSI Phobic Anxiety sub-scale and changes in interpretation bias (see Appendix V). This association was also statistically significant (*tau* =.-.519, $p < .05$) indicating that an increase in interpretation bias change is associated with greater change on the BSI Phobic Anxiety sub-scale.

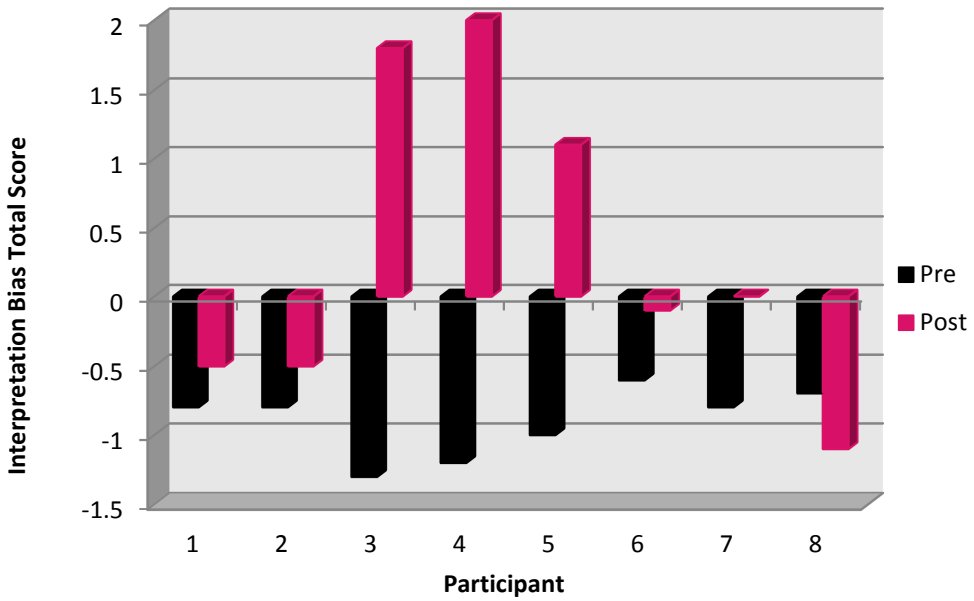

Figure 3.17. Scores on the interpretation bias measure at pre-and post-CBM-I for each participant

In order to determine whether the CBM-I training resulted in a reduction in negative interpretation bias or an increase in positive bias, further analysis was conducted (see Table 3.10). As there is no available normative data, the RCI for each domain was not able to be calculated.

Table 3.10.

Changes in Positive and Negative Interpretation Bias

Participant	Positive Interpretation Bias		Difference	Negative Interpretation Bias		Difference
	Pre	Post		Pre	Post	
1	2.3	2.5	+ 0.2	3.1	3	-0.1
2	1.8	2.5	+ 0.7	2.6	3	+ 0.4
3	1.6	3.3	+ 1.7	2.9	1.6	-1.3
4	2.5	3.5	+ 1.0	3.7	1.5	-2.2
5	2.1	3.3	+ 1.2	3.1	2.2	- 0.9
6	2	4	+ 2.0	2.6	2.6	0
7	2.2	2.5	+ 0.3	3	2.5	-0.5
8	2.4	1.8	- 0.6	3.1	2.9	-0.2

The results show that all but one participant (Participant 8) had an increased positive interpretation bias following the CBM-I training (see Figure 3.18). A total of six participants (Participants 1, 3, 4, 5, 7, and 8) experienced a reduction in negative interpretation bias following the CBM-I training (see Figure 3.19).

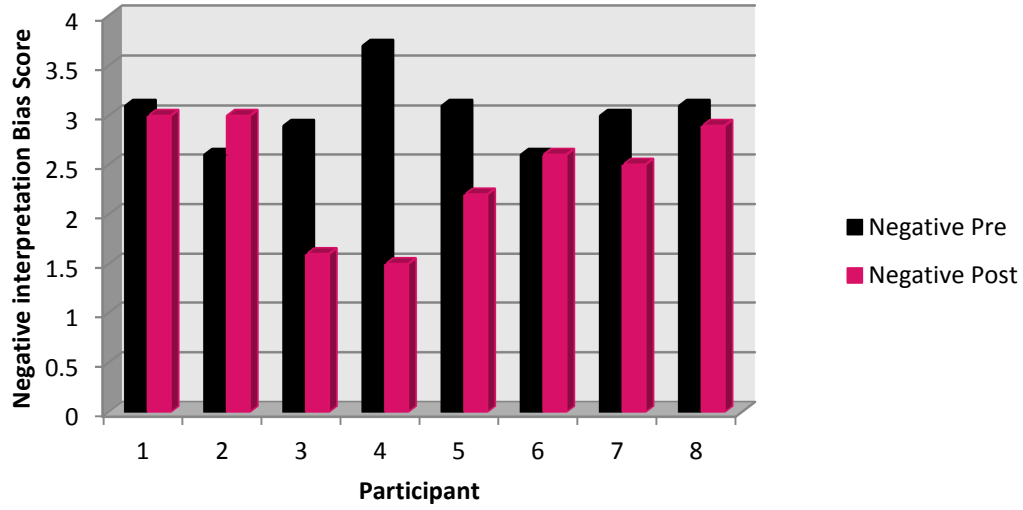

Figure 3.18. Levels of negative interpretation bias at pre-and post-CBM-I for each participant

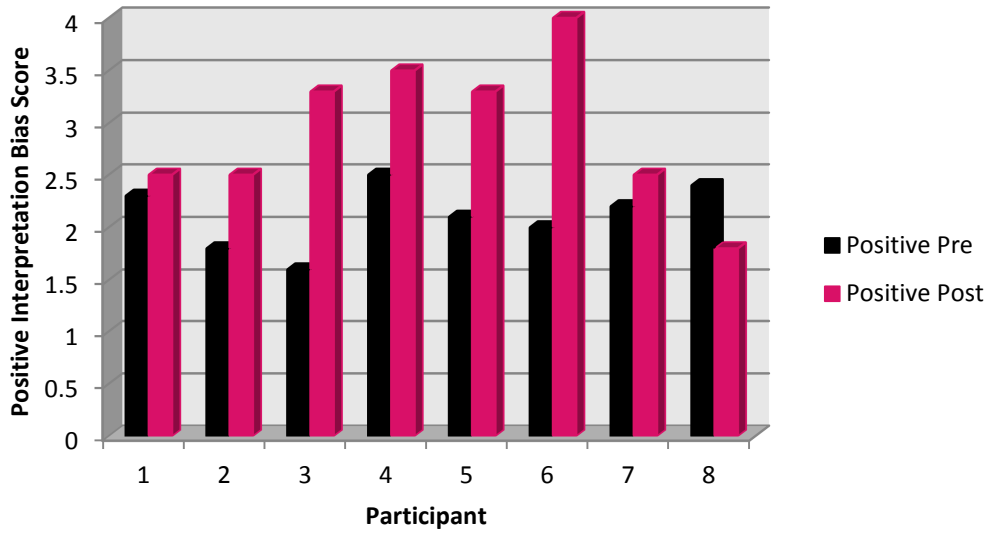

Figure 3.19. Levels of positive interpretation bias at pre-and post-CBM-I for each participant

3.6.1. Imagery pleasantness and vividness ratings.

Participants were instructed to create an image of themselves in each of the interpretation bias scenarios. Following the presentation of each scenario, participants were asked to rate how pleasant they found the image on a scale of 1 to 9 (*1 = Very unpleasant, 9 = Very pleasant*) and how vividly they had imagined themselves in the

scenario on a scale of 1 to 5 (*1 = Not at all strong, 5 = Very strong*). All participants were able to more vividly imagine themselves in the scenario post-CBM-I (see Figure 3.20) and rated the images as more pleasant and less distressing (see Figure 3.21) following the CBM-I training.

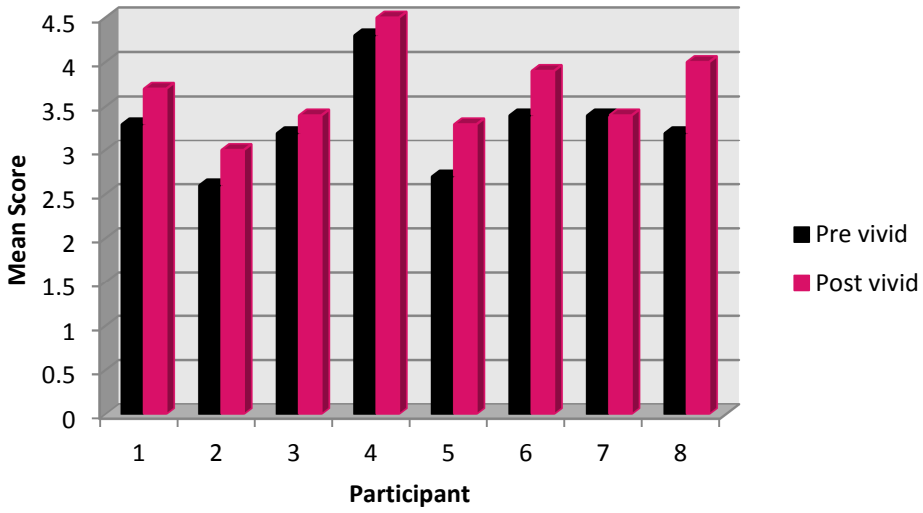

Figure 3.20. Mean scores rating image vividness at pre-and post-CBM-I for each participant

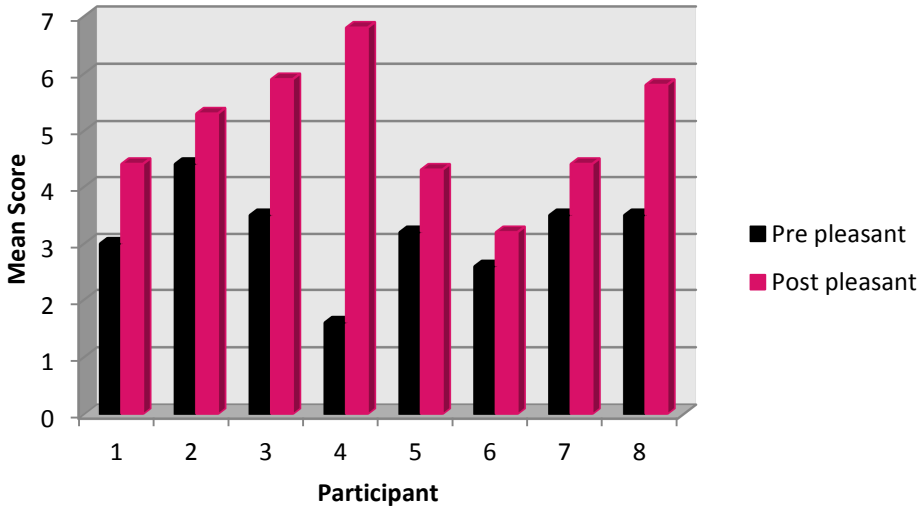

Figure 3.21. Mean scores rating image pleasantness at pre-and post-CBM-I for each participant

3.7. Changes in Daily Imagery Ratings

Participants were required to engage in two imagery exercises at the beginning of each of the CBM-I training days to help raise their awareness of the importance of imagery and also to measure their ability to form images of themselves in the scenarios (see Section 2.7 for more details). Participants were asked to rate their ability to imagine themselves in the scenarios. A total mean was calculated for each of the participants and a correlation was conducted to assess the relationship between imagery self-report ratings and changes in SAS-A Total scores from pre-to-post-CBM-I. Although analysis revealed a positive correlation, this relationship was found to be non-significant (*tau* = .357, $p \geq .05$; see Appendix W)

3.8. Group Statistical Analysis and Effect Sizes

In line with previous CBM-I research (Blackwell & Holmes, 2010), group means for the studies outcome measures were calculated at the four time points (see Table 3.11). Related samples Wilcoxon signed rank tests (Wilcoxon, 1945) were then conducted to assess changes over time. Cohen's (1992) *r* effect sizes were also calculated to identify the magnitude of any observed effects. Analysis revealed that despite changes in the group means on all of the SAS-A outcome sub-tests (Total, FNE, New, and General) the differences were found to be non-significant. Group scores on the BSI Phobic Anxiety sub-scale were however, found to be statistically lower at post-CBM-I (z = -2.207, N – Ties = 2, p = .027), and at follow-up (z = -2.530, N – Ties = 0, p = .011) compared to pre-CBM-I. The observed effects were medium (r = -.55) at post-CBM-I and medium (r = .63) at follow-up (Cohen, 1992). In addition to this, interpretation bias scores were also found to be significantly lower at post-CBM-I (z = -2.103, N – Ties = 0, p = .035), with an observed medium effect size (r = .52). Finally, analysis revealed that there was a statistically significant difference

between pleasantness ratings pre-to post-CBM-I (z = -2.524, N – Ties = 0, p = .012), with a medium effect size (r = .63), meaning that all participants found the social scenarios less threatening post-CBM-I training.

Table 3.11.

Mean Outcome Measure Scores at all Time Points

	Time Points			
Measure / Sub -scale	Assessment	Pre-CBM	Post-CBM	Follow-up
SAS-A Total				
M	73.75	69.87	60.87	58.75
SD	7.08	13.74	10.85	12.31
SAS-A FNE				
M	31.37	28.87	26.50	25.12
SD	5.09	8.62	5.31	4.91
SAS-A New				
M	27.00	25.00	22.00	21.1
SD	2.56	2.77	4.37	4.76
SAS-A General				
M	15.37	14.76	12.37	12.50
SD	2.72	2.91	2.38	4.11
BSI – Phobic Anxiety				
M	72.37	73.37	66.62	64.12
SD	4.1	5.41	8.85	9.1
Interpretation Bias				
M	-	-0.9	0.34	-
SD		0.24	1.15	
Pleasantness				
M	-	3.16	5.01	-
SD		0.81	1.14	

Note. BSI = Brief Symptom Inventory; IBI = Interpretation Bias Index; PANX = Phobic Anxiety; SAS-A = Social Anxiety Scale for Adolescents; SAS-A FNE = Social Anxiety Scale for Adolescents Fear of Negative Evaluation sub-scale; SAS-A SAD- New = Social Anxiety Scale for Adolescents Social Avoidance and Distress New sub-scale; SAS-A SAD- General = Social Anxiety Scale for Adolescents Social Avoidance and Distress General sub-scale.

3.9. Participant and Parent Feedback

In order to assess the views of those who engaged in the CBM-I training, participants completed the PAQ and their parents/guardians completed an end of research questionnaire. The adolescent responses to the PAQ, including both quantitative and qualitative feedback, will be considered first, followed by the parent feedback.

3.9.1. Participant Acceptability Questionnaire (PAQ).

All eight participants completed the PAQ at the end of the research. A total of nine VASs were presented, with numerical anchors ranging from 0 (*Very poor/unacceptable*) to 10 (*Very much/acceptable*). In addition to the VASs, qualitative comments regarding the intervention and its applicability were also recorded. Figure 3.22 outlines the group means for each of the VASs.

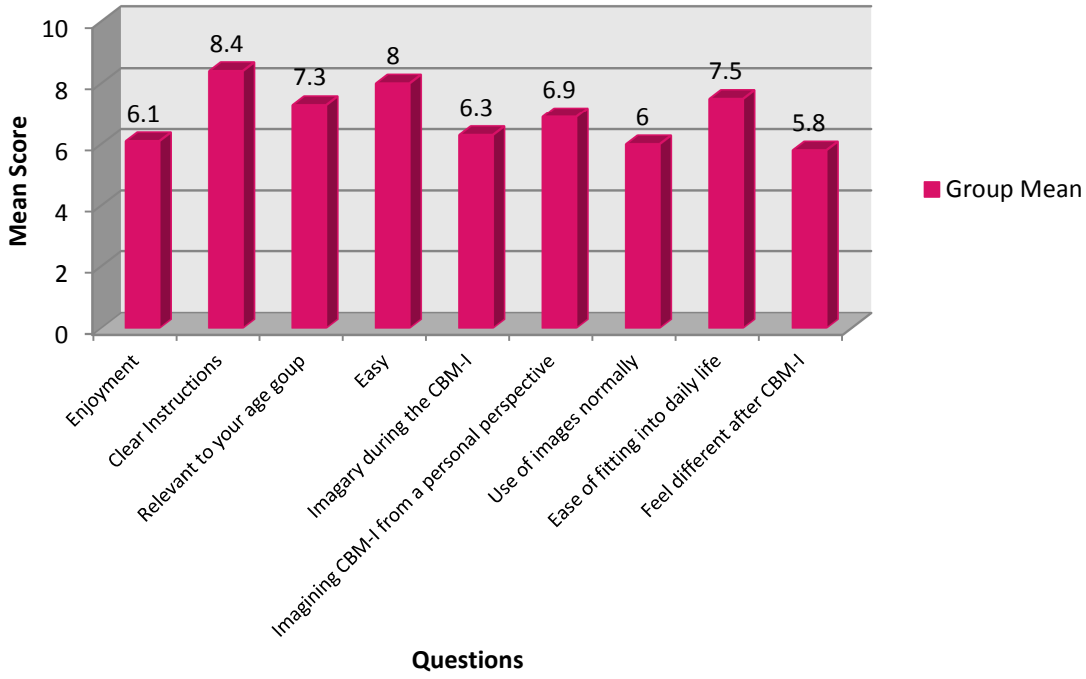

Figure 3.22. Group means for the VASs of the PAQ

3.9.1.1. The impact of the programme on social phobia symptoms.

The lowest mean rating was given to question nine, which asked participants whether they found themselves feeling any differently in social situations following the CBM-I training (M = 5.8). Interestingly, this question also had the largest standard deviation, (SD = 3.1) with responses ranging from 0 to 10. This large range in scores, therefore, indicated that the CBM-I programme was deemed to be *extremely helpful* to some and *not at all helpful* to others. Participant 3 reported that, "It taught me to think more positively, meaning my confidence can get stronger. It was very successful". Other participants also felt that the programme helped them to think differently, Participant 4 stated, "I really did enjoy the course and it has helped me in crowded places and social situations". Participant 6 felt that she was able to transfer the learning from the CBM-I programme to real life situations stating that, "In some real situation I was able to visualise what I'd done in the computer programme which has helped me feel better." She also reported that it helped her to feel differently about returning to school, "It doesn't feel as bad when I think about going to school because of the situations on the computer" and linked completing the programme to returning back to school, "I might go back to school for half days soon". Participant 7 stated that the training helped her to think more "positively". In addition, she reported that she had learnt skills to think differently but had difficulty putting them into practice, "I now know how I should react based on what I learnt on the computer programme but after a few seconds I start to have horrible thoughts again." Despite showing an increase in social phobia symptoms, Participant 8 also reported feeling differently after the CBM-I training. He reported that, "I have thought back to it [CBM-I] to help me cope when I'm with people". Interestingly, he reported that engaging in the CBM-I training had led him to have more insight into his difficulties.

Within the PAQ, he reported that "[It] helped me to think about how I'm actually feeling. When I'm in my room it seems okay, this helped me to realise that I need to do something about the way I am." Participant 8 also reported behaviour changes, stating that he had been out twice since the programme had ended, something that he had not done for some time. This behaviour change could have influenced the increase in social phobia symptoms recorded on the outcome measures.

3.9.1.2. CBM-I scenario relevance.

One question which had a wide range of responses ranging from 2 to 9, was how relevant participants felt that the CBM-I training scenarios were to their age group (M = 7.3, SD = 2.25). The two youngest participants (Participants 2 and 3) had mixed opinions on this issue with Participant 2 rating the scenario relevance as 2 out of 10, and Participant 3 rating the scenario relevance as 8 out of 10. Participant 2 reported that, "I could not imagine myself in any of the situations in real life because they are not what I would do or be able to do…so it was hard to answer them". Participant 3 on the other hand stated, "It was easy and taught me to think more positively meaning my confidence can get stronger. It was very successful." Two of the oldest participants (Participants 5 and 7) reported that at times, the scenarios were not always relevant. For example, Participant 5 reported that, "some of the situations were difficult to put myself in…like the sport scenarios". In addition, those participants who were not at school due to their anxieties (Participants 6 and 8) reported finding some of the school/college related scenarios less relevant. Participant 8 reported, "There were some things I could not relate to because I don't go to school or go out".

3.9.1.3. Ease and enjoyment.

Overall, participants rated the CBM-I instructions as clear and easy to understand (*M* = 8.4, *SD* = 1.77). The computer tasks were also rated as easy to complete (*M* = 8, *SD* = 2.88). One participant reported that she felt that the programme was "Very clear and easy" (Participant 3). It appeared that most participants were able to fit the CBM-I training into their daily lives (*M* = 7.5, *SD* = 1.07). However, both of the participants who dropped out of the research during the training stated that they were not able to complete the training due to time restraints linked to their GCSE's/A Levels. Participant 1 had similar concerns stating that, "It took up quite a bit of my time when I have exams and coursework to do". Enjoyment ratings of the CBM-I training ranged from 2 to 10 (*M* = 6.1, *SD* = 2.53), with those who rated the programme most enjoyable (Participants 3, 4, and 7) making some of the largest improvements in terms of social phobia symptoms (see Sections 3.4.3, 3.4.4, and 3.4.7). Some positive comments regarding enjoyment were also reported at the end of training. Participant 4 stated that she "really enjoyed the programme" and thanked the researcher "for the opportunity". Several participants felt that being able to complete the programme from home was a positive aspect of the training. Participant 4 stated that, "It was good that I could do it at home without having to go anywhere. It made me feel more in control of getting better". Participant 6 reported that completing the training online was helpful as she could do the training at both her mother and father's house on different computers.

3.9.1.4. Imagery.

There were mixed responses regarding the use of imagery during the CBM-I training (*M* = 6.3, *SD* = 1.58). Several of the participants reported that they had difficulties imagining themselves in the scenarios, some of these comments were

connected to the relevance of the scenarios based on the restraints that they feel their anxiety disorders put on them. For example, Participant 2 stated, "I could not imagine myself in any of the situations in real life because they are not what I would be able to do…so it was hard to answer them". Participant 6 on the other hand reported that she was able to use imagery in daily life and stated that she was able to "visualise" what she had done during the CBM-I when she was in social situations which help her to "feel better".

3.9.1.5. Programme development.

Several of the participants made comments regarding potential areas for programme development. Key themes included; the look of the programme, the length of the programme, the method of presentation, and computer errors. Participant 1 felt that the programme was "too repetitive" and had several "errors". In addition, he felt that the programme would benefit from "more colours and pictures" to engage the participants. Participant 5 felt that the daily CBM-I sometimes took "too long", specifically towards the end of the week. Participants 4 and 6 disagreed with this, with participant 6 stating that "the programme was long enough each day", but suggested that it may have been "helpful to have done the training for more than seven days." Participant 8 has a keen interest in computers and felt that the programme could be developed, stating that there were "coding errors on the page that could have been changed" specifically, he reported that the selection buttons disappeared regularly taking a long time to generate.

3.9.2. Parent Questionnaire

Out of the eight participants who took part in the CBM-I, seven of their parents completed the parent feedback questionnaire. A total of three VASs were presented with numerical anchors ranging from 0 (*Very much encouragement needed/*

Very hard to fit the programme into their day/ Very little change in child) to 10 (*Very little encouragement needed/Very easy to fit the programme into their day/ Very different*). In addition to the VASs, qualitative comments and thoughts regarding the intervention and its applicability were also recorded. Figure 3.23 outlines the group means for each of the VASs.

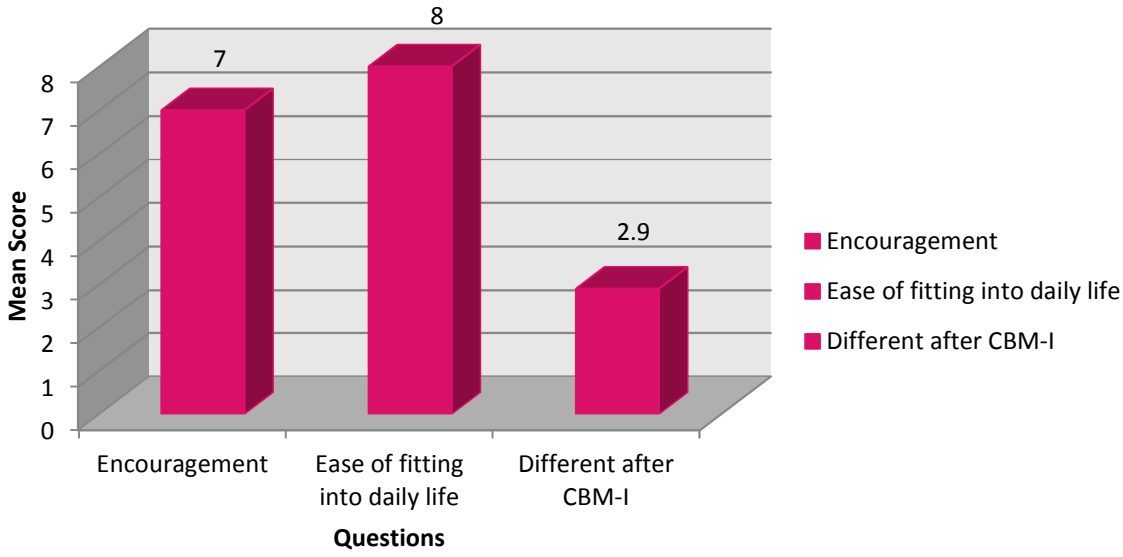

Figure 3.23. Group mean scores on the VASs of the Parent Questionnaire

3.9.2.1. Encouragement needed to engage in the CBM-I training.

Based on the parent feedback, it appeared that overall, parents were not required to give their children much encouragement to engage in the CBM-I training (M = 7, SD = 3.65). This did however vary (range 0 to 10), with some parents feeling responsible for reminding their child to engage in the daily tasks. Participant 8's parent reported that "he engaged with the programme without any prompting from me", Participant 2's parent on the other hand felt that she had to give her child a lot of encouragement. Another parent (Participant 5) felt that as she was not required to drive her daughter anywhere (i.e., CAMHS), it gave her child "more independence and control". One participant (Participant 7) engaged in the programme so

independently that their parent felt that they would have difficulty completing the feedback questionnaire.

3.9.2.2. Practicalities of the CBM-I training.

Based on the total mean rating, parents reported that the CBM-I training was easy to fit into their child's day (M = 8, SD = 3.31), no parents rated this question as *very hard*. Several parents commented on the ease of the CBM-I (Participants 5 and 2) with specific comments being made about the approachability of the researcher such as, "She liked [the researcher] which made it easier for her to talk to her and do the course on the computer".

3.9.2.3. Observed changes in social phobia symptoms.

Parents were asked to rate how different their child had been in social situations following the CBM-I training in their opinion (0 = *Not at all different* to 10 = *Very different*). A group mean of 2.9 (SD = 2.47) was generated meaning that most parents did not notice a great deal of improvement in their child's ability to engage in social situations post-CBM-I training. Responses to this question ranged from 0 to 6. The majority of the qualitative feedback regarding the CBM-I was focused on this aspect of the training. Although some parents noticed some positive improvements (Participants 3, 4, 6 and 8), the remaining parents made comments indicating that they had noticed few, if any, changes in their child's presentation. Positive comments included, "two weeks ago she went to a friend's house, something she has not done for a long time" (Participant 6) and "I think it has made her think before assuming that others are thinking negatively of her. She has actively tried to be more outgoing" (Participant 4). Negative comments included, "this has only scratched the surface" (Participant 2), and "[he is] still not socialising much" (Participant 1).

Chapter 4: Discussion and Conclusion

4.1. Chapter Introduction

This chapter reviews the aims of the study, which is followed by a discussion of the findings from the data analysis in line with the study's research questions. The strengths and limitations of the research are then outlined followed by an account of how the results relate to the literature and theories described in the introduction. The clinical implications of the research findings are then discussed with a focus on the applicability of CBM-I in the changing NHS. This is followed by suggestions for future research generated from the current research findings and the study's strengths and weaknesses. Finally, a conclusion of the current research study is provided.

4.2. Aims of the Study

The aim of this study was to investigate the effects of a seven session CBM-I procedure on modifying interpretation biases and symptomology in adolescents with social phobia. Following a review of the existing literature (e.g., Holmes et al., 2009), positive imagery was considered an important component of CBM-I and the study therefore aimed to investigate the application of imagery in CBM-I with this population. As CBM-I research with adolescents experiencing clinical levels of anxiety is still in its infancy (Lau et al., 2012), the study also aimed to investigate the efficacy, applicability and feasibility of CBM-I with this population by gathering participant and parent feedback.

4.3. Summary of the Results

As with all single-case series, the results of the current study must be interpreted with caution due to the small sample size (Kazdin, 2010). With this in mind, the findings relevant to each of the research questions will now be considered.

4.3.1. Is a seven session positive imagery CBM-I programme able to modify interpretation biases in adolescents with clinical levels of social phobia symptoms?

In support of this research question, six of the eight participants (Participants 1, 3, 4, 5, 7, and 8) experienced reduced negative interpretation biases post-CBM-I training compared to pre-CBM-I training. In total, three participants (Participants 3, 4, and 5) moved from a negative interpretation bias pre-CBM-I training to a positive interpretation bias post-CBM-I training. Reliable clinical change calculations revealed that the changes in interpretation bias scores made by Participants 3, 4, and 5, represented significantly reliable change from pre-to-post-CBM-I training. It is important to note that these three participants had the largest negative interpretation biases at the pre-CBM-I training assessment, indicating that the CBM-I training was most successful in reducing negative interpretation biases in those who had the largest negative biases pre-training. This is a new adolescent finding, as to the authors knowledge, no other adolescent CBM-I study had indicated that CBM-I had the greatest effect on those who had the greatest biases at pre-training. This supports the findings from the adult literature (e.g., Salemink et al., 2011). Interestingly, the three participants who made significant changes in interpretation bias scores post-CBM-I were also classified as responders on the visual inspection of their changes on the SAS-A (see Section 3.4). The other responder (Participant 7) also had a reduced negative interpretation bias and an increased positive interpretation bias but these changes were not statistically significant. This suggests that the changes in interpretation biases were associated with greater reductions on social phobia symptoms. Specifically, those participants who had the largest interpretation bias at

pre-CBM-I also made the most reductions in anxiety symptoms as well as interpretation bias at post-CBM-I.

In addition to the individual differences, there was a significant main effect of CBM-I on the interpretation bias total group mean at post-intervention (p = .035), with a medium effect size (r = .52). This finding indicates that overall, the CBM-I training was able to significantly modify interpretation biases. Additional analyses were conducted to determine whether the observed differences were a result of an increase in positive interpretations or a reduction in negative interpretations. The results demonstrated that seven participants (all except Participant 8) experienced an increase in the amount of positive interpretations made following the CBM-I training. It is possible that Participant 8 did not experience a change in interpretation bias as he was developing insight during the CBM-I rather than being in a position to start making changes. A total of six participants (Participants 1, 3, 4, 5, 7, and 8) experienced a reduction in negative interpretation bias following the CBM-I. This therefore suggests that the CBM-I training resulted in an increase in positive interpretations and a decrease in negative interpretations, with a greater effect being seen on positive interpretations.

These results support previous research which found that CBM-I was able to reduce negative interpretation biases and increase positive interpretation biases in individuals with social phobia symptoms (e.g., Amir & Taylor, 2012; Bowler et al., 2012; Turner et al., 2011). They also support previous research which found that CBM-I was able to reduce negative interpretation biases in adolescents (e.g., Salemink & Wiers, 2011). It is however, the first study, to the author's knowledge, to reduce negative interpretation bias and increase positive interpretation bias in adolescents with clinical levels of social phobia. In summary, the findings from the

current study support research question one, as overall, seven participants experienced a change in interpretation bias post-CBM-I training; three of these changes were considered significantly reliable.

4.3.2. Is a seven session positive imagery CBM-I programme able to reduce levels of social phobia in adolescents with clinical levels of social phobia symptoms?

In support of the second research question, visual inspection of the data revealed that levels of social phobia, as measured by the SAS-A, reduced in four of the eight participants (Participants 3, 4, 5, and 7). These four responders demonstrated improvements in trend, slope, and mean from the baseline to the intervention phase. However, only two of the eight participants (Participants 3 and 4) were found to have made reliable and clinically significant changes on the SAS-A Total score at the follow-up time point. As La Greca (1999) suggested looking at the sub-scales of the SAS-A in addition to the SAS-A Total score, additional analyses were conducted looking at changes in each of the sub-scales used to assess social phobia symptoms. It was found that two participants (Participants 3 and 4) made reliable changes post-training on the SAS-A Fear of Negative Evaluation subscale. Only two participants (Participants 4 and 7) made reliable changes pre-to-post-training on the SAS-A Social Avoidance and Distress General sub-scale. In addition, only one participant (Participant 4) made reliable changes on the SAS-A Social Avoidance and Distress for New Events sub-scale. This suggests that despite four participants being classified as responders, the changes they made were not all considered to be reliable. Those considered to have made clinically significant changes from pre-to post-CBM-I training on all four sub-scales of the SAS-A were also limited. Participants 3 and 4 were found to have made clinically significant

changes post-CBM-I on the SAS-A Total score and SAS-A Fear of Negative Evaluation. The greatest changes were seen on the SAS-A Social Avoidance and Distress General sub-scale with five participants (Participants 3, 4, 5, 6, and 7) being considered in the non-clinical range post-CBM-I training. Overall, based on the scores from the SAS-A, it is possible to conclude that half of the participants showed a reduction in symptoms. However, the degree of symptom change following the CBM-I training, as calculated using the RCI and CSC, was limited.

Analysis from the BSI Phobic Anxiety sub-scale indicated that reductions in social phobia symptoms were seen in six participants (Participants 2, 3, 4, 5, 7, and 8). Participant 3 was considered to have made reliable changes, and Participants 3, 4, and 5 were considered to have made clinically significant changes post-CBM-I training.

Group mean statistics revealed that there were no significant differences between the levels of social phobia symptoms, as measured by the SAS-A subscales, pre-to-post-CBM-I training. There was however, a significant group reduction in social phobia symptoms as measured by the Phobic Anxiety sub-scale on the BSI. It is therefore possible to conclude that in response to the second research question, CBM-I training did not significantly reduce social phobia symptoms for the majority of the participants. Despite this, some symptom reduction was observed in four of the eight participants which is positive given the level of severity experienced by this clinical population. It is important to note that this study's participants had a greater symptom severity pre-CBM-I as measured by the SAS-A Total score (M = 68.6) than the matched clinical sample data (M = 43.2) provided by La Greca (1999).

These findings are relatively weak in comparison to several of the CBM-I multiple session studies conducted with adults who found significant reductions in social phobia symptoms post-CBM-I training (e.g., Beard, Weisberg, & Amir, 2011).

With regard to an adolescent population, this study's findings do support that of Fu et al. (2012), who found no significant differences between pre-and post-anxiety scores, post-CBM-I with a clinical population.

4.3.3. Are any changes in levels of social phobia identified after the final session of CBM-I maintained at a two week follow-up assessment?

All changes observed at post-CBM-I intervention were maintained at the two week follow-up, with the exception of Participant 7's score on the SAS-A Social Avoidance and Distress General sub-scale, which increased. Interestingly, not only were these gains maintained at the two week follow-up time point, but several participants also demonstrated additional improvements across all sub-scales of the SAS-A and the BSI Phobic Anxiety sub-scale. Some of the changes from the pre-to follow-up time points were large enough to be considered reliable (Participants 3 and 4) and clinically significant (Participants 1, 3, and 7).

Group total means for each of the outcome measures were lower at follow-up than at either pre-or post-CBM-I. However, the reductions on the SAS-A Total and other sub-scales were not found to be statistically significant. Group means on the BSI Phobic Anxiety sub-scale were however found to be statistically lower at follow-up compared to pre-intervention, with a medium effect size (r = .63). As social phobia symptoms were found to be lowest two weeks after the CBM-I training finished, there is evidence of a delayed intervention effect. Other CBM studies have also found a delay in the onset of therapeutic effect (Browning, Holmes, Charles, Cowen, & Harmer, 2012), similar to that found in pharmacological interventions (Harmer et al., 2009). Despite needing to be cautious when interpreting group means from a small sample (Fox, & Mathers, 1997), these findings do support to some extent the efficacy of CBM-I for adolescents with social phobia as all outcome measures

completed at follow-up reduced, one significantly (BSI Phobic Anxiety), at the follow-up time point.

4.3.4. What are the participants' and their parents' views of the CBM-I programme and its impact upon their social phobia symptoms?

Several important findings can be concluded based on the qualitative feedback generated from the participants and their parents. Overall, most of the participants felt that the programme had some positive impact upon their social phobia symptoms and associated behaviours (e.g., thinking more positively, less avoidance, and engagement in social activities). Interestingly, even Participant 8, whose scores on the outcome measures got worse over time, spoke about the benefits of the programme in increasing his insight into his difficulties and reported realising that he now needs to make some changes (e.g., less avoidance). It is therefore possible that his scores on the outcome measures got worse because he gained more insight into his difficulties. Based on this, it is tentatively suggested that CBM-I training can work as an initial engagement tool, which opens individual's minds to the possibility of further change as well as helping some individuals to make those changes. With this in mind, the qualitative findings support the idea of CBM-I being utilised as a precursor or adjunction to other forms of treatments (MacLeod & Mathews, 2012).

Interestingly, it appeared that participant enjoyment was associated with social phobia symptom change. The findings indicated that those who rated the programme as most enjoyable (Participants 3, 4, and 7) made some of the largest improvements on the outcome measures. This highlights the need for CBM-I procedures with adolescents to be fun and enjoyable to increase engagement and treatment outcomes. Feedback was provided by several of the participants on how to increase enjoyment

which included; the use of colour, pictures, detailed graphics, and increased audio cues and presentations.

It is possible based on the results that the relevance of the scenarios was also linked to symptom change. For example, Participant 2 felt that the scenarios were not relevant to her due to her levels of anxiety (e.g., she would not be in a position to go out with friends) and therefore made it difficult for her to imagine herself in the social scenarios. It is therefore interesting that she did not make any treatment gains with regard to her social phobia symptoms. It appears based on these findings, scenarios in CBM-I for adolescents should be age specific (e.g., one set of scenarios for younger adolescents and one for older adolescents) and symptom specific (e.g., school related and non-school related) as a way of potentially increase treatment outcomes.

There were mixed responses as to whether parents had noticed an improvement in their child's ability to engage in social situations based on the parental feedback. The group mean for this question was low meaning that most parents did not notice an improvement in their child's ability to engage in social situations. The most improvement was noticed by parents of Participants 3 and 4, of whom both adolescents gave the highest enjoyment ratings regarding the programme. Despite parents noticing little change overall, additional qualitative feedback demonstrated some important behavioural changes (e.g., increased social activities) for half of the participants (Participants 3, 4, 6, and 8). This indicates that some minimal changes in social phobia symptoms were observed in half of the participants, even if they were not perceived as large improvements.

With regard to the practicalities of the CBM-I programme, it appeared that participants valued being able to complete the training at home online as it made it accessible and feasible to complete. Mixed responses were given regarding the length

of the programme with two participants (Participants 4 and 6) specifically stating that they felt they would have benefited from completing more sessions. This adds to the uncertainty around the optimal number of CBM-I sessions in bringing about symptom and interpretation bias change (Hallion & Ruscio, 2011). It is possible, based on these findings and those of others (e.g., Hallion & Ruscio, 2011), that the optimal number of CBM-I sessions should be tailored to the individual and their specific needs, similar to that of other psychological therapies such as CBT (NICE, 2012). It is also questionable as to whether daily treatment sessions are appropriate for this age group as they are at a challenging and demanding stage in their education. This is evidenced by the two young people who withdrew from the research partially as a result of the demands of the CBM-I programme.

4.3.5. The role of imagery in the findings.

Based on the findings, it is possible to conclude that the use of imagery in this study did not enhance the effects of the CBM-I training. There was a non-significant positive correlation between imagery self-report ratings and changes in SAS-A Total scores from pre-to-post-CBM-I, meaning that those who used increased levels of imagery did not experience a greater reduction in symptom severity as a result. As a non-imagery matched comparison group was not used in this study, further conclusions about the impact of imagery on CBM-I outcome cannot be made.

During the recognition test, pre-and-post CBM-I, participants were required to imagine themselves in each of the 10 scenarios and rate how pleasant they found each of the images. In comparison to the pre-CBM-I ratings (M = 3.16), all participants rated their images as more pleasant and less distressing following the CBM-I intervention (M = 5.01). This, therefore, indicates that the CBM-I training was able to reduce participant levels of distress when thinking about social situations. Although

this cannot be generalised to real life social situations, it is possible to conclude that CBM-I training has the potential to reduce distress levels experienced by adolescents with social phobia when in social situations.

4.4. Strengths and Limitations

4.4.1. Methodological limitations.

This research utilised a multiple baseline design as it has been considered an appropriate method to evaluate potential interventions that are at an early stage of clinical testing such as CBM-I (Kazdin, 2010). However, it should be considered that for some time, single-case research design has been criticised for its potential lack of generalisability (e.g., Blackwell & Holmes, 2010; Platt, 1992) meaning that the results of the current study cannot be applied to all adolescents experiencing social phobia symptoms. Flyvbjerg (1994) argued that criticising this design for a lack of generalisability represents a misunderstanding of case-study research and proposed that case studies are a necessary and sufficient method for important research tasks in psychology. Such tasks include research in the preliminary stages of investigation as the method is able to test hypotheses and build on existing theory. Flyvbjerg (1994) also argued that case series design is scientifically strong when compared to other methods in the social science research such as qualitative methodology. As there is still much debate regarding this issue, it would be sensible to interpret the results of this study with caution.

As well as identifying whether the CBM-I training phase was able to result in changes in levels of social phobia symptoms and interpretation bias at post-intervention, the study aimed to identify whether any observed changes at post-intervention were maintained at the two week follow-up time point. Despite this, levels of interpretation bias were not recorded at the two week follow-up time point,

meaning that it was not possible to determine whether the CBM-I intervention was able to produce longer term changes in interpretation bias. This was a methodological weakness and thus limits the conclusions which can be drawn regarding the longevity of the improvements which had been made at post-CBM-I.

It should also be considered that participants were aware of the purpose of the study (e.g., to positively modify the way they interpret social situation) which could have biased the results. Field et al. (2007) found that CBM had larger effects on those participants who reported awareness of the training contingency they were assigned to compared to those who were blind to the training contingency. MacLeod and Mathews (2012) supported this finding and suggested that changes following CBM interventions may be the result of insight into the training contingency rather than the training itself. Although being aware of the proposed benefits of a clinical intervention is standard practice in clinical services, it is not possible to rule out whether knowledge of the purpose of the training in this study was responsible for the changes in symptom severity and interpretation bias as a placebo training condition was not utilised.

4.4.2. Recruitment difficulties.

Previous feasibility studies investigating CBM-I have consider six to nine participants to be adequate (e.g., Blackwell & Holmes, 2010; Turner et al., 2011). Due to the identified limitations of single-case research discussed above (e.g., Plat, 1992), it would have been more desirable to have recruited nine participants as opposed to eight. Several strategies were employed to maximise recruitment opportunities such as; including clinicians in the early protocol and design phase of the study to ensure feasibility, spending time attending team meetings, and regularly contacting team leaders in charge of recruitment at the individual sites via phone and

email to discuss recruitment and potential participants. One of the biggest barriers was the exclusion criteria of depression, which was put in place to ensure that the study was investigating the effects of the CBM-I on social phobia. Team leaders reported that approximately half of the individuals that the teams assessed to have social phobia had comorbid depression which immediately excluded them from being informed of the research. This is not surprising given that a recent investigation found that 19.5% of individuals with social phobia were also classified as having a major depressive disorder (Ohayon & Schatzberg, 2010). As the study progressed, the number of CAMHS sites involved in the research increased in order to widen the recruitment field. This was deemed appropriate as the original research site was not receiving suitable referrals at the time of recruitment. This was consistent with Olfson et al. (2000), who reported that individuals diagnosed with social phobia regularly fail to access empirically supported treatments. It is also important to note that the CAMHS sites in NSFT were undergoing a radical pathway re-design in relation to the current financial climate and recruiting practitioners were faced with redundancy and uncertainty around posts at the time of recruitment (see Appendix X for a recruitment time-line).

In addition to the recruitment difficulties mentioned above, two participants withdrew from the research at the CBM-I intervention phase (see Section 2.3.4.). It is interesting that both participants had undergone the assessment procedure and fully completed the baseline phase before withdrawing. It is possible that it was the CBM-I intervention itself that contributed to the drop-out rate. The second participant explicitly stated that a computerised intervention was not for him following the first day of training. He reported that he would prefer to receive no intervention whilst he waited for 1:1 psychological intervention rather than continue with the CBM-I.

Similar CBM-I studies with adults had not experienced any drop-outs (e.g., Blackwell & Holmes, 2010). Both of the individuals who withdrew, as well as one other participant who fully completed the programme, reported that the programme was time consuming at a period where school work was increasing in line with GCSE and A Level examinations. This does however contrast somewhat with the quantitative results regarding time pressures on the PAQ (see Section 3.9.1.3.). Based on the contrasting information regarding the applicability of multi-session CBM-I with this population, further research regarding the time demands and preferences for face-to-face interventions with this population should be investigated.

4.4.3. Measures.

In line with previous research conducted with adolescents (Lothmann et al., 2011), VASs were used as a self-report measure of social phobia symptoms and anxiety. It was also deemed appropriate to use VASs rather than a longer standardised measure to reduce burden on the adolescents. However, based on the instability of the results from the VASs, it is questionable as to how valid these measures were, making it more difficult to form conclusions regarding changes in symptomology. It is possible that the observed variability could have been a result of the participants not completing the VASs correctly, or because participants' experiences of their symptoms changed daily based on the events of that day. Couper, Tourangeau, and Conra (2006) reported that the use of VASs when social science research is conducted online, as with the current study, is no more beneficial in terms of missing data and response time compared to other methods of data collection (e.g., simple text). Based on this research and the variable nature of the VAS responses in the current study, it is felt that the research would have benefited from fewer VASs

which were tailored specifically to social phobia symptoms (e.g., anticipatory anxiety and avoidance).

It is also important to note that the clinical sample data (see Table 3.1) for the SAS-A as presented in the manual (La Greca, 1999) were derived from a small sample of 18 adolescents with social phobia. As there were no other data available from larger UK samples, these data were used as the matched sample to calculate the RCI in this study. It is well documented that larger samples will provide a more reliable estimate of the standard deviation (Curran-Everett, 2008). As the standard deviations of the small matched sample were relatively large, this will have increased the size of the reliable change index and limited the number of individuals assessed as having made reliable changes from pre-to-post and pre-to-follow-up time points (Evans, 1998).

4.4.4. Statistical analysis.

There is much debate as to which form of CSC to adopt in order to best measure whether participant scores have reduced to a level that is considered to be likely of a non-clinical population (Wise, 2004). It has been documented that the three criterion identified by Jacobson, Follette, and Revenstorf (1984) for calculating CSC, have several limitations and should, therefore, be used and interpreted with caution (Wise, 2004). The use of criterion C in this study may have led to inaccurate or over generous findings. For example, Participant 5 only made a reduction of one point on the SAS-A SAD New sub-scale at post-CBM-I, but as this was then lower than the CSC criterion, this participant was recorded as having made a CSC pre-to-post-CBM-I. Despite this, criterion C is considered more robust than criterion B (Wise, 2004). Criterion C was, therefore, used in the absence of a more widely recognised alternative at this time. Kazdin (1999) states that symptom change may

not be the gold standard on which to base clinical change and suggests paying careful attention to changes in quality of life and daily impairment. In light of this, CSC is only used to inform the data and in isolation is not enough to draw reliable conclusions from. In line with Kazdin's recommendations, qualitative findings and behavioural changes are also considered through the use of the PAQ and parent end of study questionnaire.

4.4.5. Strengths.

To date, this is the first study to investigate a multiple session CBM-I with adolescents with social phobia symptoms. Due to the debilitating nature (Beidel & Turner, 1998) and high prevalence (Costello et al., 2011) of social phobia in this population, research such as this is beneficial and warranted in order to develop further treatment options. The novelty and importance of the current study is therefore viewed as a strength. In light of the fact that CBM-I with this population is in the early stages of testing, qualitative feedback was gathered to help assess the efficacy and clinical applicability of the intervention. This feedback provided some important qualitative information regarding potential developments of the programme, including utilising training scenarios which are age, gender, and symptom specific. It was also identified that creating imagery connected to the training scenarios was more difficult when participants were unable to personally identify with the scenarios. This therefore, suggests that tailored training scenarios would potentially increase the use of imagery and participants' ability to relate to the training and benefit from the CBM-I. The qualitative information also enabled additional conclusions to be drawn from the data. For example, those participants who rated the CBM-I programme as most enjoyable (Participants 3, 4, and 7) made some of the largest improvements with regard to their level of symptom reduction. This link between enjoyment and

improvement is an important finding which should be considered in future CBM-I interventions (e.g., examine cause and effect). It is possible, based on additional qualitative feedback that increased use of pictures, audio recording, and bright colours would go some way to improve enjoyment and potentially increase positive outcomes post-CBM-I intervention.

The level of engagement was high in the study with a total of eight participants fully completing the programme. Interestingly, Participant 8 who was referred to the NSFT youth service, due to a lack of engagement with traditional CAMHS, fully engaged in the programme and did not miss a day of the baseline or CBM-I. Based on the qualitative feedback from participants and their parents, this was in part connected to regular researcher contact (i.e., face-to-face meetings, training on how to use the programme, and daily text/or email contact). Other research on self-help interventions for anxiety has also suggested that clinician involvement increases the effectiveness of the interventions (e.g., Cuijpers, Donker, van Straten, Li, & Andersson, 2010). It is therefore felt that clinician involvement enhanced participant engagement and is a strength of the current research.

Overall, four of the eight participants were classified as responders to the CBM-I training. This is positive given the high level of symptom severity in the current sample (i.e., a group mean SAS-A Total score 17.3 points higher than the available matched clinical sample). To therefore create changes in half of the participants, despite these not all being reliably and clinically significant, is a positive initial finding which warrants further investigation. This outcome is comparable to the findings of Davidson et al. (2004), who suggested that approximately 50% of individuals diagnosed with social phobia are classified as treatment responders when given a form of conventional treatment such as CBT.

4.5. Relating the Results to the Existing Theory and Research

This research has developed our knowledge and understanding related to the applicability of adult models of social phobia (e.g., Clark & Wells, 1995; Rapee & Heimberg, 1997) to adolescents. Cartwright-Hatton et al. (2011) reported that little research has been conducted to ascertain whether or not socially anxious adolescents interpret ambiguous social information in an anxiety provoking fashion similar to adults. In support of the limited existing research on the presence of negative interpretation bias in anxious adolescents (e.g., Cartwright-Hatton et al., 2011; Hadwin & Field, 2010; Miers et al., 2008; Waters, Craske, Bergman & Treanor, 2008), this research found that adolescents with clinical levels of social phobia interpreted ambiguous social scenarios in a negative manner, indicating the existence of a negative interpretation bias in this population. This therefore supports Kendall's (1985) theory of child and adolescent anxiety, which states that cognitive factors are central to the development and maintenance of anxiety disorders such as social phobia in adolescents. The current findings also support the application of modified adult procedures used to treat social phobia with adults to adolescents. In the current study, it was found that a modified procedure originally designed for use with an adult population could be successfully applied to an adolescent population. The results from the current study indicate that CBM-I procedures can reduce interpretation bias in adolescents with social phobia similarly to studies conducted with adult populations (e.g., Amir & Taylor, 2012; Bowler et al., 2012; Brosan, Hoppitt, Shelfer, Sillence, & Mackintosh, 2011).

These findings can also be applied to the most recent social phobia model by Clark and Wells (2010). This model suggests that there are three phases to social anxiety; the anticipatory phase, situational exposure, and post-event processing. The

current findings are most relevant to the situational exposure phase as it was found that participants had exaggerated beliefs about danger and being perceived in a negative light by others. The findings from the image pleasantness ratings also supports the idea that social encounters do not need to occur in order for anxiety symptoms to develop and be maintained (Gangemi et al., 2012) as individuals were not engaging in real life situations but still rated scenarios and the idea of engaging in social situations as unpleasant (e.g., threatening).

Previous research with adults has found that imagery is a central component to the maintenance of social phobia (Holmes & Mathews, 2005) and that the use of imagery in CBM-I enhances the procedures efficacy (Holmes et al., 2009). This study does not support the importance of imagery in reducing anxiety as it was found that there was a non-significant positive correlation between imagery self-report ratings and changes in SAS-A Total scores from pre-to-post-intervention. Hirsch, Mathews, Clark, Williams, and Morrison (2006) found that socially anxious adults experience distressing negative imagery connected to anticipated and actual social encounters which increases anxiety. The current study supported this, finding that all participants found the social scenarios presented in the recognition test significantly less threatening post-intervention compared to pre-intervention demonstrating the ability of CBM-I procedures to reduce distressing images.

With regard to other existing research findings, Murphy et al. (2007) found that adults reported feeling significantly less anxious about future social situations following CBM-I training therefore providing evidence that CBM-I can be linked to a reduction in anticipatory anxiety. The current study found that participants reported feeling less anxious about future events (e.g., returning back to school) following the

CBM-I training, therefore supporting the finding that CBM-I has the potential to reduce anticipatory anxiety in adolescents.

4.6. Clinical Implications

The findings from the current study have several important clinical implications. These will be discussed in relation to both adolescents with social phobia and NHS services.

4.6.1. Implications for adolescents with social phobia.

The current study found that a multi-session CBM-I training programme for adolescents with social phobia was able to produce a reduction in negative interpretation bias and an increase in positive interpretation bias in seven of the eight participants. In addition, the training brought about some minimal reductions in social phobia symptoms in several of the participants as measured by the outcome measures and behavioural changes reported from the participants and their parents. The current study also found that the CBM-I procedure was able to engage a previously reluctant young person in a psychological intervention, increasing his insight into his difficulties, and developing his motivation to change. This highlights the importance of outreach work and technology in engaging young people. These promising initial findings also indicate that CBM-I procedures may be a useful adjunction to other psychological interventions. MacLeod and Mathews (2012) state that it would be ambitious at this stage of testing to suggest that CBM-I procedures could be used in isolation as a treatment for adolescents with social phobia, but believe that with further refinement CBM-I procedures will be a useful component of a treatment package.

As many individuals diagnosed with social phobia fail to access empirically supported treatments (Olfson et al., 2000), Coles et al. (2004) argued that more

accessible treatments need to be developed in an attempt to increase the amount of individuals receiving appropriate treatment. As mental health interventions are beginning to be accessed independently though enhanced technology, such as smartphone applications, new avenues for providing innovative psychological treatments are currently being developed (Heron & Smyth, 2010). This study has revealed that CBM-I interventions can be delivered and be effective with minimal face-to-face therapist contact through internet delivery. With this in mind, it is felt that internet based self-help CBM-I interventions such as the training paradigm delivered in this study, alongside therapist contact through text and email, could help individuals to access empirically supported treatment and potentially reduce levels of social phobia within adolescent populations.

4.6.2. Implications for services.

It appears based on the current findings that CBM-I has the potential to be used as a waiting-list intervention for adolescents with social phobia. Only two participants made changes on the social phobia outcome measure which warranted no further treatment. This therefore, indicates that the current CBM-I procedure may be useful as a pre-cursor to a clinician-led psychological intervention which is able to develop insight and engagement. Palmqvist, Carlbring, and Andersson (2007) support this finding, stating that internet based psychological treatments are more effective when combined with regular support from a clinician but highlight that the total amount of therapist time is much less with internet based treatments than that involved in traditional face-to-face therapy. CBM-I therefore has the potential to save time and money in a period when the NHS is having to make significant financial savings, many of which are being made by limiting the number of clinician led sessions services can offer individuals with mental health diagnoses (Radhakrishnan

et al., 2013). The NHS Trust where this piece of research was conducted is currently in a stage of change and radical redesign. Due to the economic downturn, NSFT has been tasked with reducing costs by 20% over 4 years from April 2012. It is assumed that the number of service users will remain the same despite a reduction in funding and a reduction of 502 jobs (NSFT, 2012). With this is mind, clinical psychology needs to be creative and become more efficient at seeing the same number of people with fewer clinicians, whilst continuing to provide high quality services. Bower, Richards, and Lovell (2001) stated that self-help treatments have the potential to improve the overall cost-effectiveness of mental health services. The findings from the current study, indicate that CBM-I procedures do have the potential to reduce interpretation bias and social phobia symptoms in some adolescents, with minimal face-to-face clinician contact. CBM-I is cost-effective as once the programme is developed it can be used with multiple clients, using their own computers. It is also possible that a support worker could facilitate the training and support the young people through the CBM-I which would target service waiting-lists as well as reduce clinical costs. This therefore, supports the suggestion from Koster et al. (2009) that CBM-I interventions have the potential to be used as cost-effective adjunctions to 1:1 psychological therapy.

4.7. Future Research Recommendations

As this was the first piece of research where multiple CBM-I sessions were administered to adolescents with clinical levels of social phobia, a replication of the current study addressing the highlighted methodological weaknesses would be beneficial. Specifically, future studies should use behavioural measures to assess social phobia symptoms alongside the SAS-A. Interestingly, Amir and Taylor's (2012) CBM-I study found that despite reductions in clinician rated social anxiety

symptoms (65% of participants no longer meet DSM-IV criteria), there were no significant group differences between self-reported social phobia symptoms post-intervention. This means that participants were not able to identify that they had made changes in symptom severity. It would, therefore, be beneficial to conduct a similar study to the current study, which utilises a clinician validated tool as well as self-report measures to make the findings of the current study more robust. It would also be useful to deliver the interpretation bias recognition test at the assessment and follow-up time points to assess the longevity of the CBM-I procedure in modifying interpretation bias. As the study demonstrated a delayed intervention effect, it would also be interesting to investigate the longevity of both interpretation bias and symptom change at 3 and 6 month follow-up periods. It would be appropriate based on the initial findings of this study, to conduct a larger scale study to further evaluate the clinical utility of CBM-I procedures with this population. Within this, it would be of value to compare the efficacy of CBM-I against other established treatment options such as CBT to establish the clinical utility of CBM-I compared to other treatments with this population. In addition, it would be beneficial to investigate whether CBM-I reduces the amount of subsequent treatment sessions needed compared to those who were kept on the waiting list. Contrary to previous research (e.g., Holmes et al., 2009), which found that imagery enhanced the efficacy of CBM-I, this study found no significant relationship between imagery and changes in social phobia symptoms from pre-to-post-intervention. Based on these contradictory results, more research should be conducted to further investigate the effects of imagery in CBM-I procedures with this population.

As CBM-I procedures are still within their infancy with adolescent populations, further research needs to be conducted to establish the optimal conditions

needed to create maximum symptom and interpretation bias change. The qualitative findings from this study highlight the need for CBM-I interventions to be tailored to match the specific needs and characteristics of the individual clients. It would therefore, be helpful to develop future CBM-I programmes which are gender, age, and symptom specific and assess whether this tailored approach enhances efficacy. Involving service users in the further development of CBM-I procedures is warranted based on the extremely insightful and valuable feedback generated from the participants and their parents in this study. Service user involvement in the development of mental health interventions is also in line with current NICE guidelines (2011).

4.8. Conclusions

In conclusion, the results of the current study indicate the potential value of CBM-I in modifying negative interpretative biases and symptomology in adolescents with social phobia. However, the findings were not absolute, with variability amongst participants making it difficult to draw strong conclusions from the findings. Contrary to previous research (e.g., Holmes et al., 2009), the increased use of imagery did not enhance the effects of the CBM-I procedure. However, participant enjoyment was found to be linked with increased positive outcomes with regard to changes in symptomology and interpretation bias. The study highlights some areas for development including participant tailored CBM-I training procedures. This multiple session CBM-I study provides an interesting initial insight into the efficacy and feasibility of this approach with an adolescent clinical population. It is felt that CBM-I procedures have a number of important clinical implications for both services and clients including accessibility of treatment and potential cost-savings. These clinical

implications warrant the further investigation of this procedure with clinical adolescent populations.

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Appendices

Appendix A - Initial Consent Form

University of East Anglia

Norfolk and Suffolk NHS
NHS Foundation Trust

Consent form for adolescent's details to be given to the researcher

Title of Project: Modifying interpretation bias in adolescents with high levels of social anxiety: A case design series using Cognitive Bias Modification.

Name of researcher: Amie Cooke

	Please initial each box
1. I agree that my details (name, telephone number, and age) can be passed on to Amie Cooke, Trainee Clinical Psychologist so that I can be contact to be given more details about the study.	☐
2. I have been given the information sheet dated **09.10.12** (version **3**).	☐
3. I understand that this does not mean that I have to take part in the study.	☐

_____	_____	_____
Name of adolescent	Signature	Date
_____	_____	_____
Name of parent/guardian (If adolescent if under 16 years old)	Signature	Date
_____	_____	_____
Name of CAMHS Practitioner	Signature	Date

Version: 1

Date: 20.01.12

Appendix B - Social Anxiety Scale for Adolescents (SAS-A)

SAS-A (Adolescents)

This is not a test, there are no right or wrong answers. Please answer each item as honestly as you can.

Use these numbers to show HOW MUCH YOU FEEL something is true for you:

1 = Not at all
2 = Hardly ever
3 = Sometimes
4 = Most of the time
5 = All the time

Now let's try these sentences first. How much does each describe how you feel?

a. I like summer vacation..... 1 2 3 4 5
b. I like to eat spinach..... 1 2 3 4 5

1. I worry about doing something new in front of others..... 1 2 3 4 5
2. I like to do things with my friends..... 1 2 3 4 5
3. I worry about being teased..... 1 2 3 4 5
4. I feel shy around people I don't know..... 1 2 3 4 5
5. I only talk to people I know really well..... 1 2 3 4 5
6. I feel that peers talk about me behind my back..... 1 2 3 4 5
7. I like to read..... 1 2 3 4 5
8. I worry about what others think of me..... 1 2 3 4 5
9. I'm afraid that others will not like me..... 1 2 3 4 5
10. I get nervous when I talk to peers I don't know very well..... 1 2 3 4 5
11. I like to play sports..... 1 2 3 4 5
12. I worry about what others say about me..... 1 2 3 4 5
13. I get nervous when I meet new people..... 1 2 3 4 5
14. I worry that others don't like me..... 1 2 3 4 5
15. I'm quiet when I'm with a group of people..... 1 2 3 4 5
16. I like to do things by myself..... 1 2 3 4 5
17. I feel that others make fun of me..... 1 2 3 4 5
18. If I get into an argument, I worry that the other person will not like me.. 1 2 3 4 5
19. I'm afraid to invite others to do things with me because they might say no..... 1 2 3 4 5
20. I feel nervous when I'm around certain people..... 1 2 3 4 5
21. I feel shy even with peers I know well..... 1 2 3 4 5
22. It's hard for me to ask others to do things with me..... 1 2 3 4 5

Appendix C: Development and Well-being Assessment (DAWBA)

Due to the length of the measure (49 pages) the web link to the full measure has been provided: http://www.dawba.com/py/doc/b1list.py?language=English.
The entire measure is available from the author upon request.

Appendix D: Brief Symptom Inventory (BSI)

Brief Symptom Inventory

"Here I have a list of problems people sometimes have. As I read each one to you, I want you to tell me HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU <u>DURING THE PAST 7 DAYS INCLUDING TODAY</u>. These are the answers I want you to use. *[Hand card and read answers.]* **Do you have any questions?"**

0 = Not at all
1 = A little bit
2 = Moderately
3 = Quite a bit
4 = Extremely
R = Refused

1. Nervousness or shakiness inside 0 1 2 3 4 R
2. Faintness or dizziness 0 1 2 3 4 R
3. The idea that someone else can control your thoughts 0 1 2 3 4 R
4. Feeling others are to blame for most of your troubles 0 1 2 3 4 R
5. Trouble remembering things 0 1 2 3 4 R
6. Feeling easily annoyed or irritated 0 1 2 3 4 R
7. Pains in the heart or chest 0 1 2 3 4 R
8. Feeling afraid in open spaces 0 1 2 3 4 R
9. Thoughts of ending your life 0 1 2 3 4 R
10. Feeling that most people cannot be trusted 0 1 2 3 4 R
11. Poor appetite 0 1 2 3 4 R
12. Suddenly scared for no reason 0 1 2 3 4 R
13. Temper outbursts that you could not control 0 1 2 3 4 R
14. Feeling lonely even when you are with people 0 1 2 3 4 R
15. Feeling blocked in getting things done 0 1 2 3 4 R
16. Feeling lonely 0 1 2 3 4 R
17. Feeling blue 0 1 2 3 4 R
18. Feeling no interest in things 0 1 2 3 4 R
19. Feeling fearful 0 1 2 3 4 R
20. Your feelings being easily hurt 0 1 2 3 4 R
21. Feeling that people are unfriendly or dislike you 0 1 2 3 4 R
22. Feeling inferior to others 0 1 2 3 4 R
23. Nausea or upset stomach 0 1 2 3 4 R
24. Feeling that you are watched or talked about by others 0 1 2 3 4 R

25. Trouble falling asleep 0 1 2 3 4 R

26. Having to check and double check what you do 0 1 2 3 4 R

27. Difficulty making decisions 0 1 2 3 4 R

28. Feeling afraid to travel on buses, subways, or trains 0 1 2 3 4 R

29. Trouble getting your breath 0 1 2 3 4 R

30. Hot or cold spells 0 1 2 3 4 R

31. Having to avoid certain things, places, or activities because they frighten you 0 1 2 3 4 R

32. Your mind going blank 0 1 2 3 4 R

33. Numbness or tingling in parts of your body 0 1 2 3 4 R

34. The idea that you should be punished for your sins 0 1 2 3 4 R

35. Feeling hopeless about the future 0 1 2 3 4 R

36. Trouble concentrating 0 1 2 3 4 R

37. Feeling weak in parts of your body 0 1 2 3 4 R

38. Feeling tense or keyed up 0 1 2 3 4 R

39. Thoughts of death or dying 0 1 2 3 4 R

40. Having urges to beat, injure, or harm someone 0 1 2 3 4 R

41. Having urges to break or smash things 0 1 2 3 4 R

42. Feeling very self-conscious with others 0 1 2 3 4 R

43. Feeling uneasy in crowds 0 1 2 3 4 R

44. Never feeling close to another person 0 1 2 3 4 R

45. Spells of terror or panic 0 1 2 3 4 R

46. Getting into frequent arguments 0 1 2 3 4 R

47. Feeling nervous when you are left alone 0 1 2 3 4 R

48. Others not giving you proper credit for your achievements 0 1 2 3 4 R

49. Feeling so restless you couldn’t sit still 0 1 2 3 4 R

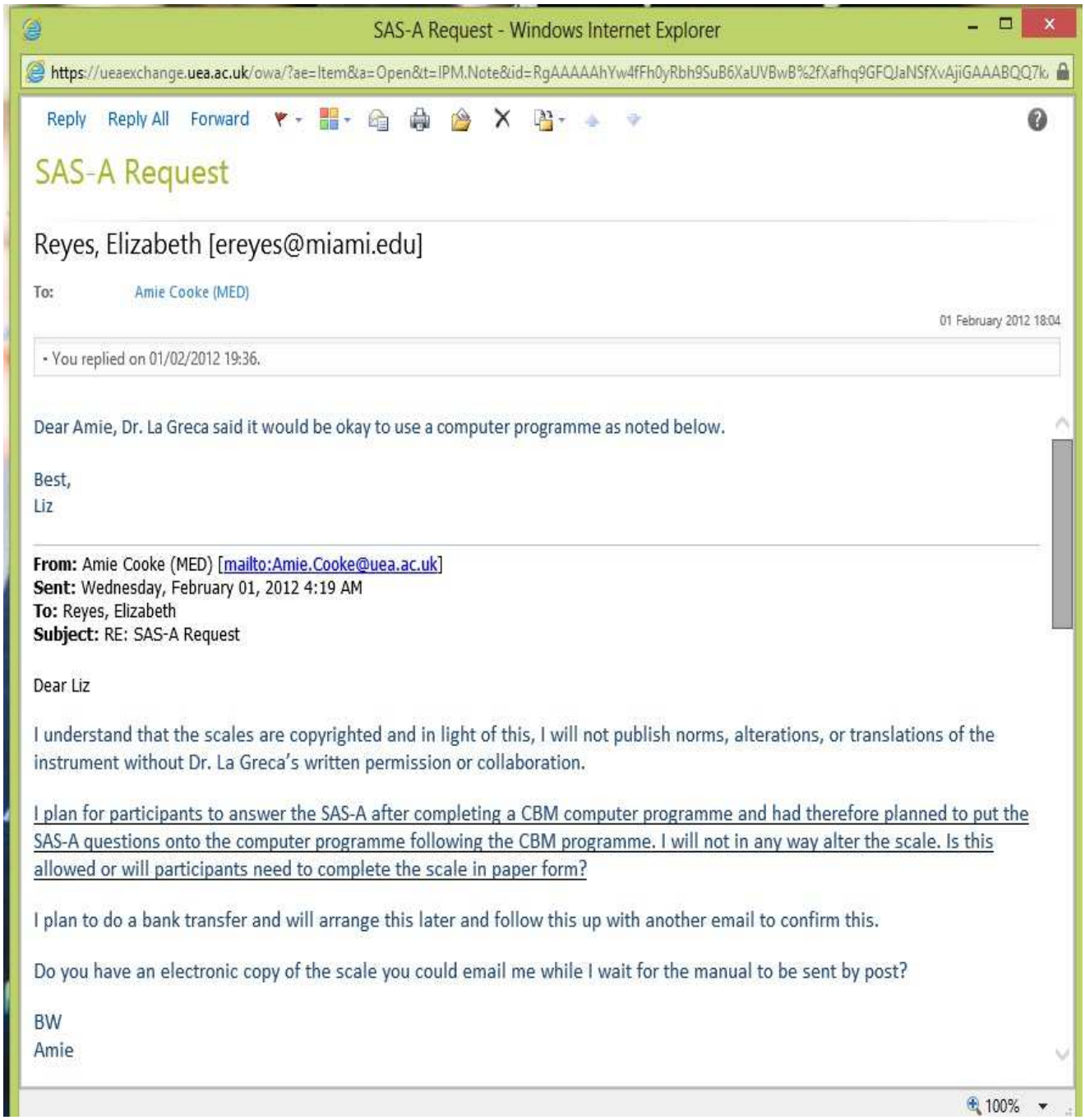
50. Feelings of worthlessness 0 1 2 3 4 R

51. Feeling that people will take advantage of you if you let them 0 1 2 3 4 R

52. Feeling of guilt 0 1 2 3 4 R

53. The idea that something is wrong with your mind 0 1 2 3 4 R

Appendix E - Permission to Modify SAS-A Presentation



SAS-A Request - Windows Internet Explorer

https://ueaexchange.uea.ac.uk/owa/?ae=Item&a=Open&t=IPM.Note&id=RgAAAAAhYw4fFh0yRbh9SuB6XaUVBwB%2fXafhq9GFQJaNSfXvAjiGAAABQQ7k

Reply Reply All Forward

SAS-A Request

Reyes, Elizabeth [ereyes@miami.edu]

To: Amie Cooke (MED)

01 February 2012 18:04

- You replied on 01/02/2012 19:36.

Dear Amie, Dr. La Greca said it would be okay to use a computer programme as noted below.

Best,
Liz

From: Amie Cooke (MED) [mailto:Amie.Cooke@uea.ac.uk]
Sent: Wednesday, February 01, 2012 4:19 AM
To: Reyes, Elizabeth
Subject: RE: SAS-A Request

Dear Liz

I understand that the scales are copyrighted and in light of this, I will not publish norms, alterations, or translations of the instrument without Dr. La Greca's written permission or collaboration.

I plan for participants to answer the SAS-A after completing a CBM computer programme and had therefore planned to put the SAS-A questions onto the computer programme following the CBM programme. I will not in any way alter the scale. Is this allowed or will participants need to complete the scale in paper form?

I plan to do a bank transfer and will arrange this later and follow this up with another email to confirm this.

Do you have an electronic copy of the scale you could email me while I wait for the manual to be sent by post?

BW
Amie

100%

Appendix F -Visual Analogue Scales

1. **How worried do you feel?**

0 _____10

(Not worried at all) (Very worried)

2. **How nervous do you feel?**

0 _____10

(Not nervous at all) (Very nervous)

3. **How scared do you feel?**

0 _____10

(Not scared at all) (Very scared)

4. **I find it difficult to think of anything other than bad endings for events**

0 _____10

(Not at all true) (Very true)

5. **When something has gone wrong I feel that it is my fault**

0 _____10

(Not at all true) (Very true)

6. **I expect the worst**

0 _____10

(Not at all true) (Very true)

7. **When I have made a mistake it makes me think negative things about myself**

0 _____10

(Not at all true) (Very true)

8. **Negative thoughts just seem to pop into my head**

0 _____10

(Not at all true) (Very true)

Appendix G - Participant Acceptability Questionnaire (PAQ)

Participant Questionnaire

1. **How much did you enjoy the CBM computer task?**

   0 _____10

   (Not at all) (Very much)

2. **Were the CBM instructions and tasks clear enough to understand?**

   0 _____10

   (Not clear at all) (Very Clear)

3. **Were the training scenarios relevant to you and your age group?**
   0 _____10

   (Not at all relevant) (Very Relevant)

4. **How easy was it to complete the CBM computer tasks?**
   0 _____10

   (Very Hard) (Very Easy)

5. **How much (during the session) did you find yourself thinking in images?**

   0 _____10

   (Very Little of the Time) (Most of the Time)

6. **How much were you imagining the situation from a personal point of view?**

   0 _____10

   (Very Little of the Time) (Most of the Time)

7. **In everyday life how much of the time would you say that you use images?**

   0 _____10

   (Very Little of the Time) (Most of the Time)

8. **How easy was it for you to fit the CBM sessions into your day?**

   0 _____10

   (Very Hard) (Very Easy)

9. **Did you find yourself feeling any different in social situations after the week of training?**

   0 _____10

   (Not at all) (Very Different)

10. **Please give any other comments about the computer task?**

    _____

    _____

    _____

    _____

    _____

Version: 1
Date: 15.06.2012

Appendix H - Parent Questionnaire

Norfolk and Suffolk NHS
NHS Foundation Trust

Parent Questionnaire

1. **How much did you have to encourage your child to engage in the CBM sessions?**

   0 _____10

   (Very Much) (Very Little)

2. **How easy was it for you to fit the CBM sessions into your and your child's day?**

   0 _____10

   (Very Hard) (Very Easy)

3. **Did you find your child to be any different in social situations after the week of training?**

   0 _____10

   (Not at all) (Very Different)

4. **Please give any other comments**

   _____

   _____

   _____

   _____

Version: 1
Date: 15.06.2012

Appendix I - Example CBM-I Training Scenarios

Below is a random sample of the 210 CBM-I training scenarios. A copy of all of the training scenarios is available from the author upon request. See section 2.6 for more details.

1. You are in an after school club with some friends
   it is getting late as you have been there for two hours after school.
   You are telling the others about the holiday you had in the summer.
   As you speak you notice that they are yawning and realise they are…

   Word fragment: ti-ed
   Comprehension question: Were your friends yawning because they were bored?

2. You are invited to a fancy dress party
   and decide to wear a bright costume.
   The next day your picture has been put on facebook.
   The thought of everyone seeing it makes you feel…

   Word fragment: pl-as-d
   Comprehension questions: Are you happy that the picture from the party was on facebook?

3. You decide to take your dog for a walk around the local field
   when you arrive at the field you see your next door neighbour
   as you walk over they say they are about to leave.
   You think they must have…

   Word fragment: f-n-shed
   Comprehension question: Is your neighbour ignoring you?

4. You like singing and decide to join the choir at school.
   The choir was asked by your head teacher to sing at assembly
   you agree, but you have no time to practice before and you make a mistake.
   When you talk to the other members they think you did…

   Word fragment: we--
   Comprehension question: Were the others unhappy with your singing?

5. You are about to do a presentation for your English class
   and you are being marked.
   As you stand up to speak you feel nervous.
   After you finish talking you think these nerves made you seem like you…

   Word fragment: car-d
   Comprehension questions: Did being nervous make you do badly?

6. You are reading a book on the bus travelling into the city.
   The bus stops and a girl from school gets on.
   You smile at her but she does not come to sit with you, and sits on her own.
   You think this is because she thinks you are

   Word fragment: read-ng
   Comprehension question: Did the girl sit on her own because she does not like you?

7. You are in your history class and it is nearly time to end.
   Your teacher asks you to read a passage of your work out to the class.
   You stand up and start to read when you finished reading,
   you see some of your class mates…

   Word fragment: wr-ting
   Comprehension question: Do you think you sounded silly?

8. You walk into a cafe on your own
   you sit down and decide to order a milkshake.
   The waitress comes over to take your order and sees that you are on your own
   she thinks that you are…

   Word fragment: fi-e
   Comprehension question: Did the waitress think you were strange sitting on your own?

9. You ask your friend to stay over at the weekend
   they say yes and you plan lots of things to do
   after they have been at your house for a while
   they say they are leaving because they are…

   Word fragment: unwe--
   Comprehension question: Did they want to stay at your house?

10. The next school prom is in June.
    You and your friends are all going.
    There will be lots of people there dancing and having fun
    when you think about the prom and all the people you feel…

    Word fragment: e-cited
    Comprehension question: Do you feel nervous?

Appendix J - Imagery Exercise

It will be important that you imagine each situation as you go through the task. This means that you should create a picture in your head of you in the social situation. To help you do this, please do the imagery exercises before you start the task.

1. Close your eyes and imagine that you have just walked into your house after being at school or college all day, say out loud what you can see. What can you smell? What do you feel?

   How clear is the image you have made in your head?

   0_____10

(I cannot imagine it) (I can see it as if I were there)

2. Close your eyes and imagine that you have just cut a fresh, juicy lemon in half. Now imagine lifting it to your noise and have a smell. What does it smell like? Now take a bite and suck the juice. What does it taste like? What feelings do you get in your body?

   How clear is the image you have made in your head?

   0_____10

(I cannot imagine it) (I can see it as if it were real)

Note. The imagery instructions were presented in both written and oral format

Appendix K - North Wales Research Ethics Committee Approval

Part of the research infrastructure for Wales funded by the National Institute for Social Care and Health Research, Welsh Government.
Yn rhan o seilwaith ymchwil Cymru a ariannir gan y Sefydliad Cenedlaethol ar gyfer Ymchwil Gofal Cymdeithasol ac Iechyd, Llywodraeth Cymru

North Wales REC (Central & East)
G1/G2 Croesnewydd Hall
Croesnewydd Road
Wrexham Technology Park
Wrexham LL13 7YP

Telephone : 01978 726377

E-mail : tracy.biggs@wales.nhs.uk

Website : www.nres.nhs.uk

27 September 2012

Miss Amie Cooke
Trainee Clinical Psychologist
Cambridgeshire and Peterborough NHS Foundation Trust
Department of Psychological Sciences
Norwich Medical School, University of East Anglia
Norwich
NR4 7TJ

Dear Miss Cooke

Study title: **Modifying interpretation bias in adolescents with high levels of social anxiety: An explorative case design series using Cognitive Bias Modification.**

REC reference: **12/WA/0279**

Thank you for your letter of 11 September 2012, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information was considered by a sub-committee of the REC at a meeting held on 27 September 2012. A list of the sub-committee members is attached.

Confirmation of ethical opinion

On behalf of the Committee, I am pleased to confirm a favourable ethical opinion for the above research on the basis described in the application form, protocol and supporting documentation as revised, subject to the conditions specified below.

Ethical review of research sites

NHS sites

The favourable opinion applies to all NHS sites taking part in the study, subject to management permission being obtained from the NHS/HSC R&D office prior to the start of the study (see "Conditions of the favourable opinion" below).

Conditions of the favourable opinion

The favourable opinion is subject to the following conditions being met prior to the start of the study.

1) **Please reformat the Information Sheets for ease of reading and increase the font size. The line currently dividing the text appears to run through certain letters.**

Management permission or approval must be obtained from each host organisation prior to the start of the study at the site concerned.

Management permission ("R&D approval") should be sought from all NHS organisations involved in the study in accordance with NHS research governance arrangements.

Guidance on applying for NHS permission for research is available in the Integrated Research Application System or at http://www.rdforum.nhs.uk.

Where a NHS organisation's role in the study is limited to identifying and referring potential participants to research sites ("participant identification centre"), guidance should be sought from the R&D office on the information it requires to give permission for this activity.

For non-NHS sites, site management permission should be obtained in accordance with the procedures of the relevant host organisation.

Sponsors are not required to notify the Committee of approvals from host organisations

It is the responsibility of the sponsor to ensure that all the conditions are complied with before the start of the study or its initiation at a particular site (as applicable).

You must notify the REC in writing once all conditions have been met (except for site approvals from host organisations) and provide copies of any revised documentation with updated version numbers. Confirmation should also be provided to host organisations together with relevant documentation.

Approved documents

The final list of documents reviewed and approved by the Committee is as follows:

Document	*Version*	*Date*
Covering Letter		20 August 2012
Covering Letter		11 September 2012
Evidence of insurance or indemnity		15 May 2012
GP/Consultant Information Sheets	1	19 July 2012
Investigator CV		20 August 2012
Investigator CV		
Investigator CV		20 August 2012
Letter from Sponsor		14 August 2012
Other: Debrief Sheet	1	20 January 2012
Other: Imagery Instruction Sheet	1	15 June 2012
Other: CAMHS Eligibility Criteria		10 September 2012
Other: Lone Worker Policy		30 November 2011
Participant Consent Form: Initial consent	1	20 January 2012
Participant Consent Form: Assent	2	20 August 2012
Participant Consent Form: Over 16	2	20 August 2012
Participant Consent Form: Parental	2	20 August 2012
Participant Information Sheet: Parent	1	13 August 2012
Participant Information Sheet: 13-15 years	1	10 September 2012
Participant Information Sheet: 15-17 years	1	10 September 2012
Protocol	3	10 September 2012
Questionnaire: BSA		
Questionnaire: DAWBA		
Questionnaire: SAS-A		

Questionnaire: Participant (end of research)	1	15 June 2012
Questionnaire: Parent (end of resarch)	1	15 June 2012
Questionnaire: Visual Analogue Scales	1	20 January 2012
REC application 108210/355853/1/113		21 August 2012
Response to Request for Further Information		11 September 2012
Summary/Synopsis	2	15 June 2012
Summary/Synopsis	2	15 June 2012

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

After ethical review

Reporting requirements

The attached document *"After ethical review – guidance for researchers"* gives detailed guidance on reporting requirements for studies with a favourable opinion, including:

- Notifying substantial amendments
- Adding new sites and investigators
- Notification of serious breaches of the protocol
- Progress and safety reports
- Notifying the end of the study

The NRES website also provides guidance on these topics, which is updated in the light of changes in reporting requirements or procedures.

Feedback

You are invited to give your view of the service that you have received from the National Research Ethics Service and the application procedure. If you wish to make your views known please use the feedback form available on the website.

Further information is available at National Research Ethics Service website > After Review

12/WA/0279	**Please quote this number on all correspondence**

With the Committee's best wishes for the success of this project

Yours sincerely

T. A. Biggs.

Professor Alex Carson
Chair

E-mail: tracy.biggs@wales.nhs.uk

Enclosures: List of names and professions of members who were present at the meeting and those who submitted written comments

"After ethical review – guidance for researchers"

Copy to: Sue Steel, University of East Anglia
Dr Bonnie Teague, Norfolk and Suffolk NHS Foundation Trust

North Wales REC (Central & East)
G1/G2 Croesnewydd Hall
Croesnewydd Road
Wrexham Technology Park
Wrexham LL13 7YP

Telephone : 01978 726377

E-mail : tracy.biggs@wales.nhs.uk

Website : www.nres.nhs.uk

25 October 2012

Miss Amie Cooke
Trainee Clinical Psychologist
Cambridgeshire and Peterborough NHS Foundation Trust
Department of Psychological Sciences
Norwich Medical School, University of East Anglia
Norwich
NR4 7TJ

Dear Miss Cooke

Study title:	**Modifying interpretation bias in adolescents with high levels of social anxiety: An explorative case design series using Cognitive Bias Modification.**
REC reference:	**12/WA/0279**
Amendment number:	**1**
Amendment date:	**10 October 2012**

The above amendment was reviewed at the meeting of the Sub-Committee held on 25 October 2012.

The members of the Committee taking part in the review gave a favourable ethical opinion of the amendment on the basis described in the notice of amendment form and supporting documentation.

Approved documents

The documents reviewed and approved at the meeting were:

Document	Version	Date
R&D correspondence		10 October 2012
Participant Information Sheet: 16-17	3	09 October 2012
Participant Information Sheet: 13-15	3	09 October 2012
Protocol	4	09 October 2012
Notice of Substantial Amendment (non-CTIMPs) 108210/372999/13/921/15574	1	10 October 2012

Membership of the Committee

The members of the Committee who took part in the review are listed on the attached sheet.

R&D approval

All investigators and research collaborators in the NHS should notify the R&D office for the relevant NHS care organisation of this amendment and check whether it affects R&D approval of the research.

Statement of compliance

The Committee is constituted in accordance with the Governance Arrangements for Research Ethics Committees and complies fully with the Standard Operating Procedures for Research Ethics Committees in the UK.

12/WA/0279:	**Please quote this number on all correspondence**

Yours sincerely

T.a. Biggs.

Professor Alex Carson
Chair

E-mail: tracy.biggs@wales.nhs.uk

Enclosures: List of names and professions of members who took part in the review

Copy to: Dr Bonnie Teague, Norfolk and Suffolk NHS Foundation Trust
Sue Steel, University of East Anglia

Appendix L - Norfolk and Suffolk Research and Development Committee Approval

Norfolk and Suffolk NHS
NHS Foundation Trust

Research and Development
The Knowledge Centre
Hellesdon Hospital
Drayton High Road,
Norwich, NR65BE
Telephone 01603 421255
E mail: RDofficemailbox@nsft.nhs.uk

Miss Amie Cooke
Elizabeth Fry Building
University of East Anglia
Norwich
NR4 7TJ

29th October 2012

Dear Miss Cooke,

Re: 2012MH25: Modifying interpretation bias in adolescents with high levels of social anxiety: An explorative case design series using Cognitive Bias Modification

Thank you for submitting the above project for local research governance approval. I am pleased to inform you that your project has been given full approval and you may begin your research at the following site:

- Norfolk & Suffolk NHS Foundation Trust

I have enclosed two copies of the Standard Terms and Conditions of Approval. Please sign both copies returning one copy to the Research and Development office, at the above address, and keeping the other in your study file. Failure to return the standard terms and conditions may affect the conditions of approval. **Under the agreed Standard Terms and Conditions of Approval you must inform the R&D department of any proposed changes to this study and submit annual progress reports to the R&D department.**

Any researcher(s) whose substantive employer is not the Norfolk & Suffolk NHS Foundation Trust must have a Letter of Access or Honorary Research contract and evidence of Good Clinical Practice (GCP) training before coming on site to conduct their research in this project. Please note that you cannot take part in this study until you have this documentation. If a Letter of Access / Honorary Research Contract has not been issued – please contact us immediately.

If you have any queries regarding this or any other project, please contact, Tom Rhodes, Research Governance Administrator, at the above address.

The reference number for this study is: **2012MH25,** and this should be quoted on all correspondence.

Yours sincerely,

Dr Jon Wilson
Deputy Medical Director (Research)

Appendix M: 13-15 year old Information Sheet (scanned copy to maintain format)

University of East Anglia

Norfolk and Suffolk NHS
NHS Foundation Trust

Information about the study (Aged 13-15)

Title: Modifying interpretation bias in adolescents with high levels of social anxiety

We are asking if you would join in a research project to find the answer to the question, can a computer training programme help young people feel less worried about being in social situations. Before you decide if you want to join in, it is important to understand why the research is being done and what it will involve for you. So please read this leaflet carefully. Talk to those who are close to you about it. If there is anything that is not clear, please contact me Amie Cooke, Trainee Clinical Psychologist, via e-mail at amie.cooke@uea.ac.uk.

Why are we doing this research?

- We want to see if a new computer training programme can help young people to feel less worried when they are in social situation.

camhs
Where Young Minds Matter

Why have I been invited to take part?

- You have been asked to take part because you are involved with Child and Adolescent Mental Health Services (CAMHS) to receive some help for your worries.
- There will be about 8 other young people in the study

Do I have to take part?

- No. It is up to you. Whether you decide to take part or not, your care with the CAMHS team will not be affected.

What will happen to me if I take part?

- Usually, you have to wait before you are seen at CAMHS. This research will take place whilst you wait.
- You will be in the research for between 5-7 weeks depending on what group you are put in.
- You will be visited by a researcher called Amie Cooke, who will help you to fill in some questionnaires about your mood and worries.
- Depending on your scores you may not be able to take part
- If your answers fit with what is needed for the study you will be asked if you would like to take part.
- If you want to take part, your parent/guardian will be asked to sign a consent form to say they agree.
- You will also have to sign a form, known as an assent form, to say that you agree.
- If you change your mind about taking part this is okay and you can stop being involved in the research at any point up until your results are analysed. Just contact Amie Cooke or ask your parent/guardian to.

What will I be asked to do?

- You will complete a computer programme every day for one week at your home. You will be sent an email or text message daily to remind you to do this.
- Depending on what group you are put in you will be asked to fill in some questions for one, two, or three weeks, every day before you start the training. This group will be decided at random once you agree to take part.
- The computer programme will show you several written paragraphs about social situations and ask you to fill in missing letters from a word which is linked to the written paragraph.
- We are looking to try and train you to look at situations more positively.
- Each computer session will last about 40 minutes. After the computer training each day, you will be asked to fill in questions on the computer about how you are feeling.

What will happen when the training is finished?

- When you have finished the seven days of computer training, you will also be asked to fill in the same questions that you did at the beginning of the research.
- After a two week break, you will be asked to fill in the same questions again and then a different short form asking you what you thought about the computer programme, for example, did you like it?
- Amie Cooke will then answer any questions and give you a £10 Amazon gift voucher to say thank you.

Is there anything to be worried about? 

- There are no risks in taking part in the study.
- But it will take up quite a bit of your time so you should make sure you have enough time to take part.
- As a guide - screening questionnaires (1 hour), the anxiety questionnaires (25 minutes each day) the computer programme and questionnaires for seven days when the training begins (45 minutes each day), and the follow up questionnaires (1 hour)

What are the possible benefits of taking part? 

- We cannot promise that the study will help you, but the information we get might help treat other young people who also get worried in social situations.
- If you complete the study, you will receive a £10 gift voucher to say thank you for taking part.

Who will see my answers? 

- We will keep your information in confidence. This means we will only tell those who have a need to know.
- If you would like your questionnaire scores to be shared with your team at CAMHS please sign to say you would like this to happen on the consent form. I will write a short letter to your doctor to tell them you are participating in the study if you agree to this.

Who has reviewed this study?

- All research in the NHS is looked at by independent group of people, called a Research Ethics Committee, to make sure the research is done properly. This study has been reviewed and okayed by the North Wales Research Ethics Committee (Central & East).

What will happen to the results of the research?

- The results will be submitted to the University of East Anglia as part of the thesis for the researcher's Doctorate in Clinical Psychology. You will not be identifiable in this piece of work.

What happens next? 

- It is up to you to decide if you would like to take part, you may find it helpful to speak to those people close to you to help you make this decision.
- Amie Cooke will also be happy to answer any questions you may have by email. If you agree (please sign the consent form), you will be visited by Amie Cooke, so that you can ask her any questions you may have.

Further information and contact details

- If you wish to talk more about the study, before or after taking part, please feel free to contact the researcher, Amie Cooke, at amie.cooke@uea.ac.uk.
- If you have any problems or have any complaints about the study then please contact Dr Margo Ononaiye, at margo.ononaiye@uea.ac.uk

Version: 3
Date: 09.10.12

Appendix N: 16-17 year old Information Sheet (scanned copy to maintain format)

University of East Anglia

Norfolk and Suffolk NHS
NHS Foundation Trust

Information about the study (Aged 16-17)

Title: Modifying interpretation bias in adolescents with high levels of social anxiety

You are invited to take part in a study looking at ways of reducing social anxiety in young people. The symptoms of social anxiety are feeling worried about being in social situations and thinking that others will think negative things about you. Before you decide if you want to join in, it is important to understand why the research is being done and what it will involve for you. So please read this leaflet carefully. Talk to those who are close to you about it. If there is anything that is not clear, please contact me Amie Cooke, Trainee Clinical Psychologist, via e-mail at amie.cooke@uea.ac.uk.

Why are we doing this research?

- We want to see if a new computer training programme, called Cognitive Bias Modification (CBM), can help to reduce social anxiety symptoms in young people.

Why have I been invited to take part?

- You have been asked to take part in this research because you have been referred to Child and Adolescent Mental Health Services (CAMHS) to receive some help with your anxieties or worries.
- There will be about 8 other young people in the study

Do I have to take part?

- No. It is up to you. Whether you decide to take part or not, your care with the CAMHS team will not be affected.

What will happen to me if I take part?

- Usually, you have to wait before you are seen at CAMHS. This research will take place whilst you wait.
- You will be in the research for between 5-7 weeks depending on what group you are put in.
- You will be visited by a researcher called Amie Cooke, who will help you to fill in some questionnaires about your mood and worries.
- Depending on your scores you may not be able to take part in the study.
- If your answers fit with what is needed for the study you will be asked if you would like to take part.

What will I be asked to do?

- You will complete a computer programme every day for up to four weeks at your home. You will be sent an email or text message to remind you to do this.
- Depending on what group you are put in you will be asked to fill in some questions for one, two, or three weeks, every day before you start the training. This group will be decided at random once you agree to take part.
- These questions will take about 15 minutes to answer.
- The computer programme will show you several written paragraphs about social situations and ask you to fill in missing letters from a word which is linked to the written paragraph.
- We are looking to try and train you to look at situations more positively by telling you if you have looked positively at the situation or not.
- Each computer session will last about 40 minutes. After the computer training each day, you will be asked to fill in questions on the computer about how you are feeling.

What will happen when the training is finished?

- When you have finished the seven days of computer training, you will also be asked to fill in the same questions that you did at the beginning of the research.
- After a two week break, you will be asked to fill in the same questions again and then a different short form asking you what you thought about the computer programme, for example, did you like it?
- Amie Cooke will then answer any questions you have and give you a £10 Amazon gift voucher to say thank you.
- If you want to withdraw your data from the study you can do this at any point up until the data has been analysed. If you want to do this just contact Amie Cooke.

Is there anything to be worried about if I take part?

- There are no risks in taking part in the study.
- But it will take up quite a bit of your time so you should make sure you have enough time before you agree to take part.
- As a guide - screening questionnaires (1 hour), the anxiety questionnaires (25 minutes each day) the computer programme and questionnaires for seven days when the training begins (40 minutes each day), and the follow up questionnaires (1 hour)

What are the possible benefits of taking part?

- We cannot promise the study will help you but the information we get might help treat other young people who also get worried in social situations.
- If you complete the study, you will receive a £10 gift voucher to say thank you for taking part.

Who will see my answers?

- We will keep your information in confidence. This means we will only tell those who have a need or right to know. If you would like your questionnaire scores to be shared with your team at CAMHS please sign to say you would like this to happen on the consent form.
- I will write a short letter to your doctor to tell them you are participating in the study if you agree to this.

Who has reviewed this study?

- All research in the NHS is looked at by independent group of people, called a Research Ethics Committee, to make sure the research is done properly and is suitable for adolescents. This study has been reviewed and okayed by the North Wales Research Ethics Committee (Central & East).

What will happen to the results of the research study?

- The results will be submitted to the University of East Anglia as part of the thesis for the researcher's Doctorate in Clinical Psychology.
- You will not be identifiable in this piece of work.

What happens next?

- It is up to you to decide if you would like to take part, you may find it helpful to speak to those people close to you to help you make this decision.
- Amie Cooke will also be happy to answer any questions you may have. If you agree (please sign the attached consent form), you will also be visited by Amie Cooke, so that you can ask her any questions you may have.
- Remember – If you want to stop the research at any point you can do so simply by contacting Amie Cooke.

Further information and contact details

- If you wish to talk more about the study, before or after taking part, please feel free to contact the researcher, Amie Cooke, at amie.cooke@uea.ac.uk.
- If you have any problems or have any complaints about the study then please contact Dr Margo Ononaiye, at margo.ononaiye@uea.ac.uk.

Version: 3
Date: 09.10.12

Appendix O: Parental Information Sheet

Norfolk and Suffolk NHS
NHS Foundation Trust

University of East Anglia

Information about the study – Parents of adolescents under 16 years old

Title: Modifying interpretation bias in adolescents with high levels of social anxiety: A case design series using Cognitive Bias Modification.

Your child is invited to take part in a study looking at ways of reducing social anxiety in young people. The symptoms of social anxiety are feeling worried about being in social situations and thinking that others will think negative things about you. This information sheet is to help you decide if you want your child to take part in the research. Please read this sheet carefully and discuss it with your child. If there is anything that is not clear, or that you would like to know more about, please contact me Amie Cooke, Trainee Clinical Psychologist, via e-mail at amie.cooke@uea.ac.uk.

What is the purpose of the research?
We want to see if a new computer training programme, called Cognitive Bias Modification (CBM), can help to reduce social anxiety symptoms in young people.

Why has your child been chosen?
Your child has been asked to take part in this research because they have been referred to Child and Adolescent Mental Health Services (CAMHS) to receive help with their anxieties in social situations.

Do they have to take part?
No. If your child does not take part this will not affect their care with the CAMHS team. They will simple continue to be on the waiting list until a practitioner becomes available. This is the normal procedure.

What will happen if your child takes part?
Usually, your child will have to wait before they are seen by a professional at CAMHS, and this research is something that they can do whilst they are waiting to be seen. Firstly, you and your child will be visited by a Trainee Clinical Psychologist called Amie Cooke, who will help your child to fill in three questionnaires about their mood and anxieties. Depending on your child's scores on these questionnaires they may not be able to take part in the main study. If their answers fit with the requirements of the study they will be asked if they would like to take part. Please note, as your child is under 16 years old if they want to take part in the research you will be asked to sign a consent form to confirm that you agree with this decision. Your child will also have to sign a form, known as an ascent form, to say that they agree. The research involves your child completing a computer programme daily for up to four weeks at home. Depending on what group your child is put in at the beginning of the research (this will be decided at random) they will be asked to fill in some questions for one, two, or three weeks, every day before they start the training. This set of questions will take them approximately 15 minutes to answer. Your child will then complete the seven days of training, and you will be shown how to use the training programme. This computer programme will show your child several written paragraphs about social situations and ask them to fill in missing letters from a word which is linked to the written paragraph. We are looking to try and train your child to look at

situations more positively by telling your child if they have looked positively at the situation or not. Each computer training session will last about 45 minutes. After the computer training each day, your child will be asked to fill in daily questionnaires on the computer about how they are feeling. This allows us to see if there has been any change in the way they are feeling.

When your child has finished the seven consecutive days of computer training, Amie Cooke will come to your house and speak to both you and your child about the computer programme. Your child will also be asked to fill in the same questions that they did at the beginning of the research. After a two week break, they will be asked to fill in the same questions again and then a different short form asking them what they thought about the computer programme, for example, did they like it? Did it make a difference to how they felt? We will also ask you what you thought about the computer programme and the research. Amie Cooke will then answer any questions either of you have and give your child a £10 Amazon gift voucher to say thank you for their time and effort.

What are the possible disadvantages and risks of taking part?
There are no risks in taking part in the study. However, your child will need to have time available to complete the screening questionnaires (1 hour), the anxiety questionnaires (15 minutes each day) for the weeks before the training, the computer programme and questionnaires for seven days when the training begins (45 minutes each day), and the follow up questionnaires (45 minutes).

What are the possible benefits of taking part?
Your child will be helping us to look at whether this type of programme is a beneficial and helpful intervention for young people with social anxiety. It may also help change the way your child feels when they are in social situations, but this is not guaranteed. Your child will also receive a £10 gift voucher to say thank you for taking part if they complete the research in full.

Will your child's data be confidential?
Yes. Only the Trainee Clinical Psychologist, Amie Cooke, will know your child's answers. Your child's questionnaires will not have their name on as they will be given a number to use instead of their name. Their name and data will be stored apart at all times. Your child's responses to the questions will be kept on a password protected memory database. If you would like your child's questionnaire scores to be shared with your team at CAMHS please discuss this with your child and sign to say you would like this to happen on the consent form. I will write a short letter to your child's GP to tell them that they are participating in the study if you agree to this.

What will happen if you or your child does not want them to carry on with the study?
Your child's treatment with CAMHS will not be effected. If you or your child choose to stop the study at any time all you will need to do is to let Amie Cooke (amie.cooke@uea.ac.uk) know and she will collect the computer, destroy all of your child's data and forms, and let CAMHS know that they are no longer involved in the research.

Who has reviewed this study?
All research in the NHS is looked at by independent group of people, called a Research Ethics Committee, to make sure the research is done properly and is suitable for adolescents. This study has been reviewed and okayed by the North Wales Research Ethics Committee (Central & East) and has been peer reviewed at the UEA.

What will happen to the results of the research study?
The results will be submitted to the University of East Anglia as part of the thesis for the researcher's Doctorate in Clinical Psychology. You will not be identifiable in this piece of work. It is hoped that the findings will also be published in an academic journal.

What happens next?
It is up to you and your child to decide together if your child would like to take part. Amie Cooke will be happy to answer any questions you may have by email. If you decided that your child will participate in the study (please sign the attached consent form), you will also be visited by the researcher, Amie Cooke, so that you can ask her any questions you may have. This will be arranged by telephone. If after this meeting you and your child would like to take part in the first stage of the research you will be asked to sign a consent form. Your child can then begin the research!

Further information and contact details
If you wish to discuss the project further, either before or after taking part, please feel free to contact the researcher, Amie Cooke, at amie.cooke@uea.ac.uk. If you have any problems or have any complaints about the study then please contact Dr Margo Ononaiye, at margo.ononaiye@uea.ac.uk. You may also contact the Patient Advice and Liaison Services Complaints manager Michael Lozano on 01603 421191.

Version: 1
Date: 13.08.12

Appendix P: Parental Consent Form

University of East Anglia

Norfolk and Suffolk NHS
NHS Foundation Trust

Patient Identification Number:

PARENTAL CONSENT FORM

Title of Project: Modifying interpretation bias in adolescents with high levels of social anxiety: A case design series using Cognitive Bias Modification

Name of Researcher: Amie Cooke

Please initial all boxes

1. I confirm that I have read and understand the information sheet dated **13.08.12** (version **1**) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. ☐

2. I understand that my child's participation is voluntary and that I am free to withdraw my consent at any time without giving any reason, without my medical care or legal rights being affected. ☐

3. I understand that any of the data collected during the study may be looked at by individuals from regulatory authorities or from the NHS Trust, who monitor the conduct of research to ensure it is being carried out correctly and ethically. I give permission for these individuals to have access to my child's data. ☐

4. I agree to my child's GP being informed of their participation in the study. ☐

5. I agree that the child named below can take part in the above study and confirm that I have parental responsibility for them. ☐

Name of Participant	Date	Signature
Name of Person taking consent.	Date	Signature

Version: 2
Date: 20.08.2012

Appendix Q: Participant Consent Form

Norfolk and Suffolk NHS
NHS Foundation Trust

University of East Anglia

Patient Identification Number:

PARTICIPANT CONSENT FORM (OVER 16 YEARS OLD)

Title of Project: Modifying interpretation bias in adolescents with high levels of social anxiety: A case design series using Cognitive Bias Modification

Name of Researcher: Amie Cooke

Please initial all boxes

6. I confirm that I have read and understand the information sheet dated **09.10.12** (**version 3**) for the above study. I have had the chance to read and think about the information, ask questions and have had these answered. ☐

7. I understand that I do not have to take part in the study and even if I do decide to, I can change my mind at any time and this will not affect me. ☐

8. I understand that any of my data collected during the study may be looked at by people from regulatory authorities or from the NHS Trust, who monitor the research to ensure it is being carried out correctly and safely. I give permission for these people to have access to my data. ☐

9. I agree that my doctor can be informed that I am taking part in this study. ☐

10. I agree to take part in the above study. ☐

Name of Participant	Date	Signature
Name of Person taking consent.	Date	Signature

Version: 2
Date: 20.08.2012

Appendix R: Participant Assent Form

Patient Identification Number:

PARTICIPANT ASSENT FORM

Title of Project: Modifying interpretation bias in adolescents with high levels of social anxiety: A case design series using Cognitive Bias Modification

Name of Researcher: Amie Cooke

Please initial all boxes

11. I have read the information sheet dated **09.10.12** (version **3**) for this study. I feel that I understand the information sheet and I have been able to ask questions and had these answered. ☐

12. I understand that I do not have to take part in the study and even if I do decide to, I can change my mind at any time and this will not affect me in any way. ☐

13. I agree that my doctor can be informed that I am taking part in this study. ☐

14. I agree to take part in the above study. ☐

Name of Participant	Date	Signature
Name of Person taking consent.	Date	Signature

Version: 2
Date: 20.08.2012

Appendix S: Letter to GP

Faculty of Medicine and Health Sciences
Postgraduate Research Office
University of East Anglia
Norwich NR4 7TJ
United Kingdom

Tel: +44 (0) 1603 593310
Fax: +44 (0) 1603 591132

GP Address

Dear Dr Date

RE: Participant D.O.B

Following a referral from ?? at ?? Child and Family Centre, we have invited ?? to take part in a piece of research connected to the University of East Anglia. The aim of the study is to investigate the effectiveness of a computer programme known as Cognitive Bias Modification at reducing social anxiety in adolescents. The full details of the project have been made clear to both parent and adolescent and should they wish to stop the research at any point they will be supported to do so.

Should you have any questions relating to the above or any other issues concerning the research please feel free to contact either myself, Amie Cooke, at amie.cooke@uea.ac.uk, or ?? (Case Holder, CAMHS) on 01493 337601.

Yours sincerely

Amie Cooke
Trainee Clinical Psychologist, University of East Angia

Version: 1
Date: 19.07.12

Appendix T: Debrief

Participant Debrief Sheet

Title: Modifying interpretation bias in adolescents with high levels of social anxiety: A case design series using Cognitive Bias Modification.

Thank you for taking part in this study. The study aimed to find out if the computer programme was helpful in reducing symptoms of social anxiety in adolescents.

Do you have any questions about the study? If so please ask me now, or email me at a later date when they arise on amie.cooke@uea.ac.uk.

Would you like to receive a brief summary of the study and the findings? If so, please let me know.

Child Adolescent Mental Health Services have been let know that you have finished this research.

If you wish to remove your answers from the report please contact me on amie.cooke@uea.ac.uk, this will have no effect on you or your future care.

If you have any further questions please contact me on the above email address.

Thank you again for your participation

Amie Cooke
Trainee Clinical Psychologist

Version: 1
Date: 20.01.12

Appendix U: Kendall's Tau (1970) Statistical Outputs

Tau Values: Participant One

Correlations

			Baseline	SAS
Kendall's tau_b	Baseline	Correlation Coefficient	1.000	-.335
		Sig. (2-tailed)	.	.099
		N	14	14
	SAS	Correlation Coefficient	-.335	1.000
		Sig. (2-tailed)	.099	.
		N	14	14

			Baseline
Kendall's tau_b	Baseline	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	14
	VAS1	Correlation Coefficient	.371
		Sig. (2-tailed)	.086
		N	14
	VAS2	Correlation Coefficient	.071
		Sig. (2-tailed)	.736
		N	14
	VAS3	Correlation Coefficient	.375
		Sig. (2-tailed)	.078
		N	14
	VAS4	Correlation Coefficient	-.014
		Sig. (2-tailed)	.948
		N	14
	VAS5	Correlation Coefficient	.381
		Sig. (2-tailed)	.081
		N	14
	VAS6	Correlation Coefficient	.000
		Sig. (2-tailed)	1.000
		N	14
	VAS7	Correlation Coefficient	.132
		Sig. (2-tailed)	.559
		N	14
	VAS8	Correlation Coefficient	.190
		Sig. (2-tailed)	.404
		N	14

Tau Values: Participant Two

Correlations

			Baseline	SAS
Kendall's tau_b	Baseline	Correlation Coefficient	1.000	-.029
		Sig. (2-tailed)	.	.916
		N	9	9
	SAS	Correlation Coefficient	-.029	1.000
		Sig. (2-tailed)	.916	.
		N	9	9

			Baseline
Kendall's tau_b	Baseline	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	14
	VAS1	Correlation Coefficient	.371
		Sig. (2-tailed)	.086
		N	14
	VAS2	Correlation Coefficient	.071
		Sig. (2-tailed)	.736
		N	14
	VAS3	Correlation Coefficient	.375
		Sig. (2-tailed)	.078
		N	14
	VAS4	Correlation Coefficient	-.014
		Sig. (2-tailed)	.948
		N	14
	VAS5	Correlation Coefficient	.381
		Sig. (2-tailed)	.081
		N	14
	VAS6	Correlation Coefficient	.000
		Sig. (2-tailed)	1.000
		N	14
	VAS7	Correlation Coefficient	.132
		Sig. (2-tailed)	.559
		N	14
	VAS8	Correlation Coefficient	.190
		Sig. (2-tailed)	.404
		N	14

Tau Values: Participant Three

Correlations

			Baseline	SAS
Kendall's tau_b	Baseline	Correlation Coefficient	1.000	-.036
		Sig. (2-tailed)	.	.828
		N	21	21
	SAS	Correlation Coefficient	-.036	1.000
		Sig. (2-tailed)	.828	.
		N	21	21

			Baseline
Kendall's tau_b	Baseline	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	21
	VAS1	Correlation Coefficient	-.401*
		Sig. (2-tailed)	.016
		N	21
	VAS2	Correlation Coefficient	-.492**
		Sig. (2-tailed)	.003
		N	21
	VAS3	Correlation Coefficient	-.375*
		Sig. (2-tailed)	.026
		N	21
	VAS4	Correlation Coefficient	-.403*
		Sig. (2-tailed)	.016
		N	21
	VAS5	Correlation Coefficient	.005
		Sig. (2-tailed)	.975
		N	21
	VAS6	Correlation Coefficient	.397*
		Sig. (2-tailed)	.024
		N	21
	VAS7	Correlation Coefficient	-.249
		Sig. (2-tailed)	.127
		N	21
	VAS8	Correlation Coefficient	-.477**
		Sig. (2-tailed)	.004
		N	21

Tau Values: Participant Four

Correlations

			Baseline	SAS
Kendall's tau_b	Baseline	Correlation Coefficient	1.000	.686**
		Sig. (2-tailed)	.	.001
		N	14	14
	SAS	Correlation Coefficient	.686**	1.000
		Sig. (2-tailed)	.001	.
		N	14	14

			Baseline
Kendall's tau_b	Baseline	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	14
	VAS1	Correlation Coefficient	.656**
		Sig. (2-tailed)	.003
		N	14
	VAS2	Correlation Coefficient	.669**
		Sig. (2-tailed)	.003
		N	14
	VAS3	Correlation Coefficient	.562*
		Sig. (2-tailed)	.012
		N	14
	VAS4	Correlation Coefficient	.
		Sig. (2-tailed)	.
		N	14
	VAS5	Correlation Coefficient	.
		Sig. (2-tailed)	.
		N	14
	VAS6	Correlation Coefficient	.
		Sig. (2-tailed)	.
		N	14
	VAS7	Correlation Coefficient	.
		Sig. (2-tailed)	.
		N	14
	VAS8	Correlation Coefficient	.
		Sig. (2-tailed)	.
		N	14

Tau Values: Participant Five

Correlations

			Baseline	SAS
Kendall's tau_b	Baseline	Correlation Coefficient	1.000	-.462**
		Sig. (2-tailed)	.	.007
		N	21	21
	SAS	Correlation Coefficient	-.462**	1.000
		Sig. (2-tailed)	.007	.
		N	21	21

			Baseline
Kendall's tau_b	Baseline	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	21
	VAS1	Correlation Coefficient	-.015
		Sig. (2-tailed)	.938
		N	21
	VAS2	Correlation Coefficient	.376*
		Sig. (2-tailed)	.040
		N	21
	VAS3	Correlation Coefficient	.033
		Sig. (2-tailed)	.858
		N	21
	VAS4	Correlation Coefficient	-.015
		Sig. (2-tailed)	.938
		N	21
	VAS5	Correlation Coefficient	-.259
		Sig. (2-tailed)	.157
		N	21
	VAS6	Correlation Coefficient	-.301
		Sig. (2-tailed)	.101
		N	21
	VAS7	Correlation Coefficient	-.271
		Sig. (2-tailed)	.140
		N	21
	VAS8	Correlation Coefficient	.138
		Sig. (2-tailed)	.453
		N	21

Tau Values: Participant Six

Correlations

			Baseline	SAS
Kendall's tau_b	Baseline	Correlation Coefficient	1.000	-.271
		Sig. (2-tailed)	.	.197
		N	14	14
	SAS	Correlation Coefficient	-.271	1.000
		Sig. (2-tailed)	.197	.
		N	14	14

			Baseline
Kendall's tau_b	Baseline	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	14
	VAS1	Correlation Coefficient	-.247
		Sig. (2-tailed)	.263
		N	14
	VAS2	Correlation Coefficient	-.206
		Sig. (2-tailed)	.343
		N	14
	VAS3	Correlation Coefficient	.069
		Sig. (2-tailed)	.756
		N	14
	VAS4	Correlation Coefficient	.474*
		Sig. (2-tailed)	.031
		N	14
	VAS5	Correlation Coefficient	.073
		Sig. (2-tailed)	.745
		N	14
	VAS6	Correlation Coefficient	.533*
		Sig. (2-tailed)	.017
		N	14
	VAS7	Correlation Coefficient	-.189
		Sig. (2-tailed)	.413
		N	14
	VAS8	Correlation Coefficient	-.014
		Sig. (2-tailed)	.951
		N	14

Tau Values: Participant Seven

Correlations

			Baseline	SAS
Kendall's tau_b	Baseline	Correlation Coefficient	1.000	-.358*
		Sig. (2-tailed)	.	.025
		N	21	21
	SAS	Correlation Coefficient	-.358*	1.000
		Sig. (2-tailed)	.025	.
		N	21	21

			Baseline
Kendall's tau_b	Baseline	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	21
	VAS1	Correlation Coefficient	.031
		Sig. (2-tailed)	.853
		N	21
	VAS2	Correlation Coefficient	-.125
		Sig. (2-tailed)	.457
		N	21
	VAS3	Correlation Coefficient	-.207
		Sig. (2-tailed)	.216
		N	21
	VAS4	Correlation Coefficient	-.416*
		Sig. (2-tailed)	.016
		N	21
	VAS5	Correlation Coefficient	.049
		Sig. (2-tailed)	.780
		N	21
	VAS6	Correlation Coefficient	-.331
		Sig. (2-tailed)	.061
		N	21
	VAS7	Correlation Coefficient	.045
		Sig. (2-tailed)	.797
		N	21
	VAS8	Correlation Coefficient	-.283
		Sig. (2-tailed)	.102
		N	21

Tau Values: Participant Eight

Correlations

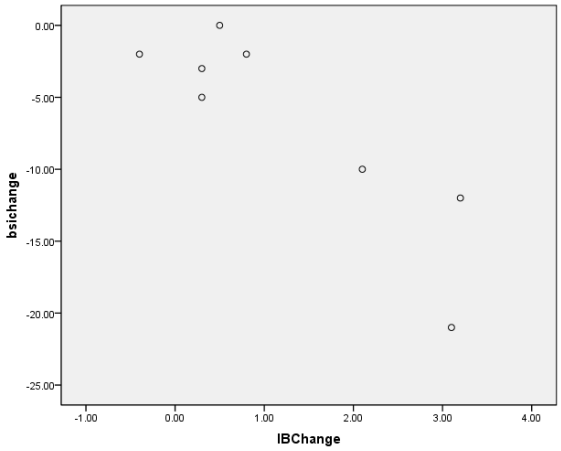
			Baseline	SAS
Kendall's tau_b	Baseline	Correlation Coefficient	1.000	-.390
		Sig. (2-tailed)	.	.224
		N	7	7
	SAS	Correlation Coefficient	-.390	1.000
		Sig. (2-tailed)	.224	.
		N	7	7

			Baseline
Kendall's tau_b	Baseline	Correlation Coefficient	1.000
		Sig. (2-tailed)	.
		N	7
	VAS1	Correlation Coefficient	-.252
		Sig. (2-tailed)	.480
		N	7
	VAS2	Correlation Coefficient	-.414
		Sig. (2-tailed)	.245
		N	7
	VAS3	Correlation Coefficient	-.620
		Sig. (2-tailed)	.071
		N	7
	VAS4	Correlation Coefficient	.282
		Sig. (2-tailed)	.411
		N	7
	VAS5	Correlation Coefficient	.050
		Sig. (2-tailed)	.878
		N	7
	VAS6	Correlation Coefficient	-.630
		Sig. (2-tailed)	.077
		N	7
	VAS7	Correlation Coefficient	.000
		Sig. (2-tailed)	1.000
		N	7
	VAS8	Correlation Coefficient	-.476
		Sig. (2-tailed)	.153
		N	7

Appendix V: BSI and Interpretation Bias Correlation Output

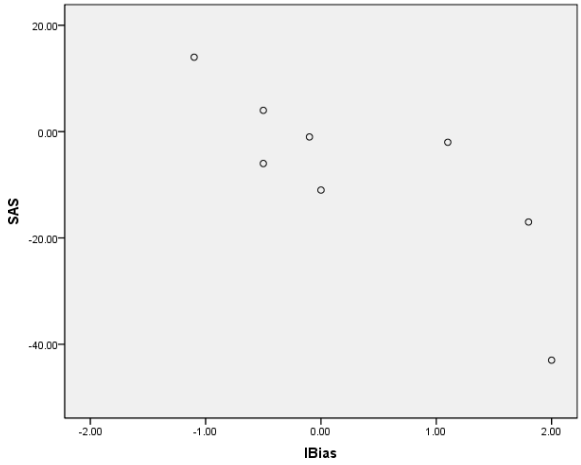
Correlations

			IBChange	bsichange
Kendall's tau_b	IBChange	Correlation Coefficient	1.000	-.519*
		Sig. (1-tailed)	.	.039
		N	8	8
	bsichange	Correlation Coefficient	-.519*	1.000
		Sig. (1-tailed)	.039	.
		N	8	8



Correlations

			IBias	SAS
Kendall's tau_b	IBias	Correlation Coefficient	1.000	-.764**
		Sig. (1-tailed)	.	.004
		N	8	8
	SAS	Correlation Coefficient	-.764**	1.000
		Sig. (1-tailed)	.004	.
		N	8	8



Appendix W: Imagery and SAS-A Correlation Output

Correlations

			VAR00002	VAR00001
Kendall's tau_b	Imagery	Correlation Coefficient	1.000	.357
		Sig. (1-tailed)	.	.108
		N	8	8
	SAS	Correlation Coefficient	.357	1.000
		Sig. (1-tailed)	.108	.
		N	8	8

Appendix X: Recruitment Timeline

- 07/11/11 – CAMHS Norwich service manager supports recruitment strategy.
- 01/02/12 – Contact with Clinical Psychologist CAMHS Norwich re recruitment.
- 05/03/12 – Contact with Team Leader as Clin Psych preparing for maternity leave.
- 14/03/12 – Meeting with Clinical Psychologist CAMHS Norwich re recruitment.
- March – June – Various meetings with Team Leader regarding ethics and recruitment.
- 05/11/12 – Meeting at CAMHS Norwich regarding potential participants.
- 15/11/12 – Meeting with Great Yarmouth Service Manager re recruitment expansion
- 30/11/12 – Email sent to all CAMHS Great Yarmouth staff re recruitment.
- 30/11/12 – Email sent to all CAMHS Lowestoft staff re recruitment.
- 05/12/12 - Meeting at CAMHS Norwich regarding potential participants.
- 07/12/12 – Meeting with all CAMHS Great Yarmouth staff re recruitment.
- 07/12/12 – Contact with CAMHS Lowestoft – Poster sent re recruitment.
- 07/12/12 – Phone call with Point One manager to discuss recruitment.
- 19/12/12 – Recruitment meeting 9am cancelled by Point One
- 19/12/12 – Email send to encourage recruitment to CAMHS Norwich.
- 21/12/12 - Phone call with Point One manager to discuss recruitment.
- 21/12/12 – Meeting at CAMHS Great Yarmouth.
- 02/01/13 – Email to check for any new potential participants.
- 04/01/13 – Telephone contact with Dr Richard Pratt regarding recruiting from Point One CAMHS.
- 04/01/13 – Subsequent email to Point One team manager re recruitment as suggested by Dr Pratt.
- 09/01/13 – Meeting with Point One to discuss research and identify potential referrals.
- 11/01/13 – Dr Pratt's team meet and agree to be part of the recruitment team.
- 12/01/13 – Email to Point One team manager to arrange meeting.
- 12/01/13 – Attended CAMHS Great Yarmouth team meeting.
- 16/01/13 – Meeting with Point One cancelled by manager due to snow.
- 19/01/13 – Point One Great Yarmouth contact – cannot offer support.
- 22/01/13 – Email contact with CAMHS Norwich to ask about recruitment.
- 24/01/13 – Continued email contact with Team Leader CAMHS Norwich.
- 28/01/13 – Telephone contact with CAMHS Lowestoft re recruitment.
- 04/02/13 – Email to Point One for recruitment update.
- 13/02/13 – CAMHS Lowestoft email / meet with Tania Pomberio to discuss project.
- 13/02/12 – Meeting with Point One team to go through referrals.
- 18/02/13 – Contact with CAMHS Lowestoft.
- 27/02/13 – Email contact with Youth Services Norwich.
- 04/03/13 – Attended Youth Service Norwich team meeting.
- 11/03/13 – Email contact with Youth Services re recruitment.
- 12/03/13 – Email to all services and recruiters across NSFT.
- 12/03/13 – Email to recruitment lead CAMHS Great Yarmouth.
- 20/03/13 – Email contact with Youth Service Norwich.
- 21/03/13 – Email for Point One saying they could no longer be involved in recruitment due to service changes.
- 26/03/13 - Email contact with Youth Service Norwich.

Note. This is not all the correspondence but the records the Author has in her diary and email inbox