A feasibility study into the efficacy of a three session Cognitive Bias Modification for Interpretation (CBM-I) training, with Implementation Intentions (II), for adolescents experiencing high levels of social anxiety: A single-case series.

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Abstract

Previous research has found that Cognitive Bias Modification for Interpretation (CBM-I) is effective for modifying interpretation biases and reducing anxiety in adults (e.g., Mathews & Mackintosh, 2000). Beard (2011) recommended investigating the effectiveness of CBM-I in adolescents, particularly those experiencing social anxiety, and enhancing effects of CBM-I. Webb, Ononaiye, Sheeran, Reidy and Lavda (2010) found that implementation intentions (II) could promote rapid disengagement from threatening stimuli and decrease poor self-evaluation for people with high levels of social anxiety. Therefore the current study aimed to investigate the effects of CBM-I with II using a three session CBM-I training programme with adolescents experiencing clinical levels of social anxiety. Curtis (2013) found that adolescents with SAD showed greater reductions in anxiety and negative interpretation bias following a CBM-I programme if they enjoyed the programme. Therefore the study looked at whether adolescents who reported greater enjoyment displayed greater reductions in negative interpretation bias and social anxiety symptoms than those that reported low levels of enjoyment. Overall, CBM-I with IIs did not significantly reduce negative interpretation biases and levels of social anxiety. Still, minimal reductions in negative interpretation bias and social anxiety symptoms were found for some adolescents and the enjoyment level experienced was related to outcomes. The clinical and theoretical implications were discussed (e.g., aetiology of SAD and implications for treatment), alongside limitations of the study (e.g., recruitment and sample considerations) and potential directions for further research were suggested (e.g., increasing the number of CBM-I sessions) to develop our understanding of the variables involved in modifying interpretation bias and social anxiety in adolescents.

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Chapter One - Introduction

1.1 Overview of the Chapter

This chapter explains how social anxiety disorder (SAD) presents in young people, how it is classified, the prevalence and epidemiology of the disorder, followed by a summary of the underlying theories and a discussion on the treatment for SAD in this population.

1.2 Social Anxiety Disorder as a Diagnosis

The Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition (DSM-V; American Psychiatric Association, 2013) details that those with SAD have an out of proportion excessive fear of social and performance situations. These situations can include interacting with unknown people and the belief that in a social situation they will be negatively evaluated by others. The fear of these situations leads to excessive anxiety, avoidance and distress. Furthermore, the DSM-V proposes that for a clinical diagnosis, these symptoms are required to be experienced for a minimum of six months and have an impact on daily functioning. There are two subtypes of SAD: generalised social phobia and specific social phobia. Generalised social phobia is defined as lifetime social phobia, where most of the 12 social fears are endorsed, while specific social phobia includes social phobia which is specific to a particular social situation (DSM-V; 2013). The current study focuses on generalised social phobia rather than specific social phobia.

1.3 Epidemiology

SAD has a high prevalence rate and is known to be one of the most common mental health disorders (National Institute of Health and Care Excellence, NICE; 2013). In western countries, SAD has a 12% prevalence rate and in general the prevalence rates have been found to be between 2.4% and 13% across different surveys (e.g., Alonso et al., 2004; Kessler, Berglund, Demler, Jin, & Walters, 2005).

Adult research has found that social phobia is more common amongst females, younger populations, those on lower incomes, unmarried or separated people, and those with little education (Chalebly, 1987; Davidson, Hughes, George, & Blazer, 1993; Fehm, Pelissolo, Furmark, & Wittchen, 2005; Furmark, Tillfors, Everz, Marteinsdottir, Grefvert, & Fredrikson, 1999; Grant et al., 2005; Heimberg et al., 2000; Schneier, Johsnons, Hornig et al., 1992).

In considering the adolescent population, Merikangas et al. (2011) found that approximately 9% of adolescents met the criteria for SAD in their lifetime. Furthermore, they found that generalized social phobia was more common among females. In addition, Burstein, Ameli-Grillon and Merikangas (2011) reported that for generalised social phobia, adolescents had a younger age of onset, higher clinical severity scores and more comorbidity than adolescents with non-generalized forms of the disorder. The authors concluded that SAD is a highly prevalent, persistent anxiety disorder within this age group. Furthermore, the literature describes how in general, youth anxiety has a negative impact on an array of variables, including academic performance, interpersonal relationships and social functioning (Davidson et al., 1993; Last, Perrin, Hersen, & Kazdin, 1992; Van Ameringgen, Mancini, & Farvolden, 2003; Wood, 2006) and childhood anxiety has been found to be a precursor for depression (Cole, Peeke, Martin,

Truglio & Seroczynski, 1998; Woodward & Fergusson, 2001), substance abuse and dependence (Kaplow, Curran, Angold & Costello, 2001; Pine, Cohen, Gurley, Brooks, & Ma, 1998). Such research highlights the importance of developing both an understanding and an evidence base for the treatment of anxiety in young people, such as SAD, and the importance of working towards early intervention.

1.4 Vulnerabilities to Social Anxiety

1.4. 1. Risk factors.

Key risk factors in the development of SAD include being female and being under 18 years of age (Wittchen, Stein, & Kessler, 1999). Furthermore, others have found that lower socio economic status is also a risk factor (Bourdon, 1993; Bourdon, Boyd, Rae, Burns, Thompson, & Locke 1988; Magee, Eaton, Wittchen, McGonagle, & Kessler 1996). Merikanga et al. (1996) also found that SAD is more likely to occur for those with comorbid anxiety disorders. However other anxiety disorders are usually secondary to the SAD (Magee et al., 1996).

1.4.2. Family factors.

The style of parenting, in particular those that encompass over controlling and overprotection, or maternal parenting without warmth or with rejection, have been found to be present for children experiencing SAD (Caster, Inderbitzen, & Hope, 1999; Chavira & Stein, 2005; Hidalgo, Barnett, & Davidson, 2001; Hudson & Rapee, 2000; Neal & Edelmann, 2003; Ollendick & Hirshfeld-Becker, 2002; Rapee 1997; Stark, Humprey, Crook, & Lewis, 1990). Lindhout et al. (2006) described how this can impact on the development of SAD because an overprotective parenting style would inhibit their child's

exploratory behaviours, thus reducing the independent learning and development in the child's environment. The authors also suggest that this style of parenting can also result in limiting the child's abilities and confidence to interact with their surroundings. Thus, rejection and a lack of warmth from parents can create an insecure attachment, which in turn can lead to anxiety disorders (Lindhout et al., 2006).

Research attention has also been given to the role of the father's parenting style (Greco & Morris 2002; Rapee & Melville, 1997) in the development of SAD in children. Greco and Morris (2002) studied children aged 8 to 14 years old by collecting self-reports from fathers on their child's social anxiety symptoms and on their own parenting styles. Next, the father and their child were observed while they completed a difficult task. They found that fathers of highly socially anxious children showed more controlling parenting styles than parents of children with low levels of social anxiety. They concluded that fathers' parenting styles were related to the social anxiety levels in their children.

Research has also studied the impact of siblings on the development of SAD. For example, Lindhout et al. (2006) concluded that siblings would only appear to indirectly influence the presence of social anxiety symptoms in a brother or a sister by providing a comparison which could serve to lower the child's self-esteem.

1.4.3. Genetic vulnerabilities.

Gregory and Eley (2007) conducted twin studies and found a clear genetic risk factor alongside shared and non-shared environmental factors in the development of SAD. However, heritability estimates conclude that only 30% of the contributing factors of SAD can be attributed to genetic factors, indicating a larger attribution from

environmental factors (Kendler, Neale, Kessler, Heath, & Eaves, 1992b). The specific phenotypes for SAD have not been found, but research has contributed to the argument that there are predominant roles for emotional reactivity and arousal systems that propose greater risk for anxiety (Murray, Creswell, & Cooper, 2009).

1.4.4. Behavioural vulnerabilities.

Eysenck (1979) proposed the incubation theory, which suggested that anxiety develops through the process of conditioning. Pavlov (1927; cited in Gormezano & Kehoe, 1975) explained that conditioning, or classical conditioning, is a process of behaviour modification where a response to a stimulus becomes expressed in response to a previously neutral stimulus. Thus, Eysenck explained how one trial of classical conditioning, whereby a neutral stimulus is paired with a feared response, can lead to anxiety. Further exposure to the previously neutral stimulus can then lead to an increase in fear through conditioning, or the repeated pairing of the stimulus and feared response. This is the common situation for the development of phobias (DeSilva et al., 1977). Thus, DeSilva et al. (1977) proposed that unconditioned stimuli which are paired with anxiety provoking stimuli, such as threatening facial expressions and stimuli communicating physical threat are significantly more common for people with SAD.

1.4.5. Cognitive vulnerabilities.

It has been proposed that information processing biases, such as in attention, interpretation and memory, emerge in childhood and are important processes for understanding the cognitive vulnerabilities in the development of anxiety (e.g., Vasey, Dalgleish, & Silverman, 2003; Vasey & McLeod, 2001). It has been argued that

information processing biases in younger children are a risk factor for the development of anxiety disorders (Vasey & McLeod, 2001). Furthermore, Muris, Kindt, Bogels, Merckelbach, Gadet and Moulaert (2000) proposed that socially anxious children are more likely to process information in social situations in a threatening way, than less socially anxious children. In support, Bogels and Zitgerman (2000) found that children aged from 9 to17 years old diagnosed with SAD or GAD made more negative interpretations of ambiguous scenarios when they were compared with young people with an externalising disorder, such as opposition disorder, attention deficit disorder or conduct disorder. This would suggest that information processing biases in young people with anxiety disorders make them more likely to interpret situations in a threatening way compared to young people with non-anxiety related mental health disorders. Such research has been the basis for the underlying cognitive theories and models for SAD.

1.5 Cognitive Theories of Social Anxiety Disorder

Three cognitive models for understanding the development and maintenance of SAD include Clark and Wells' (1995) cognitive model of social phobia, Rapee and Heimberg's (1997) model describing the discrepancy between mental representation of self and others expected standards, and Clark and Beck's (2010) cognitive model of social phobia. Each of these models will be described and discussed in the following sections.

1.5.1. Clark and Wells (1995): A cognitive model of social phobia.

The main focus of Clark and Wells (1995) model is the predominance of shifts in attention for the maintenance of social anxiety (See figure 1 for a diagrammatical illustration of the model). They proposed that individuals with SAD believe they are

under threat of being evaluated negatively in social situations due to an interoceptive focus. Furthermore, Clark and Wells put forward that this self-monitoring serves to increase the individual's awareness of their anxious responses to the perceived social fear, which in turn reduces their attention towards the actual situation and others' behavioural responses. Repetition of this process leads people with SAD to create an overall negative image of the self and a belief that they are being negatively evaluated.

In addition, Clark and Wells (1995) proposed that people with SAD maintain their anxiety by applying safety behaviours with the intention of reducing the probability of being negatively evaluated. For example, Clark and Wells suggested that safety behaviours can include avoidance of the situation, wearing a scarf to hide a red neck, avoiding eye contact, drinking alcohol or practising conversations they want to have in their heads prior to conversing. They argued that safety behaviours only reduce the probability of people disconfirming their maladaptive beliefs and increase the possibility of the feared outcome occurring. For example, by wearing a scarf to reduce the possibility that one could be seen to be blushing, they may actually appear more blushed because they are hot from wearing the scarf and attract attention.

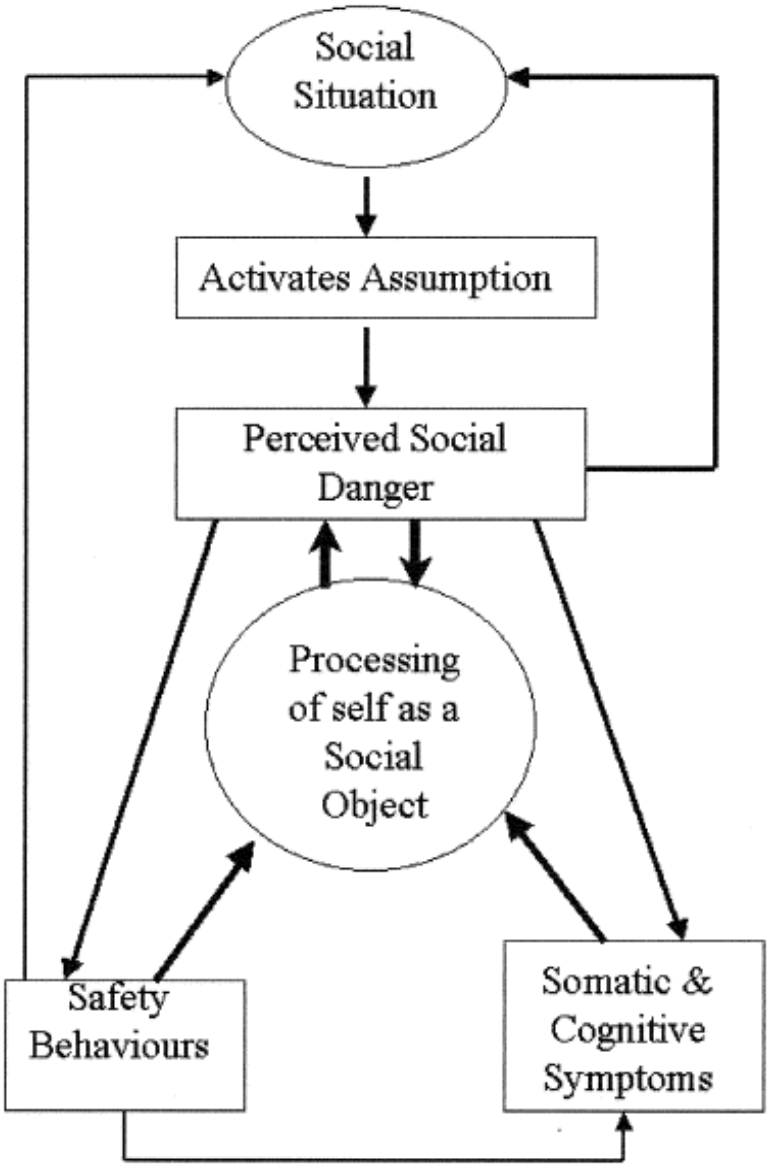

Figure 1: Clark & Wells (1995) A Cognitive Model of Social Phobia.

1.5.2. Rapee and Heimberg (1997): Discrepancy between mental representation of self and others expected standards.

Rapee and Heimberg's model (1997) was developed with the assumption that people experiencing SAD see others as highly critical, thus feeling that they are prone to negative evaluation (Leary, Kowalski, & Campbell, 1988). Furthermore, Rapee and

Heimberg proposed that social anxiety can occur in the absence of being evaluated by others and SAD can be maintained by anticipating negative evaluation from others, or from ruminating over past events where they felt negatively evaluated. Rapee and Heimberg (1997) propose that when people with SAD enter social situations they create a mental image of what they believe is their external presentation and behaviour to others (See figure 2 for diagrammatical illustration of the model). Their internalised image is then combined with any possible threat perceived within social situations. The internalised image is developed based on their long-term memories of previous experiences, as well as their understanding of current internal and external cues. For example, people may focus on someone in their environment yawning, and interpret this as this happening because they are boring their audience. The authors then suggest that the individual then forms a perception of their current self-image and performance based on their perceived audience's expectations of them and their appraisal of the audience's standards in this current situation. In turn, the individual holds great concern over whether they have met these perceived standards. Lastly, this process is coupled with the belief that there is a high probability of negative evaluations occurring, which in turn increases the level of anxiety, including physiological and behavioural responses. Finally, Rapee and Heimberg propose that these reactions to the internal processing influence the mental image the person has created of themselves and the process is maintained in a cyclical manner.

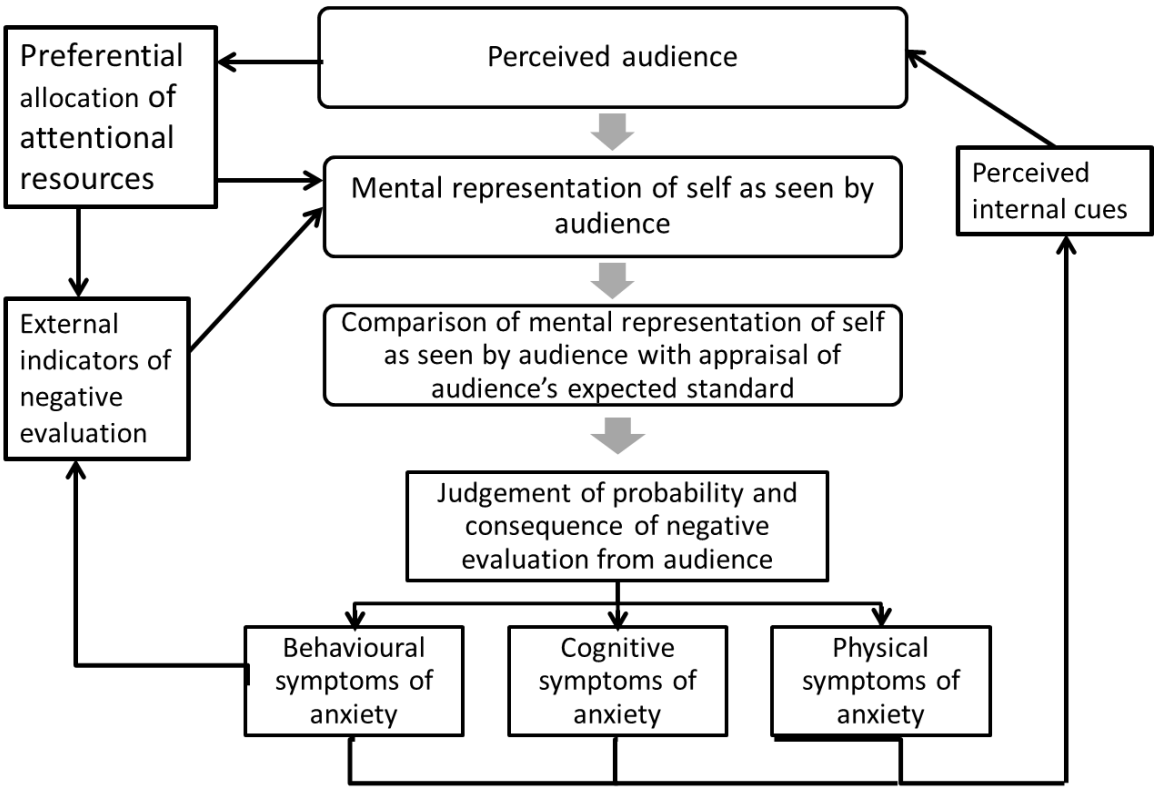

Figure 2: A model of the generation and maintenance of anxiety in social/evaluative situations (Rapee & Heimberg, 1997).

1.5.3. Critique of Clark and Wells (1995) and Rapee and Heimberg (1995) cognitive models of social phobia.

Both cognitive models of social phobia propose that people with social anxiety focus on their social performance when encountering social interactions and this reduces the attention towards other cues in the situations (Clark & Wells, 1995; Rapee & Heimberg, 1997). In support, Kimble and Zehr (1982) found that participants who obtained higher scores for self-focus traits recalled significantly less information from a social interaction compared to participants who scored low on self-focus traits. In addition, Hope, Heimberg, and Klein (1990a) reported that people with social phobia

made more mistakes, compared to controls, in their attempts to remember information about another person after a social situation. These studies support the notion, consistent with the aforementioned models (Clark & Wells, 1995; Rapee & Heimberg, 1997), that an interoceptive self-focus and/or a belief of a negative evaluation by others in social situations are characteristic of SAD.

Both models also propose that an individual with SAD is hypervigilant for threat in the environment (Clark & Wells, 1995; Rapee & Heimberg, 1997). In contrast, Rapee and Heimberg (1997) argued that looking for external social cues is also an important component to maintaining social anxiety and acts as an ingredient for the perceived mental representation of themselves in the situation from the perspectives of others. Schultz and Heimberg (2008) argued that if this process occurs, the individual would be predicted to focus both on internal and external cues interchangeably. Clark and Wells (1995) did not account for this in their model of social phobia and instead their research demonstrates strong support for internal self-focus being the process which leads to social anxiety and poor social performance (e.g., Clark, 2001; Clark & Wells, 1995; Stopa & Clark, 1993). Furthermore, Schultz and Heimberg explained that Clark and Wells outline a model which self-perpetuates and does not allow for new incoming information to be drawn into the person's cognitive processing. They continue to elaborate that this creates problems in the model for understanding how the focus on the self, in a negative or positive perspective, can be the trigger for the maintenance of anxiety. Furthermore, Vassilopoulos (2008) scrutinised Clark and Wells' model for minimising the anticipatory anxiety and post event rumination, which they argued were prominent features of SAD (e.g., Abbott & Rapee, 2004; Mellings & Alden, 2000; Vassilopoulos, 2008). Still,

evidence has supported that self-focused attention is a central feature for the maintaining of anxiety and avoidance in people suffering from SAD (Brown & Stopa, 2007; Rapee & Lim, 1992), therefore providing support for the Clark and Wells model.

Furthermore, Rapee and Heimberg's (1997) model proposes that negative life events are risk factors for the development and maintenance of SAD. This was supported by Kendler et al. (1992), who found that 30% of the variance in SAD can be argued to be accounted for by genetic factors. Thus, the remaining 70% has been argued to be a consequence of environmental influences, such as childhood experiences and social ability and skills (Kendler et al., 1992).

Despite similarities in the models, Rapee and Heimberg's (1997) model places an emphasis on the cognitive processes which involve external and internal stimuli for a person with SAD, whereas Clark and Wells (1995) place greater importance on the internal stimuli for maintenance of social anxiety.

1.5.4. Clark & Beck (2010) cognitive model of social phobia.

The Clark and Beck (2010) cognitive model of social phobia was developed from the work by Beck et al. (1985; 2005) and draws heavily on Rapee and Heimberg (1997) and Clark and Wells (1995). This more recent model proposes that there is an anticipatory phase, situational exposure phase, and post-event processing phase in the maintenance of social phobia. See figure 3 for an illustration of the Clark & Beck (2010) cognitive model of social phobia.

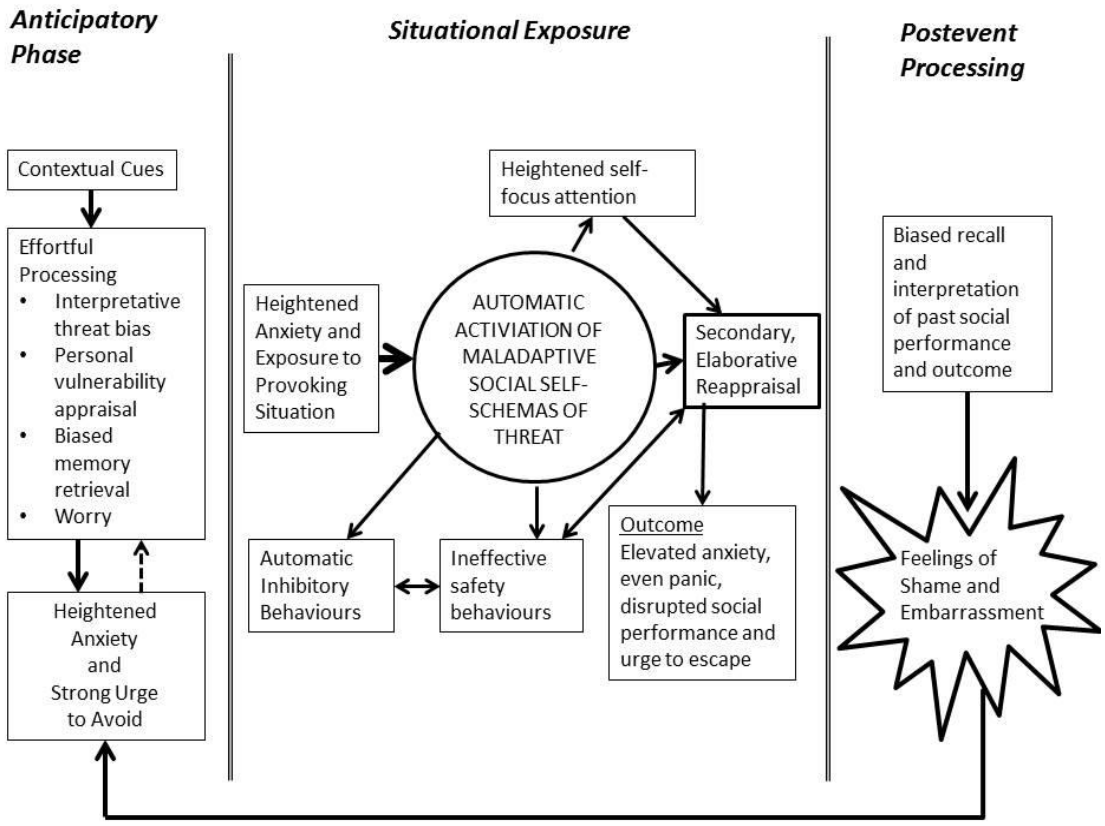

Figure 3: Cognitive Model of Social Phobia (Clark & Beck, 2010).

The model predicts that the anticipatory phase is triggered by contextual and informational cues in the person with social phobia's environment. These triggers act as signals for a potential social interaction and elicit anxiety in the person. This anticipatory phase can last between a minute and several weeks. Clark and Beck (2010) argued that as time progressed, anxiety levels would often increase in the anticipatory stage and increase the likelihood of avoidance of the feared situation. This feature of their model can be supported by Riskind (1997), who found anxiety increased with time during the anticipation phase. Clark and Beck recognised that avoidance of social situations was not always possible and when people with social phobia were exposed to social encounters

they entered the situation with heightened anxiety. They also argued that this was a result of pre-existing maladaptive social self-schemas being activated. Schemas are defined as the negative beliefs that a person with social phobia holds prior to the current feared social situation (Beck, 1967). These include believing that they are socially inadequate, that their anxiety will be unmanageable, that there will be negative judgements from others and that they will fall short of social expectations in the situation. The model argues that the thoughts and attention from these beliefs shift the person with social phobia's attention away from the actual social situation onto only the socially threatening cues in the situation. Consequently, this process maintains and/or heightens the level of anxiety (Clark & Beck, 2010). Furthermore, Clark and Beck proposed that people with social anxiety will focus only on negative cues and negative memories of feelings of embarrassment and shame. The model also suggests that this leads to experiencing greater threat and personal vulnerability from the anticipated social situation.

Clark and Beck (2010) explained that in the situational exposure phase, people with social phobia experience intense anxiety as they are exposed to the social situation that they fear. Cognitive processing of negative self-schemas and perceived personal vulnerability are activated when entering this stage, which leads to a greater focus on threatening cues in the situation both internal and external to the person. Furthermore, Clark and Beck proposed that responses from other people in the situation are interpreted negatively and social cues from others that are potentially positive or benign are minimised or disregarded. In line with Rapee and Heimberg (1997), Clark and Beck argued that the person directs most of their attention to their perceived self-image from the assumed negative perspective. The self-focused cues can be behavioural, physical or

emotional and are negatively interpreted by the individual as signs of anxiety and a loss of control. Clark and Beck argued that in turn, this cognitive process occurs whilst in a hypervigilant state and reinforces how the socially anxious person believes their audience perceives them. They added that people with SAD will then automatically display inhibitory behaviours, such as stuttering and holding a stiff posture, confirming their awkwardness and loss of control, for which they use their safety behaviours in an attempt to manage the situation (Clark & Beck, 2010).

The third stage is the post-event processing phase. In this phase the individual with social phobia ruminates negatively about the social situation that just occurred. This was drawn from Brozovich and Heimberg's (2008) work who argued that the negative cognitive processing of the social event for people with social anxiety is fundamental to the maintenance of SAD. Consequently this increases the chances of further anticipatory anxiety for the next social encounter and encourages further avoidance (Brozovich & Heimberg, 2008; Clark & Beck, 2010).

1.5.5. Application of the aforementioned cognitive models to young people.

Clark and Wells (1995) model has been reviewed for its application to young people. For example, Ranta, Tuomisto, Kaltiala-Heino, Rantanen and Marttunen (2014) found that adolescents (M=15.9 years old), experiencing social anxiety displayed negative self-focused cognitions. The researchers also observed perspective imagery and behaviours in line with those found in adults experiencing anxiety related to social situations. This would support the use of adult models being utilised for treatment with adolescents. Furthermore, Garcia-Lopez et al. (2002) found that clinical treatment for

adolescents, developed from Rapee and Heimberg's model (1997), gave promising results in the reduction of the symptoms of SAD. This suggests that Rapee and Heimberg's model is also beneficial when applied with adolescents and indicates that its model's mechanisms are transferable to young people. Lastly, research on childhood anxiety has also been found to be associated with biases in information processing (Hadwin, & Field, 2010; Kendall, 1985). Miers, Blotes, Bogel and Westenberg (2008) found that adolescents, aged from 11 to 16 years old with social anxiety, interpreted ambiguous social scenarios significantly more negatively when compared to healthy adolescents. Furthermore, Muris, Merckelbach and Damsma (2000) found that socially anxious children between 8 and 13 years old, displayed higher levels of negative feelings and cognitions about scenarios read to them when compared with non-anxious children.

From reviewing the literature on the application of SAD models for young people, Beck and Clark's model (2010) has not been investigated in terms of its application to young people. However, based on the support above for the application and mechanisms of the previous models (Clark & Wells, 1995; Rapee & Heimberg, 1997) for young people with SAD, alongside the understanding that the Clark and Beck (2010) model is based on the mechanisms of the earlier models, the application for adolescents looks promising.

1.6 Application of Cognitive Models in the Treatment of SAD

The current treatment for SAD is outlined and advocated in NICE (2013). For adults, it is recommended that individual CBT is provided and, for children and young people, individual or group CBT, with a consideration for involving the parents.

1.6.1. Cognitive behavioural therapy for adults diagnosed with social anxiety disorder.

Individual CBT is the first line of treatment, however if adults decline they are often offered pharmaceutical treatments such as selective serotonin reuptake inhibitors (SSRIs). In addition, an alternative therapeutic model is short-term psychodynamic therapy or supported self-help consisting of nine supported sessions, should the other options be declined (NICE, 2013). The specifics of the CBT are drawn from Clark and Wells (1996) and Rapee and Heimberg (1997) models for SAD (NICE, 2013). Wells (1997) provides an outline of an example of CBT treatment for SAD. The treatment includes psychological education about SAD, behavioural experiments to show the opposing outcomes of self-focused attention and evaluations, and the utilisation of video feedback to correct distorted negative self-imagery. Furthermore, it seeks to monitor and eradicate safety-seeking behaviour and shape attention focus to the person's surroundings rather than just on the self. Further work involves rescripting troublesome memories of social traumas. Lastly, the therapy also includes key CBT strategies such as the adaptation of core beliefs, shaping of unhelpful event processing and relapse prevention. Rapee and Heimberg's (1997) treatment is similar to Clark and Well's model but focuses on graduated exposure rather than video feedback.

CBT has been extensively researched and is considered the most thoroughly studied intervention for SAD (Heimberg, 2002). Meta-analyses have found that graduated exposure is equivalent to cognitive restructuring in post treatment assessments (Frederoff & Taylor, 2001). However, at follow-up they found that both CBT strategies are more effective than exposure work alone. Therefore the combination has greater lasting effects.

1.6.2. CBT for Young People diagnosed with social anxiety disorder.

Friedman and McClure (2002) outlined how cognitive therapy for young people will be slightly different to cognitive therapy with adults. Simple cognitive techniques, such as self-instructions, and more behavioural interventions are used with younger people. Leve (1995) pointed out that many children are brought to therapy by their parents and this is often because the parent recognises the impact on the child and their surrounding systems. Kimball, Nelson and Politano (1993), and Ronen (1997) emphasised the importance of adapting the therapy according to the young person's verbal and cognitive capacity, as well as their social cognitive skills. Young people have been found to benefit from simple cognitive techniques such as self-instructions and behavioural interventions (Ronen, 1998).

Over the past decade, consistent evidence has been found to support the usefulness of CBT for children and adolescents for anxiety, including social anxiety (e.g., Cartwright-Hatton, Roberts, Chitsabesan, Fothergill, & Harrington, 2004; Spence, Donovan, & Brechman-Toussaint, 2003). In support, James, Soler and Weatherell (2009) found that CBT for young people with anxiety was significantly more effective compared to attention training and a waiting list group, which served as a control group. However, they acknowledged that half of the young people's anxiety symptoms were still present after treatment had finished and suggested that further developments in CBT based treatments are required to increase the effectiveness for young people (James et al., 2009). Drug treatments do show signs of improvements in the young person's difficulties, however these are found to be only short-term (Muris, 2012). Therefore, research and

development into novel, accessible and effective interventions for children and adolescents remains a priority.

1.6.3. Computer-administered Cognitive Behavioural Therapy for adults.

Computer-administered CBT has been developed for social anxiety (cCBT) and is based on social anxiety models (Beck et al., 1985; Clark & Wells, 1995; Rapee & Heimberg, 1997). cCBT is an interactive computer programme that helps service users to learn how to modify their negative thinking and behavioural patterns (Proudfoot et al., 2004). Peck (2007) reported that cCBT can narrow the gap between the supply and demand for treatment, reduce the experience of stigma and provides a useful waiting list initiative. NICE (2006) guidelines recommend cCBT for anxiety and depression in general but not for specific anxiety disorders.

Hope, Heimberg and Bruch (1995) and Heimberg, and Hope, Dodge and Becker (1990) found that cCBT was also more effective for reducing social anxiety symptoms compared to controls on a waiting list. In addition, follow up assessments found positive treatment outcomes still present up to six years after treatment.

Furthermore, Carlbring et al. (2007) argued that therapy for SAD is effective but many individuals refrain from engaging in treatment because they feel embarrassed about seeking help. Therefore they carried out a RCT to evaluate a nine-week programme of internet-based CBT (ICBT), which was designed to increase treatment adherence by providing additional weekly telephone calls. The study compared ICBT condition with a waiting list group of controls. Carlbring and colleagues found that the ICBT group revealed larger reductions on outcome measures of general and social anxiety, avoidance

and depression post-treatment and at a one year follow up. In addition, they found that adherence to the programme was high. They concluded that the use of internet-based treatments for social anxiety, with the addition of telephone calls, should be provided by mental health services. In a later study, Carlbring, Nordgren, Furmark and Andersson (2009) developed the study by Carlbring et al. (2007), by repeating the social anxiety outcome measures 30 months after the treatment, to the original sample recruited by Carlbring et al. (2007). Carlbring et al. (2009) found the reductions in social anxiety that were found post-treatment were still present 30 months after treatment. Variations of the programme were then trialled. For example, Andersson, Carlbring and Furmark (2012) compared the effects of a similar ICBT programme, which included an online discussion forum, with a moderated online discussion forum only. The participants in the online forum discussion condition were asked to post one message each week on the forum about a new topic. The research team posted regular and new discussion topics (e.g., "What are your experiences of seeking help for SAD"). Carlbring et al. (2012) included the online forum discussion because there was conflicting research on whether online support groups are effective managing symptoms (Griffiths, Calear, & Banfield, 2009; Houston, Cooper, & Ford, 2002). They recruited 204 participants with SAD who were randomized to either guided ICBT or a control condition. The ICBT consisted of a nine-week treatment programme, which was guided by either psychology students or by qualified psychologists with previous experience of the programme. The ICBT group revealed greater reductions of social anxiety compared to the online discussion forum only group, at post treatment and this was maintained a year later, thus concluding that guided ICBT reduces symptoms of SAD. This RCT further supports the use of ICBT

programmes for social anxiety. Consequently, similar programmes have been recommended in NICE (2013) as a type of self-help for SAD. NICE (2013) recommends that self-help intervention for SAD should typically include nine sessions of supported use of a CBT self-help book, either face to face or by telephone. The support should be for a total of three hours over the course of the treatment.

1.6.4 Computer-administered Cognitive Behavioural Therapy for young people.

cCBT programmes for young people have been developed for both depression and anxiety (Richard, Stallard & Velleman, 2010) but not specifically for adolescents with SAD. Richardson, Stallard and Velleman (2010) carried out a systematic review of the limited research exploring cCBT for the treatment of mental health problems for children and adolescents. They proposed that the studies in the review found reported reductions in clinical levels of anxiety and depression and concluded that cCBT was an acceptable and effective intervention. However, Richardson and colleagues found that both young people and their caregivers were satisfied with their treatment to a moderate to high level, but that drop-out rates and non-completion were high. Thus, this would indicate the need for research to help understand why engagement worsens and motivation reduces for computerised interventions for young people.

1.6.5. Cognitive Bias Modification Training.

Research has been investigating a novel form of training that targets information processing biases for SAD (Murphy, Hirsch, Mathews, Smith, & Clark, 2007). An

outcome from this development is a paradigm known as Cognitive Bias Modification (CBM), which has been developed by Mathews and Mackintosh (2000). The two most common types of CBM tasks are CBM for attention (CBM-A) and CBM for interpretation (CBM-I). Other CBM tasks include forms addressing memory biases (Shapiro & Laliotis, 2012) and approach-avoidance (Eberl et al., 2013), however this section provides a summary of the most common tasks and those relevant to the current study. The dot probe task is a CBM-A paradigm, aimed at reducing attention bias towards threatening information through training. It can be used to encourage both adult and young participants to direct their attention away from threatening stimuli (Browning, Holmes, Murphy, Goodwin, & Harmer, 2010; Eldar, Ricon, & Bar-Haim, 2008; Krebs, Hirsch, & Mathews, 2010; MacLeod, Rutherford, Campbell, Ebsworthy, & Holker, 2002; MacLeod Soong, Rutherford, & Campbell, 2007). Attention-Training-Positive (ATP) is another modification paradigm in CBM-A, which aims to encourage people's attention bias towards positive stimuli (Dandeneau, Baldwin, Baccus, Sakellaropoulo & Pruessner, 2007). Waters, Pittaway, Mogg, Bradley and Pine (2012) developed this task by presenting the stimuli as colour-pictures of angry and happy faces and, as part of a positive modification programme, asked children to quickly select, on a computer, the happy faces amongst the angry faces. The aim of the task was to modify the children's attentional focus to the positive stimuli, rather than the negative, in attempts to modify their attentional bias style. Waters et al. (2012) concluded that the training was promising for being able to train anxious children to focus on positive features of their environment. Thus Beard (2011) puts forward that CBM-A has received greater research attention and that CBM-I requires further research.

The most common paradigm developed from CBM-I was created by Mathews and Mackintosh (2000). This paradigm involves a task which displays three-line scenario descriptions that are ambiguous until the last word. This last word is a fragment that helps resolve the ambiguity into a negative or neutral manner. Instructions are then provided to the participants to solve the fragment. Participants are usually provided with several scenarios to complete. For example, one item could be as follows:

You have not spent as much time with your new flatmates as you thought you would. Some of them are quite different to you. You decide to ask your flatmates if they fancy having a party, and their response shows they think your idea is b-illi-nt. (Hoppitt et al, 2014; p.10)

This is an example taken from Hoppitt et al. (2014), which contains an ambiguous scenario with a positive word fragment as the end.

Mathews and Mackintosh (2000) suggest interpretation bias can be measured before and after training with a series of scenarios with a 'recognition task' which includes novel ambiguous scenarios. Following this, participants are instructed to rate the similarity of four sentences to the initial scenario. Of the four sentences, one is representative of a positive interpretation, another is representative of a negative interpretation and two are neutral (Mathews & Mackintosh, 2000).

1.6.5.1. Cognitive bias modification for young people.

Beard (2011) agreed that young people are particularly important populations for CBM research to target, given that many anxiety disorders develop during this developmental stage. It has been argued that CBM-I for children and adolescents is a

beneficial intervention to develop because it lies closely to the mechanisms of how young people initially develop fears and negative interpretation styles (Benjet, Borges, & Medina-Mora, 2010). It has been proposed that young people develop anxiety by associating naturally occurring neutral stimuli with negative outcomes (Haddad, Lissek, Pine, & Lau, 2011; Lau & Viding, 2007). In addition, Pass, Arteche, Cooper, Creswell, and Murray (2012) found that children of anxious mothers display distorted social interpretations prior to the manifestation of clinical symptoms. They concluded by proposing that vicarious learning contributed to their pairing of negative outcomes and neutral stimuli, indicating that interpretation biases and clinical symptoms are related.

1.7 Cognitive Bias Modification for Interpretation: Review of the Child and Adolescent Literature

The previous subsections outlined the developments in our understanding and treatment of SAD which occurred prior to the development of CBM-I. Beard (2011) found that CBM was effective for reducing anxiety in adult populations, but the evidence base for its effectiveness with young people was in its infancy. Therefore the following section will more specifically review the literature investigating the effectiveness of CBM-I for young people with anxiety.

1.7.1. Literature search strategy.

A systematic literature search was performed using CINAHL, Embase, PsychINFO and Medline. The search was conducted in April 2015 and covered research

published from 2000 when the CBM paradigm was developed (Matthews & Mackintosh, 2000). The key search terms and Boolean connectors used were:

1. Child* OR youth* OR pediatric* OR paediatric* OR adolescen* OR "young pe*" OR teen*
2. anxi* OR worr*
3. "cognitive bias"
4. training OR modification OR intervention
5. 1 AND 2 AND 3 AND 4

1.7.2. Study criteria.

Studies were included if they: a) investigated levels of anxiety in young people, b) used a CBM-I manipulation, and, c) included results demonstrating levels of anxiety post training. Reviews were excluded if they included CBM for Attention rather than Interpretation. The potential search term 'Interpretation' was not utilised because it missed many of the studies which did not include the term as a key word. Therefore by applying the search criteria above, which exclude 'Attention' via visual inspection, the CBM for interpretation studies were not missed. The language was set to English and the publication date range was set to 2000- 2015. Further eligible studies were looked for within reports and review papers.

1.7.3. Search outcome.

The search across all databases created 84 sources. Before selecting relevant articles, duplicates were removed and titles and abstracts were inspected against the study criteria. From this screening 48 articles were selected plus four additional records

identified through citations. The abstracts were screened against the inclusion criteria; this reduced the number of articles to 22. Three further articles were removed following screening of the full text. Therefore a total of 19 articles were selected for the review (see figure 4 for consort diagram).

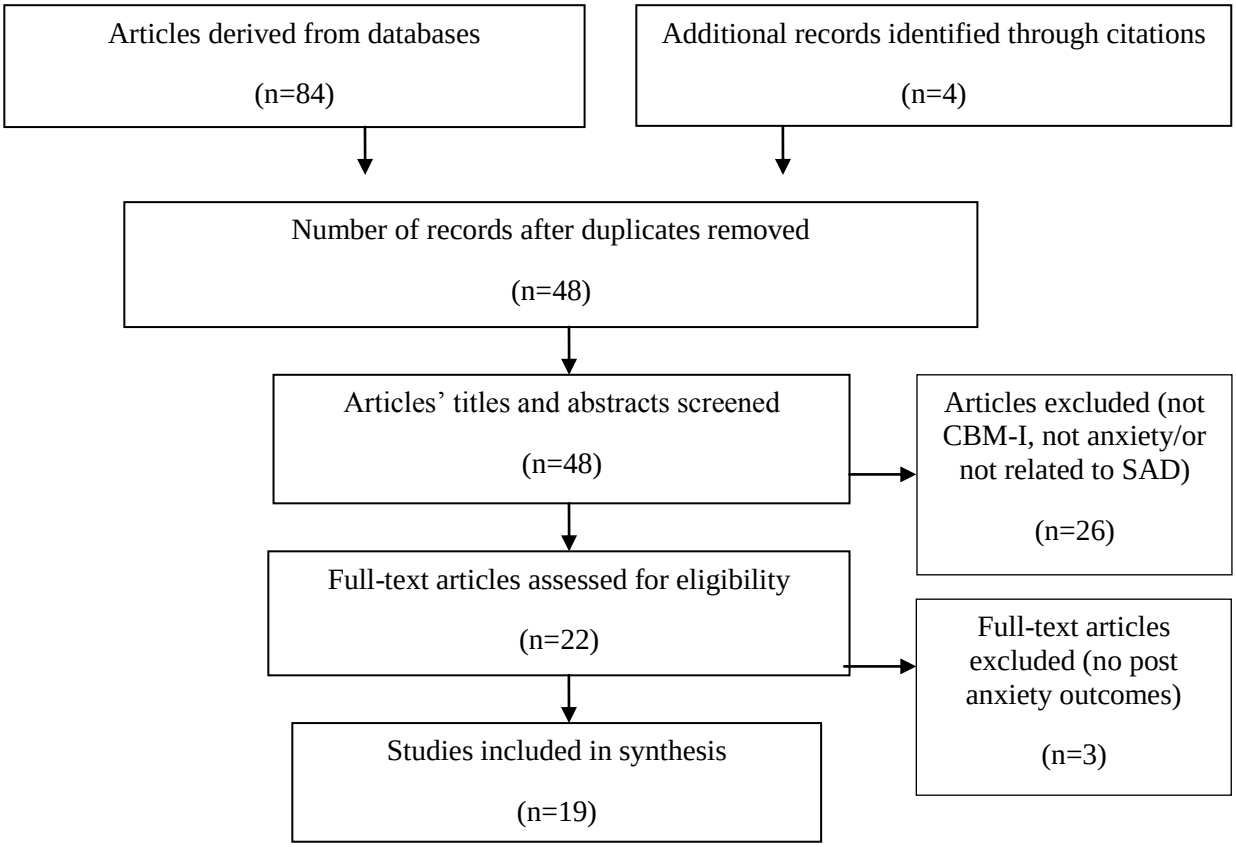

Figure 4: Consort for Review Search Procedure

1.7.4. Data extraction.

Data were retrieved and extracted and assessed for quality using the Critical Appraisal Skills Programme (CASP; Public Health Resource Unit, 2006). Each study was evaluated using the key CASP questions:

1. Are the results of the trial valid?

2. What are the results?
3. Will the results help locally?

By using these criteria, the studies' key critical points are identified and discussed. The articles are summarised and organised by their CBM-I design and key critical issues of the individual studies are discussed. The details of the study are contained within the literature search results in table 1.

1.7.5. Results from literature search.

1.7.5.1 Studies utilising a cognitive bias modification for interpretation paradigm for children.

This section discusses the eight studies which were identified through the literature search that recruited children (Lau, Pettit, & Creswell, 2013; Vassilopoulos, Banerjee & Prantzalou., 2009; Vassilopoulos, Blackwell, Moberly, & Karahaliou, 2012; Vassilopoulos, Moberly & Zisimatou, 2012; Vassilopoulos, Blackwell, Misailidi, Kyritsi & Ayfanti, 2014; Reuland & Teachman, 2014; Vassilopoulos & Brouzos, 2015; Vassilopoulos & Moberly, 2013).

Vassilopoulos et al. (2009) were the first to claim to experimentally modify interpretations in 43 children aged 10 to 11 years old using CBM-I. Participants were presented with 15 descriptions of hypothetical social events, which required them to endorse positive interpretations. After participants read each situation description, they were asked a question to elicit a required response. The answer was completed by circling one of two interpretations, which were displayed after each situation description. In their article the following example is provided:

During arts education, you ask your fellow student for one of his/her crayons, but he/she refused. What would you think if this happened to you?

a) He/she dislikes me (negative interpretation).

b) He/she needs the crayon to finish his/her painting (benign interpretation).

(Vassilopoulos et al., 2009, p. 1086)

This is then followed by corrective feedback without an explanation, to reinforce and encourage the required responses as the participant progresses through the sets of event descriptions. This study found that participants were less likely to endorse negative interpretations of new ambiguous situations following the benign training. More importantly for this review, children who received positive interpretation training had a reduction in trait social anxiety and were less anxious about anticipated social interactions compared to a control group. The authors noted that they did not have a true control condition because they compared an interpretation training condition with a test-retest control group that did not receive any parallel sessions. This could mean that the results of the training group may have been influenced by the group's being exposed repeatedly to hypothetical social situations, and therefore from practicing thinking about the social situations, rather than being modified in a positive way. Still, the large sample size would indicate that the study findings had good validity (Vassilopoulos et al., 2009). This is because a large sample size enables the results to more accurately test the hypothesis (Howell, 2010).

Vassilopoulos, et al. (2012) found that healthy children, aged 10-13 years old, trained to endorse more positive interpretations using CBM-I (Vassilopoulos et al., 2009)

showed a decrease in catastrophic interpretations of ambiguous situations, compared a control group of healthy children who received no training. However, although interpretation biases changed to become more positive, social anxiety did not reduce. The authors explained that the lack of training effects on trait social anxiety could potentially imply that the relationship between interpretation bias and social anxiety in children may not be a causal relationship. Furthermore, this study, similar to Vassilopoulos et al. (2009), did not have true control group as the groups were not treated equally. The training condition who received corrective feedback on their answers to different social situation descriptions had greater exposure to the social situations, as well as the corrective feedback. However, the non-training group were not able to read the social scenarios because they did not receive any training (Vassilopoulos et al., 2012). This could suggest that the repeated exposure could have acted as an influence on the results, with the interpretation training condition endorsing greater positive interpretation biases simply from the exposure to the social situations rather than the positive interpretation bias they were trained in. It should have only been the corrective feedback of the social scenarios which differed between the groups. Therefore it could be argued that the results were not conclusive of a valid comparison between CBM-I and non-CBM-I effects, but instead could have been influenced by confounding variables such as the training group's contact with the research assistants.

Vassilopoulos, Blackwell, et al. (2012) compared the effects of 94 healthy children's (aged between 10-12 years old) interpretations and emotions but with the additional variable of verbal instructions or imagery. The CBM-I used in this study was the same as the program used in Vassilopoulos et al. (2009). The study aimed to extend

the research by examining whether imagery versus verbal processing instructions influences interpretation biases and levels of social anxiety following CBM-I training. Children in the verbal instructions condition were asked to read descriptions of hypothetical social situations and think about the verbal meaning, whereas the children in the imagery condition were asked to imagine these hypothetical events. Children provided with verbal instructions reported a significant decrease in trait social anxiety compared to those encouraged to imagine scenarios. However, the study recruited a non-clinical sample and to maintain good ecological validity this study would have benefitted from the recruitment of children diagnosed with SAD. Clark and Wells (1988) highlighted that one of the core cognitive features which maintains social anxiety is imagining oneself in a negative perspective as an observer. However, with a non-clinical sample this cognitive symptom would have been less prominent compared to children with SAD (Vassilopoulos et al., 2012). Therefore the conclusion that imagery is less effective than verbal imagery in CBM-I cannot be confidently generalised to socially anxious children who have negative perspectives of themselves.

Vassilopoulos and Moberly (2013) used the CBM-I and incorporated a benign condition rather than a control condition and looked at the effects of self-imagery for healthy children aged from 10 to 12 years old. In this study the benign condition is different to a control condition because it aims to influence the participants to make positive interpretation biases, whereas participants in a control condition would receive no CBM-I training sessions. It has been found that the valence of an adult's self-image can be influenced by changes in interpretation biases (Hirsch et al., 2003a; Vassilopoulos, 2005; Makkar & Grisham, 2011). Thus, Vassilopoulos and Moberly added the variable of

self-imagery in an attempt to test whether it enhanced the effects of training. This was investigated by asking the children to create a mental image of themselves in the social situations, describe the image out aloud and provide ratings of how pleasant or unpleasant the image was on a Likert scale. Vassilopoulos and Moberly found that children reported more negatively valenced self-imagery after endorsing negative rather than benign interpretations. Children also showed a significant increase in state anxiety from pre to post-training but only in the negative condition. There was only a marginally significant reduction in the benign condition for state anxiety. The authors noted that baseline imagery measure would have been helpful to determine whether imagery was relative to the increase in state anxiety (Vassilopoulos & Moberly, 2013). This would have enabled interpretations of the changes in anxiety to be attributed to effects of training or imagery rather than collectively. Thus, the effects found may have just been a result of the CBM-I, or imagery or a combination of both (Vassilopoulos & Moberly, 2013).

Lau, Pettit, et al. (2013) extended the research by Vassilopoulos et al. (2009) by using their CBM-I design to investigate whether CBM-I was effective when it was administered by the parents of 36 children aged 7-11 years old. In the study, the CBM-I training group were read 45 scenarios across three consecutive evenings by their parents. The day before and after the three days of reading, parents were instructed to administer pre and post measures for interpretation bias and social anxiety. Each evening 15 scenarios were read to the children. These contained ambiguous social situations with no endings and the children were asked to complete the ending of the story by choosing either a negative or positive account. This condition was compared to a group of children who were only administered pre and post assessments and not read any scenarios by their

parents, The CBM-I group who had the scenarios read to them endorsed more neutral interpretations of ambiguous situations and reported a significant reduction in social anxiety symptoms. Lau and colleagues pointed out that the child's additional contact with their mothers, via the reading sessions, could have further reduced the children's level of anxiety over the three sessions compared to the non-training group, and therefore the conclusions should be treated with caution.

Building upon the aforementioned research, Vassilopoulos et al. (2014) aimed to investigate whether spoken or written presentations of CBM-I training, still using Vassilopoulos and colleagues' (2009) CBM-I design, was more effective for reducing anxiety related interpretation biases in children. They used a large sample size of 94 primary school children aged 10-12 year old with clinical levels of social anxiety as measured on the Social Anxiety Scale for Children – Revised (SASC-R; La Greca & Lopez, 1999). The participants were randomly allocated to one of four conditions: negative interpretation bias training in either a written or spoken form, or positive interpretation bias training in either a written or spoken form. The children were assessed pre and post CBM-I for social anxiety and depression symptoms, interpretation bias and judgement bias. They also completed an anagram, which was designed to be a stressful task (adapted from Lester, Mathews et al., 2011) before and after the training and to evaluate their performance. Vassilopoulos and colleagues found that the spoken version of the training was more effective for increasing negative interpretation bias than the written version. The positive training condition did not reveal any significant differences between outcomes for spoken and written. Still, Vassipoulos et al. (2014) stated that a limitation of the study was that the results were based on healthy children and could not

be generalised to children with clinical levels of anxiety, which would impact its ability to be used clinically (Vassilopoulos et al., 2014).

Reuland and Teachman (2014) argued that much of the research has focused on non-clinical populations or on children without an official clinical diagnosis. With this in mind, Reuland and Teachman investigated the efficacy of the online CBM-I training program with 18 young people aged 10-15 years old. They also wanted to extend the research by Lau, Pettit, et al. (2013), to see whether involving parents in the CBM-I training is more effective for reducing anxiety related interpretative biases by randomly allocating children to either a 'child-only', 'parent only' or 'combo condition'. The conditions included eight individual CBM-I training sessions. The study found that the three conditions were equally effective, however the authors acknowledged that the programme required testing with a much larger sample size (Reuland & Teachman, 2014). Vassilopoulos and Brouzos (2015) developed the existing research by looking at variants of CBM-I programs and their effectiveness with children. The aim was to investigate ways the CBM-I programme could be improved (Vassilopoulos & Brouzos, 2015). They investigated whether having a discussion with a same-gendered peer prior to making interpretations during the CBM-I training leads to reductions in social anxiety symptoms and changes in interpretation biases. They recruited 38 healthy children aged 10-11 years old, with 20 participants being randomly allocated to a 'duo' training group, which included the peer discussions alongside training, and 18 participants to a control group, consisting of no training. They found that children in the 'duo' training group made fewer negative interpretations, reported lower social anxiety symptoms and performed better in a stressful task compared with the control group. Despite

Vassilopoulos and Brouzos' findings which have identified an effective variant of CBM-I training by having peer discussions, this variant has not been compared to training with no discussions but only to a control group which has no training. This would mean that their novel feature of including peer discussions has not been compared to CBM-I training without discussions with peers, which would help to further clarify whether this variant is truly an additional benefit to enhancing training.

The above studies from the literature search recruited children to investigate the efficacy of CBM-I programmes using a programme based on Vassilopoulos and colleagues' (2009) original design. Adaptations to the programme were made, such as presenting it in written or spoken form (Vassipoulos, Blackwell, et al., 2012), and novel versions were assessed for effectiveness. It was found that the studies predominantly recruited healthy children rather than clinical samples, which Vassilopoulos et al. (2014) argued limited how much the findings could be generalised to clinical samples. Furthermore, it was found that many of the studies did not have a true control group to which the CBM-I training group could be accurately compared.

1.7.5.2. Studies utilising a cognitive bias modification for interpretation paradigm for adolescents.

Other studies have employed a modified version of the original CBM-I paradigm designed for adults (Mathews & Mackintosh, 2000) in adolescent populations. For example, Lothmann, et al. (2011) developed 60 novel adolescent related scenarios focusing on relationships and activities. After each scenario, word fragments were presented to adolescents aged 13-17 years old, followed by a comprehension question

with ‘correct’ or ‘wrong’ feedback to reinforce positive interpretation bias style. Overall 60 scenarios were included in the training across five blocks. Participants were also instructed to imagine the scenario because it has been argued that the use of imagery can increase the effects of training (Holmes, Lang, & Shah, 2009). They found that adolescents in the negative word fragment group endorsed more negative and fewer positive interpretations of new ambiguous situations than those in the positive word fragment group post-training. They found that positive training reduced affect in boys but not girls (Lothmann et al., 2011), though failed to discuss the potential reason for this gender difference.

Lau, Molyneaux, Telman and Belli (2011) investigated whether higher a level of trait anxiety was related to greater effects in bias modification in healthy adolescents aged 13-18 years old. They also measured self-efficacy to see whether this moderated changes in anxiety. Negative CBM-I training led to a reduction in positive affect but only in low self-efficacious adolescents, and no effect was found in trait anxiety. This would suggest that individuals with low self-efficacy are more susceptible to negative bias interpretations and anxiety. However, the reserachers did not find the reverse in the positive group.

Furthermore, Salemink and Wiers (2011) found changes in interpretation bias following CBM-I training in 88 healthy adolescents aged 14-16 years old. However, again no CBM-I training effects were found on state anxiety and they proposed that trait rather than state anxiety was more susceptible to changes in interpretation bias following CBM-I training (Salemink & Wiers, 2011). Still, they stated that the findings were limited by only being able to be generalised to healthy populations, and it would be more

beneficial to recruit a clinical sample to enable greater clinical utility of the findings (Salemink & Wiers, 2011).

Similarly Lau, Belli and Chopra (2013) adopted the CBM-I training containing the Lothmann et al's (2011) adolescent scenarios. A positive and negative training program was provided to 40 adolescents aged 12-18 years old, followed by a mental arithmetic task to act as a stressor. The participants were informed that they would be videotaped whilst doing the task in an attempt to create a stressful socially anxious situation. They found that adolescents in the positive training condition showed attenuated anxiety levels after the stressful situation and suggested that the CBM-I training was therefore effective. Lau and colleagues suggested that the relative attenuation of anxiety in the positive condition could have been a result of anxiety-resilience developed following the positive training. On the other hand, the negative training condition may have developed increased vulnerability (Lau, Belli, et al., 2013). However, the study did not have a true control group, i.e. a group which did not have any training sessions, positive or negative. Therefore without a control group it would be difficult to reliably conclude that effects were directly the result of the training delivered (Lau, Belli et al., 2013).

Sportel, de Hullu, de Jong and Nauta (2013) conducted a randomised controlled trial (RCT) with a CBM-I condition, a CBT condition and a control group to investigate which condition was the most effective for reducing anxiety. Sportel and colleagues recruited 240 adolescents with clinical levels of anxiety aged 13-15 years old from a school, who were randomly allocated to a condition. The CBM-I condition received 20 sessions of home internet delivered training, the CBT condition received a 10 session group CBT course, and the control group received no training or therapy. The researchers

found that the CBT condition experienced a reduction in social anxiety symptoms compared to the CBM-I and control condition. Anxiety was measured using the Revised Child Anxiety and Depression Scale (RCADS; Chorpita, Zim, Motfitt, Umemoto, & Francis, 2000) and the Spielberg Test Anxiety Inventory (Spielberg TAI; Van der Ploeg, 1988). The CBM-I condition showed lower levels of social anxiety post treatment compared to the control condition, but this reduction did not carry over to 12 months later, suggesting the effects were only short-term. Furthermore, Sportel et al. explain that the training adherence for the CBM-I condition was quite low, which could have had an impact in reliably investigating whether one condition is more effective than the other. However, in terms of considering the validity of the study, the study used a RCT design, which is highly recommended for clinical trials (Kang, Ragan & Park, 2008).

Other studies using the Lothmann et al.'s (2011) CBM-I procedure found no significant reduction in adolescents' anxiety following CBM-I training. For example, Fu, Du, Au and Lau (2013) investigated the effects of a single session of CBM-I with a clinical sample of anxious adolescents aged 12-17 years old. They assigned 28 adolescents with anxiety disorders to a positive or neutral training session. Although they found that positively trained adolescents were able to interpret novel ambiguous scenarios less negatively than the neutral CBM-I training participants, no effects were found on mood using visual analogue scales (VASs). This study was more ecologically valid than previous studies (Lau et al., 2011; Lau, Belli et al., 2013; Lothmann et al., 2011; Salemink & Weirs, 2011) because it recruited a clinical sample (Fu et al., 2013), which helps us to understand whether the effects on anxiety are similar in individuals with social anxiety.

Furthermore, Telman, Holmes and Lau (2013) found that positive training failed to shift positive affect whilst negative CBM-I training showed an increase in negative affect with 49 healthy adolescents, aged 15-18 years old. They found that participants with high-trait anxiety perceived stressors as having a greater impact than those with low-trait anxiety. They suggested that negative styles may increase negative responses toward stressors and positive styles may boost resilience. However, a closer analysis of the results showed that the reduction in negative mood found post-training was absent in the last assessment. Telman et al. (2013) state that a limitation of the study is that it did not measure the long term effects of the CBM-I training. Therefore their findings that the negative training modified interpretation biases can only be argued to have been found in the short-term.

Chan, Lau and Reynolds (2014) aimed to build on the research further by investigating the effects of CBM-I training for adolescents by including a neutral training condition. Furthermore, they aimed to develop the research by looking at the effect of multi-session CBM-I and investigate the follow-up effects rather than merely the post-treatment effects of single-session CBM-I. To address these methodological issues, Chan et al. (2014) carried out a study with 74 healthy adolescents aged 16-18 year old who were randomly allocated to two sessions of CBM-I training, using either Lothmann et al.'s (2011) scenarios or a neutral condition. The study found that both conditions showed a decrease in negative interpretation bias and an increase in positive interpretation bias with no group differences in anxiety levels post training. Chan et al. (2014) concluded that the results may have been related to the lack of a clinical sample and highlighted that

future research should recruit clinical samples to reliably assess the effectiveness of multi-session CBM-I for reducing anxiety and related interpretation bias.

Belli and Lau (2014) also built on the CBM-I research by looking at the longevity of the interpretation bias effects. They compared two groups of adolescents aged 15-17 years old using Lothmann et al's (2011) CBM-I programme compared to a CBM-I without emotional content. They found that adolescents endorsed fewer negative interpretations after CBM-I training compared to controls. However, no significant differences were found between the CBM-I training group and controls for the level of positive interpretations post-training, interpretation styles at follow-up, or anxiety levels measured using the State-Trait Anxiety Inventory for Children (STAIC; Spielberger, 1973). Chan et al. (2014) point out that the sample recruited in this study had anxiety levels in line with non-clinical populations and this would suggest that the study's findings are less able to be generalised to clinical samples, which require interventions.

The literature search identified nine studies which had used an adolescent version of the CBM-I programme (Lothmann et al., 2011). However, eight studies found that CBM-I modified interpretation bias but did not always reduce levels of anxiety following CBM-I training (Belli & Lau, 2014; Chan et al., 2014; Fu et al., 2013; Lau et al., 2011; Lothmann et al., 2001; Salemink & Wiers, 2011; Telman et al., 2013).

1.7.5.3 Studies utilising an adapted version of the "Space Odyssey" paradigm.

Muris et al. (2008) also developed a CBM-I for children, called the "Space Odyssey". Children were asked to make decisions on 30 hypothetical space scenarios. Two studies utilised this paradigm and recruited both children and adolescents. Firstly,

Lester, Field and Muris (2011) created an animal version of Muris et al.'s (2008) Space Odyssey. This version involved children being presented with ambiguous animal situations. Children were assigned to positive or negative training and assessed for interpretation biases, avoidance behaviour and anxiety vulnerability. The results were similar to other CBM-I designs; the training revealed significant effects on post interpretation biases of ambiguous situations. The positive training led to a decrease, and the negative training led to an increase, in threat biases. Positive training also attenuated behavioural avoidance compared to negative training but no significant reductions were found on anxiety vulnerability. Muris et al. (2008) stated that a limitation of their study was that it did not include a baseline assessment, which meant that they were not able to study the change in interpretation bias following CBM-I training.

Similarly, Lester, Field and Muris (2011b) compared effects of CBM-I training, of interpretation bias and anxiety, in children and adolescents separately using two topics (animal and social fear). These were based on the format of the "Space Odyssey" CBM-I programme developed by Muris et al. (2008). They found significant increases in positive interpretation bias for the positive CBM-I training condition and significant increases in negative interpretation bias for the negative condition. However, no significant differences were found between the conditions for anxiety following training. Both Muris et al. (2008) and Lester et al. (2011b) found that CBM-I training could modify interpretation bias but training did not significantly reduce levels of anxiety. Although these studies are beneficial for developing an understanding of CBM-I and post-training anxiety, both adopted negative training rather than a benign comparator, which raises ethical concerns because of the way that they induce negative interpretation styles in

young people. Thus, if the young people were trained to interpret scenarios more negatively, this may increase their level of social anxiety. If they received neutral training, they would not be encouraged to interpret the scenarios positively or negatively, reducing the potential of increased anxiety levels for the participants.

Table 1:

Review Studies from Literature Search with Summaries of Population, Design, Measures and Results

Child Paradigm

Study	Participant Characteristics	Design	Anxiety Measures	Results
Vassilopoulos et al. (2009)	*n*= 43 Healthy Children (10 to 11 years old) High on social anxiety	Three interpretation bias training sessions compared with a control group.	SASC-R Anticipated anxiety	Reduction in trait anxiety and anticipatory anxiety.
Vassilopoulos et al. (2012)	*n*=153 Healthy children (10 to 13 years old)	Three positive and mildy negative interpretation bias training sessions and control group.	SASC-R	No effect on anxiety.
Vassilopoulos & Moberly (2012)	*n*=115 Healthy children (10 to 12 years old)	Interpretation bias training program followed by imagery task. Benign or negative training condition.	SASC-R VAS	The interpretation manipulation induced only short-term increases in state anxiety.
Vassilopoulos, Blackwell, et al. (2012)	*n*=94 Healthy children (10 to 12 years old)	Interpretation bias training followed by event description. Imagery condition or verbal instructions manipulation.	SASC-R	The verbal instruction group reported a significant decrease in trait social anxiety.
Lau, Pettit, et al. (2013)	*n*=36 Healthy children (7 to 11 years old)	CBM-I training delivered through bedtime scenarios across three consecutive evenings compared to control group.	SASC-R	CBM-I condition showed a significant reduction in social anxiety post-training.
Vassilopoulos et al. (2014a)	*n*=94 Healthy children (10 to12 years old)	CBM-I training in written or spoken form. Compared negative and benign program for each form (4 conditions)	SASC-R VAMS	Negatively trained children made more negative interpretation biases in the spoken condition. A trend was found for spoken condition in the benign group towards more

				positive interpretation biases post-training.
Reuland & Teachman (2014)	*n*=18 Adolescents with clinical diagnosis of anxiety (aged 10 to 15 years old)	Eight sessions of online CBM-I training (conditions were either for child, parent or a combination of both)	SAS-A (child & parent versions)	No significant differences across conditions.
Vassilopoulos & Brouzos (2015)	*n*=38 Healthy children (aged 10 to 11 years old)	CBM-I training session with peer discussion compared to no training group.	SASC-R	CBM-I training with peer discussions was superior to no training for social anxiety.

Adolescent Paradigm

Study	Participant Characteristics	Design	Anxiety Measures	Results
Lothmann et al. (2011)	*n*= 82 Healthy adolescents (13 to 17 years old)	CBM-I training with adolescent scenarios related to relationships and activities. Positive and negative training conditions.	SASC-R	Positive training reduced affect but only in boys.
Lau, Belli, et al. (2013)	*n*= 40 Healthy adolescents (12 to 18 years old)	CBM-I and imagery task. Positive and negative training condition.	VAS (based on PANAS-C)	Positively trained adolescents showed attenuated anxiety levels following a stressor but not before.
Sportel et al. (2013)	*n* = 240 Adolescents scoring above the clinical cut off for an anxiety disorder (aged 13 to 15 years old).	Compared positive CBM training (interpretation and attentional bias), CBT and control group.	STAI-C-T RCADS STAI STIAT	The CBM condition showed a trend –significant result for social anxiety post treatment. This was absent at the 12 month follow up. CBT was the most effective condition for

				reducing social anxiety.
Fu et al. (2013)	*n*= 28 Adolescents with anxiety (aged 12 to 17 years old)	Positive or neutral single session CBM-I training.	VAS (based on PANAS-C)	No significant differences on the VAS.
Salemink & Wier (2011)	*n*=170 Healthy adolescents (14 to 16 years old)	Positive CBM-I training or placebo-control condition.	STAI-C	No effects on state anxiety were observed from positive training.
Lau et al. (2011)	*n*= 36 Healthy adolescents (13 to 18 years old)	CBM-I and imagery task. Compared positive and negative training condition.	VAS (based on PANAS-C) STAI-C-T	No significant differences in anxiety between the conditions.
Telman et al. (2013)	*n*=46 Healthy adolescents (15 to 18 years old)	Computerised positive or negative CBM-I training with mental imagery	STAI-T-C VAS (based on PANAS-C)	No significant differences in anxiety between the conditions.
Chan et al. (2014)	*n*= 74 Healthy adolescents (16 to18 years old)	Two CBM-I training sessions compared with two neutral training sessions	PANAS STAI-S & STAI-T	CMB-I condition displayed greater reductions in negative affect, no difference in trait anxiety.
Belli & Lau (2014)	*n*=69 Healthy adolescents (15 to17 years old)	Positive CBM-I training compared with training with no emotional content	STAIC VAS	No significant differences between conditions for anxiety.

Adapted Version of the "Space Odyssey" Paradigm

Study	Participant Characteristics	Design	Anxiety Measures	Results
Lester et al. (2011a)	*n*=67 Healthy children (6 to 11 years old)	Positive or negative interpretation bias paradigm conditions	STAI-C FSSC-R VAS	No significant differences for anxiety across conditions.

Lester et al. (2011b)	*n*= 103 Healthy young people (aged 7 to 10 and 11 to 15 years old)	30 training scenarios (animal or social; positive or negative)	FSSC-R STAI-C VAS	No significant differences between anxiety on pre and post measures.

Note: SASC-R = The Social Anxiety Scale for Children-Revised (La Greca & Stone, 1993); VAS = Visual Analogue Scale; VAMS = Visual Analogue Mood Scales; PANAS-C = Positive and Negative Affect Scale for Children (Laurent et al., 1999); RCADS = A Revised Child Anxiety and Depression Scale (Chorpita, Yim, Moffitt, Umemoto, & Francis, 2000); STIAT = Single Target Implicit Association Test (de Hullu, de Jong, Sportel, & Nauta, 2011); FSSC-R = Fear Survey Schedule for Children-Revised (Ollendick, 1983).

1.7.5.4. Summary of results

From the 19 studies, eight were found to reduce levels of anxiety following CBM-I (Lau, Belli, et al., 2013; Lau, Pettit, et al., 2013b; Sportel et al., 2013; Vassilopoulos & Moberly, 2012; Vassilopoulos et al., 2009; Vassilopoulos et al., 2012; Vassilopoulos & Brouzos, 2015). However, the majority of these studies did not display a strong evidence base for the reduction in levels of anxiety, but found that CBM-I had significant effects on interpretation bias with positive interpretation bias training by reducing negative bias post-training.

1.7.6. Methodological limitations.

A limitation which is evident throughout ten of the studies was a lack of a true control group (Lau, Belli, et al., 2013; Lau, Pettit, et al., 2013b; Lester et al., 2011a; Lester et al., 2011b; Lothmann et al., 2011; Reuland & Teachman, 2014; Salemink & Miers, 2011; Vassilopoulos et al., 2009; Vassilopoulos et al., 2012; Vassilopoulos & Brouzos, 2015). Often the studies compared positive CBM-I training to no sessions or negative CBM-I training, rather than using a neutral CBM-I training condition. By having a control group which received neutral training, the effects of positive bias modification would have been more experimentally valid. Five studies used an absence of training as the control group (Lau, Pettit, et al., 2013; Vassilopoulos et al., 2009; Vassilopoulos et al., 2012; Vassilopoulos & Brouzos, 2015; Sportel et al., 2013). It could be argued that the contact during training and the exposure to the scenarios in the positive training could have confounded the results. Of the studies that found reductions in anxiety (Lester et al. 2011a; Lau, Belli, et al., 2013; Lau, Pettit, et al., 2013; Lothmann et al., 2011; Lothmann et al., 2013; Sportel et al. 2013; Vassilopoulos et al., 2009; Vassilopoulos & Brouzos, 2015), six did not have a control group and used baseline measures as a comparator.

Furthermore, Sportel et al. (2013) used a control group but only found a significant reduction in anxiety which was not maintained at a 12 month follow up. Chan et al. (2014) argued that a control group in CBM-I studies is important for comparisons to be made so that the observed differences are not due to the impact of the training sessions rather than the underlying components of CBM. In addition there were only four studies that administered follow-up assessments (Chan et al., 2014; Reuland & Teachman, 2014; Sportel et al. 2013). Generally, longer term effects of CBM-I training have sparse levels of evidence (Chan et al., 2014).

The studies utilised CBM-I procedures developed from three paradigm designs (Vassipoulos et al., 2009; Lothmann et al., 2011; Muris et al., 2008). Many of these designs were adapted, to address a specific research question, which creates difficulties when replicating studies. Lester et al. (2011a; 2011b) adapted the scenarios to animal and social contexts, which reduced the opportunity of this specific design being replicated by others to construct an evidence base. Such adaptations were helpful for developing ideas in the field of CBM-I, but with novel variables the fundamental questions around its effectiveness appeared to have been overlooked.

Many of the studies utilised single-session training (e.g., Lau, Belli, et al., 2013; Lester et al. 2011a; Lothmann et al., 2011). In many of the studies, the aim of effectively modifying positive interpretation bias in young people was achieved, although the greater reductions in anxiety were more frequently present in multi-sessions designs (Lau, Pettit, et al., 2013; Sportel et al., 2013; Vassilopoulos, et al., 2009; Vassilopoulos, et al., 2012). Thus, this would indicate that multi-session CBM-I could lead to greater reductions in anxiety.

Approximately half of the studies recruited samples of over 70 participants (e.g., Lester et al., 2011b; Sportel et al., 2013; Vassipoulos & Moberly, 2012). This would suggest that these results held good statistical power. However, the category of participants was particularly poor for making generalisations. Only three of the studies recruited adolescents with clinical levels of anxiety (Fu, et al., 2013; Reuland & Teachman, 2014; Sportel, et al., 2013). Therefore the majority of the results can only be generalised to non-clinical populations. Sportel et al. (2013) found a significant trend between reductions in anxiety and negative interpretations, but only found weak significant effects when compared to CBT.

Of the different anxiety measures, the SAS-A, STAI-C-T, FSSC-R and SASC-R are deemed reliable in terms of their internal consistency, and convergent and divergent validity (Muris, Merckelbach, Ollendick, King, & Bogie, 2002; Storch, Masia-Warner, Dent, Robert & Fisher, 2004). Hughes and Kendall (2009) found convergent validity for the PANAS-C, the measure used directly to inform the VAS in many studies. However, the discriminant validity was weak, especially for anxiety. Therefore the PANAS-C would be less reliable for measuring this specific disorder. Another limitation concerns the assessment time points, because the majority of the studies used baseline measures as a comparator for measuring outcomes after training, and only one study measured effects after 12 months (Sportel et al., 2013). Therefore the majority of the studies only measured short term effects by administering measures post training, and not the long term effects. This is problematical because it is important to investigate how long the effects last to see how effective it would be as an intervention, if used in clinical settings.

The review highlighted some important issues surrounding the implications of CBM-I training. As previously discussed, CBM-I was developed based on the theoretical assumption

that negative interpretation biases are present in anxiety (e.g., Beck & Clark, 1997). CBM-I works on the principle that if negative interpretations are reduced or manipulated to become benign or positive, anxiety should reduce (Mathews & Mackintosh, 2000). The review demonstrated how CBM-I modified negative biases in young people, but there were mixed results for reducing anxiety symptoms. It could be argued that this is maybe dependent on other factors such as the developmental stage of the young people spanning from 6 to 18 years old. This age range includes different developmental stages which could in turn have impacted the effectiveness of the CBM-I paradigms. This is because it has been found that adolescents are at greater risk of developing SAD compared to younger children (Brook & Schmidt, 2008), which suggests that adolescents' social anxiety levels may be more severe than young children's. This would be important to acknowledge because research findings making clinical implications may be different depending on the particular age range of the samples.

Furthermore, the review showed that multi-session CBM-I appeared most effective in reducing anxiety. Four of the five studies that used multi-session CBM-I (Lau, Pettit, et al., 2013; Sportel et al., 2013; Vassilopoulos et al., 2009; Vassilopoulos et al., 2012) contributed to over half of the studies that were effective in reducing anxiety in the review. Thus, if more multi-session training packages were trialled there could be a greater evidence base for the reduction in anxiety and also the number of sessions required could be investigated further. Thus, the current research is too premature to reliably answer the question of whether reductions in anxiety occur, and the research in the maintenance of the effects on anxiety is particularly sparse.

The review highlighted the lack of research into the effectiveness of CBM-I with clinical samples. This is similar to what has been found with the adult literature (Mobini, Reynolds & Mackintosh, 2013).

1.7.7. Future research.

The literature review reveals gaps in the evidence base for CBM research. Future research should continue to develop an understanding of the effectiveness of CBM-I training. This could include the investigation of multi-session CBM-I and its application to clinical samples focusing on a specific age group and look at ways the efficacy of the programmes can be enhanced.

Currently, research investigating the effectiveness of CBM-I tasks for young people with anxiety is weak and still in its infancy (Beard, 2011). There are many reasons why developing CBM-I programmes and assessing their effectiveness is important. CBM-I training programmes are appropriate for young people for several reasons. The training design and underlying theoretical mechanisms are suitable for young people and accessible to their developmental needs (Beard, 2011). Thus, it has been suggested that adolescents have plasticity in their cognition functioning and are at a maturation stage ideal for cognition change (Giedd, 2008). In addition, CBM training is easy and cheap to deliver to adolescents in comparison to psychological therapy (Yiend et al. 2013).

1.7.8. Clinical implications.

From the literature review, it would seem that previous research has investigated ways to enhance the interpretation bias effects of CBM-I for young people with anxiety, however the research has been limited to finding positive improvements in anxiety (e.g., Sportel et al., 2013; Vassilopoulos, et al., 2009; Vassilopoulos, et al., 2012) so as to justify its value as an intervention . There is some suggestion from the adult literature that multi-session CBM-I may enhance the effects of positive training (Hallion & Ruscio, 2011). Most importantly, when

thinking about clinical implications it is evident that the research has limited studies recruiting clinical samples (Fu, et al., 2013; Reuland & Teachman, 2014; Sportel, et al., 2013) so the effectiveness of training for adolescents with anxiety is limited.

1.8 Implementation Intentions

Implementation Intentions (II) has been applied to help understand motivation, engagement and success in therapy (Gollwitzer & Sheeran, 2006). IIs have been found to repeatedly promote the achievement of goals (for a review see Gollwitzer & Sheeran, 2006). IIs were originally developed from the Rubicon Model of Action Phases (MAPS; Heckhausen, 1987; Heckhausen & Gollwitzer, 1986; 1987). This model demonstrated that motivation is the first stage for managing undesirable responses to situations. This model proposes that effective self-management of mood, emotions and control involves a stage whereby the individual makes a decision on when, where, and how to behave prior to taking action – thus creating an II. The format for this plan is *"if situation x is encountered, then I will initiate response y!"*

Research has found that IIs are effective for helping individuals manage different self-regulatory tasks (Gollwitzer & Sheeran, 2006) by encouraging people to recognise, engage and promote planned strategies. Webb, Miles and Sheeran (2012) found that self-regulatory plans can attenuate anxiety and IIs can have a medium to large effect on participants' changes in anxiety with goal intention instructions (Webb et al., 2012).

More specifically, Webb, Ononaiye, Sheeran, Reidy and Lavda (2010) found that IIs can promote rapid disengagement from threatening stimuli and decrease poor self-evaluation in performance situations for people with high levels of social anxiety. Webb and colleagues carried out a series of experiments to investigate the effect of IIs on the management of self-

regulatory difficulties for people with social anxiety. Their first experiment compared the level of attentional bias to socially threatening words in a Visual Dot Probe (VDP) task and found that participants high in social anxiety that formed IIs to manage attentional biases exhibited less negative bias to socially threatening words (Webb et al., 2010). This method is often used to measure selective attention to threatening stimuli in participants with anxiety disorders (Macleod, Mathews and Tata, 1986). Webb et al. (2010) included either a goal intention or II on the computer screen, depending on the condition, after the practice trials but before the actual trials of the VDP computer task. The goal intention condition computer screen read "During the computer task, it is important that you remain calm and do not worry about the speech". The II condition were given the same VDP instructions but were also informed to form a plan: "If I see a neutral word, then I will focus all my attention on it!" (Webb et al., 2010). By including the different types of instructions (II or goal intention), they were able to investigate which was more effective for helping the participants manage their attentional focus.

Webb et al. carried out a further experiment to see if IIs specifically contributed to the disengagement from socially threatening words or whether it was merely a goal intention rather than IIs that could have this effect. From this experiment they found that participants with a high level of social anxiety who formed IIs, identified probes that followed social threat (Webb et al., 2010). Webb et al. also investigated whether IIs could affect the attentional bias of highly social anxious participants' evaluations of their performance. They found that creating IIs contributed to greater performance appraisals in the participants with high levels of social anxiety (Webb et al. 2010). Webb et al. propose that future research could investigate the effect of IIs integrated with interventions created for people high levels of social anxiety. Current theory proposes that the formation of a plan increases the accessibility of the asserted cue and elicits strong cue-

response links (Sheeran et al., 2005; Webb et al. 2012). Thus, the resulting II, or 'if-then' plan, could help undermine negative interpretation bias present in people with SAD by adjusting the interpretation of the negatively perceived social situation. Therefore it is possible that IIs could enhance the effectiveness of positive CBM-I programmes. An II could help by instructing people to interpret ambiguous scenarios in a positive way. With a series of CBM-I scenarios with an II, people could learn and develop a more positive interpretation style, in turn enhancing the effectiveness of CBM-I programmes.

1.9. Thesis Investigation

The current study proposed to investigate the effectiveness of a three session CBM-I training programme, with II, for adolescents with clinical levels of social anxiety.

1.9.1. Development on Curtis (2013).

This aim built on the work by Curtis (2013), which looked into developing a novel, accessible and effective CBM-I programme for adolescents with social anxiety. Curtis (2013) investigated the application of a multi-session CBM-I programme in an adolescent sample with clinical levels of social anxiety. Eight adolescents (14 -17 years old) were recruited into a CBM-I case series. Participants were asked to complete a seven session CBM-I program in their homes. The multi-session CBM-I programme trained participants to interpret ambiguous events in a positive way. Participants were asked to complete self-report measures to monitor changes in interpretation biases and levels of anxiety. Curtis (2013) found that four participants made improvements on their levels of social anxiety post training. In addition, the results showed that six participants displayed reduced levels of negative interpretation bias after training. Curtis (2013) also found upon graphical inspection of the data that optimum effects appeared after three

days of CBM-I training. Thus, it was questioned, in the discussion of the results, whether seven days was required and whether fewer sessions could achieve the same outcome. Therefore the current study included three CBM-I training trials to investigate the impact of fewer sessions on interpretation bias and anxiety symptoms. Furthermore, adolescents and their parents were asked to complete questionnaires to explore their experiences of the CBM-I programme.

1.9.2. Enjoyment and motivation.

Curtis (2013) found that those who enjoyed the task were more likely to have a greater reduction in their level of anxiety. This can be explained by intrinsic motivation (Brown, 2007; Coon & Mitterer, 2010). Intrinsic motivation is when an individual acts without any obvious external rewards, which can be merely enjoyment of an activity or an opportunity to learn or to actualise our potential (Coon & Mitterer, 2010). Brown (2007) also proposed that intrinsic motivation drives people to perform activities for satisfaction or pleasure. Therefore it may be possible that those who enjoy the task are more motivated to engage and potentially gain effects. Therefore this research investigated whether those who enjoyed the training showed greater reductions in social anxiety, and interpreted social situations less negatively after training than those who did not enjoy the task.

1.9.3. Implementation intentions.

By using a CBM-I, with II, programme the participants may be more likely to benefit from the CBM-I programme. If the participants are more motivated to engage and follow specific II instructions to interpret the social scenarios in a positive rather than negative way, it could be predicted that they would interpret the social situations less negatively. This is because it has been found that II can affect biases, by promoting rapid disengagement from threatening stimuli

and decreasing poor self-evaluation in performance situations for people with high levels of social anxiety (Webb et al., 2010). According to Brown (2007) this action would be reinforced by the intrinsic reward of pleasure and satisfaction gain from merely enjoying the task. Therefore if adolescents enjoyed the training they may be more likely to learn to interpret social situations more positively, similar to the finding in Curtis (2013).

By investigating a CBM-I training programme, with II, the current study will be building on the recommendations from previous research which highlights the importance of optimising the effects of CBM-I training (Cristea, Mogoase, David & Cuijpers, 2015). Adding II to CBM-I training would be a valuable and novel addition because research has found that II can prevent people with high levels of social anxiety from upholding an attentional bias toward threatening stimuli and help to reduce negative evaluation of performance (Webb et al. 2010). Furthermore, in order to investigate the impact of II for managing anxiety, it is recommended that clinical populations are investigated (Gollwitzer & Sheeran, 2006). Although II have been showed to be effective for a range of samples, there is evidence that outcomes are moderated by the presence of current emotional states and II have a greater effect when participants are experiencing difficulty regulating their behaviour (see Gollwitzer & Sheeran, 2006, for a review). Therefore immediately before participants complete the CBM-I computer task, in an attempt to help the participants with SAD practise interpreting social situations more positively, they will be provided with instructions using the II format (Heckhausen, 1987; Heckhausen & Gollwitzer, 1986; 1987). This was similar to the presentation of the instructions used in previous studies which found II effective for enhancing goal specific plans to regulate emotions (Webb et al., 2010; Webb et al. 2012). In the current study, the goal was to interpret the CBM-I scenarios positively.

1.10 Research Hypotheses

1. A three session positive CBM-I programme, with implementation intentions, will reduce negative interpretation biases in adolescents with clinical levels of social anxiety.
2. A three session positive CBM-I programme with implementation intentions will reduce levels of social anxiety in the participants.
3. Improvements identified in interpretation biases and/or levels of social anxiety after training will be present two weeks after the CBM-I programme.
4. Adolescents who enjoy the CBM-I programme will display larger reductions in negative biases and social anxiety post training.

Chapter Two - Methodology

2.1 Chapter Overview

This methodology chapter describes the research methods utilised to carry out the current research project. It will present the design for this study and discuss the participants, including the process of the recruitment. The outcome measures are then detailed and rationales are given for the adoption of each measure. This section is then followed by a description of the procedure used to test the study hypotheses. The procedure also summaries the CBM-I programme and how it was incorporated into the study. Lastly, the ethical considerations for the study are discussed with an outline of how guidelines were maintained throughout the research.

2.2 Design

It is recommended that single-case research designs are employed to evaluate clinical training programmes which are in their infancy (Kazdin, 2010; Salkovskis, 1995). Furthermore, Kazdin (2010) suggested that the effectiveness of programmes, such as CBM-I, can be evaluated by using a multiple-baseline across subjects, A-B design; the baselines periods for each participant act as the control period to compare the training against. By using this method participants do not have to return to a baseline or period whereby the training programme is removed. This is particularly important when recruiting from a clinical population and maintaining an ethical position. This design assumes that if changes in the outcome measures occur following the introduction of the training, it was attributable to the training programme rather than other variables. To reliably observe potential changes, block randomisation was applied. Thus, the length of baselines varied across sets of participants. Participants were allocated into groups of three across three baseline lengths using block randomisation. These

were the 7th, 9th and 11th day. During the baseline phase, participants completed daily measures on social anxiety and visual analogue scales (VASs). Participants completed three consecutive and daily CBM-I sessions alongside the daily measures. Straight after the training programme and again two weeks after training, the daily measures detailed outcome measures were repeated (Figure 5).

Pre-measures administered (n=3)	Baseline period daily measures	Training period **7th day** CBM-I	Repeat 7 days daily measures	2 weeks after daily measures repeated		
Pre-measures administered (n=3)	Baseline period daily measures		Training period **9thday** CBM-I	Repeat 9 days daily measures	2 weeks after daily measures repeated	
Pre-measures administered (n=3)	Baseline period daily measures			Training period **11th day** CBM-I	Repeat 11 days daily measures	2 weeks after daily measures repeated

Figure 5: Multiple Baseline Design

2.3 Participants

The aim was to recruit nine participants as this is considered to be a suitable sample size (Blackwell & Holmes, 2010). Kazdin (2010) recommends that eight participants is a suitable number for single-case research and enables analysis that can look at variability and trends across phases of the multiple baseline design. Furthermore, following discussions regarding recruitment for CBM studies, this number seemed practical given the service constraints.

Adolescents aged between 14 and 17 years old were recruited from the Youth Pathway clinics located in Suffolk and Norfolk Integrated Delivery Teams (IDT). This age range was selected because it would allow for a more direct comparison of the results by Curtis (2013). The Youth Pathways provides a local service for young people from the age of 14 years old and the questionnaires selected for the study are appropriate for this age group. Consequently this decision increased the quality and practicalities of the design.

2.3.1. Inclusion and exclusion criteria.

Adolescents were approached if they presented with clinical levels of social anxiety. The clinicians in the services were asked to identify adolescents from their caseloads if they thought they presented with SAD. The presence of SAD was assessed by the principal researcher to clarify this. This could be comorbid with other mental health disorders apart from those described in the exclusion criteria.

Adolescents were excluded if they were currently in treatment, because this could lead their level of social anxiety to reduce from the treatment and consequently impact the outcome measures' data. In turn, the results from the post outcome measures following the CBM-I task could not be attributed to just the CBM-I task but also the treatment they would be receiving from the clinic. Adolescents who presented with risk behaviours requiring immediate clinical management, such as suicidal behaviours, were also excluded. Furthermore, the CBM-I programme is only currently available in English and participants whose first language was not English were excluded. Adolescents with learning difficulties were also excluded, because having these difficulties could have interfered with their ability to read the scenarios and follow the training instructions. Furthermore, those presenting with moderate to severe levels of

depression and/or substance misuse problems were excluded. This is because NICE guidelines recommend that depression is treated first due to the risk of suicide associated with a depressive presentation (NICE, 2009). In addition, substance misuse in adolescents could have confounded the anxiety levels measured during adolescents' participation (Wu et al., 2010).

2.3.2. Recruitment.

Once the ethical application process had been completed and granted (Appendix A), an email was sent to the local NHS research collaborators (Appendix B) to discuss meetings with the clinics to introduce the study and answer any questions. The clinics approached were the Youth Pathways and Access and Assessment Teams in the Integrated Delivery Teams based in Ipswich, Bury St. Edmunds and Norwich. At this stage, the study's protocol was discussed in detail and the clinicians' specific proposed role and responsibilities were further discussed. The clinicians agreed to introduce the study to adolescents who presented with clinical levels of social anxiety in assessments, using the inclusion and exclusion criteria. The assessment of SAD at this stage was based on the clinicians' clinical judgement (see Appendix C for the recruitment log).

2.3.3. Sample.

The figure below summarises the recruitment process (Figure 6).

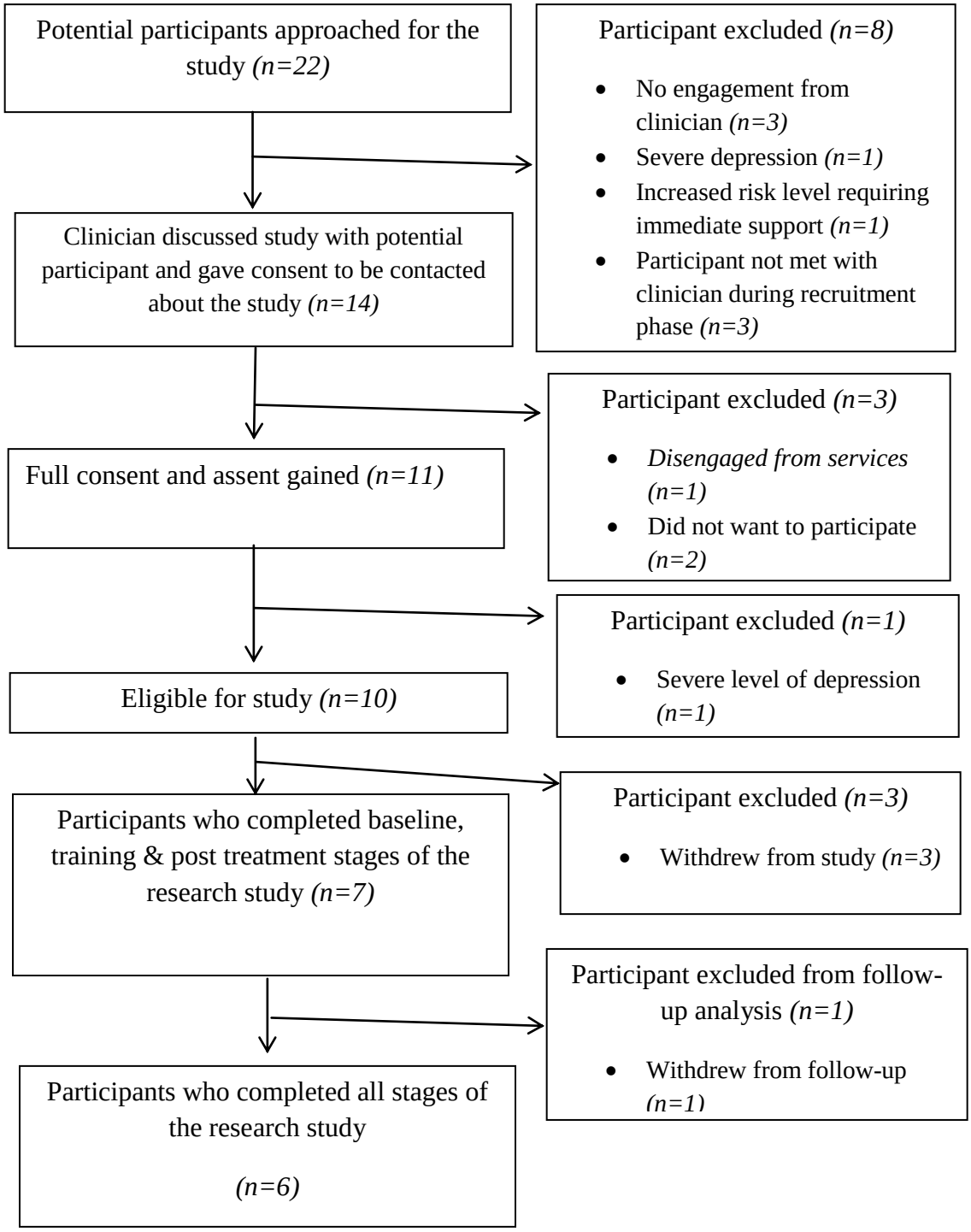

Figure 6: Consort Diagram for Recruitment

2.3.4. Participant characteristics.

A total of 11 young people consented to participate in the study, of which one participant did not meet the inclusion criteria. As described above, ten participants commenced the baseline phase of the study. Of these, seven participants completed the baseline and intervention phase. The first participant who withdrew during the baseline period (male, aged 17) reported that he found the daily questionnaires too difficult to keep completing. The next participant who withdrew (male, aged 15) stated that he found the questionnaires too demanding. The third participant who withdrew from the study stopped after the second CBM session in the intervention stage (female, aged 16) and explained that the demands of the study were too much alongside completing her revision for her exams. The seven participants who completed the baseline and intervention phase all met the inclusion criteria. The individual characteristics of these participants are outlined below.

2.3.4.1 Participant 1.

Participant 1 was a 16-year-old white British female. She was referred by her GP to the Access and Assessment Team for an initial assessment. The assessment concluded that she was experiencing social anxiety symptoms and was due to be referred onto the Well-being service, where she would be placed on a waiting list for psychological treatment. Participant 1 was currently in her last year at high school. She explained that she had felt anxious in social situations for over two years and this was having an impact on her ability to spend time with people outside the family. She reported that she became more dependent on her family as a consequence and struggled with engaging with group work at school.

2.3.4.2. Participant 2.

Participant 2 was a 17-year-old white British female. She was referred by her GP to the Access and Assessment Team because of feeling anxious, low in mood and lethargic. She was then referred onto the local Youth Pathway for a psychiatric appointment. Participant 2 was currently registered at college but was struggling with her attendance due to mental health difficulties. She received eight sessions of school counselling prior to her referral but reported that she struggled to engage with the counsellor. Participant 2 explained that her anxiety had an impact on socialising with her peers. She also reported having panic attacks and avoided places such as town, college and family events. She reported experiencing anxiety over the past six months but could not recollect a more specific start date.

2.3.4.3 Participant 3.

Participant 3 was a 15-year-old white British female. She was referred by her GP to the Access and Assessment Team because of anxiety, feeling low in mood and possible auditory hallucinations. She was referred onto the local Youth Pathway team for care coordination and support from a social worker, and was prescribed anti-psychotic medication, which she reported reduced her auditory hallucinations significantly. Participant 3 was in her penultimate year at high school. She received counselling at school that helped her manage previous symptoms of low mood and self-harming behaviours. Participant 3 explained that her social anxiety prevented her socialising with other people and from using the telephone, and that at school her difficulties had an impact on her ability to do well in tests. She reported being anxious in social situations since she was bullied two years previously.

2.3.4.4. Participant 4.

Participant 4 was a 14-year-old white British female. She was referred a year previously by her GP to the Youth Pathway following experiences of anxiety and low mood, alongside panic attacks, self-harming behaviours and suicidal ideation. Following her initial Youth Pathway assessment, she was supported by a care coordinator to help her manage risk behaviours. The support helped her manage her mood and risk behaviours and it was reported that her anxiety around others was now her main presenting problem. Following this, she was placed on the waiting list for an anxiety management group. Participant 4 was in year 9 at high school. She explained that she had felt socially anxious for over two years and this had prevented her from interacting with new people, had a negative impact on her performance at school and she struggled to ask for help with school work.

2.3.4.5 Participant 5.

Participant 5 was a 15-year-old white British female. She was assessed by the Youth Pathway following an overdose two months prior to her participation in the study. Following her initial assessment, she was supported by a care coordinator to help her manage her risk behaviours and low mood and it was felt her anxiety still remained. Participant 5 was in year 10 at high school. She explained that she had felt socially anxious for over five years when she was bullied in primary school. She reported feeling stressed with arguments at school, her academic work and home life, and also reported experiencing panic attacks. She reported that she avoided going to the shops, town and out for lunch with the family.

2.3.4.6. Participant 6.

Participant 6 was a 15-year-old white British female. She was assessed by the Youth Pathway following reports of anxiety, irritability, self-harm and suicidal ideation. Following her initial service assessment, she was supported by a mental health nurse to help her manage her risk behaviours. Participant 6 was currently in year 11 at high school. She explained that she had felt socially anxious since middle school when she experienced bullying. She reported finding it difficult to interact at school and in her free time with her peers and often spent a lot of time with her family instead. She reported avoiding town and any extra-curricular and social activities.

2.3.4.7. Participant 7.

Participant 7 was a 17-year-old white British female. She has been supported by CAMHS since she was 12 years old, originally for ADHD, which was managed with medication. She reported experiencing intermittent episodes of anxiety and depression since she was a child and received counselling. Participant 7 was currently working part-time in a shop. She reported feeling socially anxious since her parents became unwell. She reported finding it difficult to interact with her peers and instead opted for spending time with her boyfriend and family. At school she was provided with special conditions for her exams to enable her to feel less anxious.

2.4 Measures

Table 2 details when each of the following outcome measures were administered.

2.4.1. Screening Measures.

2.4.1.1. Kiddie Schedule for Affective Disorders and Schizophrenia.

The Kiddie Schedule for Affective Disorders and Schizophrenia (K-SADS-PL; Kaufman, Birmaher, Brent, Rao & Ryan, 1996) is a semi-structured diagnostic interview designed to assess current and past episodes of psychopathology in young people according to the Diagnostic and Statistical Manual of Mental Health Disorders (DSM-III; IV, American Psychiatric Association, 1980; 2000). The interview can be administered to young people aged six to 18 years old. The primary diagnoses assessed with the K-SADS-PL include: mood, anxiety and psychotic related disorders, including social anxiety disorder. It covers disorders which are in the exclusion criteria, such as severe depression, and alcohol and drug addictions. The K-SADS-PL is administered by interviewing the child or/and parent. For the current study it was only necessary to interview the adolescent. The researcher was trained in the administration of the KSAD-PL.

The majority of the items in the K-SADS-PL are scored using a 0-3 point rating scale. Scores of 0 indicate no information is available; scores of 1 suggest the symptom is not present; scores of 2 indicate sub-threshold levels of symptomatology, and scores of 3 represent threshold criteria.

The administration of the K-SADS-PL normally requires the completion of an unstructured Introductory Interview; Diagnostic Screening Interview; the Supplement Completion Checklist of the appropriate Diagnostic Supplements; the Summary Lifetime Diagnoses Checklist; and the Children's Global Assessment Scale (C-GAS) ratings. However, the current study only required the diagnostic screening interview and supplements for depression, SAD and the section on drugs and alcohol use. The decision to use a reduced version of the measure was based on the recognition that the participants would be providing information unrelated to the study's aims if they completed all the sections, which would increase the labour

and time unnecessarily for the participant. It usually takes 75 minutes to administer, however with the sections described above removed, it took 50 minutes.

Kaufman et al. (1997) found that the K-SADS-PL generates both reliable and valid diagnoses for young people. They found inter-rater reliability for the scoring screens and agreement was high for the diagnoses (93% to 100%). Furthermore, test retest reliability of K coefficients fell in the excellent (0.77 to 1.00) and good (0.63-0.67) ranges for an array of the diagnoses.

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

The BSI (Derogatis, 1993) is a self-report questionnaire containing 53 items (Appendix D). Respondents rate how much distress they have experienced for symptoms in the past week using a 4-point Likert scale. This scale ranges from *1 = Not at all,* to *4 = Extremely*. The questionnaire takes between 8 and 10 minutes to complete. The results are summarised to provide a profile of the individual's symptoms and their intensity. It also provides a Global Severity Index (GSI), which helped to provide an overall composite score of a participant's severity. Derogatis (1993) proposed that T-scores equal to 63 or above are deemed to be of clinical significance. In addition, a Positive Symptom Distress Index (PSDI), and a Positive Symptom Total (PST) was provided upon calculation. This measure can also be divided into nine disorder subscales, including anxiety, depression and psychosis.

There are adolescent norms provided for the BSI which were developed from a recruitment of 2,408 young people aged 13-17 years old (Derogatis, 1993). The questionnaire has been found to have excellent internal consistency for the nine BSI dimensions, with Cronbach alphas ranging from .71 on the Psychoticism dimension to .85 for Depression

(Derogatis & Melisaratos, 1983; Derogatis & Spencer, 1982). Other studies have also provided similar evidence for the measure (Aragón Ramírez, Bragado Álvarez, & Carrasco Galán, 2000; Gilbar & Ben-Zur, 2002; Kellett, Beail, Newman, & Frankish, 2003). The GSI also shows good reliability over time (Derogatis & Spencer, 1982).

This measure was chosen because it is recommended for clinical decision-making for the recruitment of individuals starting treatments in many different settings. It is also recommended for contexts where the measure needs to be repeated so symptomatology can be measured over time. The BSI took 10 minutes to complete.

La Greca & Lopez (1998) found Cronbach alpha of 0.93 and good to excellent inter-scale correlations for anxious populations (Ginsburg, La Greca, & Silverman, 1998). This would suggest that the items on the BSI consistently target and measure anxiety.

2.4.2. Daily measures.

2.4.2.1. Social Anxiety Scale for Adolescents (SAS-A; La Greca & Lopez, 1998).

This questionnaire was developed to measure social anxiety symptoms in adolescents aged 13-17 years old (Appendix E). It adopts a self-report design and takes approximately five minutes to complete. The responses were completed using a Likert scale, containing five points that demonstrate levels of agreement to a statement (*1 = definitely not true*, to, *5 = definitely true*). The measure comprises 22 items. Four of these items are filler items representative of hobbies. The remaining 18 items incorporate three subscales: social avoidance and distress (in the context of others, novel situations and unfamiliar people) and fear of negative evaluation. The subscale for negative evaluation ranges from 8 to 40; avoidance of novel social situations

and distress ranges from 6 to 30; and for social avoidance and distress in the context of others the range is from 4 to 40. By summing the subscale scores a total SAS-A score could be formed ranging from 18 to 90. Total scores of 50+ are indicative of clinical levels of social anxiety. This is the equivalent to one standard deviation above the mean for adolescents (La Greca & Lopez, 1998).

Storch, Masia-Warner, Dent, Robert, and Fisher (2004) found reliability coefficients of 0.93 for the total scores on the SAS-A and 0.76 to 0.91 for the subscales.

2.4.2.2. Visual Analogue Scales (VASs).

The second daily outcome measure was the VASs (Appendix F). These measured state anxiety and levels of task enjoyment. VASs are helpful for the repeated measuring of variables (Stubbs et al., 2000). The adolescent was presented with four VASs daily. Three measured state anxiety and one measured levels of enjoyment for the CBM-I session (Appendix F). The adolescents were instructed to rate on a 10cm visual analogue scale (from 0 to 10). The adolescents were asked to rate how worried, scared and nervous they felt at the time of completing the measure and how much they felt they enjoyed the session.

2.4.3 Outcome measures.

The SAS was used as the primary outcome measure as well as a screening measure.

2.4.3.1. The Interpretation Bias Measure.

Another primary outcome measure was the interpretation bias measure. This measure uses an adapted version of the Recognition Test based upon the original CBM paradigm by Mathews and Mackintosh (2000). The interpretation bias measure has been further developed

and validated with an adolescent population (Curtis, 2013). The measure comprises 10 ambiguous scenarios. Following the presentation of a scenario, a comprehension question is given to check the participant has understood the information. Four sentences are then presented. Two of these are target sentences; one is positive and the other is negative. The other two sentences are foils, which are a negative and neutral interpretation of the scenario, and include additional information that was not contained in the first scenario. Participants were required to rate the similarity of the sentences to the scenario provided just before the sentences, on a Likert scale from 1- 4 for all four sentences. This measure was administered three times in total at the end of the baseline; immediately post training and two weeks after training**.**

Table 2

Administration of Outcome Measures

Baseline Length	Measures Administered							
7	Initial Assessment	B days 1-6	B day 7	Training day 1-3	PT day 1-6	PT day 7	2W day 1-6[a]	2W day 7
	K-SADS-PL BSI SAS-A	Daily SAS-A VAS	BSI SAS-A VAS IB	Daily SAS-A VAS (plus enjoyment VAS)	Daily SAS-A VAS	Daily BSI SAS-A VAS IB	Daily SAS-A VAS	Daily BSI SAS-A VAS IB
9	Initial Assessment	B days 1-8	B day 9	Training day 1-3	PT day 1-8	PT day 9	2W day 1-8[a]	2W day 9
	K-SADS-PL BSI SAS-A	Daily SAS-A VAS	SAS-A VAS IB	Daily VAS (plus enjoyment VAS)	Daily SAS-A VAS	Daily BSI SAS-A VAS IB	Daily SAS-A VAS	Daily BSI SAS-A VAS IB
11	Initial Assessment	B days 1-10	B day 11	Training day 1-3	PT day 1-10	PT day 11	2W day 1-10[a]	2W day 11
	K-SADS-PL BSI SAS-A	Daily SAS-A VAS	Daily SAS-A VAS IB	Daily VAS (plus enjoyment VAS)	Daily SAS-A VAS	Daily BSI SAS-A VAS IB	Daily SAS-A VAS	Daily BSI SAS-A VAS IB

Note. B= Baseline phase; PT= Post-treatment phase; 2W= 2 weeks after training;

KSADS-PL = Kiddie Schedule for Affective Disorders and Schizophrenia (Kaufman, Birmaher,

Brent, Rao & Ryan, 1996); BSI = Brief Symptom Inventory (Derogatis, 1993). SAS-A = Social Anxiety Scale for Adolescents (La Greca & Lopez, 1998). VAS = Visual Analogue Scales; IB = Interpretation Bias (adapted Recognition Test; Mathews & Mackintosh, 2000; adapted by Curtis, 2013); [a] Phase begins two weeks after last training day.

2.4.4. Participant Feedback/ Service Research Project (SRP).

As part of the Clinical Psychology Doctorate, trainees are required to complete a SRP. The following measures were used as part of the SRP to evaluate and develop an understanding of the adolescent and parents' experience of using CBM-I with II. In order to assess the efficacy and clinical application of the CBM-I with II programme, participant feedback was obtained post training. Steel et al. (2010) found that participant feedback was valuable for understanding participants' views and experiences of CBM training programmes for clinical populations. Gathering feedback is of great importance because the application of CBM-I with a clinical adolescent population is in its infancy (Beard, 2011). Furthermore, with the novel addition of the II on the programme, it was crucial that adolescents' views and experiences, along with their beliefs about of the impact of the programme on their social anxiety symptoms, were collected. In addition, by exploring parents' views of their child's experience of using CBM-I with II, the acceptability of the training and efficacy could be understood from not only the child's perspective.

2.4 4.1. Participant Questionnaire.

To explore participants' views of the CBM-I with II programme, a participant questionnaire was carried out after all measures had been administered in the study (Appendix G). The participants were asked to complete the questionnaire and put it in a sealed envelope. By

putting the completed questionnaire in an envelope it was thought that the participants might be more likely to provide genuine responses knowing the researcher is not aware of their answers, in turn reducing the effects of demand characteristics.

The questionnaire was developed for administration after an intervention. The participant questionnaire was developed in a similar way to other computerised training programme feedback questionnaires (e.g., Rozenman, Weersing, & Amir; 2011) and explores adolescents' feedback on the burden and beliefs concerning computerised training programmes and the adolescent understanding of the task. The questionnaire used a Likert scale, which adopted a scale from 0 to 10 for its responses to four VASs. The individual items contain qualitative descriptors relevant to each specific question. The VASs covered ease and enjoyment, impact of the programme on social anxiety symptoms and encouraged feedback about general CBM-I instructions and the II instruction. For example the II related question is: *Did the instruction ("If I feel uncertain, then I will think positive!") at the beginning of each session help you to make choices during those sessions?* The Likert scale for this VAS ranges from, *all the time (0)* to *not at all (10).*

Furthermore, additional comments provided by participants during their assessments were recorded and added to the qualitative data collected.

2.4.4.2. Parent Feedback.

The participants' parents were also asked to record and report any observations that they had during their child's participation in the study. This included their views of the child's experience before, during and after the training. In addition, they were asked to complete a parent questionnaire after the last period of daily measures were completed (Appendix H). The

parent questionnaire addressed the exploratory question: How is the CBM-I with II programme experienced and what impact does it have on adolescents with social anxiety?

By having both adolescent and parental views, a richer understanding of the acceptability and efficacy was gathered. The parent questionnaire comprised three questions. One question asked about the parents' involvement in their child's training, followed by a question about how it affected their everyday lives. Lastly there was a question regarding their child's social anxiety and behaviour throughout their participation in the study. Similar to the participant questionnaire, the parent version finished with an optional section to add comments about their experience and their view of their child's experience of the CBM-I training. The results from the participant and parent questionnaire are presented as part of the SRP.

2.5 Experimental Manipulation: CBM-I Training Materials

2.5.1 CBM-I Paradigm.

The paradigm has been widely evaluated and recommended for CBM research (Hallion & Ruscio, 2011). CBM-I training sessions contain a series of ambiguous scenarios with word fragments at the end. The completion of the word fragment enables participants to endorse positive interpretations of situations. This is then followed by a comprehension question. By using a comprehension question the emotional significance of the scenario is enhanced. Following this participants are immediately given the correct answer.

2.5.2. Development of Scenarios.

An adapted version of Mathews and Mackintosh's (2000) CBM paradigm was used, as devised by Curtis (2013) for an adolescent sample. The following is an example from Curtis's (2013) collection followed by a word fragment and a comprehension question.

'*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...*' The following word fragment is then presented: *'pl-eased'* (pleased) and then the comprehension question: '*Was this person also pleased to see someone they knew from school?*' The correct answer was *'yes'*. Following this, immediate feedback regarding the accuracy of their response was presented i.e., *'correct'*.

The programme devised by Curtis (2013) includes 210 scenarios consisting of peer and romantic relationships, and education and recreational attainments with 50 scenarios taken from Lothmann et al. (2011).

2.5.3. Number of Scenarios.

The CBM-I initial session contained one practice trials and three training sessions. There has been no published research assessing the most suitable number of scenarios to be presented in the daily CBM- I training sessions. Previous studies delivering CBM programmes for young people (e.g. Curtis, 2013; Vassilopoulos, Banerjee, & Prantzalous, 2009) have used 30 scenarios. Therefore the current study administered 30 scenarios. In addition, it was felt that 30 daily scenarios, compared to 50 daily scenarios in adult studies, would be developmentally more appropriate and would reduce the risk of overburdening the participants. The 30 scenarios for each training session were presented in three blocks of 10 with optional rests after each block. Therefore a total of 92 scenarios over three days were used from Curtis's (2013) collection. These scenarios were randomly selected using a random number generator.

2.5.4. Implementation Intention Instructions.

Each training session began with the II instruction, which followed the format recommended by Gollwitzer (1999). The instruction was *"If I feel uncertain, then I will think positive!"* The implementation intention instruction was included with the general instructions for the CBM session (see appendix I). The instruction was presented three times prior to the start of the CBM session and presented in bold font to highlight the importance of the instruction. The participants were asked to think about the instruction when answering the questions in the CBM sessions. They were informed that after each social situation a question would be shown to check they had understood the situation, and encouraged to remember it so they could answer the question about the situation. They were then instructed to think of the answer using the II ("If I feel uncertain, then I will think positive!"). The II was provided again in the second computer screen, following instructions to imagine being in the different situations, and again in the last instruction screen, prior to trials.

2.5.5. Delivery and Administration of Training.

The CBM-I sessions were delivered at participants' home on a computer programme. The training materials were presented using E-Prime Software.

2.6 Ethical Considerations

Before participants were recruited, ethical approval was sought from the University of East Anglia Research Enterprise and Engagement department. This clarified that the study had suitable indemnity insurance (Appendix J). Ethical approval was then obtained from the Norfolk and Suffolk Research and Development Ethics Committee (Appendix K). The following sections describe the ethical considerations made for the study.

2.6.1. Consent.

The research required informed consent from the participants and parents or carers (Appendices L & M). Once a clinician had informed an adolescent about the study and they expressed an interest in participating, the adolescent was asked to sign an initial consent form to agree for their details to be passed onto the principal investigator. Adolescents under 16 years old also required assent alongside parent/caregiver consent (Appendix N). For this to be obtained participants and their families were provided with participant information sheets (Appendices O & P), followed by a discussion of the research and the opportunity to ask questions. The participants were informed that their participation was voluntary and that they were not obliged to take part in the research. 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.

The participants were recruited from Youth Pathway teams, which meant that they were on waiting lists for psychological interventions. Therefore their decision to participate was not allowed to affect their routine clinical care. Routine clinical care included case management from a Youth Pathway care coordinator and monitoring of risk and mental health difficulties. If their psychological treatment became available during their involvement in the study, they were given the option to withdraw from it, or to commence their treatment after their research participation if they felt this was appropriate. At the end of participation, the young people and their families were debriefed (Appendix Q) and given the option of having a brief synopsis of the study sent to them once the study was finished.

2.6.2. Confidentiality.

Throughout the research project confidentiality was maintained, with the exception of a young person disclosing a risk issue. It was agreed that any disclosure related to risk would be

shared with the clinicians and the participant's parents/caregivers. Furthermore, they agreed to their participation in the study being shared with their General Practitioner. This was discussed prior to consent being gained by the researcher. The participants' information and data will remain confidential in line with the Data Protection Act (2008) and British Psychological Guidelines (2009). The data was collected anonymously and stored electronically with password protection. It was identified with a participant information number (PIN). Data in paper form were anonymised, sealed, and stored in a locked cabinet. The participants' identification list was stored separately to the data. The data was kept in conjunction with the UEA guidelines and will be stored at UEA for five years and then destroyed.

2.6.3. Interventions and Clinical Care

Participants' routine clinical care was not affected and those on the waiting list at the recruitment were not withheld from treatment, as previously discussed. The research design adopts a multiple baseline structure, which means the start CBM-I and the duration of participations will vary between participants. Consequently participants were informed that the study could involve up to six weeks of participation. In addition, if they wanted to start their treatment they were reminded that they were free to withdraw from the study at any time.

2.6.4. Distress and withdrawal

Previous CBM training studies have not identified any harm from the CBM-I training programme (Curtis, 2013). However, if the participants became distressed they were given the option to have breaks or stop their participation. They were also reminded that they could withdraw from the study and their treatment would not be affected. At this stage the clinical team leader would be informed and the withdrawal procedure for the research would be discussed.

The adolescent and their parents would have the right to withdraw their data as well as discontinuing their participation without needing to provide a reason.

2.6.5. Considerations when working with adolescents under 16 years old.

Separate consent forms were developed for participants and their parents and for adolescents under and over 16 years old (Appendices L, M & N). The minimum reading age for the CBM-I with II, training was 12 years old. The younger adolescents' information sheets and assent forms were also suitable for people with a reading age of nine years old or above.

2.6.6. Researcher's safety considerations.

When the researcher visited participants in their homes, adherence to the NHS Lone Working policy (NHS Security Management Service, 2005) was observed and the use of a buddy system was adopted to reduce risk.

2.9 Procedure

Once the ethical application process had been completed and granted, an email was sent to the local NHS research collaborators (Appendix B) to discuss and arrange meetings to introduce the study. The clinics that were approached were the Youth Pathway and Access and Assessment Teams in the IDTs based in Ipswich, Bury St. Edmunds and Norwich. A presentation was delivered to the teams by the researcher in the weekly team meetings. The presentation included a summary and outline of the study and what clinicians' roles and responsibilities would be. Clinicians were provided with consent to contact sheets, information sheets with outline of the inclusion and exclusion criteria, along with the research contact details. The clinicians were asked to identify potential participants and provide them with information sheets and consent to be contacted forms (Appendix R). The clinician then notified the researcher of the participant's contact details by telephone or email. The recruitment stage

involved having regular contact with team leaders, clinicians and psychologists. It was also helpful to support clinicians on a one-to-one basis to check whether their cases met the study criteria. The researcher then contacted, by telephone, the families after 72 hours to discuss the study further. Those that were suitable and interested in the study were invited to make a date for the researcher to meet with them to complete the recruitment process. The recruitment phase took place at the adolescents' homes or at UEA by the researcher. Consent and/or assent were taken if they agreed to participate. The participants were then screened against the inclusion/exclusion criteria. This involved administration of the following screening measures: SAS-A, K-SADS-PL and BSI. If they met the criteria for the study, participants were randomised using block randomisation (Altman & Bland, 1999) to a 7, 9, or 11 day baseline length. This was carried out by randomly allocating each participant in sets of three. Therefore the first three participants recruited were allocated to either baseline 7, 9, or 11. Once these three participants had been allocated the next three participants were allocated to the baseline length of 7, 9, or 11, and so on. If the participant was not suitable for the study then they were thanked for their interest and it was explained to them why they were not suitable for this particular study by the researcher. The researcher then contacted the referring clinician and the clinic manager via email to explain that the adolescent was not suitable for the study and that they would need to continue on the waiting list.

Three suitable participants were allocated to each staggered starting point (7, 9, 11 baseline length). During the baseline period, participants completed the SAS-A and VASs daily and interpretation bias was measured the day before CBM-I training commenced. A daily text message or email was sent to them to remind them to complete these measures by the researcher. Once the baseline phase was completed, the researcher visited the participants to show them how

to use the CBM-I with II training programme and the SAS-A, VASs, and BSI was re-administered. The training phase then commenced and continued for three consecutive days. Texts and/or emails were sent to the participants to remind them to complete the CBM-I sessions on each day. The method of contact was discussed with the participant at the beginning of their participation. After each training session participants were instructed to complete the SAS-A and the VAS. Participant adherence of the CBM-I programme and the measures were monitored. If a participant did not complete a session, they were encouraged to complete the missed training session.

Following the training phase, the daily measures were repeated (SAS-A & VAS) and the BSI and interpretation bias measure was repeated on the last day of the two post-training phases. Furthermore, during the last contact, participants and parents were asked to meet with the researcher at home or at UEA to complete the Participant Questionnaire and Parent Questionnaire. The participants were then debriefed by the researcher, given a debrief sheet (Appendix Q) and given a £10 Amazon gift voucher as a thank you for their participation. The researcher then notified the clinical team that the adolescent had finished their participation in the study so the clinicians could continue to provide their psychological interventions as normal (see figure 7 for flow diagram of the procedure).

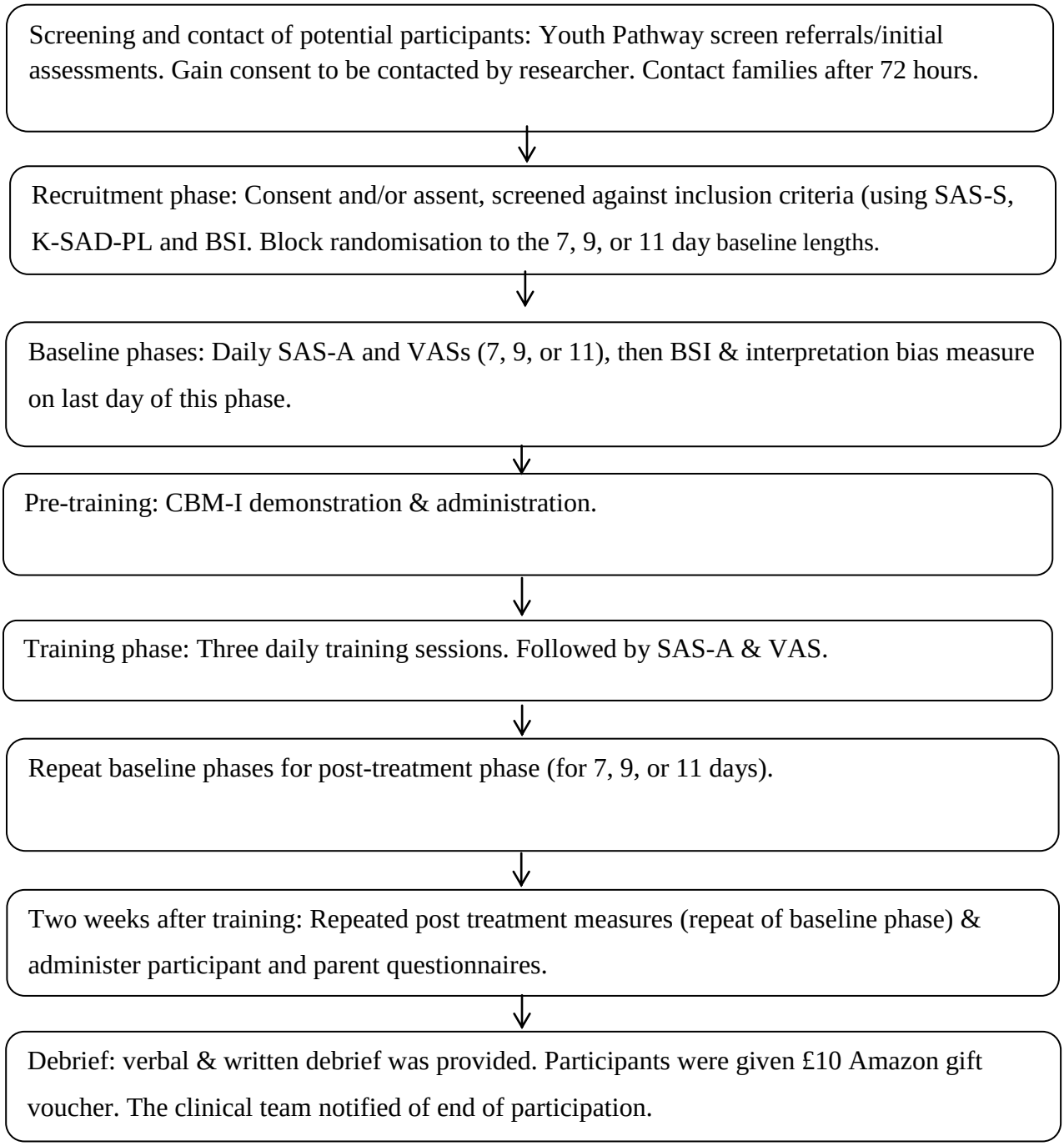

Figure 7: Flow Diagram of Procedure

Chapter Three – Results

3.1 Chapter Introduction

This chapter outlines the data analysis and subsequent results in relation to the research hypotheses. A total of seven adolescent participants completed the baseline phase and three days of CBM-I with implementation intentions training. The participants' data from the training were first analysed to check the level of compliance with the training instructions. Following this, participants' daily SAS-A scores were visually inspected to examine who had responded to the CBM-I training programme and who did not. Next, outcome measures were analysed for reliable and clinically significant change across the baseline, post treatment phases time points. The outcome measures analysed for these were the SAS-A, VAS (excluding the enjoyment scale), BSI and interpretation bias score which is measured by the Recognition Test. Correlational analysis was conducted to explore whether there was a relationship between enjoyment and outcome measures. Changes in group means were then analysed to identify group changes across the outcome measures at the three time points.

3.2 Data Preparation

All of the seven participants completed all three days of their CBM-I with II training. However, participant 2 only completed the first two days of the post training daily measures and did not complete the interpretation bias or BSI at the end of the last phase. Therefore seven participants' data sets were utilised for the analyses for compliance screening, and visual inspection was used for the response following training (apart from the post training interpretation bias, BSI analyses and follow up investigations, these being based on the data of six participants). Hypotheses including the analysis of post training effects were based on seven

participants, with participant 2's data being adapted using the Arnold and Kronmal (2002) method for replacing missing data. This method recommends that the missing baseline data are generated using the mean substitution, whereby the mean of the baseline measures is used to replace the missing data (Arnold & Kronmal, 2002).

3.3 Compliance Screening

The data from the CBM-I training programme was analysed to establish whether the participants followed the instructions accurately. Bowler, Mackintosh, Dunn, Mathews, Dalgleish and Hoppitt (2012) suggest that CBM-I outputs are assessed for accuracy to check that participants followed the instructions. The outputs required for this analysis were the frequency of correct word fragments and correct answers for the comprehension questions. The participants correctly completed between 81% and 99% of the word fragments. The participants' percentage range for the correctly answered comprehension questions were between 49% and 94%. All of the seven participants' total frequency scores for the three days of training fell within two standard deviations of the means for both the number of correct word fragments and number of correct comprehension question responses. Overall, this would suggest that the participants' compliance was relatively good, indicating that they followed the protocol appropriately.

3.4 Visual Inspection of Daily Outcome Data

Prior to visual inspection procedures, the baseline daily outcome scores for each participant at baseline were assessed to establish whether they were stable prior to the introduction of CBM-I training. This was assessed using Kendall's *tau* calculation (Kendall, 1970). Kendall (1970) suggests that a significant result indicates a relationship between time and scores; it can be used to explore if there was a change in the levels of symptoms prior to the

intervention being introduced (Kendall's *tau* calculations for each participant are provided in Appendix S).

The visual inspection of the data was then completed using time series plots (Barlow & Hersen, 1984). This enabled the identification of trends for the SAS-A and VASs, across the baseline, post treatment and two weeks after training. Kazdin (2010) recommends four criteria for visual inspection. Using the Kazdin (2010) criteria, the trends in the mean, level and slope from baseline to the end of the training phase of the SAS-A were analysed to determine whether each participant responded to the training. This would be shown by a decline in the mean and level on the SAS-A following completion of the CBM-I with II training. According to Kazdin (2010), the level of change in scores needed to be constant, or display a declining slope throughout the training phase, to suggest a response to treatment. Consequently they were labelled as either *responders* or *non-responders*. A further visual inspection was carried out with the VASs "worried", "nervous" and "scared", to provide support for the conclusions from SAS-A visual inspection. However, the outcome of the VASs visual inspection did not determine whether a participant was a *responder* or *non-responder*. Following the visual inspection, results that appeared to show changes following training and less variability in scores were computed using simulation modelling analysis (SMA; Law, 2006) to see if these results were significant. By computing the individual participants' VAS and SAS-A means using SMA, an inferential statistical analysis can be carried out. This was completed using an SMA software package developed by Clinical Researcher Solutions, and was designed specifically for single-subject clinical case analyses. It incorporates bootstrapping techniques for testing statistical significance for single-subjects within case series (Law, 2006). Law (2006) explained that SMA enables data from small sample sizes to be analysed and allows inferences to be made from the sample to a

wider population. Similar to how other inferential statistics operate, the analysis was based on the dependent variables (VAS & SAS-A) and compared the means of the outcomes from the baseline phases to either the post-training or phases two weeks after training, separately for the participants. If the differences between phase means were found to be significant different, with a decline over time, it could be argued that the scores reduced from the CBM training.

3.4.1. Visual inspection of data for Participant 1 (*Responder*).

The trend throughout the baseline was considered stable (*tau* = .27, $p \geq .05$). There was a reduction in the overall mean score on the SAS-A from the baseline phase (*M*= 61.78) to during post training phase (*M*=57.44) and to the phase two weeks after training (*M*=50.44).

For Participant 1 there was an abrupt change in the slope of the data from the end of the baseline to the beginning of the CBM-I training (see Figure 8). However, towards the end of the CBM-I training there was a reversal to the previous levels. There was a general reduction from baseline phase to post-training phase and this continued two weeks after training. This would suggest that Participant 1 is a *responder*. Furthermore, the level of change from the baseline to the phase two weeks after training, revealed a significant change (*R*= - 0.97, $p < 0.001$).

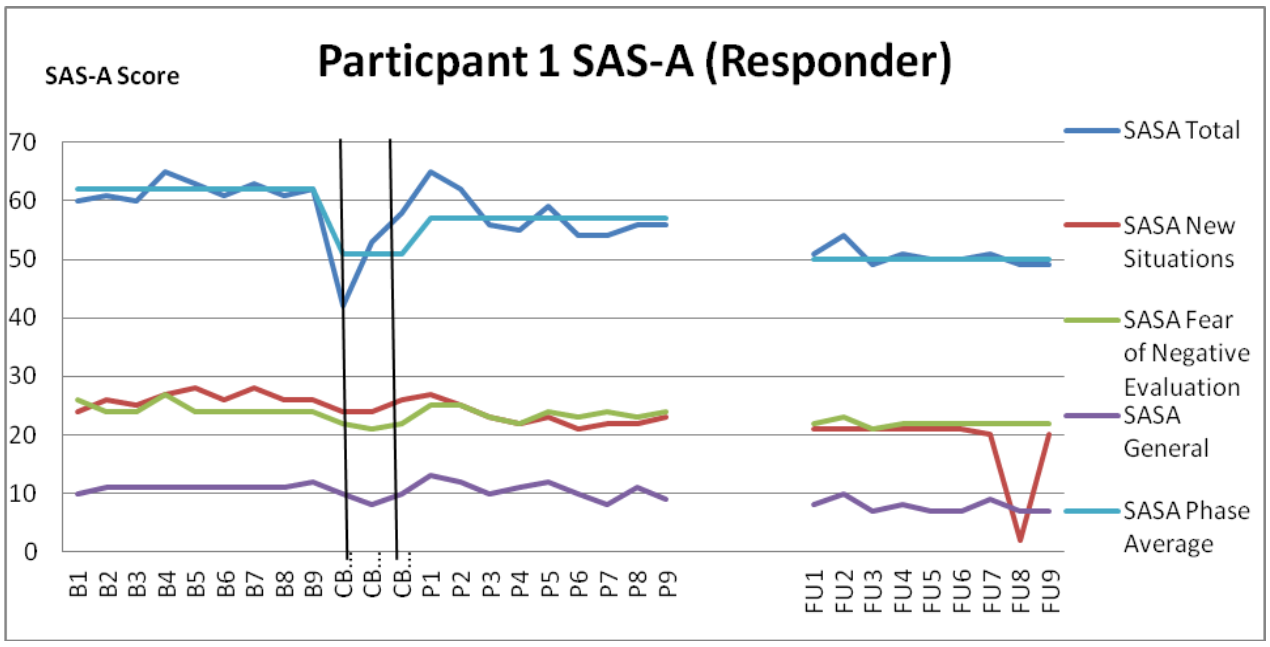

Figure 8. SAS-A scores across phases for Participant 1 (Responder).

The VAS means for "nervous" and "scared" declined over time from baseline, to post training, and continued to decline through to the mean taken two weeks after training.

Table 3

Participant 1 VAS Means across Phases.

Visual Analogue Scale	*M* of Baseline (9 days)	*M* of Post-treatment (9 days)	*M* 2 weeks after training (9 days)
Worried	3.33	4.0	2.0
Nervous	3.33	2.4	2.1
Scared	1.8	1.4	0.7

However, examination of the plot displaying the VAS scores for "worried", "nervous" and "scared" failed to reveal any major trends. There was no change in slope apart from "scared" during the training phase, which accelerates in the post treatment phases. Furthermore, there was poor stability for the baseline VASs "worried", "nervous" and "scared" (respectively: *tau*= -.59, $p < .05$; *tau*= -.53, $p < .05$; *tau*= -.61, $p < .05$). This would suggest that the VASs outcomes for participant 1 were interpreted with caution.

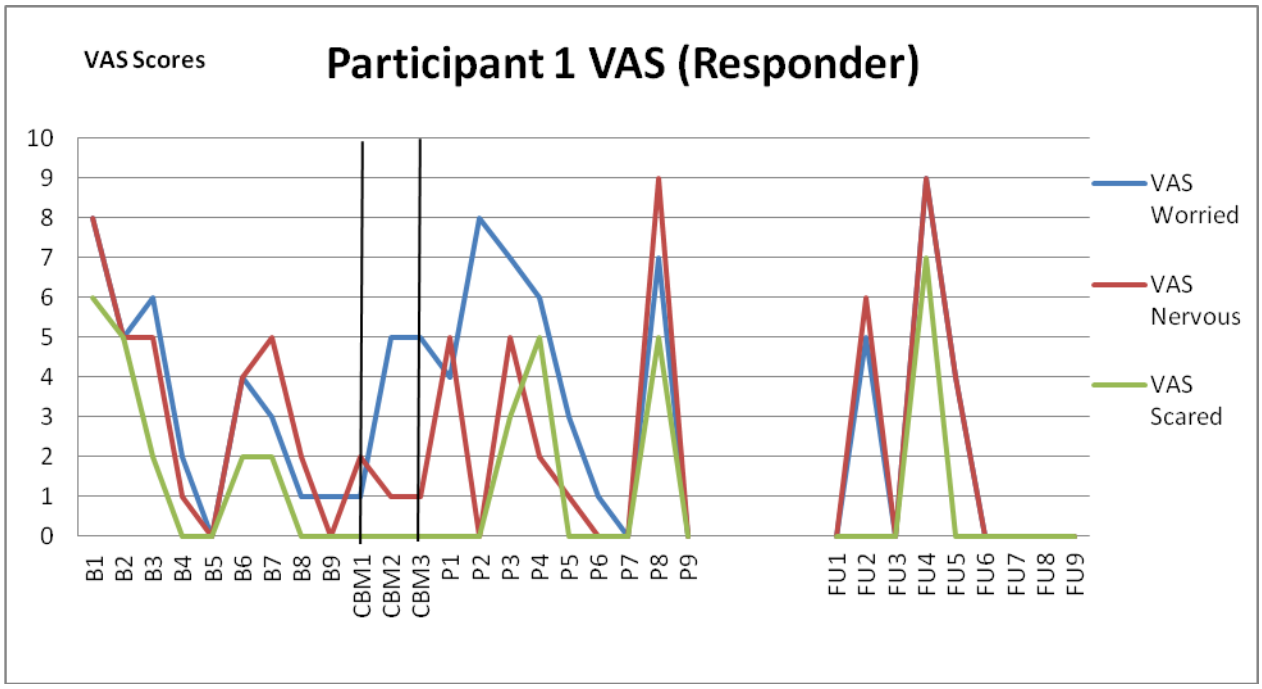

Figure 9. Anxiety VASs across phases for Participant 1 (Responder)

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

Participant 2 did not complete the last set of daily measures and missing data were replaced using the mean of the completed daily measures (Arnold & Kronmal, 2002). The trend throughout the baseline is considered stable for the baseline (*tau* = -.15, $p \geq .05$). There was a marginal reduction in the overall mean score on the SAS-A from the baseline phase (*M*=83.29)

to the post training phase (*M*=82.86), which remained quite stable into the training phase (*M*=82.33).

There was no change in the slope of the data from the end of the baseline to the beginning of the CBM-I training, or the end of CBM-I training to post treatment (see Figure 10). However, towards the end of the CBM-I training this showed a decline, which means that Participant 2 was a *non-responder* based on the visual inspection of the SAS-A scores.

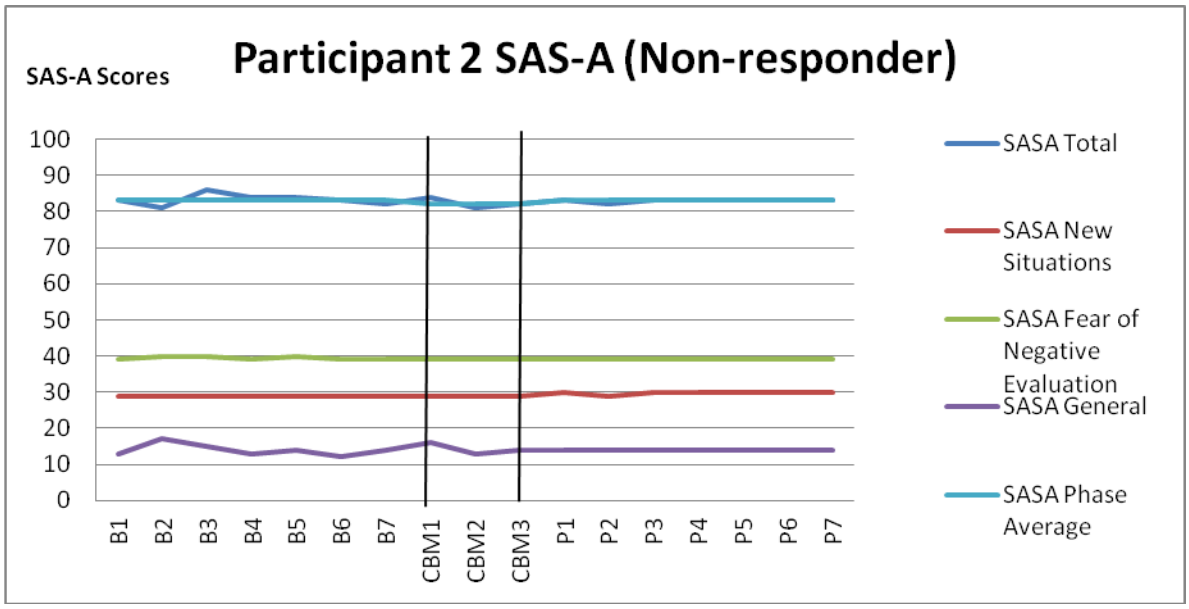

Figure 10. SAS-A across phases for Participant 2 (Non-responder)

The means of each VAS across the phases failed to show any decline in scores. Furthermore, the plot displaying the VAS scores for "worried", "nervous" and "scared" fails to show any improvements following CBM-I training. There is no major change apart from the slope from the end of the training phase to the post-treatment phase for "nervous". Furthermore, the increase in the level for the "scared" scores from baseline to post-training was significant ($R = 0.86$, $p < 0.05$). This suggests that Participant 2's "scared" scores increased following training

rather than decreased. However, the "worried" and "nervous" scores for the baseline phase were not considered stable (*tau*= .72, p < .05; .tau= .69, p < 0.05).

Table 4

Participant 2's VAS Means across Phases

Visual Analogue Scale	*M* of Baseline (7 days)	*M* of Post-treatment (7 days)
Worried	7.86	9.86
Nervous	7.58	7.86
Scared	3.57	10.00

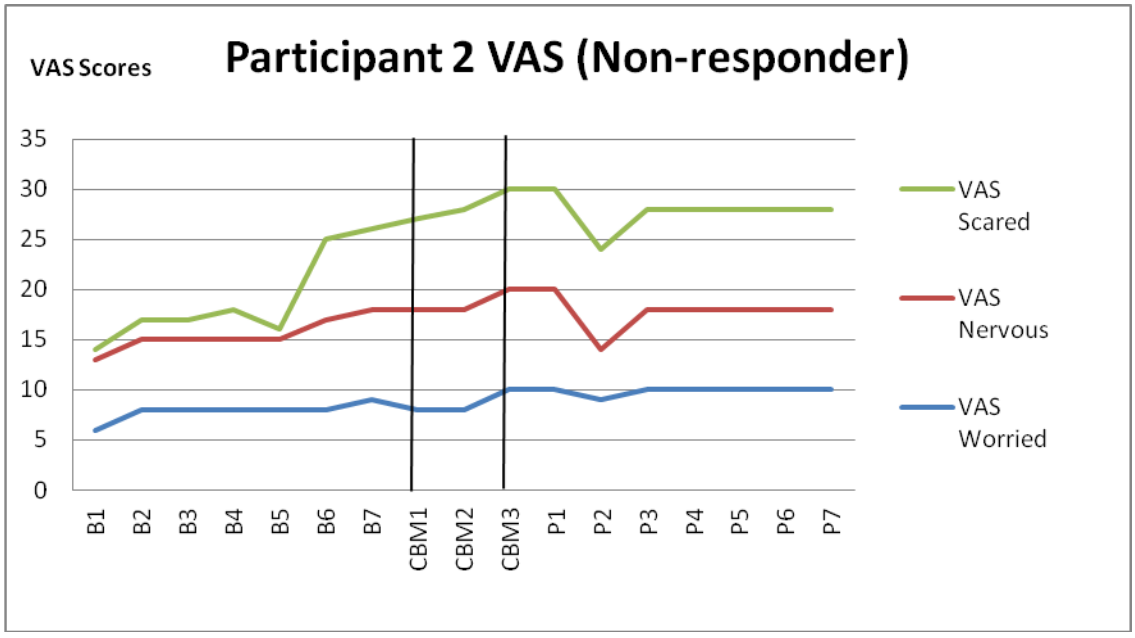

Figure 11. Anxiety VAS across phases for Participant 2 (Non-responder)

The results for SAS-A and VAS visual inspection suggest that Participant 2 was not a *responder* to the training.

3.4.3. Visual inspection of data for Participant 3 (*Non-responder*).

For participant 3 the baseline was considered stable (*tau* = -.04, $p \geq .05$). There was a marginal increase in the overall mean score on the SAS-A from the baseline phase (*M*=71.27) to the post training phase (*M*=71.91), to the phase two weeks after training (*M*=72.18).

There was no change in the slope of the SAS-A from the end of the baseline to the beginning of the CBM-I training, or the end of CBM-I training to post treatment (see Figure 12). This would suggest that Participant 3 is a *non-responder*.

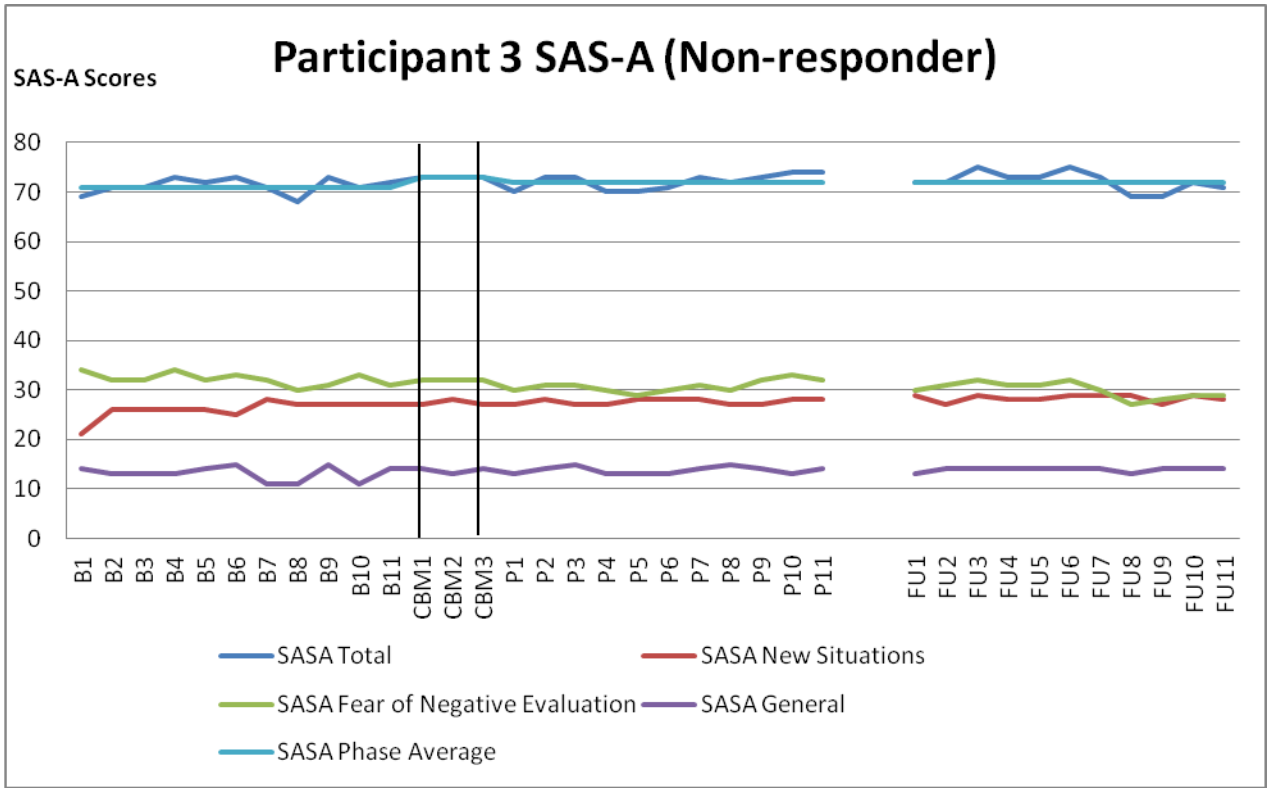

Figure 12. SAS-A across phases for Participant 3 (Non-responder)

The VAS scores for the baseline phase were considered stable (See appendix S for outputs). The means of "worried" and "nervous" across all the phases showed a marginal decline in scores, but there was a greater decline for "scared" (See table 4 for Participant 3's VAS mean scores across the phases).

Table 5

Participant 3's VAS Means across the Phases

Visual Analogue Scale	*M* of Baseline (11 days)	*M* of Post-treatment (11 days)	*M* of 2 weeks after training (11 days)
Worried	8.18	7.55	7.73
Nervous	8.64	8.55	7.18
Scared	7.73	7.18	5.73

The plot displaying the VAS scores for "worried", "nervous" and "scared" did not display any abrupt or major changes from one phase to the next but merely a gradual decline of scores for the "worried" and "scared" VASs. There was one abrupt decline from the CBM-I training phase to the post-treatment phase for the "scared" VAS. This decline was found to be significant ($R = -0.67$, $p < 0.05$). However, this change was not maintained during the following phases (Figure 13).

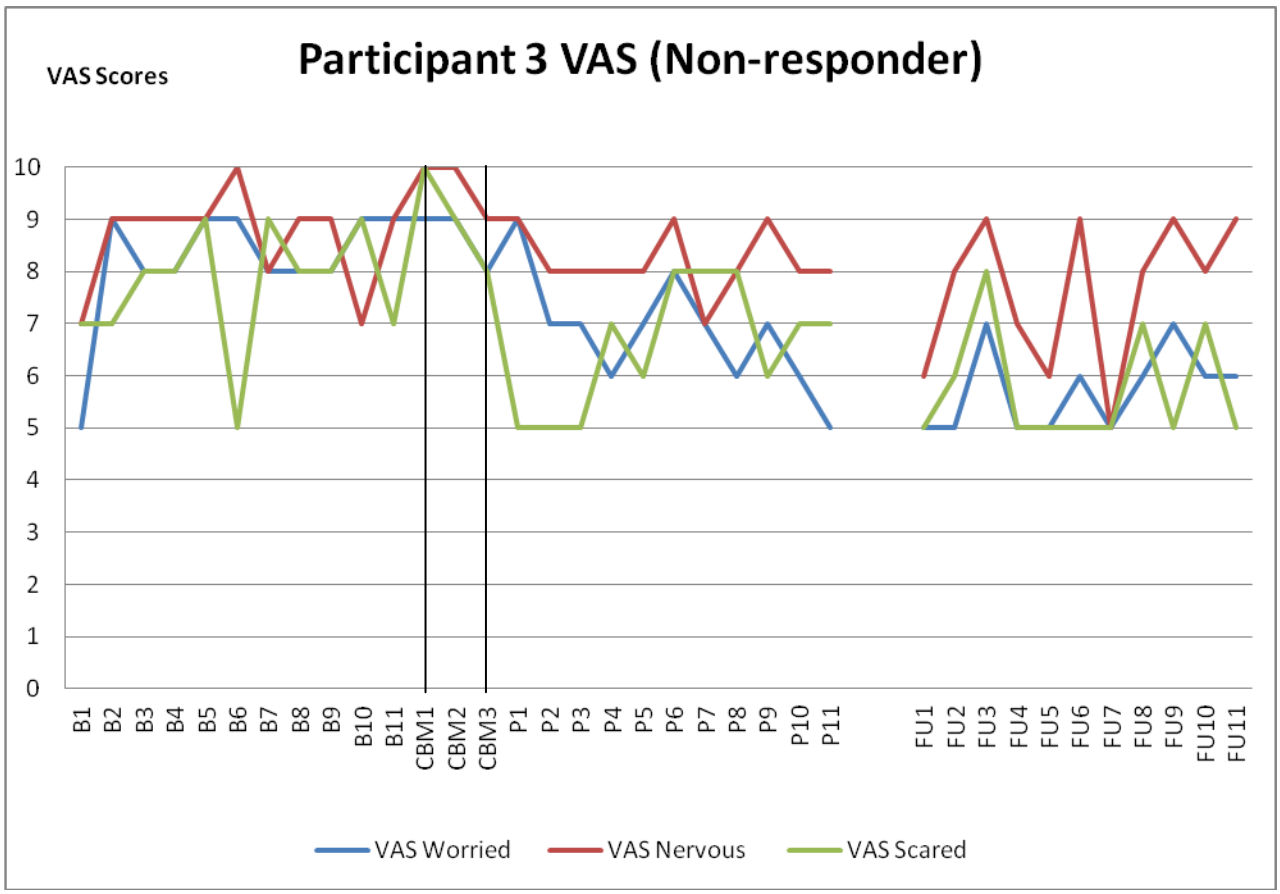

Figure 13. Anxiety VASs across phases for Participant 3 (Responder)

3.4.4. Visual inspection of data for Participant 4 (*Responder*).

The baseline phase was considered stable (*tau* = .83, p ≥ .05). There was a decline in the mean score on the SAS-A totals from the baseline phase (M=81.11) to the post training phase (*M*=74.00), to the phase two weeks after training (*M*=71.67).

There was decline in the SAS-A total scores from the baseline phase into training phase and a further but a smaller decline from the post-treatment to phase two weeks after training (see Figure 14). The decline in the level was found to be significant from baseline to post-training and

to the phase two weeks after training (respectively: R= - .73, p < 0.05; R = -.91, p < 0.05). Therefore Participant 4 was a *responder*.

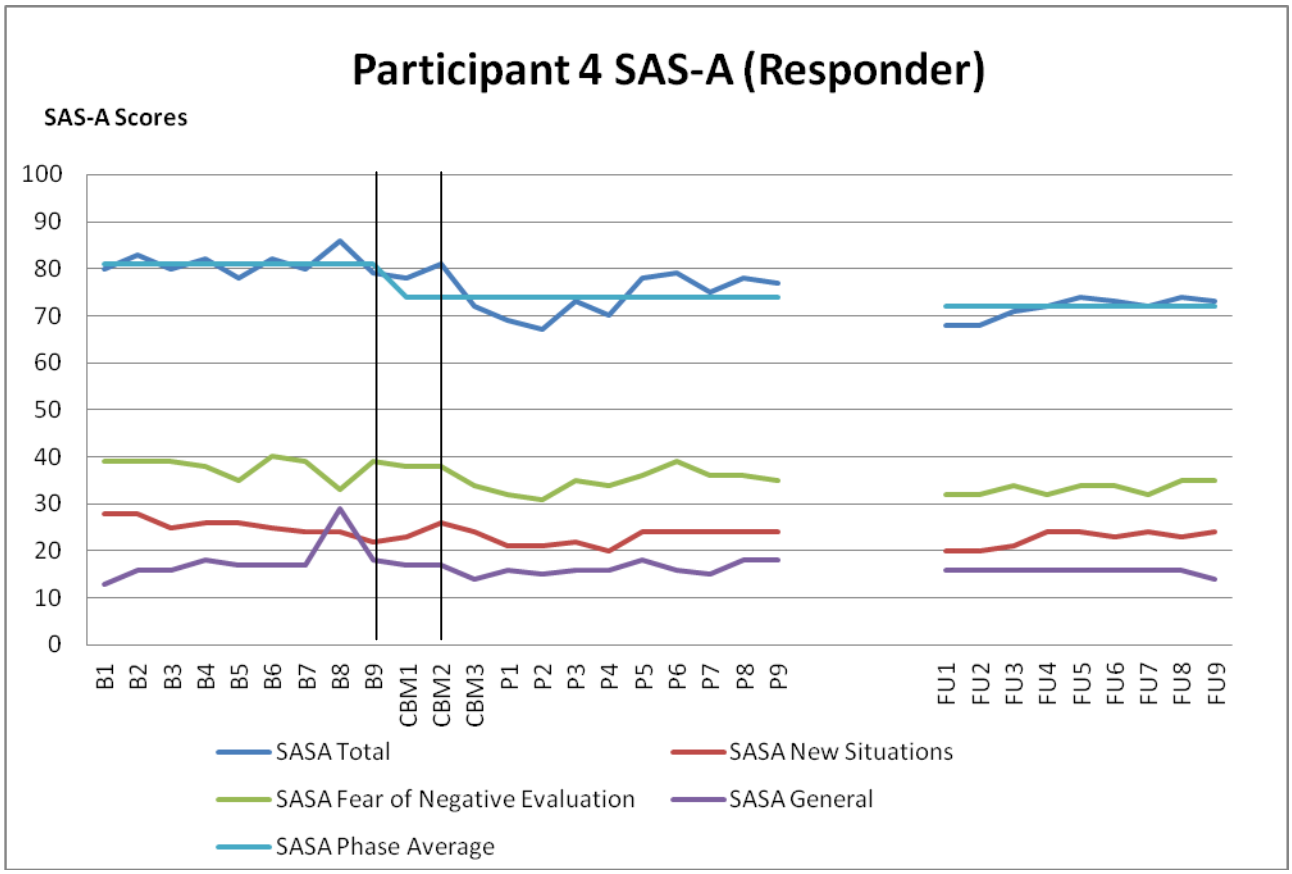

Figure 14. SAS-A across time points for Participant 4 (Responder)

The baseline VAS phases for "worried", "nervous" and "scared" did not reveal any significant correlations when Kendall's *tau* was calculated. There was no decline in the means for each of VAS', indicating that anxiety did not decrease as a response to the CBM-I training (table 5).

Table 6

Participant 4's VAS Means across Phases

Visual Analogue Scale	*M* of Baseline (9 days)	*M* of Post-treatment (9 days)	*M* of 2 weeks after training (9 days)
worried	3.44	4.11	4.0
nervous	3	3.56	3.33
scared	3.56	4.78	3.22

The scores for each VAS across all the phases only showed an marginal shift towards the end of CBM-I with II training phase (day 2) through to the beginning of the post-treatment phase (See figure 15). However, the latency of this shift was not brief and just outside of the phase change. This would suggest the impact from the CBM-I with II training was not evident in the VAS scores.

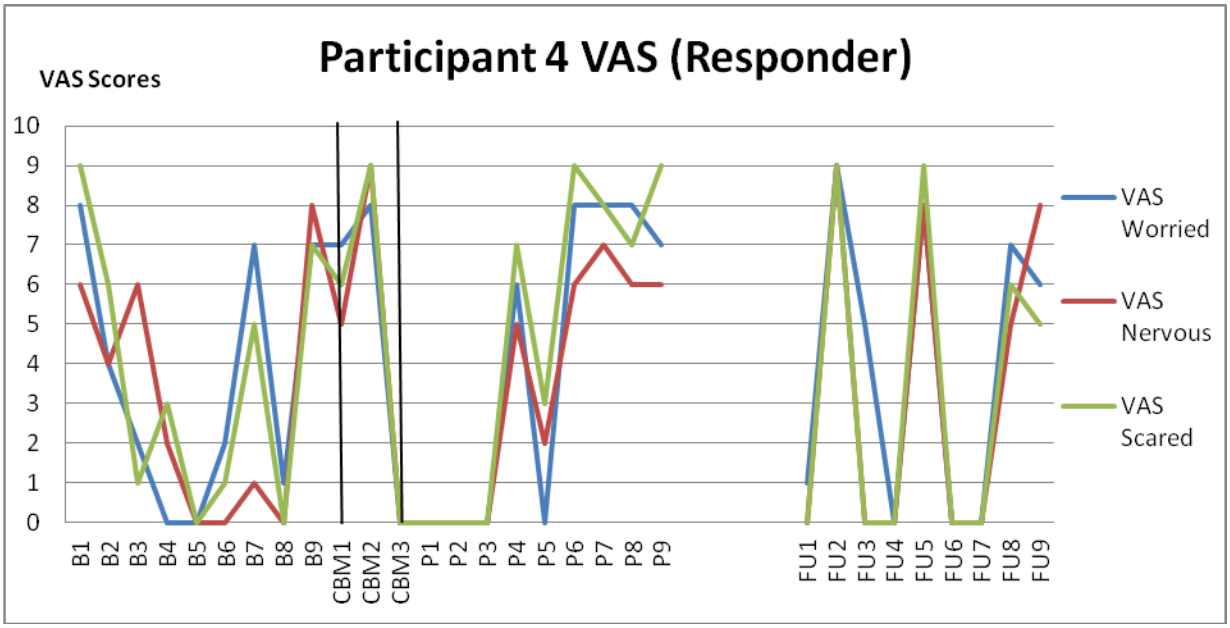

Figure 15. Anxiety VASs across phases for Participant 4 (Responder)

The results for SAS-A would suggest that Participant 4 was a *responder* to the CBM-I with II training. However, this outcome was not replicated in the VAS scores.

3.4.5. Visual inspection of data for Participant 5 (*Non-responder*).

A significant correlation was found for Participant 5's baseline phase SAS-A total scores (*tau* = -. 81, $p \geq .001$). This would suggest that interpretation involving the baseline SAS-A total phase was treated with caution (See appendix S for Kendall's *tau* calculations). There was a decline in the mean score on the SAS-A totals from the baseline phase (*M*=67.17) to the post training phase (*M*=63.36) and slight acceleration to the phase two weeks after training (*M*=66.27). In light of the instability found in the baseline phase, it would be inappropriate to suggest that there was a true change in the mean scores. However, the acceleration from mean found in the post-treatment to the phase two weeks after training would seem to be more valid. It

is difficult to draw a clear conclusion from the results given the extent of the variability within the scores.

There were no abrupt changes across the phases for the SAS-A total scores and the slope remained fairly stable through the data with a slight acceleration in the phase two weeks after training (see figure 16).

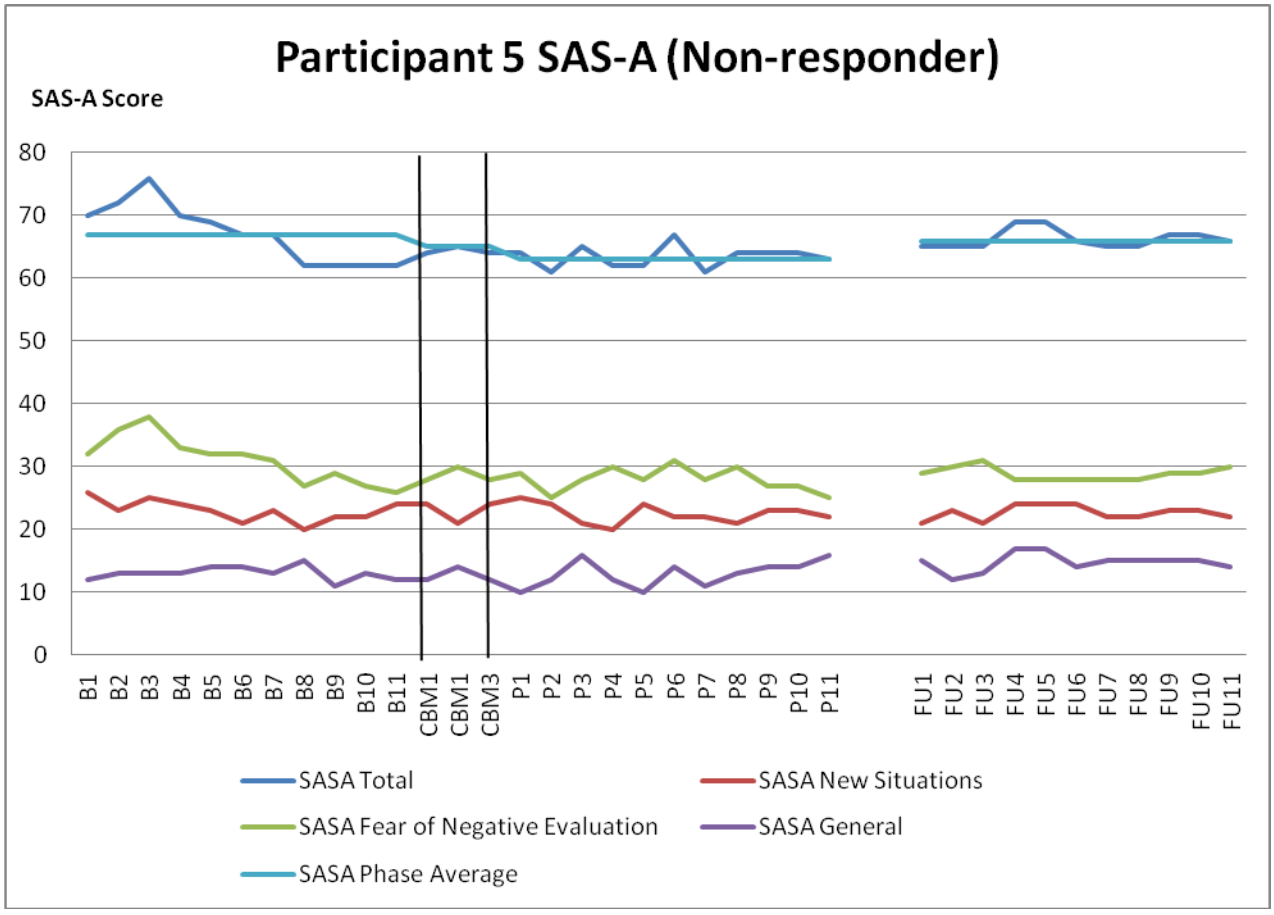

Figure 16. SAS-A across phases for Participant 5 (Non-responder)

The visual inspection of the SAS-A total scores for Participant 5 would suggest that they did not respond to the CBM-I with II training. Still the instability of the baseline SAS-A total scores would indicate that the lack of changes identified should be interpreted with caution.

Participant 5's baseline VAS scores were all considered stable (See appendix S for Kendall's *tau* outputs). A decline in the mean VAS scores was found for all VASs from the baseline, to post- treatment. This decline was also found in the means for both the "worried" and "nervous" VAS scores from post-treatment to the phase two weeks after training but not for the "scared" VAS mean scores (see table 6 for VAS means at each phase).

Table 7

Participant 5's VAS Means across Phases

Visual Analogue Scale	*M* of Baseline (11 days)	*M* of Post-treatment (11 days)	*M* of 2 weeks after training (11 days)
worried	5.55	4.45	4.27
nervous	6.18	4.64	4.91
scared	5.18	3.36	4.55

Upon further visual inspection of participant 5's VAS scores, it was found that both the "worried" and "scared" VAS scores decelerated at the end of the training phase through to the post-treatment phases. The brief latency of this change was identified for the "nervous" VAS, revealing an earlier change following the introduction of the CBM-I with II training. The "worried" and "nervous" VAS scores continued with a declining slope through to the phase two weeks after training (see figure 17 for a graphical illustration of the VAS scores across the phases). Furthermore, the level of change for "nervous" across baseline to two weeks after

training was found to be significant (R= -.51, p< 0.05) as well as the baseline to post-training scores for "scared" (R= -.54, p< 0.05).

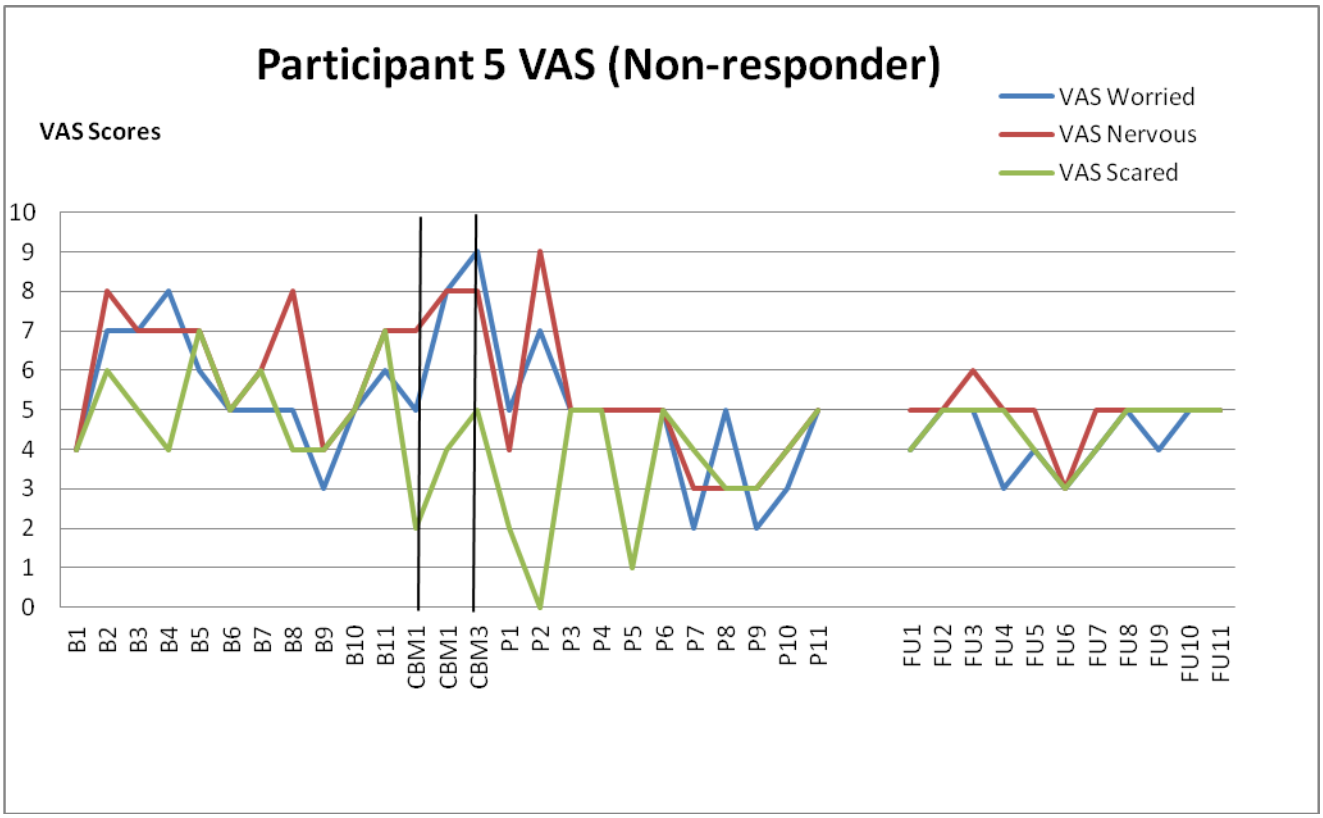

Figure 17. Anxiety VASs across phases for Participant 5 (Non-responder)

The visual inspection for Participant 5 would suggest that that they were not a *responder* to the CBM-I with II training based on the SAS-A scores. This outcome was not replicated in the VAS scores and the VAS visual inspection would suggest that CBM-I with II training had a positive effect on social anxiety. This participant was still classified as a *non-responder* because the SAS-A was the leading outcome measure for the classified process, however the declining means and slope alongside the baseline phase instability of the SAS-A total scores would suggest that interpretation will be less clear and consistent.

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

Participant 6's stability tests using Kendall's *tau* calculations revealed no significant results, which indicates that the stability was maintained throughout baseline for the SAS-A total scores (See appendix S for Kendall's *tau* outputs). There was increase in the mean scores for SAS-A totals from the baseline (*M*= 72.86) to the post-treatment phase (*M*=83.43) and then a slight decline from the post-treatment to two weeks after training (*M*= 81.46). The acceleration from the baseline phase to the training phase suggests that the CBM-I with II training did not decrease SAS-A scores but instead led to an increase (figure 18). This change had a brief latency which further supports the negative effect the training had on the SAS-A total scores. This would suggest that Participant 6 was a *non-responder* to the CBM-I with II training. Furthermore the visual inspection revealed a declining slope from the post-treatment to phase two weeks after training, however this was slight and remained stable through the last phase.

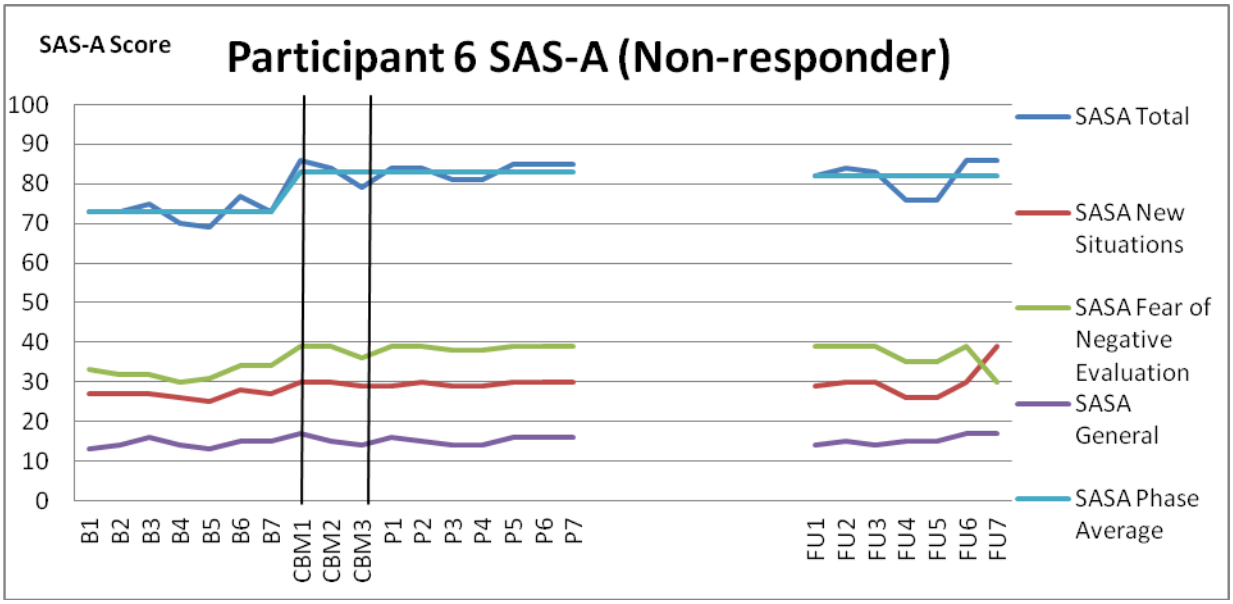

Figure 18. SAS-A across time points for Participant 6 (Non-responder)

Participant 6's VAS scores were also all considered stable (See appendix S for Kendall's *tau* outputs). All of the VAS means increased from baseline to post-treatment (See table 7 for the VAS means across the baseline, post-treatment and phase two weeks after training). This inclination continued for the "worried" VAS in the phase two weeks after training but declined slightly for both the "nervous" and "scared" VAS means in the last phase.

Table 8

Participant 6's VAS Means across Phases

Visual Analogue Scale	*M* of Baseline (7 days)	*M* of Post-treatment (7 days)	*M* of 2 weeks after training (7 days)
worried	3.14	5.57	5.71
nervous	3.0	6.29	5.43
scared	1.43	6.0	5.57

Upon further visual inspection of Participant 6's VAS scores both the "worried" and "nervous" VAS scores accelerated on the introduction of the CBM-I with II training with an abrupt change. These scores then declined as training days continued and acceleration occurred following the end of training into the post-treatment phase. The brief latency of these changes would suggest that an effect occurred from the CBM-I with II training, but by increasing VAS "worried" and "nervous" scores rather than resulting in an expected decline following training (see figure 19 for a graphical illustration of the VAS scores across the phases for Participant 6).

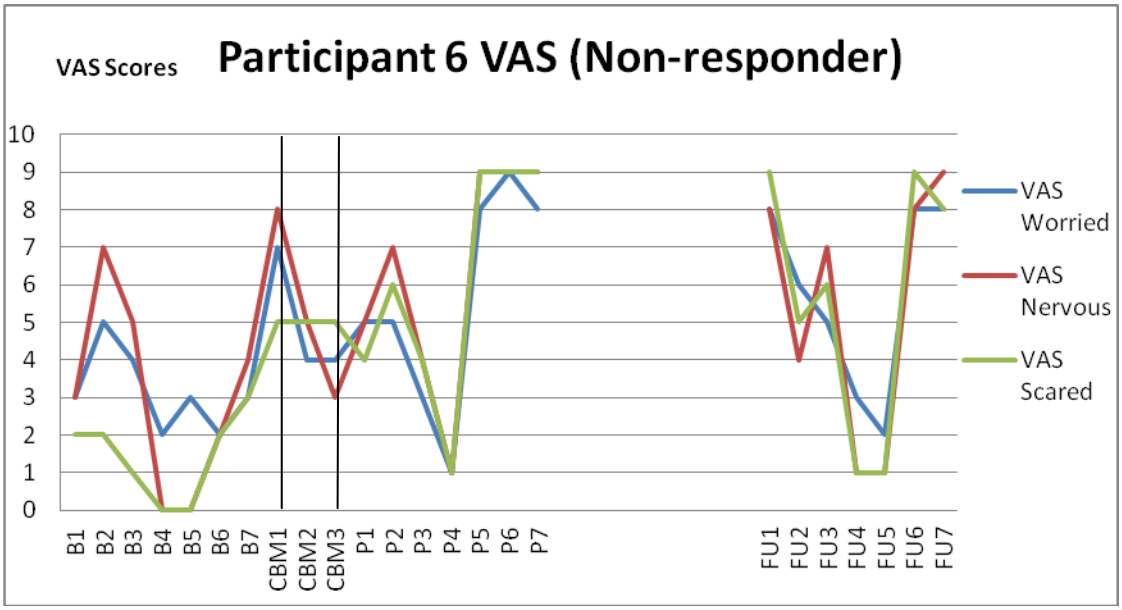

Figure 19. Anxiety VASs across phases for Participant 6 (Non-responder)

The visual inspection for Participant 6 would suggest that that they were a *non-responder* to the training based on the SAS-A scores and VAS scores.

3.4.7. Visual inspection of data for Participant 7 (*Non-responder*).

Participant 7's stability test using Kendall's *tau* calculations did not reveal a significant result for the SAS-A total baseline phase (*tau* = .00, $p \geq .05$; see appendix S for full Kendall's *tau* calculations), which indicates that the baseline phase was stable. The SAS-A total mean scores remained stable across the baseline phase (*M*=88.33) to the post-treatment phase (*M*=89.44) and the phase two weeks after training (*M*= 88.22). From a visual inspection of the scores it can be seen that there were no abrupt changes in the scores from the end of one phase to the next across all phases (figure 20). Furthermore there was no gradual slope across the four phases. This would indicate that participant 7 was a *non-responder* to the training.

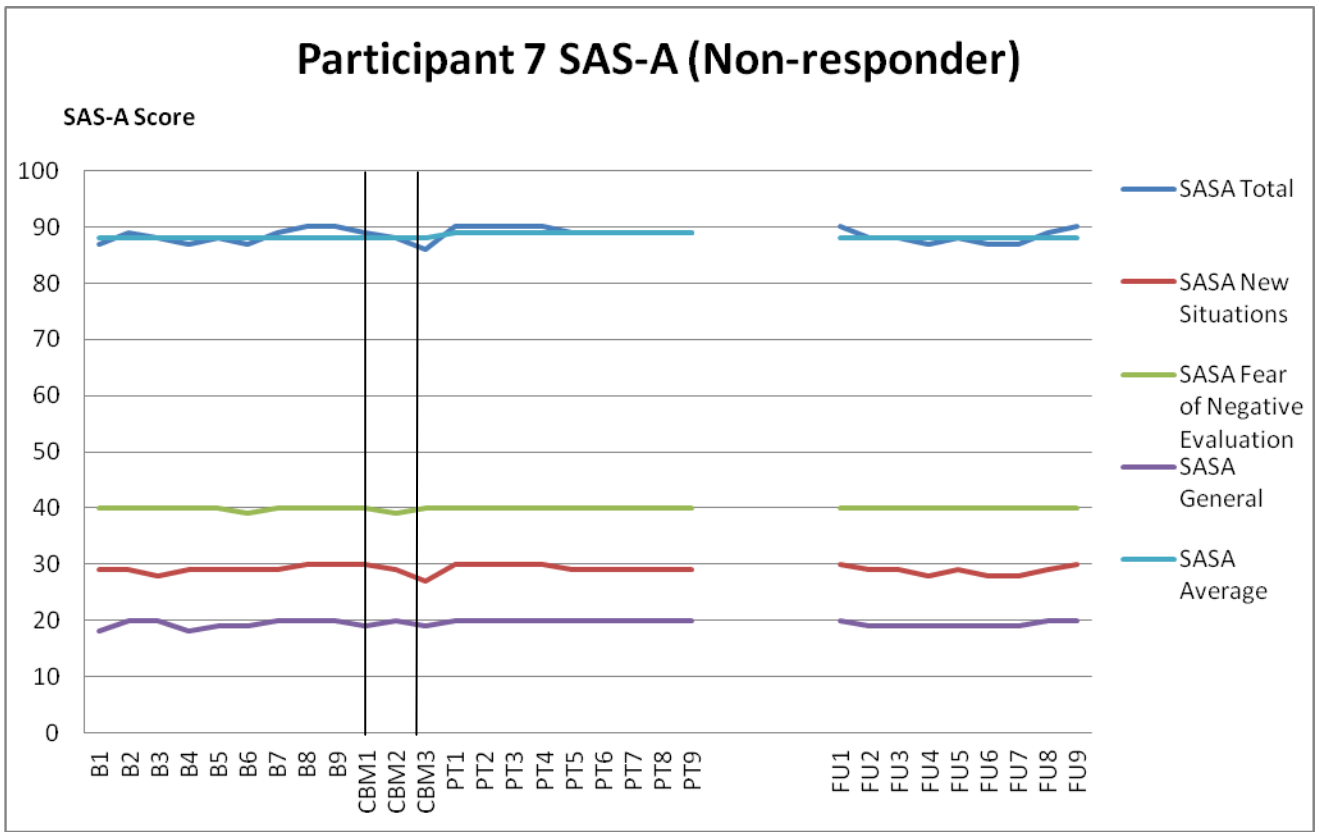

Figure 20. SAS-A across time points for Participant 7 (Non-responder)

Participant 7's VAS baseline phases for the "worried", "nervous" and "scared" VAS were all found to be stable from Kendall's tau calculations (See appendix S for Kendall's *tau* outputs). All of the VAS means increased from baseline to post-treatment, and from post-treatment to two weeks after training (See table 8 for the VAS means across the baseline, post-treatment and phase two weeks after training).

Table 9

Participant 7's VAS Means across Phases

Visual Analogue Scale	*M* of Baseline (9 days)	*M* of Post-treatment (9 days)	*M* of 2 weeks after training (9 days)
worried	7.22	7.89	8.78
nervous	7.44	8.11	8.78
scared	6.33	7.67	8.78

A visual inspection of participant 7's VAS scores found no abrupt changes for the "worried", "nervous" or "scared" VASs. Instead a slight and gradual acceleration was noticed across the phases for each of the VASs (figure 21).

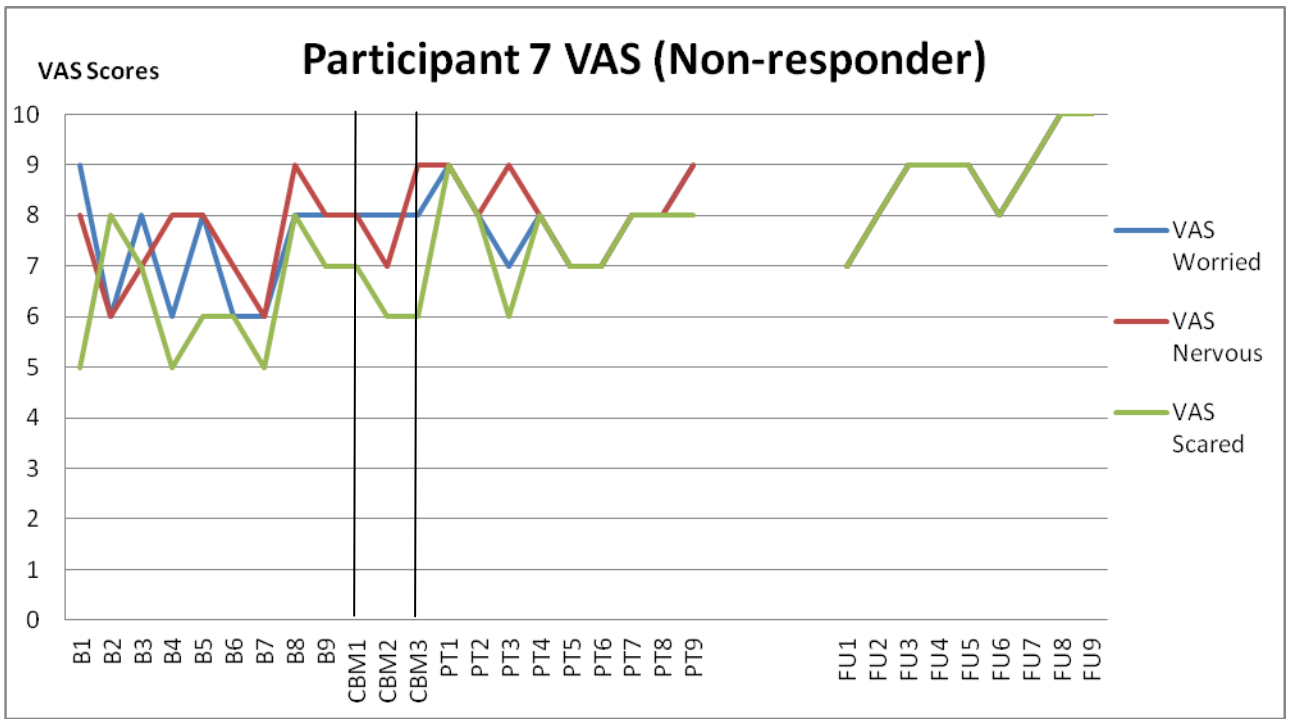

Figure 21. Anxiety VASs across phases for Participant 7 (Non-responder)

Furthermore, the increase in the level of change for "scared" from baseline to post-training and two weeks after training, was found to be significant (R=.55, $p<0.05$; R=.74,$p<.0.05$). The findings from the visual inspection of the VASs further supports the findings from the SAS-A visual inspection, that participant 7 was a *non-responder* to the CBM-I with II training.

3.5 Reliable and Clinically Significant Change

The Social Anxiety Scale for Adolescents (SAS-A; La Greca & Lopez, 1999) total scores, and Brief Symptom Inventory Phobic Anxiety subscale (BSI; Derogatis, 1993) were used to measure levels of social anxiety for each participant at each time points. Interpretation bias was measured before training, post-training and in the phase two weeks aftertime training. These

outcomes were used to assess whether any change in social anxiety symptomatology and interpretation bias were reliable changes (Jacobson and Truax (1991)). Furthermore, the different time point scores before and after treatments were calculated to assess whether scores after training were the same as those found in non-clinical populations (Jacobson, Follette, & Revenstorf, 1984).

The reliable change index (RCI) was calculated using the following formula (Jacobson & Truax 1991):

$$1.96*SD1*\sqrt{2}*\sqrt{(1-r)}$$

Where SD1 = standard deviation of the sample and r = internal consistency coefficient.

This formula relies on a matched population sample. From this sample the mean and standard deviation are computed alongside the internal consistency coefficient for each of the outcome measures. There is no published normative data for the BSI for adolescent clinical samples, therefore the adult psychiatric outpatient norms are utilised for the Phobic Anxiety subscale mean and standard deviation (Derogatis, 1993). The interpretation bias calculations for the RCI were also based on an adult sample because of the early stage of CBM-I research for adolescents (Lothmann et al., 2011). Therefore psychometric properties from an adult sample (Perez-Olivas et al., 2012) were utilised for the calculations of the interpretation bias RCI. It is important to note that any conclusions using the RCI adult sample may not be directly generalised to the adolescent data in the current study.

Table 10

Reliable Change Index for Outcome Measures

Outcome Measure	Matched Population Sample *M (SD)*	α	RCI
SAS-A –FNE	23.6 (9.5)	.94	6.45
SAS-A-N	18.1 (6.4)	.87	6.39
SAS-A-G	9.6 (4.4)	.80	5.49
SAS-A-Total	51.3 (18.6)	.94	12.63
BSI-PANX	0.91 (.91)	.77	1.21
IBI	-1.60 (.70)	.81	.85

Note. α = Reliability Co-efficient Alpha; RCI = Reliable Change Index; SAS-A FNE = Social Anxiety Scale for Adolescents Fear of Negative Evaluation sub-scale; SAS-A SAD- N = Social Anxiety Scale for Adolescents Social Avoidance and Distress New sub-scale; SAS-A SAD- G= Social Anxiety Scale for Adolescents Social Avoidance and Distress General sub-scale; SAS-A = Social Anxiety Scale for Adolescents; BSI = Brief Symptom Inventory; PANX = Phobic Anxiety; IBI = Interpretation Bias Index.

The Clinical Significant Change (CSC) is the difference between a representative score from a participant from a clinical sample and a representative score from a participant in a non-clinical sample (Evans et al., 1998). To calculate the CSC for the outcome measures, the Jacobson-Truax formula was utilised (Jacobson & Truax, 1991). There are three criteria available for calculating the CSC. For full details of these criteria see Jacobson et al. (1984). Criterion C was utilised to obtain CSC cut-off points (Evans et al., 1998). Criterion C is based on the recommendation that functioning level following intervention should lie closer to the mean of the non-clinical population than the clinical population (Jacob et al., 1984). This criterion was

used as it allows for the use of a formula for populations which have different variances, but when clinical and non-clinical populations overlap, which occurred with this current data set (Jacobson et al., 1984). Furthermore, Wise (2004) argued that criterion C is more robust.

The calculations were computed using the following statistical formula (Jacobson et al., 1984):

CSC= [SD (non-clinical) x M (clinical)] + [SD (clinical) x M (non-clinical)] / SD (non-clinical) + SD (clinical).

For CSC calculations standardised data from La Greca (1999), Walters, Caster and Inderbitzen (1996) and Derogatis (1993) were used (table 11). The SAS-A norms for the data are based on adolescents aged 12-17 (La Greca, 1999) and there are specific norms for females (Walters et al., 1996) which were used, as all the participants in the current study were female. Normative data for females was also utilised for the BSI Phobic Anxiety subscale (Derogatis, 1993). No normative data were available to calculate a CSC for the interpretation bias data. The CSC computed was then used to assess whether there were clinical significant changes between the study sample's outcome measures across the phases. If the individual participants' means on the different outcome measures (see the first column in table 11 for different outcome measures) were below the CSC for that outcome measure (see the last column for CSC) the adolescents' change in scores were in line with non-clinical populations rather than clinical populations. The CSC calculation (see formula above) was computed by using the means and standard deviations from the normative data as listed in the non-clinical population column of table 11. The clinical population data within table 11 comprises the study group's means and standard deviations before CBM-I training. Once the CSC values had been computed for each outcome measure,

each participant's mean scores, post-training and two after training, were contrasted with the appropriate CSC. If the participant's mean, post-training or two weeks after training, was less than the CSC, a clinically significant change had occurred following training.

Table 11

Clinically Significant Change Calculations for the Social Anxiety Scale for Adolescents and Brief Symptom Inventory Phobic Anxiety subscale

	M (SD)		
Outcome Measure	Clinical Population	Non-clinical Population	Clinically Significant Change
SAS-A –FNE	23.6 (9.5)	20.9 (7.1)	22.05
SAS-A-N	18.1 (6.4)	13.7 (4.2)	15.44
SAS-A-G	9.6 (4.4)	10.2 (3.8)	9.92
SAS-A-Total	51.3 (18.6)	44.8 (12.8)	47.45
BSI-PANX	1.82 (1.02)	.48(.59)	.97

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

3.5.1. Application of the reliable clinical change and clinically significant change on the SAS-A Total score for the study participants.

The mean phase SAS-A total scores were used to assess whether each participant displayed reliable changes from baseline to post-treatment and from baseline to the end phase. None of the participants displayed reliable changes in their SAS-A total scores. The same means

were used to assess if the participants' scores indicated any clinically significant changes. The assessment revealed no clinically significant changes in their SAS-A total scores.

3.5.2. Application of the reliable change and clinically significant change on the SAS-A Fear of Negative Evaluation subscale for the study participants.

The mean phase SAS-A Fear of Negative Evaluation subscale (SAS-A-FNE) scores were used to assess whether each participant displayed reliable changes from baseline to post-treatment and from baseline to the end phase. None of the participants displayed reliable changes in their SAS-A FNE scores. Participant 6 revealed a marginal reliable change in the opposite direction, suggesting that their FNE score increased significantly from baseline to post-treatment. Participant 1 was the only participant who showed clinically significant changes in scores at post-treatment and at the last phase.

3.5.3 Application of the reliable change and clinically significant change on the SAS-A New subscale for the study participants.

The mean phase SAS-A New subscale (SAS-A-N) scores were used to assess whether each participant displayed reliable changes from baseline to post-treatment and from baseline to the last phase. Participant 1 was the only participant that displayed a reliable change in their SAS-A-N score from the baseline phase to the phase two weeks after training. None of the participants showed any clinically significant changes in SAS-A-G scores from the baseline to post-treatment and at the phase two weeks after training.

3.5.4 Application of the reliable change and clinically significant change on the SAS-A General subscale for the study participants.

The mean phase SAS-General subscale (SAS-A-G) scores were used to assess whether each participant displayed reliable changes from baseline to post-treatment and from baseline to the last phase. No participants displayed any reliably significant changes in their SAS-A-G scores from the baseline phase to the post-treatment or phase two weeks after training. Participant 1 was the only participant that displayed a clinically significant change in their SAS-A-G score from the baseline phase to the end phase. None of the other participants showed any clinically significant changes in their SAS-A-G scores.

3.5.5 Application of the reliable clinical change and clinically significant change on the Brief Symptom Inventory Phobic Anxiety Subscale (Derogatis, 1993) for the study participants.

The Brief Symptom Inventory Phobic Anxiety subscale (BSI-PANX) scores were used to assess whether each participant displayed reliable changes from baseline to post-treatment and from baseline to the phase two weeks after training. Participant 1 showed a reliable change in their BSI-PANX score from baseline to two weeks after training. Participant 4 also displayed a reliable change from their BSI-PANX score from baseline to post-treatment. Participant 1 also showed a clinically significant change from baseline to two weeks after training, on the BSI-PANX.

3.5.6 Application of the Reliable Change Index for Interpretation Bias for the study participants.

As discussed previous initially in section 3.5, only a reliable change index (RCI) was available to be applied to the study's data (see table 11 for participants' interpretation bias data and RCI application). Using the RCI to measure change it was found that Participants 1 and 3

made reliable changes from baseline to post-treatment in their interpretation bias scores. A more positive bias score reflects a more positive interpretative bias. Only Participant 1 made a reliable change in the positive direction and Participant 3 reliably declined towards a more negative bias at post-treatment. Reliable changes were observed for three participants from baseline to the phase two weeks after training (Participant 1, 4 & 7). Visual inspection of the three means also revealed that Participant 4's interpretation bias score increased modestly following CBM-I training and Participant 5's increased modestly two weeks after training.

Table 12

Reliable Change of Interpretation Bias Recognition Test for all Participants across Time Points

	Recognition Test Scores			Difference in scores		Reliable Change	
Participant	Baseline	Post treatment	2 weeks after training	Baseline - Post treatment	Baseline – 2 weeks after training	Post treatment	2 weeks after training
1	-.40	1.80	1.80	2.20	2.20	Yes	Yes
2	.40	-.20	-	-.60	-	-	-
3	.40	-1.20	-.20	-1.60	0.60	Yes*	No
4	-.60	.10	.80	70.0	1.40	No	Yes
5	.10	.20	.80	.10	.70	No	No
6	-1.20	-2.00	-1.80	-.80	-.60	No	No
7	.10	.10	1.40	0.00	1.30	No	Yes

Note. *Reliable Change found in negative direction

Following the assessment of the RCI for the interpretation bias changes for each participant, further analyses were carried out to assess whether changes in interpretation bias were related to changes in SAS-A and BSI-PANX scores. The mean of the SAS-A and BSI-PANX at each time point were analysed to see if they were correlated to the mean interpretation

bias scores at each phase. The analysis looked for correlations between the mean scores from baseline to post-treatment, and baseline to two weeks after training, using Kendall's tau calculations. A negative relationship was found between SAS-A total means and interpretation differences for both baseline to post-treatment and baseline to two weeks after training (respectively: *tau*= -.71, $p<0.05$; *tau*= -.87, $p<0.05$). There were no significant correlations between interpretation bias changes and BSI-PANX scores.

3.6 Changes in Positive and Negative Interpretation Bias

To establish whether positive interpretation bias increased and negative interpretation bias decreased, each participant's data were visually inspected. The data was inspected by focusing on the individual participant's differences from baseline to post-treatment and baseline to two weeks after training. The latter was important for investigating whether any improvements in interpretation bias were present at the two week after training phase (see table 12 for positive and negative recognition scores at each phase for each participant).

Table 13

Changes in Positive and Negative Interpretation Bias (Recognition Test Scores)

	Positive IB			Differences in Positive IB		Negative IB			Differences in Negative IB	
Participant	B	PT	2W	B – PT	B – 2W	B	PT	2W	B - PT	B – 2W
1	2.30	3.10	2.80	.80	.50	2.70	1.30	1.00	-1.40	-1.70
2	2.70	2.60	-	-.10	-	2.30	2.80	-	.50	-
3	3.70	1.90	2.40	-1.80	-1.30	3.30	3.10	2.60	-.20	-.70
4	2.00	2.80	2.90	.80	.90	2.60	2.70	2.10	.10	-.50
5	2.50	1.90	2.80	-.60	.30	2.40	1.70	2.00	-.70	-.40
6	2.00	1.20	2.50	-.80	.50	3.20	3.20	3.80	.00	.60
7	1.60	1.90	2.60	.30	1.00	1.50	1.80	1.20	.30	-.30

Note. IB= Interpretation Bias measured using the Recognition Test (design based on Mathews & Mackintosh, 2000); B=Baseline score; PT= Post-treatment score; 2W= 2 weeks after training score; B-PT= Difference between baseline and post-treatment scores; B-2W= Difference between baseline scores and scores two weeks after training

From visually inspecting the interpretation bias scores, it was observed that three participants showed increases in positive interpretation bias both at post-treatment and two weeks after training (Participants 1, 4 & 7). Furthermore, two participants displayed increases in positive interpretation biases two weeks after training (Participants 5 & 6). A decrease in negative interpretation biases was observed for three participants at post-treatment and two weeks after training (Participants 1, 3 & 5) and a further two participants showed a decrease from baseline to the last phases (Participants 4 & 7).

3. 7 Enjoyment and Outcome Measures

To assess whether individual participants who enjoyed the training also showed greater reductions in negative interpretation bias and social anxiety symptoms the mean enjoyment ratings across the three training days were visually inspected (table 13).

Table 14

Participant Mean Enjoyment Ratings during CBM-I Training

	M of Enjoyment Ratings
Participant	
1	6
2	2.67
3	8
4	4
5	3.67
6	5
7	9.67

The presence or absence of a reduction in negative interpretation bias and social anxiety symptoms were assessed two weeks after training, alongside the mean level of enjoyment. Three of the participants who had reductions in negative interpretation bias two weeks after training also revealed mean enjoyment levels above 5/10 (Participant 1, 3 & 7). Furthermore, all of the participants who did not show reductions in negative interpretation bias two weeks after training displayed mean enjoyment scores at a 5/10 or below (Participants 2, 5 & 6). Of the participants that rated the enjoyment level above 5/10, it was only participant 1 of this group that showed

reductions in social anxiety symptoms two weeks after training, as measured by the SAS-A and BSI-PANX.

To analyse, as a group, whether these participants' enjoyment of the CBM-I with II training was related to having positive improvements in social anxiety and interpretation, each of the outcome measures was correlated with the participants' group mean enjoyment rating using Kendall's *tau* (appendix S). No significant correlations were found between the enjoyment ratings and outcome measures.

3. 8 Statistical Analysis of Group Outcome Measures

The group means for the different outcome measures used in the study were computed using the time points: baseline, post-treatment and two weeks after training (see table 14 for group outcome measure median and interquartile ranges). The data was not normally distributed, so for the related sample the Friedman's test was utilised to assess whether there were any changes between time points (see appendix S for calculations). No significant results were found across the phases for each outcome measure.

Table 15

Group Medians and Interquartile Ranges at Baseline, Post-treatment and two weeks after training for the Outcome Measures

Outcome Measure/ Subscale	Phase		
	Baseline	Post-treatment	2 weeks after training
SAS-A Total	72.07 (17.08)	72.96 (23.05)	71. 93 (21.14)
SAS-A-F	32.24 (8.87)	32.86 (12.11)	31.67 (10.25)
SAS-A-N	26.11 (2.56)	25.33 (6.86)	25.50 (7.57)
SAS-A-G	13.69 (5.75)	14.51 (5.0)	15.01 (4.36)
BSI-PANX	3.2 (2.45)	2.8 (2.5)	2.8 (2.95)
IB-Total	-.15 (.93)	.10 (2.0)	.80 (1.98)
IB –Positive	2.15 (.90)	1.90 (1.15)	2.70 (.35)
IB – Negative	2.65 (1.05)	2.25 (1.53)	2.05 (1.75)

Note. Interquartile ranges in parentheses; 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 subscale. BSI = Brief Symptom Inventory; IBI = Interpretation Bias Index; PANX = Phobic Anxiety

Chapter Four - Discussion and Conclusion

4.1 Chapter Overview

This section discusses the aims of the study and a summary of the results in regard to each of the research hypotheses. Theoretical and clinical implications are then outlined based on the findings. Following this, the study's strengths and limitations are presented with the focus on methodological issues, the sample, the outcome measures and the quality of the analysis adopted for the results. Based on the findings and evaluation of the study, future research ideas are then proposed. Lastly, a conclusion is provided summarising the key findings and the discussion points.

4.2 Aims

The main aim of the study was to investigate whether a three session CBM-I programme with II was able to reduce negative interpretation bias and social anxiety symptoms in adolescents with clinical levels of social phobia. In addition, it investigated whether adolescents who enjoyed the programme had greater reductions in negative interpretation bias and social anxiety symptoms post-training and two weeks after training.

The aims were based on the research reporting that positive CBM-I training was effective for reducing negative interpretation biases in adolescents, but there were conflicting findings regarding its effectiveness for reducing social anxiety symptoms (e.g., Belli & Lau, 2014; Chan et al., 2014; Fu et al., 2013; Lau et al., 2011; Lau, Pettit, et al., 2013; Lothmann et al., 2011; Salemink & Wier, 2011; Telman et al., 2013). Furthermore, reviews of the CBM literature (Beard, 2011; Cristea et al., 2015) highlighted that the effectiveness and application of CBM for

adolescents was in its infancy. In particular, Beard (2011) suggested that novel CBM-I protocols could be investigated in attempts to enhance the impact of training. It was suggested that this could be achieved by assessing the ideal number of sessions required for therapeutic benefit, or by combining different CBM paradigms, such as CBM-I and CBM-A (Beard, 2011). In turn, this study incorporated a novel addition to CBM-I training by including implementation intentions (II). This was included because previous research had found that II were effective for improving performance appraisals in participants with high levels of social anxiety and could enhance effects of training (Webb et al., 2010). Furthermore, it has been argued that multi-session CBM-I showed greater improvements post-training than a single session (Hallion & Ruscio, 2011). However, the number of sessions required for training to be effective is unknown. Curtis (2013) found, through visual inspection of the data, that seven sessions produced improvements in social anxiety symptoms in half of herstudy's sample of adolescents and that these improvements appeared visible after three sessions. Thus, this study adopted a three session CBM-I training programme to explore this further. Furthermore, Curtis (2013) found through participant feedback regarding a CBM-I with II programme, that those who enjoyed the training also displayed greater improvements post-training. Therefore the current study aimed to investigate whether adolescents who enjoyed the CBM-I programme produce a greater reduction in social anxiety and negative interpretation bias after they had completed the training.

4.3 Summary of Results

This section provides a summary of the results and discusses the findings, in line with previous literature investigating the efficacy of CBM-I for adolescents with clinical levels of social anxiety.

4.3.1. A three session positive CBM-I programme, with implementation intentions, will reduce negative interpretation biases in adolescents with clinical levels of social anxiety.

Overall the group analysis of total interpretation bias scores, and both negative and positive interpretation biases scores, revealed no significant results, suggesting that collectively participants did not show reductions in their negative interpretation bias at the post-training phase.

However, visual inspections of the differences in interpretation bias scores from baseline to the post-training phase were mixed. The results found that Participant 1, 3 and 5 displayed reductions in negative interpretation bias at post-training. Furthermore, Participant 1 revealed a reliable clinical change in their interpretation bias post-training.

In support of these findings, four studies have found that negative interpretation bias reduces post-training for adolescents with clinical levels of social anxiety (Curtis, 2013; Fu et al., 2013; Reuland & Teachman, 2014; Sportel et al., 2013). For example, Curtis (2013) found that six out of a sample of eight adolescents showed reductions in negative interpretation bias at a post-training phase. Reductions in negative interpretation bias post-training was less evident in the current study as only three participants from a sample of seven participants showed reductions in negative interpretation bias, compared to six in Curtis' study (2013). This difference in the results could be due to the difference in the CBM-I protocol. In Curtis's study, seven CBM sessions were completed, whereas in the current study three sessions were completed by adolescents. This explanation for the difference in the results could contribute to the current evidence base because previous studies found greater reductions in studies with

multi-sessions designs (Lau, Pettit, et al., 2013; Sportel et al., 2013; Vassilopoulos, et al., 2009; Vassilopoulos, et al., 2012).

In addition, the current study revealed that five participants showed reductions in negative interpretation bias two weeks after training. This finding suggests that with only three sessions, reductions in interpretation bias may take a longer period to take effect, as reductions were visible for more participants two weeks after training than at post-training.

Fu et al. (2012) also found post-training reductions in negative interpretation bias for 28 adolescents who met criteria for a current anxiety disorder. The results of the current study challenge the evidence that negative interpretation bias consistently reduces post-training. It could be argued that Fu et al. (2012) had a larger sample size and therefore greater statistical power to support their results when compared to the current study, which recruited a smaller sample size of seven adolescents. However, only 40% of the sample in Fu et al. (2013) met the diagnostic criteria for SAD and the remainder met the criteria for Generalised Anxiety Disorder. Therefore Fu and colleagues' results are less able to be specifically generalised to adolescents with clinical levels of social anxiety.

Reuland and Teachman (2014) also found reductions in negative interpretation bias for adolescents with clinical levels of social anxiety at the post-training phase. This is in line with findings from visual inspections of the current study but not for the group analysis. However, both Reuland and Teachman and the current study were based on small samples and the finding should be cautiously interpreted. Furthermore, the current study more consistently found that reductions in interpretation bias were more evident two weeks after training than at post-training, suggesting that reductions in interpretation bias may have been a consequence of delayed

treatment effects. Furthermore Reuland and Teachman (2014) found reductions in negative interpretation at post-training and two weeks after training, whereas the current study found more consistent reductions two weeks after training. This is similar to what was found in Browning, Holmes, Charles, Cohen and Harmer (2012). They found that recurrence risk in depressed adult patients reduced four weeks after the completion of an Attention Bias Modification (ABM) procedure. However, their finding of a delay treatment effect was based on a different design than the current study. For example, Browning and colleagues' study involved exploring depression in adult patients and adopted an attention based CBM programme rather than interpretation based protocol with adolescents. Still, acknowledgement of a possible delayed treatment effect is helpful in developing our knowledge base into effects of CBM more generally.

Sportel et al. (2013) found a reduction in negative interpretation bias post-training for adolescents with clinical levels of social anxiety, when CBM was compared to a CBT group and a control group, consisting of no training or intervention. Their finding is challenged by the current study, which did not consistently find reductions in negative interpretation bias across participants at the post-training phase. The discrepancy between the studies' results for a reduction in interpretation bias post-training may be a result of a different number of sessions completed by the participants. Sportel et al. (2013) asked adolescents to complete 20 sessions of CBM, whereas the adolescents in the current study completed three sessions. In addition, it is important to acknowledge Sportel et al. (2013) did not measure interpretation bias two weeks after training. Therefore the current study adds to the literature by showing that negative interpretation bias reduced two weeks after training for five participants, but not as consistently at post-training.

4.3.2. A three session positive CBM-I programme, with implementation intentions, will reduce levels of social anxiety in the participants.

The group analysis found that adolescent social anxiety scores, as measured by the Social Anxiety Scale for Adolescents (SAS-A; La Greca & Lopez, 1999), did not reduce significantly from baseline to the post-training phase. This was also found when comparing the SAS-A subscales and the Brief Symptom Inventory, Phobic Anxiety subscale (BSI-PANX; Derogatis, 1993) from baseline to post-training. This would suggest that collectively social anxiety did not reduce following CBM-I training.

When this hypothesis was tested through visual inspection of the SAS-A scores, the presence or absence of reliable changes, and clinically significant changes, Participants 1 and 4 showed clear reductions in their social anxiety from their baseline to post-training scores. A reduction on the SAS-A total score was found for Participant 4 for their baseline to post-training scores. In addition, Participant 4 revealed a reliable change for the BSI-PANX subscale from the baseline to the post-training phase. This provided evidence that both Participant 4 and 1 were *responders* to the training according to changes in scores from baseline to the post-training phase. The remaining participants failed to display significant reductions in social anxiety, as measured by the SAS-A at post-training or two weeks after training. From the group analysis and the participants' visual inspections it can be argued that reductions in social anxiety symptoms are limited following CBM-I with II training.

The limited effect of CBM-I on social anxiety symptoms for adolescents with clinical levels of social anxiety is similar to previous studies (Curtis, 2013; Fu et al., 2012; Reuland & Teachman, 2014; Sportel et al., 2013). Curtis (2013) found, using visual inspection, that four

participants from a sample of eight showed reductions in social anxiety symptoms post-training. However, of this sample, Curtis (2013) found that only two adolescents showed reliable changes in SAS-A scores from baseline to post-training. Two participants of the current study were also found to have reliable changes in their SAS-A score, however this was found two weeks after training rather than in the post-training phase. Furthermore, Curtis (2013) carried out a group analysis to compare the social anxiety levels from baseline to post-training and two weeks after training and found a significant reduction only on BSI-PANX scores two weeks after training and no significant differences on the SAS-A totals. Therefore the current findings support the argument that reductions in social anxiety symptoms, following CBM-I are limited and inconsistent. However, it could be argued that with three sessions of CBM-I compared to seven sessions, which was used by Curtis (2013), fewer reductions in social anxiety are found following training.

Similar to the current study, Fu et al. (2012) also found no effects on anxiety following CBM-I training. Similar to the current study they utilised "nervous", "worried" and "scared" VAS as their measures of anxiety (VAS; based on PANAS-C, Laurent et al., 1999) and found no significant reductions in the level of these VAS post-training. The current study also found very limited changes in VAS from baseline to post-training, with Participant 3 revealing a significant reduction on the "scared" VAS' at post-training. The current study aimed to enhance the validity and reliability of the findings by using both VAS and SAS-A scores to understand whether CBM-I led to reductions in state anxiety and social anxiety. By using SAS-A rather than just VAS the study adopted a more robust measure with good psychometric properties (Storch et al., 2004) and found limited reductions in anxiety in general and social anxiety.

The current finding is in line with findings from Sportel et al. (2013) who found reductions in social anxiety to be limited, and the overall difference from their pre-training to post-training did not reach significance. Therefore both the current findings and Sportel et al. (2013) found that CBM training could potentially lead to reductions in social anxiety symptoms but consistent significant results are yet to be found for adolescents with clinical levels of social anxiety.

Lastly the current findings revealed that a CBM-I, with II, training programme contributed to reductions in social anxiety symptoms for one participant at the post training phase (Participant 1). Webb et al. (2010) found that anxiety levels attenuated following the use of CBM with IIs, however the occurrence of this effect was much less consistent for the current study because only two of seven participants showed reductions in social anxiety after CBM-I, with II training, either at post training or two weeks after training. This may be due to the different protocols of the studies. The current study utilised a CBM-I programme, whereas Webb et al. (2010) utilised a CBM programme which used the dot probe task, which is based on attentional bias rather than interpretation bias. It may be that the attentional bias paradigm was required to produce the findings in Webb et al. (2010).

4.3.3. Improvements identified in interpretation biases and/or levels of social anxiety after training, will be present two weeks after the CBM-I programme.

This study's group analysis, found that reductions in negative interpretation bias and social anxiety failed to be consistent for the overall sample two weeks after training. The visual inspections of each participant's data found reductions in negative interpretation biases for five participants from baseline to two weeks after training (Participants 1, 3, 4, 5 & 7). Furthermore, three of the participants' changes in interpretation bias, when compared from baseline to two

weeks after training, were deemed reliable changes (Participants 1, 4 & 7). The negative reductions in interpretation bias two weeks after training are considered of greater importance because it indicates a more valuable account of the lasting effects of the CBM-I training than post-training scores. As a result of three participants showing reductions two weeks after training but not post training, it could be suggested that a period of consolidation may be needed to show any true lasting effects of training.

Within the literature which has investigated whether CBM-I training was effective for reducing negative interpretation bias for clinical adolescent samples (Curtis, 2013; Fu et al., 2012; Reuland & Teachman, 2014; Sportel et al., 2013) only Reuland and Teachman (2014) measured interpretation bias at follow up. They tested whether the effects found at post-training were also present between one to two months after training. They found that reductions in negative interpretation bias post training were also present at the follow up time point (Reuland & Teachman, 2014). Therefore the current finding adds to the literature by providing further evidence that reductions in interpretation bias can be found two weeks after training. It is important to note however that this was not a robust finding for the current study because only three of six participants demonstrated this effect two weeks after training, whereas Reuland and Teachman's (2014) finding was more consistent across their sample. This could be a consequence of their sample completing eight sessions of CBM-I rather than three sessions (Reuland & Teachman, 2014). Still both studies form conclusions based on small sample sizes and implications should therefore be made cautiously. In addition, it may be too early to make robust conclusions because the evidence base for changes in interpretation bias two weeks after training for clinical adolescents is very limited, which is in line with conclusions drawn from Chan et al. (2014).

In terms of the levels of social anxiety two weeks after training, the group analysis found that adolescents' social anxiety scores, as measured by the Social Anxiety Scale for Adolescents (SAS-A; La Greca & Lopez, 1999), did not reduce significantly from baseline to the last phase. This was also found when comparing the SAS-A subscales and the Brief Symptom Inventory, Phobic Anxiety subscale (BSI-PANX; Derogatis, 1993) from baseline to the last phase. This would suggest that collectively social anxiety did not reduce two weeks after the completion of the CBM-I training.

Participant 1 was also the only adolescent who showed reductions in social anxiety symptoms at post-training which were maintained two weeks after training. Therefore only one participant showed reductions in social anxiety post-training which were also present two weeks after CBM-I, with II, training. However, the visual inspection revealed that two participants (Participant 1 & 4) showed reductions two weeks after training, therefore it can be argued that there is potential for CBM-I to be efficacious for some adolescents with SAD, in terms of symptom reduction two weeks after training.

Reductions in social anxiety symptoms at follow up were found by Reuland and Teachman (2014). They found that approximately 50% of their sample showed reductions in social anxiety levels, whereas the current study found only two of seven participants had reductions in social anxiety. However, Reuland and Teachman's (2014) CBM-I programme consisted of eight sessions rather than three, which could suggest that a greater number of sessions could lead to greater reductions in social anxiety at follow up.

Consistent with Reuland and Teachman (2014) the current study also found very limited evidence of post-training social anxiety reductions being maintained at follow up as only two

participants showed reduction in social anxiety. Therefore the current finding supports previous research (Reuland & Teachman, 2014) which argues that CBM-I produces mixed results regarding reductions in social anxiety symptoms being maintained at follow up (see Lau, 2013 for a review).

4.3.4. Adolescents who enjoy the CBM-I programme will display larger reductions in negative interpretation bias and social anxiety post training.

Overall there was no significant relationship between enjoyment ratings and the outcome measures for the group collectively. However, the visual inspections of the mean enjoyment levels were also assessed to test this hypothesis. Three out of four of the participants who had reductions in negative interpretation bias two weeks after training also revealed mean enjoyment levels above 5/10 (Participant 1, 3 & 7). Participant 4 revealed a mean enjoyment level of 4. In addition, all of the participants who did not show reductions in negative interpretation bias at two weeks after training displayed mean enjoyment scores at a 5/10 or below (Participants 2, 5 & 6). Participant 1 was the only participant who showed reductions in social anxiety symptoms two weeks after training, as measured by the SAS-A and BSI-PANX and a mean enjoyment level of 6.

This hypothesis was generated from the visual inspections produced in Curtis (2013), who proposed a possible relationship between enjoyment and reductions in negative interpretation bias and social anxiety symptoms following CBM-I training. It could be argued that a significant relationship between the mean enjoyment level of the group and their mean outcome measures was not found because the sample size was too small (Howell, 2010). This is a feasible interpretation for the lack of a significant result because from the visual inspections of

the data, three participants that did enjoy the task also showed improvements and three participants who did not enjoy the task did not show improvements. Therefore the data from six out of seven participants supported the hypothesis that those who enjoy the CBM-I task also show improvements in social anxiety and interpretation bias. This could be because those who enjoyed this particular CBM-I, with II task, engaged with the specific implementation intentions instructions, and interpreted the social scenarios less negatively. As described in the introduction section, motivation to follow instructions for a particular activity, like the CBM task, has been found to occur when people are reinforced by intrinsic rewards, such as gaining satisfaction or pleasure from an activity (Brown, 2007). By enjoying the task, the participants would have been more motivated to follow the instructions and interpret the scenarios less negatively, resulting in a relationship between participants' level of enjoyment and the outcome.

However, the adolescent literature has found other moderating factors such as pre-existing negative bias, trait anxiety and self-efficacy, which has influenced outcomes. Still, results supporting these factors has been less consistent and the evidence for moderators in the effectiveness of CBM-I training is still in its infancy (Lau, 2013).

4.4 Theoretical Implications

This research adds to our theoretical understanding for the application of adult models of SAD (Clark & Beck, 2010; Clark & Wells, 1995; Rapee & Heimberg, 1997) to the adolescent population. Overall the group analysis revealed that adolescents with clinical levels of social anxiety have a negative interpretation bias, which can be supported by the measurements taken at baseline. This is in line with existing research that found that anxiety in young people is associated with biases in information processing (Hadwin, & Field, 2010; Kendall, 1985; Miers

et al., 2008). Cartwright-Hatton et al. (2011) proposed that there has been limited research on applicability of the adult models of SAD (Clark & Well, 1995; Rapee & Heimberg, 1997; Clark & Beck, 2010) to adolescents and on our understanding of whether adolescents interpret ambiguous social information in a negative manner, similarly to adults (e.g., Cartwright-Hatton et al., 2011; Hadwin & Field, 2010; Miers et al., 2008). The current study found that adolescents with clinical levels of social anxiety interpreted ambiguous social information in a negative fashion, supporting the presence of a negative interpretation bias in adolescents.

The study also adds to our understanding of the CBM paradigm (Mathews & Mackintosh, 2000) and whether the paradigm can be applied to adolescents with social anxiety. Beard (2011) argued that the evidence base for CBM-I and its underlying mechanisms being applicable to adolescent clinical samples was sparse. The current study found that an adapted CBM-I protocol, initially developed for adults, reduced negative interpretation bias for the majority of adolescents recruited into this study. However, after training, reductions in social anxiety were found to be very limited and the current findings would question whether cognitive processes are central to the maintenance of social anxiety (Kendall, 1985). This finding is consistent with Hoppitt, Matthews, Yiend and Mackintosh (2010a), who found that changes in interpretation bias following CBM-I, was not always congruent with changes in subsequent emotional responses. Hoppitt et al. (2010a) investigated whether training participants to select threat or nonthreat interpretations of emotionally ambiguous stimuli or passively exposing participants to the scenarios, leads to modification of interpretation bias beyond training. They found that congruent changes in emotional responses only occurred during training when participants were encouraged to actively select meanings of new ambiguous scenarios after CBM-I training. Hoppitt et al. (2010a) concluded that active generation of the meaning of the scenarios during

CBM-I training is necessary for post-training changes in emotional respones. Therefore in the current study, it is possible that reductions in negative interpretation bias did not lead to subsequent reductions in social anxiety because the active generation of meaning of the scenarios only occurred when participants were primed in the training or during the Recognition Test and not beyond these tasks. Hoppitt, Mathews, Yiend and Mackintosh (2010b) proposed that passive training only facilitates training-congruent emotional priming (Grey & Mathews, 2000). They argued that the effects of this generic priming could appear as an interpretive bias but the actual learning may not involve the generation and range of valenced meanings when ambiguity is later met (Hoppitt et al., 2010b). Thus, this would suggest that the reductions in negative interpretation bias were limited and unable to have an significant impact on levels of social anxiety.

Another potential explanation for the reductions found in negative interpretation bias but not in social anxiety could be because the changes found on the Recognition Test did not reflect real changes in participants' interpretation bias in social situations. It could be argued that the Recognition Test is not a valid measure of interpretation bias in social contexts, which could explain why changes were not found in social anxiety. For example, Mobini et al (2013) highlighted that the Recognition Test as a measure of interpretation has not yet been validated for social anxiety. Still, an adapted version of the measure was chosen because it had been with trialed with an adolescent population (Curtis, 2013), which made it the most suitable measure for the current design.

Furthermore, the current finding also questions the validity of the most recent model of SAD developed by Clark and Beck (2010). The model proposes that there are three stages to the development and maintenance of SAD (Clark & Beck, 2010), the anticipatory phase, the

situational exposure phase, and the post-event processing phase. The situational phase is the most relevant to the current finding that adolescents had negative interpretation biases prior to CBM-I, with II, training. The baseline interpretation biases of the adolescents in the study indicated negative self-schemas, in line with how Clark and Beck (2010) proposed that responses from other people in a social situation are interpreted negatively when social cues from others that are potentially positive or benign, are minimised or disregarded. Although the study found reductions in negative interpretation bias, which is line with the explanation described in the situational phase, the lack of reductions in social anxiety found in the study still raises questions about the relationships between interpretation bias and social anxiety.

Much of the research into the relationship between social anxiety symptoms and interpretation bias has focused on adolescents with solely negative interpretation bias rather than on the social anxiety symptoms effects following a change in interpretation biases. For example, Miers, Blotes, Bogel and Westenberg (2008) found that adolescents with social anxiety interpreted ambiguous social scenarios significantly more negatively, when compared to healthy adolescents. The current study revealed a relationship between the interpretation bias and social anxiety, but how much the interpretation bias needed to change to have an impact on social anxiety symptoms is still unknown, because although reductions in negative interpretation were found in five participants, only two displayed reductions in social anxiety symptoms. Therefore changes in interpretation bias itself may not be useful clinically if symptoms do not change. It is possible that larger reductions in negative interpretation bias may lead to more consistent reductions in social anxiety symptoms. However, the current finding that negative interpretation bias reduces following CBM-I, with II, training but not social anxiety, leads to questions regarding the clinical utility of the CBM-I studies and their findings (Lau, 2013). As discussed

previously, it may be possible that the underlying mechanisms of CBM-I requires evaluation in terms how it is delivered and how it can reliably lead to changes in social anxiety (Hoppitt et al., 2010a; 2010b).

The study also added to our understanding of the effects of implementation intentions in CBM-I training. Heckhausen (1987), and Heckhausen and Gollwitzer (1986; 1987) proposed that motivation is the first stage for managing undesirable responses to situations and that effective self-management of mood, emotions and control involves a stage whereby the individual makes a decision on when, where, and how to behave prior to taking action – thus creating an II. The current study cannot confirm that the addition of II helped to reduce negative interpretation bias in five of the participants. Despite reductions in negative interpretation, whether the II were required to achieve the same outcomes is less clear because the use of CBM-I with II and without II was not investigated.

The II instruction was included into the CBM-I task to encourage participants to positively interpret ambiguous scenarios. The instruction did not encourage participants to apply this instruction to their lives outside of the sessions. This means that interpretation styles may have only changed whilst completing the CBM-I task and it is unknown whether participants' applied this to their everyday lives. This may have had an impact on the participants' ability to interpret real social situations in a positive way and reduced the possibility of their level of social anxiety subsequently changing. The II in the current study is similar to the inclusion of 'explicit' instructions, investigated for effectiveness in the CBM-I tasks by Mobini et al. (2014). Mobini et al. (2014) compared CBM-I tasks with explicit instructions and standard CBM-I instructions. The explicit instructions encouraged participants to think positively during the task and the standard instructions were minimal, with no additional directions on how to interpret the

scenarios (Mobini et al., 2013). Mobini et al. (2013) found no significant difference between the changes in interpretation bias between participants who completed the CBM-I task with explicit or standard instructions. Therefore it could be argued that the IIs do not enhance the effectiveness of CBM-I tasks however, it is possible that the specific wording of the study's II, requires further consideration in future research.

The finding from the visual inspections showed that the level of enjoyment experienced for the task may be a variable related to efficacy of CBM-I training. This is because those who enjoyed the task tended to show greater reductions in negative interpretation bias. Three out of four of the participants who had reductions in negative interpretation bias two weeks after training also revealed mean enjoyment levels above 5/10 (Participant 1, 3 & 7). Furthermore, of the participants, who did not show reductions in negative interpretation bias two weeks after training, displayed mean enjoyment scores at a 5/10 or below (Participants 2, 5 & 6). The cognitive models of social anxiety (Clark & Wells, 1995; Rapee & Heimberg, 1997; Clark & Beck, 2010) have been limited in understanding and application to adolescents compared to its adult samples with clinical levels of social anxiety (Ranta et al., 2014) and it may be that effective modification of interpretation bias and social anxiety symptoms is related to other variables in comparison to adults. In order to motivate adolescents to engage in the CBM-I task, it could be argued that it helps if adolescents enjoy the task. Thus, the finding from the current study supports theories of intrinsic motivation (Brown, 2007; Coon & Mitterer, 2010) because those who enjoyed the training tended to also show reductions in negative interpretations.

4.5 Clinical Implications

The study found that five adolescents displayed reductions in negative interpretation bias and one adolescent displayed a reduction in social anxiety symptoms two weeks after training. This would suggest that some, but not all, adolescents with clinical levels of social anxiety benefit from CBM-I, with II. Furthermore, the group analysis was unable to provide evidence that the training was effective for reducing negative interpretation bias and levels of social anxiety in all the adolescents. With this in mind, it would be appropriate to suggest that a three session CBM-I with II would not be a suitable first line treatment for adolescents with SAD. Curtis (2013) found larger reductions in social anxiety and negative interpretation bias following a seven session CBM-I programme for adolescents with social anxiety. Thus, it could be argued that the number of sessions in the current study was too small to create clinical changes large enough to warrant being an effective intervention. Still, the effects of CBM-I training for adolescents with social anxiety has been minimal (Curtis, 2013; Sportel et al., 2013). This suggests that existing interventions, such as CBT, remain the superior treatment for SAD at this current stage. This can be supported by Ginsbury and Kingery (2007) who found on average 60-80% of young people who received CBT no longer meet the criteria, as measured by the DSM, for their anxiety disorders after treatment.

From the study, it can be argued that CBM-I for young people is limited in its effectiveness in comparison to CBT (Sportel et al., 2013). However, the practicalities for providing and delivering CBM-I is far easier than CBT (Yiend et al., 2013). Yiend et al. (2013) argued that CBM-I offers a potentially cost effective and widely accessible solution for people with mental health difficulties. They explained that CBM as an intervention can provide several advantages over traditional therapies. For example, Yiend and colleagues suggested that CBM-I packages are more practical, cost effective and accessible forms of intervention which do not

require the employment of a therapist and require less supervision. In turn, they argued that the absence of therapy contact could also be more useful for adolescents with SAD because the interaction with another person is minimal, which Yiend and colleagues suggested reduces the demand on the patient compared to traditional therapies. Furthermore, CBM could help to solve the more national problem highlighted by Layard (2005) who stressed that more cost-effective and accessible treatment was required to meet the demand of mental health problems in the UK. Therefore although CBM-I, with II, currently shows limited effectiveness compared to CBT (Sportel et al., 2013) the low cost and low use of resources would suggest that CBM-I was worth further research, with the aim of increasing clinical utility. Although based on the study's findings and previous research (Curtis, 2013, Reuland & Teachman, 2014), it would be more appropriate to highlight that the use of CBM-I as an intervention targets predominantly interpretation biases in young people, rather than symptom reduction, and only for some cases.

4.6 Strengths and Limitations

The study's findings will now be discussed, alongside the strengths and limitations of the method, sample, outcome measures and statistical analyses.

4.6.1. Methodological Issues.

Case series and multiple baseline designs are appropriate for investigating effects of novel interventions (e.g., Kazdin, 2010; Salkovskis, 1995). However Kazdin (2010) also pointed out that findings based on studies using this method should be interpreted with caution as there are still questions regarding their ability to be generalised to populations. However, the functions of single-case designs are only to establish preliminary and exploratory findings of novel interventions, and often in a natural context (Flyvbjerg, 1994). Given the novelty of

implementation intentions and infancy of the research in CBM-I training for adolescents with SAD, it would seem that the multiple baseline design adopted for the study is a strength at this early stage.

Furthermore, a critique of CBM-I research is that many studies which showed reductions in social anxiety failed to include a control group (Lau, Belli, et al., 2013; Lau, Pettit, et al., 2013; Lester et al., 2011a; Lothmann et al., 2011; Lothmann et al., 2013; Sportel et al., 2013; Vassilopoulos & Brouzos, 2015; Vassilopoulos et al., 2009). Chan et al. (2014) found that when a control group was provided with training sessions, which were not negative or positive training, CBM-I training effects were minimal. To overcome this methodological issue, this current study adopted a multiple-baseline design, which meant that participants' baselines acted as their own controls for comparison (Kazdin, 2010). However, unlike the comparative design adopted by Chan et al. (2014), the current study only utilised baseline scores as the control. Therefore it could be argued that the results of the current sample were less valid because it did not utilise a separate control group.

Another limitation of the study's design was the hypothesis testing of the effectiveness of the CBM-I with II training. This study's design did not separate the additional novel feature of II but merely tested the hypotheses of CBM-I training and II together. This means that adolescents' interpretation bias and social anxiety following training cannot be attributed to training or IIs separately. Therefore the validity of results investigating the addition of II to CBM-I training requires further investigation. This could be achieved by carrying out a study comparing a CBM-I condition with a CBM-I with II condition.

4.6.2. Sample and recruitment.

A limitation of the study was that only seven participants were recruited rather than nine as planned. Previous research has found that between six and nine participants is adequate for case series designs (Blackwell & Holmes, 2010; Curtis, 2013; Turner et al., 2011). However, the minimal reductions found in negative interpretation bias and social anxiety for the sample may have been influenced by having a smaller sample size and it is possible that a larger sample could have revealed more improvements for the sample.

A major strength of the study was that the sample consisted of adolescents with clinical levels of social anxiety, which had only been incorporated into four previous studies (Curtis, 2013; Fu, et al., 2013; Reuland & Teachman, 2014; Sportel, et al., 2013). This feature of the study is helpful because the results can be more directly generalised to clinical populations and more valid clinical implications can be recommended for adolescents with clinical levels of social anxiety.

The final sample of participants consisted of females. This would suggest that the findings of the study can only be generalised to adolescent females with SAD. The sample consisting of just females is not surprising given that SAD is more common for females (Chalebly, 1987; Davidson, Hughes, George, & Blazer, 1993; Fehm, Pelissolo, Furmark, & Wittchen, 2005; Furmark, Tillfors, Everz, Marteinsdottir, Grefvert, & Fredrikson, 1999; Grant et al., 2005; Heimberg, Stein, Hiripi, & Kessler, 2000; Schneier, Johsnons, Hornig Liebowitz, Weissman, 1992). Still the results are limited in their ability to be generalised in that they cannot be reliably applied to males with SAD.

In addition, the recent inclusion of 16 year old adolescents with SAD being referred to Well-being services meant that a proportion of the potential sample was held within Well-being services. This limited what adolescents were recruited into the study. This was because

adolescents in the Well-being services were provided with treatment within a month of their referral, which would not have allowed time for the adolescents to complete the study prior to treatment. This would have influenced which populations the findings could be generalised to because the mental health presentations of adolescents who are supported by youth mental health teams are different to adolescents from Well-being services. Service users who present with greater symptom severity are supported in specialist mental health teams (e.g. Adult team, Youth teams, & Later Life), but if they do not meet the threshold for the specialist mental health teams and have milder symptoms they would be supported in Well-being services (NICE, 2011). Therefore the severity level of SAD would be different between the two services and therefore the findings should be generalised to the specialist youth mental health services rather than Well-being services.

Furthermore, three participants dropped out of the study, which led to a reduction in the overall sample size. The two participants that withdrew during the baseline phase reported that they struggled to feel motivated to complete the daily questionnaires. The withdrawal of the two participants may have been a result of the daily measures being too arduous. However, other participants reported that these were manageable. It would be helpful if further research monitored factors that contribute to drop out rates in CBM-I research. An alternative explanation could be that these participants did not enjoy the task. However, reports of enjoyment were not taken prior to the end of their involvement in the study. The participant who dropped out at the end of the baseline phase and commenced the CBM-I training reported that they were unable to manage their studying alongside participating in the research. Therefore it may be that motivation and external factors influenced participation.

4.6.3. Outcome measures.

Three participants withdrew from the study and one participant provided incomplete post-training measures. This could suggest that between seven and eleven days of daily outcome measures (SAS-A & VAS) was too long for some of the participants, resulting in withdrawals from the study. Still, this was also a strength of the study because it incorporated 7-11 days of daily SAS-A questionnaires to represent the post-training and two weeks after training, mean scores for the participants' visual inspections and group analysis. This enabled the current study to more thoroughly assess the social anxiety after training. To the author's knowledge this is the first study which has closely monitored social anxiety symptoms after CBM-I training. Therefore, it could be argued that the finding that social anxiety does not significantly reduce following training can be put forward more confidently from this study than from studies (e.g., Curtis, 2013) which have utilised single time points to represent scores post-training and two weeks after training.

The use of the enjoyment VAS was helpful for monitoring the enjoyment level during the training phase because it enabled a quantitative measurement of how much the adolescent enjoyed training. However, it could be questioned whether the three anxiety VAS effectively captured levels of social anxiety. The three anxiety VASs were state measures and only asked the participants about their level of anxiety in the moment. The items did not ask clearly about how they felt over their whole day, which would have provided data that was more representative of their overall level of anxiety. Furthermore, the VAS measured participants' level of anxiety in general, rather than adolescents' anxiety specific to social contexts. This limits how valid the VAS was for gathering data and testing whether the CBM-I, with II, impacted adolescents' social anxiety specifically, rather than anxiety levels in general. However, the SAS-A provided a more robust indication of levels of anxiety, and specific to social situations,

because it holds greater psychometric properties (Storch et al., 2004). That said, a limitation of the SAS-A is that it focuses more on monitoring trait social anxiety, and it could be argued that it is restricted in its ability to monitor daily changes. This is because the items ask the respondents how they generally feel rather than how they feel on a particular day. Thus, it may have not been particularly sensitive to change.

On the training days, the daily measures were taken after the training sessions. It could be argued that completing them after the sessions, rather than before, reduced their comparability to the other days when sessions were not completed. It is possible that immediate effects, rather than longer term effects from the CBM-I, with II, sessions, could have influenced the outcome on the VAS and SAS-A on the training days but not on the others days.

4.6.4 Statistical analyses.

As discussed above, the study obtained multiple daily measures of social anxiety. This is a strength of the study because it enabled simulation modelling analysis (SMA; Law, 2006). SMA (Law, 2006) is an inferential statistical test, and rather than just assessing the descriptive statistics from visual inspections, inferential statistics could be performed to enable generalisation of the sample's results to a population (Howell, 2010). It incorporates bootstrapping techniques for testing statistical significance for single-subjects within case series (Law, 2006). Law (2006) explained that SMA enables data from small sample sizes to be analysed and allows inferences to be made from the sample to a wider population. If the differences between phase means were found to be significantly different, with a decline over time, it could be argued that the scores reduced from the CBM training. To the author's knowledge this is the first case series design study which has tested the effectiveness of CBM-I

for adolescents with SAD based on rich data for phases, post-training and two weeks following training. Therefore the results analysing social anxiety following training can be more confidently interpreted because their analysis was grounded in inferential statistics. Thus, the use of inferential statistics enables conclusions to be made beyond the data produced by the sample (Field, 2010), which is the difficulty with using case series designs.

Another strength of the analysis was that both clinically significant changes (CSC) and reliable changes (RCI) were investigated for the participants' interpretation bias and social anxiety scores. From these calculations, some participants (participant 1, 4 & 7) were found to have reliable changes in their interpretation bias following training. By using the RCI and CSC, the study was able to establish whether the participants who presented with changes were representative of levels beyond that attributed to measurement error and that their outcome scores following training were similar to those of a non-clinical population (Jacobsen et al., 1984; Evans et al., 1998). Thus, by computing CSC calculations, it was established that Participant 1 and 4 revealed BSI-PANX scores following training, in line with non-clinical samples rather than clinical samples. However, a disadvantage of using the CSC and RCI for the interpretation bias and BSI-PANX was that the calculations were derived from adult populations (Derogatis, 1993; Perez-Olivas et al., 2012). Consequently, it could be argued that the calculations are therefore less applicable for adolescents, and interpretations from the calculation should be provided with caution.

4.7 Future Research

The discussion above highlighted some limitations of the study that could be addressed with further research. The novel use of II in the current study could be further investigated to

establish whether II enhance CBM-I training for adolescents with SAD. This could be investigated by using a different multiple baseline design, such as an ABAB design (Kazdin, 2010). An ABAB design represents a design alternating between baseline or measurement phases, similar to the current study's design (labelled as "A"), and an intervention phase (labelled as "B"). This design assesses the effects of an intervention by alternating the baseline phase with the intervention phase, and this set of phases are repeated (Kazdin, 2010). Kazdin (2010) proposed that intervention effects are present if the performance improves following the introduction of the intervention, reverts to the baseline performance when intervention is withdrawn and improves again when reintroduced. Therefore the first intervention phase could contain CBM-I without II, and the second contain CBM-I with II, to establish a better understanding of whether II enhances the programme effects. Alternatively, to reduce the overlapping effects of CBM-I training with and without II, a between-subjects design could be adopted rather than a case series design. However, this would mean that a larger sample size would need to be recruited to sustain enough power for the implementation of a robust comparative design (Marszalek, Barber, Kohlhart, & Holmes, 2011).

The CBM-I with II programme was provided in three sessions. Curtis (2013) found that seven sessions of CBM-I training produced greater improvements in social anxiety and interpretation bias. Therefore it may be beneficial that the study is replicated with a greater number of training sessions and indeed a mix of males and females. However, Cristea et al. (2014) found in a meta-analysis of CBM training for adolescents that the number of sessions did not appear to be a contributing factor for improvements following training. Therefore, at this stage in the CBM-I research for adolescents, increasing the number of CBM-I sessions and carefully considering whether to use II and how, should be the focus of future research.

The anxiety VAS appeared less relevant in the interpretation of the study. To reduce the demands on the adolescents in an attempt to avoid withdrawal from the study, this measure could be dropped and the focus could be on the social anxiety measured by the SAS-A. Furthermore, the current study measured interpretation bias at single time points to represent each phase. The advantages of using several time points to measure outcomes across a phase of time were discussed in terms of being suitable for inferential statistical analysis. Therefore it would be advantageous that the interpretation bias measure is also used more frequently to allow for further more stringent statistical analyses. This could be achieved by reducing the length of the Recognition Test and asking participants to complete it at more regular intervals.

An alternative approach employed for case series is the iterative case series design (Carroll, 1977). If clear results across the initial participants are not found, which is what happened in the study, an explanation for why the intervention was not effective is formed. This hypothesis is then tested out on the next participants after the intervention has been refined. Blackwell and Holmes (2010) provide an example of this approach for a CBM-I task. In their research, when the task was found to be less effective than hypothesized, participants were asked to provide qualitative feedback. This data was then utilised to inform how the task could be refined, with the aim of improving its effectiveness. Blackwell and Holmes (2010) found that one participant who did not respond to the CBM-I programme because they reported not engaging with the task and instead passively completed the programme. In the current study, engagement was only measured by the frequency of correct answers on the comprehension questions, as an indication that they were following the instructions of the task. It could be argued that this was a less robust measure of engagement and other means of measuring engagement could be adopted for future research. This could be achieved by gathering

qualitiative feedback and asking the participants after each session. Furthermore, in their study they found that by providing a clear rationale for engaging in the task, motivated participants to actively engage (Blackwell & Holmes, 2010). In turn, the current study could be improved by monitoring the engagement levels and the programme could be adapted to encourage greater engagement with a clear rationale for engaging actively. Blackwell and Holmes (2010) also hypothesised that two participants did not respond to the CBM-I programme because of associated verbal rather than imagery processing of the scenarios (Holmes et al., 2009). The current study encouraged a predominantly verbal processing rather than imagery, which Blackwell and Holmes (2010) found was less effective for their CBM-I task. Therefore future research could adapt the programme to encourage more imagery based processing, rather than verbal, in attempts to enhance the programmes effectiveness. Lastly, in the current study, the lack of enjoyment found in the task by some participants could have been explored, prior to further training. This process could help to develop an understanding from the participants about how the task could be made more enjoyable. Based on the feedback, changes could be made to the task, in attempts to enhance the effectiveness and improve outcomes.

4.8 Conclusion

The findings of the study indicated the limited effects of CBM-I with II for adolescents with clinical levels of social anxiety. It demonstrated that CBM-I, with II, has the potential for reducing negative interpretation biases in this population but there is a need for future research to explore this further. In terms of symptom reduction, this finding is consistent with previous adolescent research, which failed to find a robust reduction in symptoms for adolescents with clinical levels of social anxiety (Curtis, 2013; Fu et al., 2012; Reuland & Teachman, 2014; Sportel et al., 2013). Furthermore, preliminary findings that the level of enjoyment could be

related to improvements following CBM-I, with II, training (Curtis, 2013), were also tentatively made in the sample of adolescents with clinical levels of social anxiety. Based on the findings it seems fair to propose that from a clinical perspective, CBM-I, with II, training is limited in its ability to be used clinically, with adolescents with SAD, in its current format. However, the current findings suggest that further research is required to work towards the aim of finding more effective and age appropriate CBM-I with II programmes for adolescents with clinical levels of social anxiety.

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Appendices

A: Confirmation Letter Ethical Approval from NRES Committee South East Coast - Surrey

B: Letter to NHS Managers/Collaborators

C: Recruitment Log

D: Brief Symptom Inventory (Derogatis, 1993)

E: Social Anxiety Scale for Adolescents (SAS-A; La Greca & Lopez, 1998)

F: Visual Analogue Scale

G: Participant Feedback Questionnaire

H: Parent Feedback Questionnaire

I: Computer Instructions

J: University of East Anglia Research Enterprise and Engagement Indemnity Insurance.

K: Confirmation from Norfolk and Suffolk Research and Development Ethics Committee

L: Participant Consent Form

M: Parent Consent Form

N: Assent Form

O: Participant Information Sheet

P: Parent Information Sheet

Q: Debrief Sheet

R: Consent to be Contacted Form

S: Kendall's *tau* Calculations (Kendall, 1970)

Appendix A: Ethical Approval from NRES Committee South East Coast - Surrey

NRES Committee South East Coast - Surrey

Bristol Research Ethics Committee Centre

Whitefriars

Level 3, Block B Lewins Mead

Bristol

BS1 2NT

08 October 2014

Miss Holly Smith

Trainee Clinical Psychologist

Cambridge & Peterborough NHS Foundation Trust

Doctoral Programme in Clinical Psychology

2.30 Elizabeth Fry Building, School of Medicine, Health Policy & Practice

University of East Anglia, Norwich, Norfolk

NR4 7TJ

Telephone: 0117 342 1380

Study title:	An exploratory investigation of the efficacy of a three session Cognitive Bias Modification for Interpretation (CBM-I) training, with Implementation Intentions (II), for adolescents experiencing high levels of social anxiety: A single-case series.
REC reference:	14/LO/1599
IRAS project ID:	150198

Thank you for your letter of 07 October 2014, responding to the Committee's request for further information on the above research and submitting revised documentation.

The further information has been considered on behalf of the Committee by the Chair.

We plan to publish your research summary wording for the above study on the HRA website, together with your contact details. Publication will be no earlier than three months from the date of this opinion letter. Should you wish to provide a substitute contact point, require further information, or wish to make a request to postpone publication, please contact the REC Manager, Miss Gemma Oakes, nrescommittee.secoast-surrey@nhs.net.

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.

Conditions of the favourable opinion

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

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

Registration of Clinical Trials

All clinical trials (defined as the first four categories on the IRAS filter page) must be registered on a publically accessible database within 6 weeks of recruitment of the first participant (for medical device studies, within the timeline determined by the current registration and publication trees).

There is no requirement to separately notify the REC but you should do so at the earliest opportunity e.g when submitting an amendment. We will audit the registration details as part of the annual progress reporting process.

To ensure transparency in research, we strongly recommend that all research is registered but for non-clinical trials this is not currently mandatory.

If a sponsor wishes to contest the need for registration they should contact Catherine Blewett (catherineblewett@nhs.net), the HRA does not, however, expect exceptions to be made. Guidance on where to register is provided within IRAS.

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).

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).

Approved documents

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

Document	*Version*	*Date*
Evidence of Sponsor insurance or indemnity (non NHS Sponsors only) [I & I FROM UEA]	1	06 August 2014
Interview schedules or topic guides for participants [KSADS for screening_October 1996]	1	
IRAS Checklist XML [Checklist_01102014]		01 October 2014
IRAS Checklist XML [Checklist_22082014]		22 August 2014
Non-validated questionnaire [SRP non-thesis measure]	1	04 December 2013
Non-validated questionnaire [SRP non-thesis parent measure]	1	04 December 2013
Non-validated questionnaire [Visual Analogue Scales]	1	12 December 2013
Other [Dave Peck CV 2ND SUPERVISOR]	1	14 August 2014
Other [Interpretation Bias Items]	1	14 August 2014
Other [Consent to be contacted (Clean Copy)]	4	23 September 2014
Other [REC Letter 140814]	1	14 August 2014
Other [Interpretation Bias Instructions]	1	14 August 2014
Other [Research Protocol with revised title (Tracked Copy)]	3	23 September 2014
Other [RD Feedback 140814]	1	14 August 2014
Other [CBM-I Programme Instructions]	1	14 August 2014
Other [CBM-I Programme items]	1	14 August 2014
Other [Changes made following provisional opinion]	1	23 September 2014
Other [Research Protocol with revised title (Clean Copy)]	3	23 September 2014
Other [Debrief Sheet (Tracked Copy)]	5	23 September 2014
Other [Debrief Sheet (Clean Copy)]	5	23 September 2014
Other [Letter to Managers (Tracked Copy)]	4	23 September 2014
Other [Discussion with supervisor following proposal]	1	12 February 2014
Other [Letters to managers/clinicians (Clean Copy)]	4	23 September 2014
Other [Consent to be Contacted (Tracked Copy)]	4	23 September 2014
Participant consent form [Participant consent form over 16 (Clean	4	23 September 2014
Participant consent form [Participant Assent Form (Tracked Copy)]	5	23 September 2014
Participant consent form [Parent Consent Form (Clean Copy)]	4	23 June 2014
Participant consent form [Parent Consent Form (Tracked Copy)]	4	23 September 2014
Participant consent form [Assent Form (Clean Copy)]	5	23 June 2014
Participant consent form [Participant Consent Form (Over 16 yr olds) (Tracked Copy)]	4	23 September 2014
Participant information sheet (PIS) [YP PIS (Clean Copy)]	5	23 June 2014
Participant information sheet (PIS) [YP Participant Information	5	23 September 2014

Participant information sheet (PIS) [Parent PIS (Clean Copy)]	3	23 June 2014
Participant information sheet (PIS) [Parent Information Sheet	3	23 September 2014
REC Application Form [REC_Form_20082014]		20 August 2014
Summary CV for Chief Investigator (CI) [CI CV]	1	11 August 2014
Summary CV for supervisor (student research) [Research	1	17 June 2014
Validated questionnaire [Sample of SAS-A]		
Validated questionnaire [BSI]		

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

User Feedback

The Health Research Authority is continually striving to provide a high quality service to all applicants and sponsors. You are invited to give your view of the service you have received and the application procedure. If you wish to make your views known please use the feedback form available on the HRA website:

http://www.hra.nhs.uk/about-the-hra/governance/quality-assurance/

HRA Training

We are pleased to welcome researchers and R&D staff at our training days – see details at http://www.hra.nhs.uk/hra-training/

14/LO/1599 Please quote this number on all correspondence

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

Yours sincerely

pp Prof David Russell-Jones

Chair

Email: nrescommittee.secoast-surrey@nhs.net

Enclosures: "After ethical review – guidance for researchers" *[SL-AR2]Copy to: Mrs Sue Steel,* sue.steel@uea.ac.uk

Dr Bonnie Teague, rdofficemailbox@nsft.nhs.uk

Appendix B: Contact Letter to Managers of IDT Youth Pathway Clinic

23.09.14/ Version 4

Norwich Medical School

Doctorate Programme in Clinical Psychology

University of East Anglia

Norwich

Norfolk

NR4 7TJ

Date (of letter)

Dear clinician

Re: A feasibility study into the efficacy of a three session Cognitive Bias Modification for Interpretation (CBM-I) training, with Implementation Intentions (II), for adolescents experiencing high levels of social anxiety: A single-case series.

I am a University of East Anglia (UEA) Trainee Clinical Psychologist. My position is in partnership with the NHS. I would like to invite your clinic and adolescent patients to be part of my research study. This study is part of my Doctorate training course at UEA. The research is supervised by two UEA supervisors: Dr. Margo Ononaiye (Clinical Psychologist) and Dr. Dave Peck (Senior Lecturer).

This study is looking into the efficacy of Cognitive Bias Modification for Interpretation (CBM-I) training for adolescents with social anxiety. CBM-I is a computerised training package aimed at reducing anxiety symptoms. More specifically, I am investigating an adapted version of the training package, including instructions designed to enhance the effectiveness. Social anxiety is common disorder within the adolescent population and research has been looking at improving the interventions.

In order to conduct the research alongside your clinic, I aim to recruit adolescents aged 14-17 years old who have clinical levels of social anxiety. Comorbidity diagnoses will accepted, apart from where stated in the research exclusion criteria. This information can be discussed upon meeting with your clinic. These would be adolescents who are on your waiting lists. Unfortunately those in treatment will not be able to take part in the study as the clinic treatment could affect the outcomes.

Potential participants and their parent/caregivers will be given information packs about the study and I would need to ask your team to gain consent from them for me to contact the adolescents. I would be grateful if your clinic could identify potential participants. I will be recruiting nine participants.

Adolescents who agreed to participate will go through an initial screening phase whereby I will carry out interviews and ask them to complete a practice trial of the CBM-I training. Adolescents eligible for the study will be entered into the core phase of the study. This will involve participants completing three further CBM-I sessions and daily questionnaires in their own homes. Previous research in this field has not found any risk to participants. If risk issues are identified in the assessment, agreements will be made between the adolescent and me that this information is passed on to the clinic and their parents. Following their participation in the study they will be given a verbal and written debrief and a £10.00 Amazon voucher to thank them for the participation.

Thank you for taking the time to read my invitation to the study. If you are interested we can arrange a meeting with you and your staff to discuss it further. I will contact your clinic in two weeks to see whether you would like to meet to discuss this further.

Please do not hesitate to contact me if you have any questions at this stage or would like to arrange a meeting.

Yours sincerely

Holly Smith

Trainee Clinical Psychologist

Supervised by Dr. Margo Ononaiye (Clinical Psychologist) and Dr. Dave Peck (Senior Lecturer)

Contacts details:

Researcher:

Holly Smith

Norwich Medical School

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Tel: (Research Mobile Number)

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Research Supervisors:

Dr. Ononaiye/Dr. Peck

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dfpeck@btinternet.com

Appendix C: Recruitment Log

05.11.14 – Email Ipswich Manager to introduce study and arrange meeting.

13.11.14 – Email Norwich Manager to introduce study and arrange meeting.

12.11.14 – Email Ipswich Access and Assessment to introduce study and arrange meeting.

17.11.14 – Norwich Youth Pathway recruitment meeting.

24.11.14 – Email Bury Manager to introduce study and arrange meeting.

24.11.14 – Ipswich Youth Pathway recruitment meeting.

02.12.14 – Bury St. Edmunds Youth Pathway recruitment meeting.

19.12.14- Reminder email to Ipswich regarding study.

23.12.14 – Email Norwich team to remind them about study.

29.12.14 – Email Ipswich Well-being service to introduce study.

12.01.15 – Meeting to discuss the study with Ipswich Youth Team and one-to-one support looking through caseloads with two clinicians.

14.01.15- Arrange second meeting with Bury St. Edmunds (Psychologist & Manager).

21.01.15 – Meeting to discuss study with Bury St. Edmunds team.

21.01.15 to 29.04.15 - Individual email correspondence with clinicians re: recruits.

22.01.15 – Arrange to have meeting with Norwich team Psychologists.

23.01.15- Email Well-being service regarding criteria and arranging meeting.

26.01.15 – Email correspondence with Well-being service regarding criteria and support with recruitment procedure.

04.02.15 – Meeting to introduce study to Access and Assessment Team.

05.02.15 – Correspondence with Primary Mental Health Workers in Ipswich Youth team.

09.02.15 – Meet with Norwich Psychologist to discuss recruitment.

05.02.15 – Meeting with Access and Assessment Youth staff to support with recruitment.

05.02.15 – Meeting with Well-being service to introduce study to team.

19.02.15 – Support for Bury St Edmunds team with recruiting adolescents.

23.02.15 – Start of research assessments with participants.

29.04.15 – End of research assessments with participants.

Appendix D: Brief Symptom Inventory (Derogatis, 1993)

Brief Symptom Inventory

BSI

"Here is a list of problems people sometimes have. As you read each one, I want you to say HOW MUCH THAT PROBLEM HAS DISTRESSED OR BOTHERED YOU <u>DURING THE PAST 7 DAYS INCLUDING TODAY</u>.

0 = Not at all

1 = A little bit

2 = Moderately

3 = Quite a bit

4 = Extremely

1. Nervousness or shakiness inside 0 1 2 3 4

2. Faintness or dizziness 0 1 2 3 4

3. The idea that someone else can control your thoughts 0 1 2 3 4

4. Feeling others are to blame for most of your troubles 0 1 2 3 4

5. Trouble remembering things 0 1 2 3 4

6. Feeling easily annoyed or irritated 0 1 2 3 4

7. Pains in the heart or chest 0 1 2 3 4

8. Feeling afraid in open spaces 0 1 2 3 4

9. Thoughts of ending your life 0 1 2 3 4

10. Feeling that most people cannot be trusted 0 1 2 3 4

11. Poor appetite 0 1 2 3 4

12. Suddenly scared for no reason 0 1 2 3 4

13. Temper outbursts that you could not control 0 1 2 3 4

14. Feeling lonely even when you are with people 0 1 2 3 4

15. Feeling blocked in getting things done 0 1 2 3 4

16. Feeling lonely 0 1 2 3 4

17. Feeling blue 0 1 2 3 4

18. Feeling no interest in things 0 1 2 3 4

19. Feeling fearful 0 1 2 3 4

20. Your feelings being easily hurt 0 1 2 3 4

21. Feeling that people are unfriendly or dislike you 0 1 2 3 4

22. Feeling inferior to others 0 1 2 3 4

23. Nausea or upset stomach 0 1 2 3 4

24. Feeling that you are watched or talked about by others 0 1 2 3 4

25. Trouble falling asleep 0 1 2 3 4

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

27. Difficulty making decisions 0 1 2 3 4

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

29. Trouble getting your breath 0 1 2 3 4

30. Hot or cold spells 0 1 2 3 4

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

32. Your mind going blank 0 1 2 3 4

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

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

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

36. Trouble concentrating 0 1 2 3 4

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

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

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

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

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

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

43. Feeling uneasy in crowds 0 1 2 3 4

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

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

46. Getting into frequent arguments 0 1 2 3 4

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

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

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

50. Feelings of worthlessness 0 1 2 3 4

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

52. Feeling of guilt 0 1 2 3 4

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

Appendix E: Social Anxiety Scale for Adolescents (SAS-A; La Greca & Lopez, 1998)

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 F: Visual Analogue Scale

12.12.13/Version 1

Visual Analogue Scales (VAS)

(Reading age: 7)

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. **How much did you enjoy the training session**

   0 _____10

   (Not at all true) (Very true)

Appendix G: Participant Feedback Questionnaire

University of East Anglia

Norfolk and Suffolk NHS
NHS Foundation Trust

Participant Questionnaire

1. **How easy did you find using the CBM computer task?**

   0 _____10

   (Not at all) (Very much)

2. **Were the CBM instructions easy to follow and understand?**

   0 _____10

   (Not clear at all) (Very Clear)

3. **Did the instruction ("If I feel uncertain, then I will think positive!") at the beginning of each session help you to make choices during those sessions?**

   0 _____10

   (Not at all) (All the time)

4. **How enjoyable was the CBM sessions?**

   0 _____10

   (Very Enjoyable) (Not at all enjoyable)

5. **Did you feel that the sessions were manageable to do alongside your other everyday activities (i.e. school, homework and hobbies)?**

0 _____10

(Very Manageable) (Unmanageable)

6. **Did you notice yourself thinking any different in social situations after the sessions?**

0 _____10

(Not at all) (Very Different)

7. **Did you notice yourself behaving any different in social situations after the sessions?**

0 _____10

(Not at all) (Very Different)

8. **Did you notice yourself feeling any different in social situations after the sessions?**

0 _____10

(Not at all) (Very Different)

9. **Please give any other comments about the CBM sessions?**

_____

_____

_____

_____

_____

Appendix I: Computer Instructions

INSTRUCTIONS SCREENS FOR VERSION ONE (DAY ONE)

In this task you will read a description about a situation. Each description has four lines of text. Press the downward arrow on the keyboard to show you all four lines. The last line always has the final word missing from it. When you press the downward arrow key again, the missing word will appear but it will have some letters missing. (For example, 'tel-phone': the 'e' is missing from 'telephone').

Please think about the situation you have just read about to help you fill in the word using the right letter(s). When you know what the unfinished word is, press the downward arrow key. Then enter the FIRST missing letter (in the telephone example above, this would be 'e'), by finding this letter on the keyboard and pressing that letter key. When you have pressed the key the missing word will show on your computer screen.

Then, after each situation, a question will be shown on your screen this is to check you have understood, so remember to answer it based on the situation you have just read. For this you will be using the left (for NO) and right (for YES) arrow keys. You need to think the following when answering the questions "**If I feel uncertain, then I will think positive!"**

You will be reminded of this. Don't worry if this seems hard; there will be some practice situations at the start.

Press the downward arrow key now to find out what to do next."

INSTRUCTION SCREEN TWO

"Now, let's talk about why you are doing this! It has been suggested that imagining yourself in a range of unreal situations may help you to have less worrying feelings in real life. The goal of each computer session is to help you get used to being in lots of different situations.

To help you do this, it would be great if you could imagine that you are in each of the different situations when you read it, as if you are there. So, as well as doing the missing letter tasks that we just talked about, you need to imagine yourself as the main person in each of the situations. And again, you need to think the following when answering the questions **"If I feel uncertain, then I will think positive!"**

There will be a practice situation to start with. Please press the downward arrow key to start the practice"

THEN THEY DO PRACTICE TRIAL.

AFTER THE PRACTICE, THE FOLLOWING SCREEN IS SHOWN (INFORMING PARTICIPANT OF END OF PRACTICE).

"Well done, that is the end of the practice.

REMEMBER that the goal of doing this is to get used to being in lots of different situations, **so if you feel uncertain, you need to think positive!**

REMEMBER In the main task each situation will turn out well in the end (like the final practice item). Remembering that all of the situations END WELL will help you with the task.

Please press the downward arrow key when you are ready to begin the main task."

Appendix H: Parent Feedback Questionnaire

University of East Anglia

Norfolk and Suffolk NHS
NHS Foundation Trust

Parent Questionnaire

1. **How involved were you with your child's CBM training?**

0 _____10

(Not at all) (Very much)

2. **How much did the training sessions affect you and your child's everyday life?**

0 _____10

(Not at all) (Very much)

3. **Have you noticed any positive changes in your child's anxiety in social situations?**

0 _____10

(No Changes) (Lots of Changes)

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

_____

_____

_____

Appendix J: University of East Anglia Research Enterprise and Engagement Indemnity Insurance.

Research & Enterprise Services
West Office (Science Building)
University of East Anglia
Norwich Research Park
Norwich, NR4 7TJ

Telephone: +44 (0)1603 591486
Email: sue.steel@uea.ac.uk

Web: www.uea.ac.uk/researchandenterprise

TO WHOM IT MAY CONCERN

06/08/2014

Study: An exploratory investigation of the efficacy of a three session Cognitive Bias Modification for Interpretation (CBM-I) training, with Implementation Intentions (II), for adolescents experiencing high levels of social anxiety: A single-case series.

Chief Investigator: Holly Smith

This is to confirm that the University of East Anglia and Subsidiary Companies have arranged insurance cover as detailed on the attached Company Public Liability and Professional Negligence Insurance certificates.

The cover is subject to the terms and conditions of the policy. If you require further details, please contact the undersigned.

Yours faithfully

Sue Steel
Research Contracts Manager

ZURICH
MUNICIPAL

To Whom It May Concern

Our ref: NAP

9 May, 2014

Zurich Municipal Customer: The University of East Anglia and wholly owned subsidiary companies

This is to confirm that The University of East Anglia and wholly owned subsidiary companies has in force with this Company Public Liability Insurance until the policy expiry on 31st May 2015

Policy Number: NHE-09CA01-0013

Limit of Indemnity: £ 25,000,000

Yours faithfully

Nicola Pilsbury
Underwriting Services
Zurich Municipal
Farnborough

Zurich Municipal
Zurich House
2 Gladiator Way
Farnborough
Hampshire
GU14 6GB

Telephone 0870 2418050
Direct Phone 01252 387846
Direct Fax 01252 375893
E-mail nicola.pilsbury@uk.zurich.com

ZURICH
MUNICIPAL

To Whom It May Concern

Our ref: Our Ref:NAP 9 May, 2014

Zurich Municipal Customer: The University of East Anglia and wholly owned subsidiary companies

This is to confirm that The University of East Anglia and wholly owned subsidiary companies have in force with this Company until the policy expiry on 31st May 2015 Professional Negligence Insurance incorporating the following essential features:

Policy Number: NHE-09CA01-0013

Services covered: Training, research and consultancy services provided by the insured to outside clients in accordance with details lodged with the insurer, and excluding Services more particularly insured under this Policy or elsewhere.

Limit of Indemnity: £7,500,000 any one claim and *in the aggregate for all claims* first made against the Insured and notified to Zurich Municipal during the period of insurance

Excess : £10,000
any one claim

Retroactive Date: 1st June 2003

Exclusions
Standard insurance market exclusions apply, notably exclusion of Pollution other than sudden and accidental; punitive or exemplary damages; express warranties or guarantees; claims the cause of which occurred prior to the Retroactive Date.

This is a brief summary and the full policy should always be referred to for exact details of cover.

Yours faithfully

Nicola Pilsbury
Underwriting Services
Zurich Municipal
Farnborough

Zurich Municipal
Zurich House
2 Gladiator Way
Farnborough
Hampshire
GU14 6GB

Telephone 0870 2418050
Direct Phone 01252 383846
Direct Fax 01252 375893
E-mail
nicola.pilsbury@uk.zurich.com@zurich
.com

Appendix K: Confirmation from Norfolk and Suffolk Research and Development Ethics Committee

Norfolk and Suffolk NHS
NHS Foundation Trust
Research and Development
The Knowledge Centre
Hellesdon Hospital
Drayton High Road
Norwich
NR6 5BE

Telephone 01603 421255
E mail: RDofficemailbox@nsft.nhs.uk

Miss Holly Smith
Doctoral Programme of Psychology
Elizabeth Fry Building
University of East Anglia
Norwich
NR4 7TJ

13th October 2014

Dear Miss Smith,

Re: 2014MH15: 3 Session CBMI with II for adolescents with Social Anxiety

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 Facilitator, at the above address.

The reference number for this study is: **2014MH15,** and this should be quoted on all correspondence.

Yours sincerely,

Bonnie Teague
Research Manager

Your research governance approval is valid providing you comply with the conditions set out below:

1. You commence your research within one year of the date of this letter. If you do not begin your work within this time, you will be required to resubmit your application.
2. You notify the Research and Development Office should you deviate or make changes to the approved documents.
3. You alert the Research and Development Office by contacting the address above, if significant developments occur as the study progresses, whether in relations to the safety of individuals or to scientific direction.
4. You complete and return the standard annual self-report study monitoring form when requested to do so at the end of each financial year. Failure to do this will result in the suspension of research governance approval.
5. You comply fully with the Department of Health Research Governance Framework and Trust Research Policies, and in particular that you ensure that you are aware of and fully discharge your responsibilities in respect to Data Protection, Health and Safety, financial probity, ethics and scientific quality. You should refer in particular to Sections 3.5 and 3.6 of the Research Governance Framework.
6. You ensure that all information regarding patients or staff remains secure and strictly confidential at all times. You ensure that you understand and comply with the requirements of the NHS Confidentiality Code of Practice, Data Protection Act and Human Rights Act. Unauthorised disclosure of information is an offence and such disclosures may lead to prosecution.
7. **UKCRN Portfolio Studies only**: You will make local Trust research team members aware that it is expected that the "first participant, first visit" date should be within 70 days of the full submission for Trust Research Governance Approval, and this date must be reported to the Research and Development office using the email address above. Delay to recruitment due to study-wide developments must be reported to the Trust as soon as possible.
8. **UKCRN Portfolio Studies only**: You will report and upload Trust recruitment to the UKCRN portfolio accurately and in a timely manner, and will provide recruitment figures to the Trust upon request.

Appendix L: Participant Consent Form

23.09.14/ Version 4

Norwich Medical School

Doctorate Programme in Clinical Psychology

University of East Anglia

Norwich

Norfolk

NR4 7TJ

Participant Consent Form – Over 16

Project Title**:** A feasibility into the efficacy of a three session Cognitive Bias Modification for Interpretation (CBM-I) training, with Implementation Intentions (II), for adolescents experiencing high levels of social anxiety: A single-case series.

Researcher: Holly Smith (Trainee Clinical Psychologist, UEA)

Research Supervisors: Dr Margo Ononaiye (Clinical Psychologist, UEA), Dr Dave Peck (Senior Lecturer, UEA)

Please initial all boxes

1. I understand the information in the participant information sheet (*version 4)* summarising the above study and what it will involve for me. I confirm that I have had the opportunity to ask the researcher questionnaires and these have been answered. ☐

2. I have been informed that my participation is voluntary and I can withdraw at any time without giving a reason. If I withdraw from the study my clinic treatment will not be affected. ☐

3. I understand that the information I give in the assessments is kept private, unless I say something that puts me or other people at risk. I understand that this may need to be shared with my parents and the clinic. ☐

4. I agree to taking part in the above study. ☐

5. I understand that relevant sections of my medical notes and data collected during the study may be looked at by individuals from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my records. ☐

_____	_____	_____
Name	Date	Signature
_____	_____	_____
Name of Person Taking Consent	Date	Signature

Appendix M: Parent Consent Form

23.09.14/ Version 4

Norwich Medical School

Doctorate Programme in Clinical Psychology

University of East Anglia

Norwich

Norfolk

NR4 7TJ

Parent/Guardian Consent Form

Project Title**:** A feasibility study into the efficacy of a three session Cognitive Bias Modification for Interpretation (CBM-I) training, with Implementation Intentions (II), for adolescents experiencing high levels of social anxiety: A single-case series.

Researcher: Holly Smith (Trainee Clinical Psychologist, UEA)

Research Supervisors: Dr Margo Ononaiye (Clinical Psychologist, UEA), Dr Dave Peck (Senior Lecturer, UEA)

Please INITIAL all boxes

I have read and understood the information sheet (*version 3*) for the above study. I confirm that I have been able to consider the information provided by the researcher and have been given the opportunity to ask questions about the study. ☐

I understand that my son/daughters' participation is voluntary and that they are free to withdraw at any time without giving any reason. I also understand that if they withdraw from the study this will not affect their clinic treatment. ☐

I give consent for my child to take part in the study. ☐

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

I understand that relevant sections of my child's medical notes and data collected during the study may be looked at by individuals from regulatory authorities or from the NHS Trust, where it is relevant to my taking part in this research. I give permission for these individuals to have access to my child's records. ☐

_____

Name of Child

_____	_____	_____
Name	Date	Signature
_____	_____	_____
Name of Researcher	Date	Signature

Parents' Details

Telephone Number/s

Email/s:

Address:

Appendix N: Assent Form

23.09.14/ Version 5

Norwich Medical School

Doctorate Programme in Clinical Psychology

University of East Anglia

Norwich

Norfolk

NR4 7TJ

Participant Debriefing Sheet

Project Title: A feasibility study into the efficacy of a three session Cognitive Bias Modification for Interpretation (CBM-I) training, with Implementation Intentions (II), for adolescents experiencing high levels of social anxiety: A single-case series.

Researcher: Holly Smith (Trainee Clinical Psychologist, UEA)

Research Supervisors: Dr Margo Ononaiye (Clinical Psychologist, UEA), Dr Dave Peck (Senior Lecturer, UEA)

Thank you taking part in the study. The study was looking at whether the training helps young people who get worried in social situations feel better and change the way they look social situations after the training. The training had instructions at the start, which were put in programme to try to get you to learn to have more positive thoughts about the situations you read. I also wanted to see whether people who enjoyed the training felt less worried than those who did not enjoy the task.

What happens now?

The information I collected from you will be put with eight other young people's information from the study. This will then be looked at more closely to see whether the training is helpful

for people that worry. I will be writing the study up. This will not include any names. I hope to publish it in a journal so other researchers and clinicians can learn from the study and help other young people.

Your clinic will continue to support you. I will let them know that you have finished. Thank you again for your help. Please contact me if you have further questions.

Contact for Further Information

Researcher:	**Research Supervisors:**
Holly Smith	Dr. Ononaiye/Dr. Peck
Norwich Medical School	Norwich Medical School
Doctorate Programme in Clinical Psychology	Doctorate Programme in Clinical Psychology
University of East Anglia	Norwich
Norwich	Norfolk
Norfolk	NR4 7TJ
NR4 7TJ	
Tel: Mobile	Email:m.ononaiye@uea.ac.uk
Email: holly.smith@uea.ac.uk	dfpeck@btinternet.com

UEA Contact Details for the Complaint Procedure

Professor Ken Laidlaw

Programme Director

Norwich Medical School

Doctorate Programme in Clinical Psychology

Norwich

Norfolk

NR4 7TJ

Email: k.laidlaw@uea.ac.uk

Appendix O: Participant Information Sheet

23.09.14/Version 5

Norwich Medical School

Doctorate Programme in Clinical Psychology

University of East Anglia

Norwich

Norfolk

NR4 7TJ

PARTICIPANT INFORMATION SHEET

Project Title: A feasibility study of the efficacy of a three session Cognitive Bias Modification for Interpretation (CBM-I) training, with Implementation Intentions (II), for adolescents experiencing high levels of social anxiety: A single-case series.

Researcher: Holly Smith (Trainee Clinical Psychologist, UEA)

Research Supervisors: Dr Margo Ononaiye (Clinical Psychologist, UEA), Dave Peck (Senior Lecturer, UEA)

Thank you for being interested in taking part in the above study. Please read this information sheet to learn more about the study. The study is being carried out by Holly Smith (Trainee Clinical Psychologist). Holly is training in NHS clinics in Suffolk and attends the University of East Anglia (UEA).

This study is being carried out as part of a Doctorate in Clinical Psychology at UEA.

Please feel free to contact Holly if you have any more questions after reading this information sheet.

Why is this study being carried out?

The study is looking at Cognitive Bias Modification for Interpretation (CBM-I) training for young people who get worried about social situations. CBM-I is a computer programme which can help people change the way they look at situations in life, e.g. social situations. This research has been carried out in the NHS before but this training has been changed and we would like to see whether this helps young people to feel less worried around others.

Why have I been asked to take part?
You have been asked to take part because you are aged between 14 and 17 years olds and feel worried in social situations.

Do I have to take part?
You don't have to take part in the study and only say yes if you are happy with the study and what it will involve you doing. Also if you decide you don't want to be part of the study at any point you can let me know and your treatment at your clinic will not be affected. We also want young people to only take part if they are not in therapy. This means you will be able to join the study when you are on the clinic waiting list. If your therapy is offered before you have finished the study you have the option to withdraw from the study and start treatment.

If I agree to take part what happens next?
If you would like to be part of the study I can talk about what we would like you to do and I will then need to meet with you so we can fill in some questionnaires and talk about how you are feeling. These may be a bit like your first meeting at the clinic. This will take at least an hour and can be completed in your home, clinic or at UEA. We can arrange a convenient time to do this together. This will help me to decide whether you are okay for the study. I will be asking people to complete three sessions of the training at home. I will bring you a computer to use. You will need to regularly complete questionnaires as well. I will send reminders to you too. The training sessions take approximately 30 minutes each day and the daily questionnaires will be less than 10 minutes.

How do I agree to take part?
If you want to take part in the study please can you fill in the consent to contact form which came with this sheet? By signing this form you will be saying it is okay for me to contact you to talk to you about the study further.

There is also *'Parent or Guardian Information Sheet'*, which you need to give to your parent/guardian to read. If you are not 16 years old yet you will need to discuss the study with your parents and then they will have to sign a consent form. Please give these to your clinician. If you need some help talking about the study with your parents please contact me and I can help tell them about it.

If you take part in the study you will be given a £10 Amazon voucher as a thank you for your time in my research.

Is what I say kept private?
Your questionnaires and training will be kept private. Also I will not put your name on the information you provide. Instead a number is put on your paperwork and on the computer to keep it all nameless. However, if you tell me something that worries me, such as you want to harm yourself or someone else, I will need to inform your parents and the clinic. We will also need to tell your doctor you are in the study.

What are the good things about taking part?
Being in the study will help us learn more about social anxiety and better ways for helping young people in the future.

What are the possible risks for taking part?
Similar research studies have not found that there are any risks to taking part. Previous studies have not found that young people have felt worse and or had further problems from CBM training or having their treatment delayed, if that happens. However, it may take up some of your time. Also if you did feel upset by the training or assessments, we can stop and think about whether you want to carry on and whether you would like some further help from your parents and/or the clinic.

What will happen if I don't want to be in the study anymore?
If you would like to stop participating this is okay. You will just need to let me know. You can stop being in the study at any stage. You can call me, tell me in person or ask someone else, like your parents or your clinician to let me know. Your treatment at the clinic will not be affected if you stop participating. I will let the clinic know you are no longer in the study. You can also ask for your data to be removed.

What happens when I finish the study?
Once you have finished the study we will meet again to talk about the study. I will give you another information sheet (known as a debrief sheet) and you and your family can also ask me any further questions. We can provide you with a summary of the results when the study has finished.

What will happen to the results of the study?
As part of my training at UEA, I have to write up my study into a thesis and I also hope to publish the study. Again any personal details will not be in these documents.

What happens to my questionnaires?
At UEA, we store participants' information in a locked filing cabinet and the information is destroyed after five years.

Who has agreed to the study being carried out?
The South East-Coast Surrey Research Ethics Committee and the Norfolk and Suffolk Foundation Trust Research and Development Department have all agreed to the study being carried out.

Contact for Further Information

Researcher:	Research Supervisors:
Holly Smith Norwich Medical School	Dr. Ononaiye/Dave Peck Norwich Medical School

Doctorate Programme in Clinical Psychology University of East Anglia Norwich Norfolk NR4 7TJ Tel: (Mobile) Email: holly.smith@uea.ac.uk	Doctorate Programme in Clinical Psychology Norwich Norfolk NR4 7TJ Email:m.ononaiye@uea.ac.uk dfpeck@btinternet.com

UEA Contact Details for the Complaint Procedure:

Professor Ken Laidlaw (Programme Director), Norwich Medical School,

Doctorate Programme in Clinical Psychology, Norwich, Norfolk, NR4 7TJ.

Email: k.laidlaw@uea.ac.uk

Appendix P: Parent Information Sheet

23.09.14/ Version 3

Norwich Medical School

Doctorate Programme in Clinical Psychology

University of East Anglia

Norwich

Norfolk

NR4 7TJ

Parent/Guardian Information Sheet

Project Title: A feasibility study into the efficacy of a three session Cognitive Bias Modification for Interpretation (CBM-I) training, with Implementation Intentions (II), for adolescents experiencing high levels of social anxiety: A single-case series.

Researcher: Holly Smith (Trainee Clinical Psychologist, UEA)

Research Supervisors: Dr Margo Ononaiye (Clinical Psychologist, UEA), Dr Dave Peck (Senior Lecturer, UEA)

You have been provided with this information sheet because your son/daughter has shown an interest in above study. Please read the information detailed in this document to learn more about the research. The study is being conducting by Holly Smith (Trainee Clinical Psychologist). Holly is training in NHS clinics in Suffolk and attending the University of East Anglia (UEA). Please do not hesitate to contact her if you have any further questions about the study and your child's involvement after reading this information sheet.

This study is being carried out as part of a Doctorate in Clinical Psychology at UEA.

What is the purpose of the study?

The study is looking in the effectiveness of Cognitive Bias Modification for Interpretation (CBM-I) training for adolescents with social anxiety. CBM-I is a computer programme which

can help young people to improve their perceptions of life e.g. in social situations. Similar research has been carried out in the NHS but this training programme has been adapted and we would like to see whether this helps adolescents to feel less socially anxious.

Why has my child been asked to take part?

Your child has been selected to take part between he/she is aged between 14 and 17 years old and experiencing anxiety in social situations.

Does my child have to take part?

Your child is not expected to part in the study and you should only give consent if you are happy with the study and what it will involve. Also if your child or you decide to end participation you can say and their treatment at the clinic will not be affected. We also want adolescents at the clinics to only take part if they are not in therapy with the clinic. This means they will be able to participate when they are on the clinic waiting list. If your child's therapy is offered before they have finished the study you have the option to withdraw from the study and start treatment.

If I agree to my child taking part what happens next?

If you are happy for them to take part we can discuss their involvement in more detail and sign consent forms and I will then need to meet with your child so we can complete some questionnaires, interviews and a practice session of the training programme. This will take at least an hour and can be completed in your home, clinic or at UEA.I will ask them to complete another three sessions of the training at home. We will bring one for them to use. They will need to regularly complete questionnaires for about a month. I will send them reminders to complete the questionnaires and training. The training sessions take approximately 30 minutes each day and the daily questionnaires will be less than 10 minutes. I would be grateful if you could also support and prompt them to complete the training and/or questionnaires. At the end of the study I will ask you and your child about your experiences of the training programme.

How can we take part?

If you are happy for them to take part please can you complete the consent to contact form attached to this information sheet. By signing this form you will be agreeing for me to contact you to discuss the study further. If your child is not 16 years old or above you will have to sign a consent form and they will need to sign an assent form. Please give these to their clinician and I will collect them from the clinic.

If they take part in the study they will be given a £10.00 Amazon voucher as a thank you for their time in my research study.

Will my information and my child's information be kept confidential?

Your child's involvement in the study, questionnaires and training will be kept private. Also we do not put names on the information you provided. Instead a number is put on the documents to keep it all anonymous. However, if your child reports something that concerns me, such wanting to harm themselves or someone else, I will need to inform you and the clinic. We will also need to notify your child's GP that they are part of the study.

What are the benefits of taking part?

Being in the study will help us learn more about social anxiety and better ways for helping adolescents in the future.

What are the possible risks for taking part?

Similar research studies have not found that there are any risks to taking part. Previous studies have not found that young people have felt worse and or had further problems from CBM training or having their treatment delayed, if that happens. However, it may take up some of your child's time completing the training and questionnaires. Also if they feel distressed by the training or assessments, I can stop the assessment and we think about whether they want to continue and whether they would like some further support from you and/or the clinic.

What happens after the study?

Once you have finished the study we will meet again to discuss it. I will provide you will another information sheet (known as a debrief) and you and your son/daughter can also ask me any further questions. We can also provide you with a summary of the research results when the study has been completed.

What will happen to the results of the research study?

As part of my training at UEA, I have to write up my study into a thesis and I also hope to publish the study. Again any personal details will not be included in these documents.

What happens to my questionnaires?

At UEA, we store participants' information in a secure filing cabinet and the information is destroyed after five years.

Who has approved the study?

The South East-Coast Surrey Research Ethics Committee, the Norfolk and Suffolk Foundation Trust Research and Development Department and the University of East Anglia Ethics Committee have all agreed to the study being carried out.

Contact for Further Information

Researcher:

Holly Smith

Norwich Medical School

Doctorate Programme in Clinical Psychology

University of East Anglia

Norwich

Norfolk

NR4 7TJ

Tel: (Mobile)

Email: holly.smith@uea.ac.uk

Research Supervisors:

Dr. Ononaiye/Dr. Peck

Norwich Medical School

Doctorate Programme in Clinical Psychology

Norwich

Norfolk

NR4 7TJ

Email:m.ononaiye@uea.ac.uk

dfpeck@btinternet.com

UEA Contact Details for the Complaint Procedure:

Professor Ken Laidlaw, Programme Director, Norwich Medical School, Doctorate Programme in Clinical Psychology,

Norwich, Norfolk, NR4 7TJ

Email: k.laidlaw@uea.ac.uk

Appendix Q: Debrief Sheet

23.09.14/ Version 5

Norwich Medical School

Doctorate Programme in Clinical Psychology

University of East Anglia

Norwich

Norfolk

NR4 7TJ

Participant Debriefing Sheet

Project Title: A feasibility study into the efficacy of a three session Cognitive Bias Modification for Interpretation (CBM-I) training, with Implementation Intentions (II), for adolescents experiencing high levels of social anxiety: A single-case series.

Researcher: Holly Smith (Trainee Clinical Psychologist, UEA)

Research Supervisors: Dr Margo Ononaiye (Clinical Psychologist, UEA), Dr Dave Peck (Senior Lecturer, UEA)

Thank you taking part in the study. The study was looking at whether the training helps young people who get worried in social situations feel better and change the way they look social situations after the training. The training had instructions at the start, which were put in programme to try to get you to learn to have more positive thoughts about the situations you read. I also wanted to see whether people who enjoyed the training felt less worried than those who did not enjoy the task.

What happens now?

The information I collected from you will be put with eight other young people's information from the study. This will then be looked at more closely to see whether the training is helpful for people that worry. I will be writing the study up. This will not include any names. I hope to publish it in a journal so other researchers and clinicians can learn from the study and help other young people.

Your clinic will continue to support you. I will let them know that you have finished. Thank you again for your help. Please contact me if you have further questions.

Contact for Further Information

Researcher:	**Research Supervisors:**
Holly Smith	Dr. Ononaiye/Dr. Peck
Norwich Medical School	Norwich Medical School
Doctorate Programme in Clinical Psychology	Doctorate Programme in Clinical Psychology
University of East Anglia	Norwich
Norwich	Norfolk
Norfolk	NR4 7TJ
NR4 7TJ	
Tel: Mobile	Email:m.ononaiye@uea.ac.uk
Email: holly.smith@uea.ac.uk	dfpeck@btinternet.com

UEA Contact Details for the Complaint Procedure

Professor Ken Laidlaw

Programme Director

Norwich Medical School

Doctorate Programme in Clinical Psychology

Norwich

Norfolk

NR4 7TJ

Email: k.laidlaw@uea.ac.uk

Appendix R: Consent to be Contacted Form

23.09.14/ Version 4

Norwich Medical School

Doctorate Programme in Clinical Psychology

University of East Anglia

Norwich

Norfolk

NR4 7TJ

Consent for Researcher to Contact Participant

Project Title**:** A feasibility study into the efficacy of a three session Cognitive Bias Modification for Interpretation (CBM-I) training, with Implementation Intentions (II), for adolescents experiencing high levels of social anxiety: A single-case series.

Researcher: Holly Smith (Trainee Clinical Psychologist, UEA)

Research Supervisors: Dr Margo Ononaiye (Clinical Psychologist, UEA), Dr Dave Peck (Senior Lecturer, UEA)

Please read the information sheet carefully before thinking about whether you are interested in the study.

Potential participants will need to ask their parents/guardians to complete additional parent/guardian consent forms if they are under 16 years olds.

Please initial all boxes

1. ‘I am happy for the researcher to contact me and talk about the study in more detail’ ☐

2. ‘I understand this consent form only means the researcher can contact me not that I have to take part in the study at this stage and I can change my mind about whether to take part’ ☐

Name	Date	Signature
_____	_____	_____

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

Tau Values: Participant One

SAS-A (La Greca, 1999).

Correlations

			Day	SAS_A_Total_Baseline
Kendall's tau_b	Day	Correlation Coefficient	1.000	.269
		Sig. (2-tailed)	.	.333
		N	9	9
	SAS_A_Total_Baseline	Correlation Coefficient	.269	1.000
		Sig. (2-tailed)	.333	.
		N	9	9

Worried VAS

Correlations

			Day	VAS_BaselineW
Kendall's tau_b	Day	Correlation Coefficient	1.000	-.592*
		Sig. (2-tailed)	.	.028
		N	9	9
	VAS_BaselineW	Correlation Coefficient	-.592*	1.000
		Sig. (2-tailed)	.028	.
		N	9	9

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

Nervous VAS

Correlations

			Day	VAS_BaselineN
Kendall's tau_b	Day	Correlation Coefficient	1.000	-.530
		Sig. (2-tailed)	.	.054
		N	9	9
	VAS_BaselineN	Correlation Coefficient	-.530	1.000
		Sig. (2-tailed)	.054	.
		N	9	9

Scared VAS

Correlations

			Day	VAS_BaselineS
Kendall's tau_b	Day	Correlation Coefficient	1.000	-.609*
		Sig. (2-tailed)	.	.033
		N	9	9
	VAS_BaselineS	Correlation Coefficient	-.609*	1.000
		Sig. (2-tailed)	.033	.
		N	9	9

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

Tau Values: Participant Two

SAS-A (La Greca, 1999).

Correlations

			Day	SAS_A_Total_Baseline
Kendall's tau_b	Day	Correlation Coefficient	1.000	-.150
		Sig. (2-tailed)	.	.645
		N	7	7
	SAS_A_Total_Baseline	Correlation Coefficient	-.150	1.000
		Sig. (2-tailed)	.645	.
		N	7	7

Worried VAS

Correlations

			Day	VAS_BaselineW
Kendall's tau_b	Day	Correlation Coefficient	1.000	.724*
		Sig. (2-tailed)	.	.037
		N	7	7
	VAS_BaselineW	Correlation Coefficient	.724*	1.000
		Sig. (2-tailed)	.037	.
		N	7	7

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

Nervous VAS

Correlations

			Day	VAS_BaselineN
Kendall's tau_b	Day	Correlation Coefficient	1.000	.690
		Sig. (2-tailed)	.	.053
		N	7	7
	VAS_BaselineN	Correlation Coefficient	.690	1.000
		Sig. (2-tailed)	.053	.
		N	7	7

Scared VAS

Correlations

			Day	VAS_BaselineS
Kendall's tau_b	Day	Correlation Coefficient	1.000	.617
		Sig. (2-tailed)	.	.062
		N	7	7
	VAS_BaselineS	Correlation Coefficient	.617	1.000
		Sig. (2-tailed)	.062	.
		N	7	7

Tau Values: Participant Three

SAS-A (La Greca, 1999).

Correlations

			Day	SAS_A_Total_Baseline
Kendall's tau_b	Day	Correlation Coefficient	1.000	-.041
		Sig. (2-tailed)	.	.871
		N	11	11
	SAS_A_Total_Baseline	Correlation Coefficient	-.041	1.000
		Sig. (2-tailed)	.871	.
		N	11	11

Worried VAS

Correlations

			Day	VAS_BaselineW
Kendall's tau_b	Day	Correlation Coefficient	1.000	.046
		Sig. (2-tailed)	.	.861
		N	11	11
	VAS_BaselineW	Correlation Coefficient	.046	1.000
		Sig. (2-tailed)	.861	.
		N	11	11

Nervous VAS

Correlations

			Day	VAS_BaselineN
Kendall's tau_b	Day	Correlation Coefficient	1.000	-.237
		Sig. (2-tailed)	.	.359
		N	11	11
	VAS_BaselineN	Correlation Coefficient	-.237	1.000
		Sig. (2-tailed)	.359	.
		N	11	11

Scared VAS

Correlations

			Day	VAS_BaselineS
Kendall's tau_b	Day	Correlation Coefficient	1.000	.125
		Sig. (2-tailed)	.	.622
		N	11	11
	VAS_BaselineS	Correlation Coefficient	.125	1.000
		Sig. (2-tailed)	.622	.
		N	11	11

Tau Values: Participant Four

SAS-A (La Greca, 1999).

Correlations

			Day	SAS_A_Total_Baseline
Kendall's tau_b	Day	Correlation Coefficient	1.000	-.059
		Sig. (2-tailed)	.	.831
		N	9	9
	SAS_A_Total_Baseline	Correlation Coefficient	-.059	1.000
		Sig. (2-tailed)	.831	.
		N	9	9

Worried VAS

Correlations

			Day	VAS_BaselineW
Kendall's tau_b	Day	Correlation Coefficient	1.000	-.087
		Sig. (2-tailed)	.	.750
		N	9	9
	VAS_BaselineW	Correlation Coefficient	-.087	1.000
		Sig. (2-tailed)	.750	.
		N	9	9

Nervous VAS

Correlations

			Day	VAS_BaselineN
Kendall's tau_b	Day	Correlation Coefficient	1.000	-.295
		Sig. (2-tailed)	.	.285
		N	9	9
	VAS_BaselineN	Correlation Coefficient	-.295	1.000
		Sig. (2-tailed)	.285	.
		N	9	9

Scared VAS

Correlations

			Day	VAS_BaselineS
Kendall's tau_b	Day	Correlation Coefficient	1.000	-.229
		Sig. (2-tailed)	.	.399
		N	9	9
	VAS_BaselineS	Correlation Coefficient	-.229	1.000
		Sig. (2-tailed)	.399	.
		N	9	9

Tau Values: Participant Five

SAS-A (La Greca, 1999).

Correlations

			Day	SAS_A_Total_Baseline
Kendall's tau_b	Day	Correlation Coefficient	1.000	-.806**
		Sig. (2-tailed)	.	.001
		N	11	11
	SAS_A_Total_Baseline	Correlation Coefficient	-.806**	1.000
		Sig. (2-tailed)	.001	.
		N	11	11

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

Worried VAS

Correlations

			Day	VAS_BaselineW
Kendall's tau_b	Day	Correlation Coefficient	1.000	-.256
		Sig. (2-tailed)	.	.295
		N	11	11
	VAS_BaselineW	Correlation Coefficient	-.256	1.000
		Sig. (2-tailed)	.295	.
		N	11	11

Nervous VAS

Correlations

			Day	VAS_BaselineN
Kendall's tau_b	Day	Correlation Coefficient	1.000	-.119
		Sig. (2-tailed)	.	.628
		N	11	11
	VAS_BaselineN	Correlation Coefficient	-.119	1.000
		Sig. (2-tailed)	.628	.
		N	11	11

Scared VAS

Correlations

			Day	VAS_BaselineS
Kendall's tau_b	Day	Correlation Coefficient	1.000	.122
		Sig. (2-tailed)	.	.625
		N	11	11
	VAS_BaselineS	Correlation Coefficient	.122	1.000
		Sig. (2-tailed)	.625	.
		N	11	11

Tau Values: Participant Six

SAS-A (La Greca, 1999).

Correlations

			Day	SAS_A_Total_Baseline
Kendall's tau_b	Day	Correlation Coefficient	1.000	.000
		Sig. (2-tailed)	.	1.000
		N	7	7
	SAS_A_Total_Baseline	Correlation Coefficient	.000	1.000
		Sig. (2-tailed)	1.000	.
		N	7	7

Worried VAS

Correlations

			Day	VAS_BaselineW
Kendall's tau_b	Day	Correlation Coefficient	1.000	-.370
		Sig. (2-tailed)	.	.266
		N	7	7
	VAS_BaselineW	Correlation Coefficient	-.370	1.000
		Sig. (2-tailed)	.266	.
		N	7	7

Nervous VAS

Correlations

			Day	VAS_BaselineN
Kendall's tau_b	Day	Correlation Coefficient	1.000	-.195
		Sig. (2-tailed)	.	.543
		N	7	7
	VAS_BaselineN	Correlation Coefficient	-.195	1.000
		Sig. (2-tailed)	.543	.
		N	7	7

Scared VAS

Correlations

			Day	VAS_BaselineS
Kendall's tau_b	Day	Correlation Coefficient	1.000	.053
		Sig. (2-tailed)	.	.874
		N	7	7
	VAS_BaselineS	Correlation Coefficient	.053	1.000
		Sig. (2-tailed)	.874	.
		N	7	7

Tau Values: Participant Seven

SAS-A (La Greca, 1999).

Correlations

			Day	SAS_A_Total_Baseline
Kendall's tau_b	Day	Correlation Coefficient	1.000	.487
		Sig. (2-tailed)	.	.083
		N	9	9
	SAS_A_Total_Baseline	Correlation Coefficient	.487	1.000
		Sig. (2-tailed)	.083	.
		N	9	9

Worried VAS

Correlations

			Day	VAS_BaselineW
Kendall's tau_b	Day	Correlation Coefficient	1.000	-.068
		Sig. (2-tailed)	.	.817
		N	9	9
	VAS_BaselineW	Correlation Coefficient	-.068	1.000
		Sig. (2-tailed)	.817	.
		N	9	9

Nervous VAS

Correlations

			Day	VAS_BaselineN
Kendall's tau_b	Day	Correlation Coefficient	1.000	.189
		Sig. (2-tailed)	.	.506
		N	9	9
	VAS_BaselineN	Correlation Coefficient	.189	1.000
		Sig. (2-tailed)	.506	.
		N	9	9

Scared VAS

Correlations

			Day	VAS_BaselineS
Kendall's tau_b	Day	Correlation Coefficient	1.000	.122
		Sig. (2-tailed)	.	.665
		N	9	9
	VAS_BaselineS	Correlation Coefficient	.122	1.000
		Sig. (2-tailed)	.665	.
		N	9	9