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**UNIVERSITY OF SOUTHAMPTON**

**FACULTY OF MEDICINE, HEALTH AND LIFE SCIENCES**

School of Psychology

**Imagery and the Self in Social Phobia**

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Thesis submitted in partial fulfilment of the degree of Doctor of Clinical Psychology

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## **Disclaimer Statement**

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## Imagery and the Self in Social Phobia

### Abstract

Current cognitive models (Clark & Wells, 1995; Rapee & Heimberg, 1997) emphasise the importance of negative self-images in the maintenance of social phobia. Although evidence suggests that in social phobia these images influence some cognitive, affective and behavioural responses in social situations, it is unclear how they exert their effect. The literature review examines the proposition that these images function as self-representations that have their roots in autobiographical memory. The role of self-images, within a theoretical model of self and autobiographical memory is explored (i.e., the *Self-Memory System*; Conway & Pleydell-Pearce, 2000). A possible relationship between self-images and the *working self* (i.e., the current self-view) is discussed as a useful framework within which the effects of negative self-images in social phobia could be understood. Research is proposed which will begin to empirically test this relationship. The empirical paper investigates the effect of positive and negative self-images on different aspects of the self. Negative self-images were associated with a weaker positive implicit self-esteem bias, and less positive and more negative explicit self-esteem, in both high and low socially anxious participants. Negative self-images were also associated with reduced self-concept clarity, but only in low socially anxious participants. Following social threat activation, the increase in self-esteem associated with positive self-imagery was still evident. Findings provide some support for a relationship between self-imagery and specific self-evaluative components of the self. The potential contribution of this relationship to the persistence of social phobia is discussed.

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## **Literature Review**

### **How Do Negative Images of the Self Exert Their Effect in Social Phobia?**

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## Abstract

Current cognitive models of social phobia (Clark & Wells, 1995; Rapee & Heimberg, 1997) highlight the role of spontaneous, negative and distorted images of the self in contributing to the negative sense of self at the heart of the disorder. Furthermore, evidence suggests that these images exert an effect on a range of cognitive, affective and behavioural responses in social situations, which are implicated in the maintenance of social anxiety (e.g., Hirsch, Meynen, & Clark, 2004). However, exactly how these images exert their effects is unclear. Within this review, images of self in social phobia are conceptualised as self-representations that have their roots in autobiographical memory. The role of self-images, within a theoretical model of self and autobiographical memory (i.e., the *Self-Memory System*; Conway & Pleydell-Pearce, 2000) is explored. The relationship between self-images and the *working self* (i.e., the current self-view) is discussed as a potentially useful framework within which the effects of negative self-images in social phobia could be understood. However, further research exploring the relationship between imagery, the self and autobiographical memory is necessary before any conclusions can be drawn.

Keywords: Social anxiety; Social phobia; Imagery; Autobiographical memory; Self

## Introduction

Social phobia, or social anxiety disorder, is one of the most common anxiety disorders with reported lifetime prevalence rates as high as 24% in Europe (Fehm, Pelissolo, Furmark, & Wittchen, 2005). The disorder is characterised by a marked and enduring fear of social or performance situations in which the individual feels exposed to possible scrutiny by others (DSM-IV-TR; APA, 2000). Social phobia generally has its onset in adolescence, with a highly persistent course of symptoms impacting on everyday functioning in social, educational and occupational domains (Chartier, Hazen, & Stein, 1998; Fehm, Beesdo, Jacobi, & Fiedler, 2008; Fehm et al., 2005). At the heart of the disorder is the experience of a negative sense of self, represented by the negative self-referent thoughts described by patients (e.g., Glass, Merluzzi, Biever, & Larsen, 1982; Stopa & Clark, 1993). This negative self-view is also encapsulated for many by negative and distorted self-images.

Negative images of the self are commonly reported in social phobia (e.g., Hackmann, Clark, & McManus, 2000; Hirsch, Clark, & Yiend, 2004) and although the specific image experienced by each individual may be idiosyncratic, the meaning of the image is related to the core fears of negative evaluation, embarrassment and humiliation (Hirsch & Holmes, 2007). Within the cognitive models, these negative and distorted self-images contribute to the construction of the negative self-view that is important in maintaining social phobia (e.g., Clark & Wells, 1995; Rapee & Heimberg, 1997). Furthermore, an accumulating evidence base supports the influence of these images on specific cognitive, affective and behavioural responses implicated in the maintenance, and potentially even the development of social phobia

(e.g., Hackmann, Surawy, & Clark, 1998; Hirsch, Clark, Mathews, & Williams, 2003; Hirsch, Meynen, & Clark, 2004).

To date, research has largely focused on exploring the nature and the effects of negative self-images in social phobia. There has been relatively little theoretical or empirical investigation of the potential mechanisms which may underpin their effects. It is only through developing an understanding of these mechanisms that images can be most effectively targeted within treatment. Exploring the relationship between image of self and autobiographical memory (e.g., as demonstrated in Day, Holmes, & Hackmann, 2004; Hackmann et al., 2000; Osman et al., 2004) may offer one possible explanation. Current cognitive models of social phobia (e.g., Clark & Wells, 1995; Rapee & Heimberg, 1997) emphasise the role of negative images as representation of self. The experience of self is critically defined by a knowledge base of autobiographical memories (Conway & Pleydell-Pearce, 2000), and imagery in social phobia appears to, at least in part, have its roots in such a knowledge base (Hackmann et al., 2000). Therefore, exploring the potentially triadic relationship between imagery, autobiographical memory and the self, may usefully contribute to our understanding how negative self-images exert their effect in social phobia.

Within this context, this review has several aims. To begin with, the function of negative images of the self within contemporary cognitive models of social phobia will be evaluated. Current knowledge regarding the role of negative self-images in social phobia will then be reviewed and gaps in the literature identified. Next, the relationship between images of the self and autobiographical memory will be evaluated. The *Self-Memory System* (e.g., Conway & Pleydell-Pearce, 2000) will be introduced as a model within which the relationship between self, imagery and

autobiographical memory can be explored. The relationship between imagery and the experience of self, highlighted within the model, will be discussed as a potentially useful framework within which the effects of negative self-images in social phobia could be understood. Implications for future research exploring how images may function in social phobia will then be explored.

### **The Role of Imagery in Social Phobia: The Cognitive Models**

The cognitive models that have been most influential in furthering our understanding and treatment of social phobia are those of Clark and Wells (1995) and Rapee and Heimberg (1997). Both of these models implicate imagery in the maintenance of social anxiety, and although they share a number of similarities in their conceptualisations of self-imagery, there are also some unique differences. Each model will be briefly described here, with specific references to the maintaining role of imagery in social phobia.

A central tenet of Clark and Wells' (1995) model is that social anxiety is associated with an increase in self-focused attention and monitoring of one's own performance. They propose that, on entering a social situation, the socially phobic individual becomes increasingly focused on the self. This self-focus is triggered by a series of appraisals about the perceived danger inherent in that particular situation. These appraisals are informed by the individual's underlying assumptions about themselves and their social world. Assumptions regarding the excessively high standards required for adequate social performance, conditional beliefs concerning the (catastrophic) consequences of performing in a certain way, and unconditional negative beliefs about the self, all contribute to danger appraisals. Internal information, which is made more accessible by the increased self-focus, is then used

to infer how the individual believes that he or she will appear to others. This process informs the experience of self in social interactions. Clark and Wells propose that, automatic and intrusive negative self-images, information derived from anxiety symptoms (i.e., feeling anxious is interpreted as looking anxious), and a “*felt-sense*” (Clark, 2001, p. 408) all contribute to the construction of the negative sense of self at the heart of social phobia. The individual, therefore, becomes trapped in a closed system in which evidence for fears is mostly self-generated and potentially contradictory evidence is less accessible. Within this closed system, images of the self both represent, and serve as evidence for these fears, and the images themselves are not updated. This process is hypothesised to maintain anxiety and to reinforce the negative view of self encapsulated in the image.

The role of imagery, in Rapee and Heimberg’s (1999) model, is not significantly different from that of Clark and Wells (1995). Like Clark and Wells, they propose that imagery maintains social anxiety through the process of self-focused attention. However, Rapee and Heimberg also specifically highlight the biased processing of external cues in contributing to the maintenance of social phobia. It is proposed that attentional resources are split between the monitoring of internal and external information (e.g., any perceived threat in the social environment). Rapee and Heimberg suggest that both types of information feed into the construction of the self-image. They propose that as the person with social phobia enters a social situation, he/she forms a mental representation of his or her external appearance and behaviour, as seen by the audience. This self-generated mental representation is a loosely integrated amalgam based on a variety of inputs including information retrieved from long-term memory (e.g., recollection of general

appearance, prior experience in the situations), internal cues (e.g., physical symptoms) and external cues (e.g., audience feedback). Although, the (reduced) processing of external social cues has been acknowledged by Clark and McManus (2002), the role of self-focus and internally generated information, remains the main focus of Clark and Wells' (1995) model. Additionally, unlike Rapee and Heimberg, Clark and Wells do not specifically discuss the nature of the inputs which may contribute to the construction of the negative self-image.

Both models propose that the image represents how the individual believes they are viewed by others (i.e., the image is a representation of the self from an observer perspective). The fear of evaluation is a critical component of social phobia. This motivates the individual to try to predict the standards held by the observer, and to attempt to establish whether the internally generated mental representation of self matches these standards. However, as the mental representations of the self are already negatively biased, the person with social phobia is likely to predict failure, which creates further anxiety. The physiological, cognitive and behavioural aspects of anxiety and this negative mental representation of self influence and exacerbate each other in a vicious cycle.

In both models, the negative images trigger safety behaviours that serve as attempts to prevent or minimise the feared catastrophe encapsulated in the image. Safety behaviours can be mental operations (e.g., rehearsing what to say), or they can be behavioural manoeuvres that are more obviously observed (e.g., covering the face to avoid perceived blushing being seen). These behaviours can contaminate social interactions and have the unintended consequences of making the individual appear distracted and preoccupied. This sometimes produces poorer performance and can be

interpreted by others as lack of interest, or even dislike on the part of the individual with social phobia (Hirsch, Meynen et al., 2004). For example, an individual avoiding eye contact for fear of others observing their red face (as depicted in their self-image) may be viewed by others avoiding eye contact due to being uninterested in the social interaction.

In summary, the cognitive models described here are consistent in their conceptualisation of the self as a negative internal representation. This self-representation is linked to unconditional negative beliefs and dysfunctional assumptions regarding an inability to perform to a perceived social standard. Biased negative self-images occur spontaneously in social situations thereby contributing to, and reinforcing, the negative self-view. Imagery transforms the self into an observable entity, whose characteristics the individual becomes aware of through the process of self-focused attention. Although the models differ slightly in terms of the way in the way the image is constructed, both propose that images of the self are an important factor in the persistence of social phobia. The emphasis given to negative self-imagery in these models has stimulated a growing body of research investigating the role of imagery in social phobia. Available literature within the area will now be reviewed in order to establish an understanding of current knowledge and in order to identify gaps in the evidence base.

### **The Role of Imagery in Social Phobia: The Evidence Base**

In order to ascertain current knowledge in the area, a literature search was carried out to identify all relevant articles. The findings from this search will be discussed below. The following electronic bibliographic databases were searched: AMED, CINAHL, EMBASE, MEDLINE, PsycINFO, British Nursing Index, and



the Cochrane library. The following terms were searched for in the titles, abstracts, and in any subject heading fields in each database: ('social anxiety', 'social phobia') AND ('image\*<sup>1</sup>'). The search aimed to identify all peer reviewed, English-language published studies since 1985. Reference sections from pertinent studies were scrutinised for additional relevant articles and this process was repeated until it was felt that all relevant literature had been obtained. Initial searches produced a crude total of 390 (taking no account of duplication), and from an initial screening of abstracts for basic relevance, 31 papers were examined. Since the central research question was regarding images of the self in social phobia, studies in which imagery and social anxiety, or social phobia, were not the focus of the research, were excluded from the review (e.g., Lytwyn, 2006; Solomonova et al., 2008). After the full text of these papers had been screened, 12 papers were identified and the findings of these studies are discussed below. The papers included in the review fell into two broad categories: those exploring the nature of imagery in social phobia, and those investigating the effect of imagery manipulation on specific areas of cognition, emotion, or behaviour.

### *The Nature of Imagery in Social Phobia*

The four studies, examining the nature of imagery in social phobia (Hackmann et al., 2000; Hackmann et al., 1998; Wells, Clark, & Ahmad, 1998; Wells & Papageorgiou, 1999) confirm that images of the self are an important characteristic of social phobia. The literature suggests that in comparison to non-anxious control participants, socially anxious participants report significantly more spontaneous self-images in social situations (Hackmann et al., 1998). These images

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<sup>1</sup> \* used to denote all words starting with the prefix (e.g., image, imagery, images)

tend to be recurrent and self-focused (Hackmann et al., 2000); representative of the individual's worst fears (Hackmann et al., 2000; Hackmann et al., 1998); reported from an observer-perspective, and characterised by a distorted and negative impression of the observable self (Hackmann et al., 2000; Hackmann et al., 1998; Wells et al., 1998; Wells & Papageorgiou, 1999). Although the term 'image' generally carries with it the connotation of a visual experience, imagery can include other sensory modalities including bodily sensations, sounds and smells. Mental imagery has been defined as that which occurs when perceptual information is accessed from memory, giving rise to the experience of "*seeing with the mind's eye, hearing with the mind's ear, feeling with the mind's skin and so on*" (Kosslyn, Ganis, & Thompson, 2001, p. 4). In line with this definition, the self-images, reported in social phobia, span across several sensory domains; although the images reported in the literature to date are predominantly reported as visual experiences with accompanying bodily sensations. An additional finding, which will be discussed in more detail later, is that images of the self in social phobia appear to be, at least in part, rooted in autobiographical memory (Hackmann et al., 2000).

### *The Effects of Negative Images of the Self in Social Phobia*

In general, research manipulating the emotional content of self-images supports a role for these images in the maintenance of social anxiety (Hirsch, Clark et al., 2003; Hirsch, Mathews, & Clark, 2007; Hirsch, Mathews, Clark, Williams, & Morrison, 2003; Hirsch, Mathews, Clark, Williams, & Morrison, 2006; Hirsch, Meynen et al., 2004; Spurr & Stopa, 2003; Stopa & Jenkins, 2007; Vassilopoulos, 2005). Studies involving non-clinical populations with high levels of social anxiety have demonstrated that holding a negative self-image in mind during a social threat

activation task (e.g., giving a speech or holding a conversation with a stranger) is associated with increased anxiety (Hirsch, Mathews et al., 2006; Hirsch, Meynen et al., 2004; Vassilopoulos, 2005); increased use of safety behaviours (Hirsch, Meynen et al., 2004); poorer self and observer ratings of performance (Hirsch, Meynen et al., 2004); and an increased perception of bodily sensations (Vassilopoulos, 2005), compared to holding a positive self-image in mind. An increase in the frequency of negative thoughts and a greater belief in the validity of these thoughts has been linked to negative images of the self (Hirsch, Mathews et al., 2006). Highly socially anxious participants also rate these negative and distorted images as more representative of self, than positive images (Vassilopoulos, 2005). In addition to the research manipulating image content, one study specifically manipulated image perspective (i.e., images were generated from either an observer or a field, perspective) (Spurr & Stopa, 2003). The observer-perspective, which characterises negative self-images in social phobia (e.g., Hackmann et al., 2000), was associated with an increased frequency of negative thoughts and an increased use of safety behaviours when compared to the field-perspective (Spurr & Stopa, 2003). This finding provides support for the proposition that both image-content and image-perspective contribute to the effects of self-imagery in social phobia.

None of the studies discussed so far included a control or neutral imagery condition, which makes it difficult to evaluate the specific source of the observed differences in image valence. For example, the differences in anxiety ratings between negative and positive images might be due to an increase in anxiety in response to a negative image, to a decrease in response to a positive image, or some combination

of the two. Without a baseline, it is impossible to know which explanation is correct. Hirsch, Meynen et al. (2004) did include a control condition; however, the control image generated represented the self feeling relaxed in a social situation and therefore could represent a positive, rather than a control or neutral comparison image. An additional critique of the evidence base is that these studies used non-clinical populations, which raises questions about generalisation to a socially phobic population. However, the literature search identified one study that measured the effects of manipulating self-imagery in participants with social phobia (i.e., Hirsch, Clark et al., 2003). The results from this study are consistent with those from research using non-clinical populations. Promisingly, the manipulation of positive self-images in social phobia was associated with lower levels of anxiety, the perception that anxiety was less visible to others, and better performance ratings by self and others, compared to the negative self-imagery that usually characterises the disorder. This suggests that the generation of positive images could be beneficial in the treatment of social phobia.

There is some support for the potentially causal role of negative self-images in the development of social phobia. Hirsch, Mathews et al. (2006) found that confident public speakers holding in mind negative self-images whilst giving a speech reported increased anxiety, increased self-criticism of performance, more negative thoughts and increased belief in the validity of these thoughts, compared to those holding in mind positive self-images. However, when the effects of negative images were compared with neutral images (i.e., a shopping trip), only the effect of negative images on increased anxiety remained. The results suggest that in confident speakers negative self-images increase anxiety, but positive images do not reduce

anxiety. There were no other differences in the effects of the positive or negative images, and neutral images. However, it would be interesting to explore the relationship between emotionally valenced self-images and neutral images in patients with social phobia. Within this population we might expect negative images, which are repeatedly activated and more entrenched, to exert a greater effect. Therefore, significant differences between neutral and negative images on variables other than anxiety may be observed.

The relationship between negative self-images and anxiety in participants, who do not usually have anxiety problems, is consistent with the idea that these images are involved in the development of social phobia. However, the results of a study carried out by Vassilopoulos (2005), which also included a sample of low socially anxious participants, provided mixed support for this proposition. In contrast to Hirsch, Mathews et al. (2006), Vassilopoulos found no differences between positive and negative self-images on measures of anxiety or performance in low socially anxious participants. It is possible that differences in sample composition may have contributed to the different effects observed. Although both studies included low socially anxious participants, Vassilopoulos did not include participants who were pre-selected to represent confident public speakers as in Hirsch, Mathews et al. However, it is unclear how this could contribute to the different findings within these studies. Further studies including similar low socially anxious participants are needed to clarify the potential importance of negative images in the development of social phobia.

The study of imagery has advanced and is now beginning to focus on investigating the potential interactions between imagery and other cognitive

processes. Biases in memory, attention, and interpretation all contribute to the persistence of social phobia (see Heinrichs & Hofman, 2001; Hirsch & Clark, 2004, for a review). The literature search identified three studies that explored the relationship between imagery and two other cognitive biases: interpretation (Hirsch et al., 2007; Hirsch, Mathews et al., 2003) and autobiographical memory (Stopa & Jenkins, 2007). Firstly, evidence of a positive inferential bias (i.e., a bias towards non-threatening inferences in socially ambiguous situations) has been demonstrated in non-anxious individuals. However, high socially anxious individuals lack this positive inferential bias (e.g., Hirsch & Mathews, 2000). Additionally, holding in mind a negative self-image blocks the positive inferential bias in non-socially anxious participants (Hirsch, Mathews et al., 2003). In individuals with social phobia, imagery could therefore be indirectly preventing access to information that could contradict negative perceptions of social performance. This may be one way in which imagery is indirectly maintaining social anxiety. Furthermore, recent evidence suggests that the relationship between imagery and inferential bias may be reciprocal. Hirsch et al. (2007) demonstrated that participants trained to make negative interpretations of socially ambiguous events (i.e., inducing a negative inferential bias) generated more negative self-related images than those trained to make positive interpretations (Hirsch et al., 2007). This pattern of results was found even after controlling for levels of state anxiety. Taken together with Hirsch, Mathews, et al.'s (2003) earlier findings, the results suggest a reciprocal relationship between self-imagery and inferential bias in social anxiety, which may contribute to the maintenance of social phobia.

Secondly, Stopa and Jenkins (2007) examined the relationship between self-imagery and autobiographical memory in participants with high levels of social anxiety. This study evaluated whether holding a positive or negative self-image in mind during a speech would affect the retrieval of autobiographical memories in response to positive, negative and neutral cue words. Positive memories were retrieved more quickly in the positive imagery condition and negative memories were retrieved more quickly in the negative imagery condition. There was no difference between the latencies of memories retrieved in response to negative and neutral words, but positive memories took significantly longer to retrieve in the negative imagery condition. In this study, using the neutral word retrieval latencies as a baseline suggests that negative self-images had an inhibitory effect on the retrieval of positive autobiographical memories. Stopa and Jenkins suggest that given the recall of social memories is an important part of anticipatory and post-event processing then the inhibition of positive memories is likely to lead processing outside the social situation to become progressively more negative. This process could therefore ultimately maintain social anxiety. These three studies highlight the next step in furthering our understanding of the potential maintaining role of imagery in social anxiety; specifically, the idea that imagery may, in part, exert its effects through interactions with other cognitive processes implicated in the persistence of social phobia (Hirsch, Clark, & Mathews, 2006).

#### *Directions for Future Research*

In summary, negative images of the self appear to be an integral part of the experience of social phobia. Evidence supports their role in the maintenance of the disorder through their ability to influence the socially phobic individual's affective,

cognitive and behavioural responses in social situations. Reviewing the literature has highlighted a number of avenues for future research which would potentially further our understanding of the role of imagery in the maintenance, and even the development of social phobia.

Initial evidence suggests a similar pattern of results between clinical and non-clinical populations. However, more research is needed using participants with social phobia to enable current findings to be generalised. Additionally, it is important to begin to disentangle the effects of positive and negative self-imagery. It is necessary to establish a neutral imagery condition which acts as a baseline against which the effects of positive and negative images can be compared. The image of the shopping trip used by Hirsch, Mathews et al. (2006) as a neutral image may not be appropriate to use with highly socially anxious participants. A shopping trip represents a social situation and as such may function as a negative image for anxious participants. Using an object image (e.g., a ball) may be more representative of a neutral image across high, medium and low socially anxious groups, especially in comparison to positive and negative images of the self. Establishing the relative contributions of positive and negative self-imagery has important implications for the way in which images are targeted within treatment. For example, although the difference in anxiety associated with positive and negative imagery highlights the beneficial effects of targeting negative images, it remains unclear how these images could be most effectively targeted. If these differences are solely due to the detrimental effects of negative images, then neutralising or eliminating these images may be useful in therapy. However, if positive images lead to a reduction in anxiety, then modifying negative self-images and constructing positive images of the self may be beneficial



in treatment. However, this may be potentially more challenging in patients who have a prevailing negative social self-view.

The continued exploration of the potentially causal role of imagery in social phobia is also important given the limited number of published studies and the mixed findings. If negative images have a causal role, we would expect that holding in mind a negative self-image during a social interaction would have adverse consequences, even for individuals who are not normally prone to social anxiety. One way to test this hypothesis would be to ask participants with social phobia, as well as those who report high, medium and low levels of social anxiety, to hold in mind positive, negative and neutral images, and to measure aspects of behaviour, affect and cognition proposed to maintain social anxiety (e.g., anxiety, performance, frequency of negative thoughts). If negative images have a casual role, the direction of the effects observed across anxiety groups could be similar. However, we might expect the magnitude of differences between positive and negative images to be positive correlated with reported levels of social anxiety. Negative images are likely to be more entrenched in participants with higher levels of social anxiety and therefore may exert a more powerful effect within this group.

Future research should continue to explore the interactions between imagery and other cognitive processes. This would further our understanding of the underlying processes contributing to the persistence of social phobia and could inform more effective treatment protocols. For example, if biased cognitive processes work together to maintain social phobia, it may be necessary to target these processes together in therapy in order to facilitate clinical change (Hirsch, Clark et al., 2006). It would be interesting to explore whether the relationship between

imagery and autobiographical memory, observed by Stopa and Jenkins (2007), is reciprocal. There is some evidence to suggest the presence of a negative bias in the retrieval of memories in response to social threat-related cues (Wenzel & Cochran, 2006). In line with this evidence and the proposal that memory processes contribute to the construction of self-images in social phobia (Rapee & Heimberg, 1997), biased memory processes could contribute to the negative nature of the self-image experienced in social phobia. One way to test this hypothesis might be to introduce a bias in memory processes (e.g., participants could be trained to retrieve positive, negative or neutral autobiographical memories) and then ask participants to generate images of self. If the relationship is reciprocal, then the biased retrieval of negative memories may be associated with the construction of more negatively valenced images than the retrieval of positive or neutral memories. Conversely, the retrieval of positive memories may be associated with more positively valenced images than negative or neutral images.

Finally, to date, both the theoretical models and the research have largely focused on describing the presence, nature and the effects of the negative imagery experienced in social phobia. However, exactly how these images exert their effects continues to remain unclear. One possible answer may lie in the fact that these images function as representations of self. Given that current cognitive models of social phobia emphasise the role of images as self-representations (Clark & Wells, 1995; Rapee & Heimberg, 1997), it is perhaps surprising that this proposition has not yet been examined within the published literature. The remaining part of this paper will therefore focus on exploring the relationship between imagery and self and will

discuss the way in which this could inform our understanding of how images may exert their effect in social phobia.

### **How do Negative Images Affect the Self?**

If images do function as representations of the self in social phobia, exploring the relationship between images and the self is critical. What defines the experience of self is a complex issue. Conway and Pleydell-Pearce (2000) propose that an individual's sense of self is constructed from a knowledge base of autobiographical memories and autobiographical knowledge (Conway & Pleydell-Pearce, 2000). Autobiographical memory and self are, according to Conway and Pleydell Pearce, inextricably linked within a *Self-Memory System* (SMS). If this is the case, then the negative images in social phobia might function as part of this SMS, and accessing these images could directly influence the individual's experience of self. This proposition is in line with Rapee and Heimberg's (1997) cognitive model of social phobia, in which autobiographical memory is implicated in the construction of self-images. The potentially triadic relationship between self, autobiographical memory and imagery could therefore usefully inform our understanding of how self-images exert their effect in social phobia.

In order to explore how imagery might function within the SMS, an understanding of the nature of the relationship between autobiographical memory and self is necessary. The SMS, as first conceptualised by Conway and Pleydell-Pearce (2000) and elaborated on by Conway, Singer and Tagini (2004), is a very comprehensive theoretical model and it is not possible to explore it in detail here. However, a brief overview, which reviews the elements that may be of specific

relevance to a potential relationship between imagery, autobiographical memory and self, is given below.

### *The Working Self*

According to Conway and Pleydell-Pearce (2000), the SMS stores many different types of information about the self (e.g., knowledge about life time periods, memories about general events, and memories of specific autobiographical events). This information provides the knowledge base from which different self-representations are constructed. A critical component of the SMS is the concept of the *working self* (Conway & Pleydell-Pearce, 2000), which represents a complex hierarchy of interlocked goals and sub-goals. These goals represent a subset of working memory control processes organised into interconnected goal hierarchies. The goals of the working self motivate the generation of plans, actions, and the encoding and retrieval of memories congruent with one's current needs (Conway & Holmes, 2004; Conway & Pleydell-Pearce, 2000; Conway, Singer et al., 2004). Conway and Pleydell-Pearce draw an analogy between the working self and working memory (Baddeley & Hitch, 1974). Working memory contains information currently being used or manipulated by the memory store. In the same way, the working self provides the individual with access to the self-knowledge (e.g., beliefs, attitudes and memories) that is needed in any given context or situation (Conway & Pleydell-Pearce, 2000). The notion that not everything about the self is in awareness at any one time suggests that multiple different self-representations exist, all of which have the potential to inform the overall experience of self.

The negative sense of self that is characteristic in social phobia may represent just one of the social phobic's working self concepts, all of which have the potential

to be activated or accessible in social situations. This is in line with Brewin's (2006) retrieval competition account, in which he proposes that multiple representations of self exist in memory and compete for retrieval in any given situation. Brewin argues that self-representations consist of numerous semantic and episodic memories, together with desired and feared attributes of self. In this framework, the different representations compete for retrieval and factors such as rehearsal, the availability of specific retrieval cues, and the distinctiveness and valence of representations determine which representation is successfully retrieved (see Brewin, 2006). The existence of multiple representations of self and the activation of negative representations in social situations is also consistent with Clark and Wells' (1995) proposition that the negative self-schemas experienced in social phobia are unstable. They argue that these self-schemas are activated by anticipating, participating in, or ruminating on social interactions.

Within the SMS framework, it is possible that the negative images of the self reported in social phobia function as one form of self-representation that is highly accessible in social situations. These images could therefore contribute to the construction of the individual's working self in social situations. Within the SMS, the power of these images lies in their relationship to self and autobiographical memory. As noted above, a theoretical relationship between imagery and memory is described by Rapee and Heimberg (1997) within their model of social phobia. However, is there any evidence to support the existence of this relationship? The following section addresses this question.

## **Autobiographical Memory and Imagery**

There is only one published study that directly evaluates the validity of Rapee and Heimberg's (1997) proposition. Hackmann et al. (2000) interviewed 22 participants all of whom had a diagnosis of social phobia. They all reported experiencing recurrent and negative spontaneous images of self that were relatively stable across time and feared situations. Critically, all but one participant felt that these images were linked to a memory of earlier aversive social events (e.g., bullying, criticism and humiliation), clustered in time around the onset or worsening of their disorder. Memories and images reported in this study were linked in both theme and content. For example, one participant described herself in her image as sitting at a table, looking nervous and smaller than she was as an adult. In the linked memory, she was sitting at the tea table being criticized by her father. Although when specifically asked, participants were able to link current images with past memories, these links were not held in conscious awareness; participants did not generally report recollection of these memories when images were triggered. It is possible that the repeated activation of the images over the years may have resulted in participants forgetting the original events that triggered the image (Hackmann et al., 2000). This could then reinforce the validity of the image as an accurate reflection of the current self.

The results of this study are consistent with the proposition that unpleasant social experiences may lead individuals with social phobia to develop a negative image of the social self, which is repeatedly activated in social situations, and is relatively resistant to change (Hackmann et al., 2000). Hirsch, Clark et al. (2006) suggest that these images may not simply represent veridical sensory data, but they

can also contain interpretations of the event that were made at the time. Therefore, these images may not directly correspond to observed reality. In social phobia, where interpretations are negatively biased in social situations (e.g., Stopa & Clark, 2000), the resulting image-memory may therefore represent a distorted and negatively biased picture of the original event. This is consistent with the negative and distorted nature of the images reported in social phobia (Hackmann et al., 1998).

There are no other published studies evaluating the relationship between imagery and autobiographical memory in social phobia. This limits the conclusions which can be drawn and further research utilising larger sample sizes is essential. However, there is an emerging evidence base that supports the relationship between imagery and autobiographical memory across a range of other clinical disorders. In post-traumatic stress disorder there is a clear autobiographical precipitant and the re-experiencing of the trauma through intrusive imagery is a central feature of the disorder (APA, 2000). Furthermore, evidence suggests that distressing negative imagery is a feature of many other clinical disorders including agoraphobia (Day et al., 2004), obsessive-compulsive disorder (Speckens, Hackmann, Ehlers, & Cuthbert, 2007), body dysmorphic disorder (Osman et al., 2004), and psychosis (Morrison et al., 2002). Within all the studies quoted, the images reported by the majority of patients either represented actual memories of traumatic events, or were closely linked in content to the memories of such events. This emerging trend across a range of clinical disorders provides some indirect support for the argument that the relationship between distressing imagery and autobiographical memory is important in social phobia.

The memories associated with the distressing images across the range of clinical disorders appeared to represent self-defining moments in the individual's life, potentially representing specific *self-defining memories* (see Singer & Salovey, 1993). A self-defining memory is a highly significant personal memory that can be characterised by the following properties: it is vivid and evokes strong emotion at the time of recollection, it is repeatedly accessed and linked to other similar memories, and is connected to an enduring personal concern or unresolved conflict (Singer & Salovey, 1993). The memories described within the research above appeared to capture critical points within the lives of the participants; specifically representing a point in time when their difficulties either began or worsened (Day et al., 2004; Hackmann et al., 2000; Speckens et al., 2007). Conway et al. (2004) suggest that memories of negative self-defining moments can be aversive. This may lead the individual to avoid thinking about or processing these memories, leaving little opportunity for them to find a place within the structure of autobiographical memory. Memories of such highly self-relevant events remain in a state of high accessibility and are among the first to come to mind when a period in the past is freely sampled (Conway & Holmes, 2004). According to Conway (2005) these highly accessible memories provide the major active content of the self and it is from this knowledge that self-images emerge.

If negative self-images in social phobia and the memories on which they are based, represent such self-defining moments, then they could be highly sensitive to activation and triggered automatically by relevant cues with the potential to disrupt functioning. This proposition is in line with patients' reports of the spontaneous and intrusive nature of the self-imagery experienced in social phobia (Hackmann et al.,



1998). It is also consistent with reports from highly socially anxious participants', of the intrusive and disruptive nature of images (i.e., interfering with concentration) associated with past anxiety provoking social events (Rachman, Gruter-Andrew, & Shafran, 2000). However, research exploring the specific self-defining qualities of the memories reported in social phobia (e.g., affective intensity, vividness, high levels of rehearsal, linkage to similar memories and connection to an enduring concern or unresolved conflict; Singer & Moffitt, 1991; Singer & Salovey, 1993) would clarify whether the autobiographical memories associated with negative self-images do formally constitute self-defining memories. Qualitative analysis of the thematic content of the memories and associated images reported in social phobia would provide a useful insight into their nature.

There is indirect support for both the importance of self-defining memories and for the link between images and these memories, in two studies that have used imagery rescripting as part of a treatment programme for social phobia (see Wild, Hackmann, & Clark, 2007, 2008). Imagery rescripting involves a set of related procedures in which patients revisit their image-associated traumatic memory in a number of stages (including re-experiencing of the memory and image, cognitive restructuring and rescripting of the earlier traumatic memory). Preliminary results from these studies indicate that the process of imagery rescripting can lead to a significant improvement in negative self-beliefs, image and memory distress and vividness, fear of negative evaluation, and anxiety in feared social situations (Wild et al., 2007, 2008). The association between rescripting memories and a reduction in the distress associated with the intrusive imagery is promising because it suggests

that changing significant (and possibly self-defining) memories may have a role in improving treatment outcome in social phobia.

In summary, evidence from a number of different sources supports the proposition that there is an important relationship between distressing imagery and autobiographical memory in social phobia. This evidence, together with the relationship between self and autobiographical memory described by Conway and Pleydell-Pearce (2000), suggests that our understanding of how images exert their effects in social phobia may be usefully facilitated by exploring the relationship between imagery and self within the SMS framework. However, first we need to explore the mechanisms that underpin the relationship between autobiographical memory and self. Therefore, in the next section the SMS model will be briefly introduced and the way in which autobiographical memory and the working self may interact to contribute to the experience of self will be discussed.

### **Autobiographical Memory and the Working Self**

A critical feature of the SMS is that all cognition is goal driven. The working self draws on autobiographical knowledge and memory to set and constrain current goals (Conway & Pleydell-Pearce, 2000; Conway, Singer et al., 2004). Current goals are constrained by past experience and cannot contradict stored autobiographical knowledge. For example, the goal of becoming an Olympic swimmer could not reasonably be set or maintained if the individual can only recall memories related to a fear of water. In the same way that goals cannot contradict knowledge, the working self operates to ensure that accessed knowledge cannot contradict active goals. The working self facilitates the availability of knowledge and memories that confirm and reinforce current conceptions of self that are highly accessible (see

McAdams, 2001, for a review). This may be through influencing the initial encoding of knowledge or through the retrieval and memory construction process (Conway & Pleydell-Pearce, 2000; Conway, Singer et al., 2004). Knowledge that contradicts the active goal structure may be prevented from influencing it, or, when accessed, the knowledge may be edited, distorted or changed in some other way (Conway & Holmes, 2004). To elaborate on the example above, if autobiographical knowledge contains a mixture of positive and negative experiences of swimming performance, then knowledge of success may be facilitated and combined into accessible memory, and knowledge of failures may be inhibited or distorted.

The mechanism described above is conceptualised as the principle of *self coherence* and is fundamental to the stability of the SMS (Conway & Pleydell-Pearce, 2000; Conway, Singer et al., 2004). Discrepancies between the goals of the working self and available autobiographical knowledge indicate a breakdown in normal functioning that may lead the SMS to enter a pathological state (Conway & Pleydell-Pearce, 2000). Discrepancies challenge the goal structure of the working self resulting in tension within the SMS and instability in the experience of self. Maintaining coherence within the system is therefore a critical underlying function of the working self (Conway, 2005). One of the fundamental functions of autobiographical memory and autobiographical knowledge appears to be directly informing the goals of the working self and contributing to this coherence of self. The whole system is goal driven, and therefore, if images do have a function within this system, then it is likely that they too will have a relationship with goals. The possible relationship between imagery and goals within the SMS will be discussed next.

## Imagery, Goals and the Working Self

Within the SMS, autobiographical memories are primarily conceptualised as records of goal attainment or goal failure (Conway & Pleydell-Pearce, 2000).

Therefore, images deriving directly from such memories probably represent specific goal states (Conway, Meares, & Standart, 2004). One possibility is that the negative self-images reported in social phobia represent records of goal failure. Although Conway and Pleydell-Pearce (2000) do not specifically discuss the nature of the goals within the SMS, they do propose that theoretical approaches that focus on the control of self-discrepancies can usefully further our understanding (e.g., Higgins, 1987). In Higgins' theory of self and affect, the self is separated into three domains: the *actual self* (represented by a set of attributes that you believe you actually possess), the *ideal self* (what the self aspires to be), and the *ought self* (the self one should be, as specified by significant persons and society in general). According to self-discrepancy theory, different experiences of negative affect arise from perceived discrepancies between these different selves.

Conway and colleagues propose that the need to reduce discrepancies may be a useful way of understanding the goals of the self system (Conway & Pleydell-Pearce, 2000). In social phobia, discrepancies between actual and ought selves are characteristic (e.g., Alden & Wallace, 1991; Strauman, 1989; Weilage & Hope, 1999) and are associated with negative emotions such as agitation and fear (e.g., Higgins, Bond, Klein, & Strauman, 1986; Strauman, 1996; Strauman & Higgins, 1987). They appear to represent the individual's belief that his or her social performance will not meet the performance standards expected by the others (e.g., Weilage & Hope, 1999). Negative self-images that depict the individual's worst fears

regarding their performance may therefore visually represent a failure to reduce discrepancies between actual and ought selves.

The specific role of imagery, and the relationship between imagery and goals, has been the subject of some theoretical debate (see Conway, Meares et al., 2004), although this is largely an area of emerging interest. Conway, Meares et al. (2004) propose that images represent information about goals that cannot be directly or consciously accessed. Therefore, when an image or a set of images is accessed, important goal information becomes available. This information has the potential to influence the goals of the working self, and subsequently, to influence current processing. The role of images within the SMS is discussed in terms of their function in self-regulatory feedback loops (see Carver & Scheier, 1982, for a review of self-regulatory feedback loops). In a negative feedback loop, the overall function is to reduce the perceived deviation from a comparison value (Carver & Scheier, 1982). Conway, Meares et al. (2004) propose that the goals and sub-goals of the SMS are largely made up of these negative discrepancy-reducing feedback loops that motivate behaviour, affect and cognition. In these feedback loops, the goal state (i.e., the comparison value) represents a state of the world to be achieved. Therefore, the actual perceived state of the world is compared to this goal state, and if a discrepancy is detected, plans are put into place to reduce it. The need to reduce discrepancies is proposed as a primary goal of the SMS (Conway, Meares et al., 2004). Negative imagery provides a challenge to this goal and thus creates conflict and instability within the system (Conway, Meares et al., 2004). The content of negative self-images reported in clinical disorders, such as social phobia, are proposed to represent states of the world to be avoided (Conway, Meares et al., 2004; Dadds, Hawes,

Schaefer, & Vaka, 2004). This is consistent with the earlier proposition that images could function as visual representations of discrepancies between actual and ought selves.

Within the SMS framework, negative images may function as the goal state (i.e., the comparator value) within discrepancy-enhancing positive feedback loops (Conway, Meares et al., 2004). As such, the goal is to increase the discrepancy between the image state and the actual perceived state of the world. The unconstrained nature of these positive feedback loops is one of the factors underlying the power and the distressing nature of negative images in clinical disorders (Conway, Meares et al., 2004). These systems are unbounded. The goal is to simply avoid the image state, and therefore there is no pre-defined end point at which the goal is reached. The image and the actual state of the world can never perfectly match<sup>2</sup> and therefore, the goal can never be fully achieved.

Within the SMS, goal processing gives rise to emotion (Oatley, 1992) and emotions are conceptualised as the way in which the individual experiences progress in goal processing (Conway, Meares et al., 2004). Therefore, the experience of goal failure and the unbounded goals represented in positive feedback loops might increase tension within the SMS and intensify the experience of negatively toned emotions. During periods of instability and tension, the self is less capable of operating effectively upon the world and is more vulnerable to external stressors (Conway, 2005). Negative images of the self in social phobia may therefore function,

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<sup>2</sup> This is in contrast to negative feedback loops where the referent, e.g., the image state, represents a state of the world to be achieved and as such represents a defined end point.

within the SMS, as representations of goal failure that have the ability to influence the goals of the working self and give rise to the experience of negative affect.

In summary, the negative images experienced in many clinical disorders could represent goal-states to be avoided. Activation of these images provides the working self with access to specific goal information (i.e., the goal of avoidance and discrepancy enhancement), which influences the goals of the working self, which in turn influences the specific experience of cognition, affect and behaviour.

### **How do Negative Self-Images Exert Their Effect?**

How can the relationship between imagery, self and autobiographical memory described above contribute to our understanding of how negative self-images exert their effects in social phobia? Within the SMS framework, an image may function as one form of self-representation, which when activated, has the potential to influence the working self (i.e., the view of self that is currently active which encapsulated current goals). If the working self is ultimately responsible for the generation of plans, actions, and the encoding and retrieval of memories (e.g., Conway & Pleydell-Pearce, 2000), and if images of the self feed into the working self, then activation of these images may initiate specific processes and behaviours which may be involved in the maintenance of social anxiety (e.g., increased use of safety behaviours, the quicker retrieval of negative autobiographical memories). However, this proposition requires rigorous empirical investigation. Conceptualising self-images within the SMS framework leads to a number of testable hypotheses, which, if empirically validated would provide some support for the proposition above. In the final section of this paper some of these hypotheses will be discussed, along with a number of avenues for future research. The aim is to stimulate further

thinking within the area and to provide a starting point from which research can evolve.

*Do Negative Images of the Self Influence the Experience of Self?*

If negative images of the self function as one form of representation (rooted in autobiographical memory), then like autobiographical knowledge, these images could contribute to the construction of the individual's working self. Images of self are just one form of self-representation. If these images function within the SMS framework where self-coherence ultimately motivates cognition, then their activation could be associated with the facilitation of other negatively valenced representations of self, or indeed with the inhibition of more positively valenced representations. Conversely, positive images of the self may inhibit negatively valenced representations and facilitate more positive representations of self. If this is true, then negative images may reinforce a negative and maladaptive self-view by influencing the accessibility of other internally accessible self-related information. The importance of this information in feeding into the individual's self-view is likely to be emphasised by the process of increased self-focused attention (Clark & Wells, 1995).

To date, there are no published studies examining the relationship between imagery and the self in social phobia. However, the experience of self in social phobia has been the target of research. For example, low levels of positive implicit and explicit self-esteem (e.g., Bouvard et al., 1999; Tanner, Stopa, & De Houwer, 2006), more negative ratings of self-attributes (e.g., Moscovitch, Orr, Rowa, Reimer, & Antony, 2009), and specific schematic themes (e.g., social undesirability/defectiveness; Pinto-Gouveia, Castilho, Galhardo, & Cunha, 2006) all



appear to characterise the negative sense of self at the heart of the disorder.

Therefore, in beginning to evaluate the relationship between imagery and the self, a useful place to start may be to ask participants to hold differently valenced self-images in mind and measure active aspects of the self (i.e., the working self) such as those highlighted above. If negative images function in the way proposed, negative self-images could be associated with more negative representations of self (e.g., as represented by lower levels of self-esteem or more negative ratings of self-attributes) compared to positive self-images. The inclusion of participants reporting both high and low levels of social anxiety would allow exploration of the potential role of negative imagery in both the development and persistence of a negatively valenced self-view.

What defines self and how we measure working self is a complex issue beyond the scope of this paper. However, arguments highlighting an overreliance on specific components of self such as self-schema (Luke & Stopa, 2009) suggest a need to expand the study of self in future research. For example, literature on the self is beginning to distinguish between the content of self (e.g., who am I? how do I feel about myself?) and the structure of self (e.g., how the self-content is organised) (e.g., Campbell et al., 1996). Therefore, researchers may need to consider this distinction when designing studies that explore the imagery and the self in social phobia.

#### *Do Negative Images of the Self Represent Information About Goals?*

Within the SMS framework images are conceptualised as goal states; with negative self-images representing information about past goal failures. These negative images are described as discrepancy-enhancing and depict situations or experiences that should be avoided. One suggestion is that they represent past

failures to align actual and ought views of self. In contrast, positive images are described as discrepancy-reducing, thus representing states of the world to be achieved. One way to test the relationship between the negative self-images and self-discrepancies would be to ask individuals with social phobia, or those reporting high levels of social anxiety, to hold in mind positive, negative and neutral images of the self and to measure levels of self-discrepancies. In line with the self-discrepant nature of negative images described by Conway, Meares et al. (2004), negative images of the self could be associated with higher levels of self-discrepancies than positive or neutral images; potentially higher levels of discrepancies may exist between actual and ought selves. Additionally given the suggestion that negative images function similarly across diagnoses (Conway, Meares et al., 2004), it would be useful to explore the potentially self-discrepant nature of imagery across a range of clinical disorders (e.g., agoraphobia, body dysmorphic disorder). At a more general level, qualitative analysis of the themes encapsulated within these images and how these themes relate to the individual's personal goals may also provide useful insights into the potentially goal-related nature of images in social phobia and other clinical disorders.

#### *Do Negative Images of the Self Influence Affect and Behaviour?*

If negative self-images do represent discrepancy-enhancing goal information, then they may influence affect and behaviour through their ability to make this specific goal information available to the working self. Negative self-images may influence the experience of anxiety by providing access to discrepancy-enhancing information, which challenges the stability of the self system. Additionally, if negative self-images represent the goal of avoidance, then these images are likely to

influence the generation of plans and specific behavioural responses in social situations. The increased use of safety behaviours in social phobia that has been associated with negative self-imagery (e.g., Hirsch, Meynen et al., 2004) could be conceptualised as an attempt to avoid the image state by increasing the discrepancy between the image state and the perceived state of the world. For example, an individual experiencing an image of him or herself as visibly red and shaking, may seek to avoid eye contact, keep their face covered, tightly grip on to items in their possession or even leave the situation completely. All these behaviours could represent an attempt to stop others from noticing what they perceive to be their appearance and thus act as a way of increasing the discrepancy between the image and actual-state of the world. As highlighted, the current evidence base supports the relationship between negative self-images and increased anxiety, and the increased use of safety behaviours in highly socially anxious participants (e.g., Hirsch, Meynen et al., 2004). The relationship between imagery and goals may provide a framework within which this relationship can be understood.

#### *Do Negative Images of the Self Influence Memory Processes?*

As discussed earlier, the working self is responsible for the encoding, construction and retrieval of autobiographical memories. Therefore, if negative self-images do influence the goals of the working self, then they could indirectly influence memory processes. Consistent with the overall goal of self-coherence, negative self-images could be associated with the inhibition of positive, and the facilitation of negative, autobiographical memories. Additionally, information may also be subject to biased processing at encoding. Negative images may be associated with a self-congruent bias for the encoding of more threat-related or negative self-

related information. Evidence demonstrating selective attention to socially threat-related information in participants with social phobia is consistent with this proposition (e.g., Hope, Rapee, Heimberg, & Dombeck, 1990). Negative images of the self may therefore maintain a negative self view by minimising the accessibility of incongruent (i.e., positive) information and facilitating the accessibility of congruent (i.e., negative) information. Stopa and Jenkins (2007) provided some support for this idea when they noted an inhibitory effect of negative self-images on the retrieval of positive autobiographical memories. However, with only one published study within this area, the conclusions which can be drawn are limited and further research is needed.

There are a number of experimental paradigms that capture autobiographical memory processes that could be usefully employed to explore the interaction between imagery and memory. For example, in order to evaluate potential biases within the retrieval process, future studies could explore the effect of holding in mind differently valenced images of self on factors such as speed of memory recall in response to positive, negative, and neutral cue words (e.g., a standard autobiographical memory task as used by Williams & Broadbent, 1986). Open-ended recall tasks could be employed to assess potential biases on free recall. Inclusion of a social threat task, which is associated with the activation of a prevailing negative self-view (Clark & Wells, 1995), would usefully recreate a situation in which these biased memory processes are most likely to occur. If negative self-images function in line with the SMS goal of self-coherence, then they could lead to the faster retrieval of negative autobiographical memories, and these memories would be recalled more often than positive or neutral autobiographical memories. Conversely, positive

memories could be retrieved more quickly and more often than negative or neutral memories.

*Do Positive Images of the Self Have Beneficial Effects in Social Phobia?*

An important point arising from this account of how images may function is that if images do influence the working self, then positive images may have potentially beneficial effects in social phobia. The current evidence base provides some support for this proposition with a number of studies demonstrating the relative benefits of holding positive compared to negative images in mind, e.g., lower levels of anxiety, reduced use of safety behaviours, and higher ratings of performance by self and others (e.g., Hirsch, Meynen et al., 2004). However, as previously stated, future research should include neutral imagery conditions in order to assess the specific contribution of positive imagery in highly socially anxious participants.

Helping patients with social phobia to construct more positive images of the self in treatment (e.g., imagery rescripting; Wild et al., 2007, 2008) could be conceptualised as an attempt to increase the accessibility of more positive autobiographical knowledge and more positive self-representations, and to reduce the accessibility of more negative knowledge and negative self-representations. This proposition is consistent with Brewin's (2006) retrieval competition account of cognitive-behaviour therapy (CBT). Brewin argues that altering the relative accessibility of self-representations (creating and increasing the accessibility of more positive representations) may underpin clinical change in CBT (see Brewin, 2006 for a full review of the retrieval competition hypothesis). The accessibility of this more positively valenced self-knowledge could potentially challenge the persistent negative view of self in social phobia. This may contribute to the construction of a

more functional and adaptive working self and potentially a reduction in social anxiety. As highlighted earlier, the relationship between imagery and other representations of self requires empirical investigation. However, the relationship between self-view and social anxiety has gained some support from Hofmann, Moscovitch, Kim, and Taylor (2004) who demonstrated that reductions in negative self-perception<sup>3</sup> following treatment for social phobia were significantly correlated with reductions in social anxiety.

Furthermore, in line with the discussion above, the development of more positive self-enhancing images could also be understood as an attempt to replace discrepancy-enhancing goals (e.g., things to be avoided) with discrepancy-reducing goals (e.g., things to be achieved) (Conway, Meares, et al., 2004). These discrepancy-reducing goals may then function to maintain the stability of the self system and contribute to the reduction in anxiety observed when participants hold in mind positive self-images (e.g., Hirsch, Clark et al., 2003). One way to begin to explore this proposition may be to measure self-discrepancies prior to, and following treatments, which aim to modify the nature of the self-images experienced in social phobia. Conway and colleagues' (Conway, Meares et al., 2004) proposal indicates that in treatments where negative images are replaced with more positive images, a reduction in the experience of self-discrepancies should result.

A number of CBT programmes include techniques that aim to modify negative and distorted images of the self (e.g., Clark et al., 2003; Clark & Wells, 1995; Heimberg & Becker, 2002; Stangier, Heidenreich, Peitz, Lauterbach, & Clark,

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<sup>3</sup> Changes in negative self-perception were defined by a reduction in frequency of negative self-referent thoughts.

2003). However, such techniques have generally only been evaluated as part of a wider treatment programme including other cognitive and/or behavioural elements. Furthermore, with the exception of preliminary investigations into the effectiveness of imagery rescripting, research studies do not generally measure the effect of treatment programmes on patients' experience of imagery. Therefore, at present, it is not possible to evaluate whether treatments actually do influence the images they aim to modify, or whether modification of these images is associated with improvements in clinical symptomology. In order to assess these propositions it would be valuable to begin to evaluate the individual's experience of imagery (e.g., frequency, content, associated distress, and vividness of any imagery experienced) as a specific outcome measure of treatment. Additionally, dismantling studies may be a useful means of exploring the effect of specific imagery modification procedures on clinical symptomology.

### **Conclusion**

Spontaneous negative and distorted images of the self appear to influence a range of cognitive, affective and behavioural responses which are implicated in the maintenance of social phobia. However, how these images exert their influence is as yet unclear. The relationship between images, self and autobiographical memory suggests the utility of drawing on theoretical models of self and memory to further our understanding. Within this paper, the SMS as described by Conway and colleagues (Conway & Pleydell-Pearce, 2000; Conway, Singer et al., 2004) has been presented as a framework within which the effects of imagery in social phobia could be understood. Within this framework images may function as one form of self-representation with the potential to influence the working self. It is through this

relationship with the working self that these images could exert their effects on cognition, emotion and behaviour in social phobia. The theoretical propositions outlined indicate the need to further evaluate the potentially triadic relationship between imagery, self and autobiographical memory and a number of avenues for future research have been discussed. It is hoped that this paper will provide a springboard for future research, and that it may act as a catalyst for further thinking with regards to the mechanisms that could underpin the effects of imagery in social phobia.



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## **Empirical Paper**

### **Images of the Self in Social Anxiety: Effects on Components of the Self**

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(see Appendix B for 'Guide for Authors')

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## Abstract

This study utilised an imagery manipulation technique to examine how the valence of self-imagery affects different aspects of the self. Eighty-eight participants pre-screened for high ( $n=44$ ) and low ( $n=44$ ) levels of social anxiety held either a positive or a negative self-image in mind. Participants completed measures of implicit and explicit self-esteem, and self-concept clarity. Results indicated that both high and low socially anxious participants, holding in mind a negative self-image, reported lower levels of positive explicit self-esteem, a weaker positive implicit self-esteem bias, and higher levels of negative explicit self-esteem, than those holding in mind a positive self-image. Negative images were only associated with reduced self-concept clarity in low socially anxious participants. Participants then took part in a social threat activation task, 'Cyberball', during which they were excluded by two of the three other players in a virtual ball toss game. Results indicated that during this experience of social threat, the increase in self-esteem associated with positive self-imagery in the first part of the study was still evident across participant groups. Overall, the findings support the validity of interventions that aim to modify negative images of the self and promote more positive images in social phobia. The results suggest a potential relationship between self-imagery and some specific, self-evaluative components of the self-concept. The potential contribution of this relationship to the persistence of social phobia is discussed.

Keywords: Social anxiety; Social phobia; Imagery; Self-esteem; Self-concept clarity; Social exclusion.

## Introduction

Social phobia is characterised by the experience of a negative sense of self that is represented by the negative automatic thoughts frequently reported by patients (e.g., Glass, Merluzzi, Biever, & Larsen, 1982; Stopa & Clark, 1993). This negative self-view is also encapsulated for many by the content of the negative and distorted self-images commonly experienced in social phobia (e.g., Hackmann, Clark, & McManus, 2000; Hirsch, Clark, & Yiend, 2004). These negative images of self are, at least in part, linked to autobiographical memories of early aversive or traumatic experiences such as bullying (Hackmann et al., 2000). According to Conway and Pleydell-Pearce (2000), self and autobiographical memory are inextricably linked within a Self-Memory System (SMS). This system stores many different types of information about the self (e.g., knowledge about life time periods, memories about general events and memories of specific autobiographical events), and provides the knowledge base from which self-representations are constructed (Conway & Pleydell-Pearce, 2000; Conway, Singer, & Tagini, 2004).

The negative self-images experienced in social phobia could form part of the SMS in which the *working self* (i.e., the current active self-concept; see Conway & Pleydell-Pearce, 2000) that is retrieved in response to social threat is characterised by low self-esteem, uncertainty about self, and fear of negative evaluation by others. This suggestion is consistent with Brewin's (2006) retrieval competition hypothesis in which he argues that multiple representations of self compete for retrieval. Frequent and elaborate rehearsal of a memory representation during which it is deeply semantically processed increases its accessibility (Baddeley, 1990). For individuals with social phobia, the repeated retrieval and enhanced processing caused

by increased self-focused attention on negative self-images is likely to increase accessibility, making them more likely to win the retrieval competition. This repeated activation may also increase the accessibility of other congruent self-representations, and may reduce the accessibility of more positive competing self-representations. The latter proposition could be explained by the phenomenon of Retrieval Induced Forgetting (Anderson, Bjork, & Bjork, 1994), which demonstrates that the recall of particular information from long-term memory can impair the retention and recall of related competing memory representations. The end result of all of these processes would be to ultimately reinforce the individual's negative sense of self. If this is the case, then manipulating the content of the self-imagery experienced by individuals with high levels of social anxiety could influence the construction of the working self-concept; for example, negative self-images could activate a more negative and dysfunctional working self-concept than positive images.

The overall aim of this paper is to examine how the valence of self-imagery affects different aspects of the self. In the first part of the study, we examine the effects of manipulating positive and negative self-imagery on two aspects of the self-concept, namely self-esteem and self-concept clarity. These concepts will be described in more detail below. In the second part of the study, we investigate whether positive and negative images affect the experience of self during a social threat activation task.

### *Social anxiety and the self*

What defines self is a complex issue and our experience of self is the end result of multiple processes not all of which are accessible through conscious

reflection (Stopa, 2009). This study utilises self-esteem as a measure of self, because it provides the opportunity to measure an active evaluative attitude towards self (Demo, Savin-Williams, Lipka, & Brinthaupt, 1992; Rosenberg, 1965) at both an explicit and implicit (automatic, non-conscious) level. Low levels of explicit self-esteem (e.g., Bouvard et al., 1999; Westenberg, 1998) and a weaker positive implicit self-esteem bias (de Jong, 2002; Tanner, Stopa, & De Houwer, 2006) are reported to be components of the negative working self-concept which characterises social phobia. Not all of the processes contributing to self-esteem operate on a conscious level (i.e., schema level processes; Segal & Swallow, 1994). Therefore, measurement of this aspect of self-concept is essential at both the explicit and implicit level.

Discrepancies between levels of implicit and explicit self-esteem (e.g., Bosson, Brown, Zeigler-Hill, & Swann, 2003; Jordan, Spencer, Zanna, Hoshino-Browne, & Correll, 2003) have recently led to the suggestion that they may represent different constructs with different processes underpinning their development (Hetts & Pelham, 2001). Hetts and Pelham (2001) suggest that if, as is proposed, implicit self-esteem is formed primarily through the non-conscious automatic processing (Greenwald & Banaji, 1995) and acceptance of evaluative feedback, then, unlike explicit self-esteem, it may be relatively insensitive to conscious correction. In this way, implicit self-esteem could be proposed to reflect accumulated social evaluations, whereas explicit self-esteem may reflect conscious interpretation (or even re-interpretation) of these experiences (Zeigler-Hill, 2006). If this is true, then conscious cognitive processes such as post-event processing, which contribute to the negative sense of self in social phobia (e.g., Mellings & Alden, 2000), are likely to influence explicit self-esteem to a greater degree than implicit self-esteem;

potentially resulting in a more negative explicit compared to implicit, self-view. It is essential to measure attitudes to self at both the conscious and non-conscious level in order to capture any differences in how each may be contributing to the individual's experience of self.

Self-concept clarity (Campbell, 1990; Campbell & Lavelle, 1993) is used as a second measure of self. Self-concept clarity is defined as *“the extent to which the content of an individual's self-concept (e.g., perceived personal attributes) are clearly and consistently defined, internally consistent, and temporally stable”* (Campbell et al., 1996, p. 141). The use of self-concept clarity, in addition to self-esteem, allows us to capture not only the content of self, but also the degree of confidence with which one believes this content to be representative. Low levels of clarity are proposed as an important factor maintaining social anxiety. Wilson and Rapee (2006) suggest that uncertainty of self-concept, particularly in relation to negative self-evaluative attributes, might result in individuals with social phobia giving undue weight to other people's opinions, or at least to their perception of other people's opinions, which is often negative and distorted. The need to seek feedback to address uncertainty of self-concept fits with research highlighting intolerance of uncertainty as a factor contributing to the severity of social anxiety (Boelen & Reijntjes, 2009).

Low levels of clarity are associated with high levels of social anxiety (Moscovitch, Orr, Rowa, Reimer, & Antony, 2009; Stopa, Brown, Luke, & Hirsch, in prep; Wilson & Rapee, 2006) and as such may represent a component of the socially phobic individual's negative working self-concept. Wilson and Rapee (2006) found that after controlling for other forms of psychopathology, socially phobic

participants showed increased uncertainty in the self-descriptiveness of negative attributes compared to non-patient controls. Additionally, in a more recent study involving a non-clinical population, lower levels of self-concept clarity were associated with higher levels of social anxiety (Stopa et al., in prep). In this study, self-concept clarity was a unique predictor of social anxiety.

### *Social anxiety, the self and social threat*

Within the second part of the study, the effects of image valence on participants' experience of self during a social threat-activation task are explored. Negative self-images held in mind during social threat activation (e.g., giving a speech or holding a conversation with a stranger) are associated with increased perception of bodily sensations, increased anxiety and poorer performance ratings both by self and an observer (e.g., Hirsch, Mathews, Clark, Williams, & Morrison, 2003); increased self-accuracy compared to positive self-images (Vassilopoulos, 2005); and increased self-reported use of safety behaviours (Hirsch, Meynen, & Clark, 2004). These negative self-images also led to faster retrieval of negative autobiographical memories in comparison to positive self-images (Stopa & Jenkins, 2007). One criticism of the threat-activation tasks used within these studies is the potential for individual differences in the social experience to confound results. For example, although the verbal responses of stooges holding a conversation or listening to a speech can be scripted, it is not always possible to keep non-verbal responses consistent. In answer to this criticism, one experimental manipulation of social threat that standardises the experience of social threat is the Cyberball task, designed by Williams, Cheung, and Choi (2000). This task evokes social threat through the exclusion of participants from a virtual ball-toss game. Participants believe that they



are playing online against three other players, but in fact the game is controlled by a computer programme that can be modified to manipulate various degrees of exclusion. The current study used a partial exclusion condition (described in detail within the method section) because total exclusion was considered too aversive. Research has, as yet, failed to identify any variables that moderate the immediate effects of total exclusion (e.g., Oaten, Williams, Jones, & Zadro, 2008; Williams et al., 2000; Zadro, Williams, & Richardson, 2004). Given that a fear of negative evaluation by others is a factor maintaining social phobia, and that highly socially anxious individuals demonstrate a tendency to interpret even socially ambiguous situations in a negative way (e.g., Amin, Foa, & Coles, 1998; Stopa & Clark, 2000), we considered that a partial social exclusion task would be effective in activating social threat in a socially anxious population.

To date, the effect of exclusion has been generally measured in terms of its impact on positive affect and on four ‘fundamental need scores’, which can be conceptualised as representing aspects of the experience of self. These are self-esteem, control, belonging and meaningful existence (see Williams, 2001, for a review of these need scores). Williams proposes that these needs are critical for human motivation, efficacy and survival, and that social exclusion threatens them, thereby producing psychological discomfort. During the experience of exclusion, individuals are denied all signs of being connected to others, which reduces their sense of belonging. There is the implicit accusation of the excluded individual having done something wrong, which reduces self-esteem, and control is lost when the individual is unable to elicit any reaction from others. Thus, the existence of the individual is ultimately denied by his or her circumstances (Williams & Zadro,

2001). Evidence demonstrating the detrimental impact of just five minutes of Cyberball total exclusion<sup>4</sup> on these needs has begun to emerge over the last few years (e.g., Zadro, Boland, & Richardson, 2006; Zadro et al., 2004). In line with previous research, this study measured the effects of exclusion on these fundamental need scores.

The effect of exclusion on self-esteem is of primary interest in this study. Social threat is proposed to activate a negative view of the self in social phobia (Clark & Wells, 1995). Clark and Wells propose that individuals with social phobia have unstable self-schema, only seeing themselves negatively when a negative self-view is activated by anticipating, experiencing, or ruminating on, social interactions. Therefore, an important question to consider is whether any observed effects of positive imagery on self-esteem, which may be found in the first part of the study, could be maintained in the face of social threat activation, or whether a social threat may activate a dysfunctional and maladaptive working self, which overrides any effects of the positive imagery. Spontaneous images of the self are used by the individual with social phobia to judge their performance and infer how they appear to others (Clark & Wells, 1995). If this is true, then we would expect the valence of the available self-image to influence participants' perceptions of their experience, and to differentially influence positive affect, self-esteem, feelings of belonging, control and meaningful existence immediately following the social threat activation task.

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<sup>4</sup> In a total exclusion condition participants receive the ball twice following which they are excluded from the game by all other participants (i.e., they do not received the ball again).

## *Hypotheses*

This study builds on the current literature regarding the role of negative self-imagery in the maintenance of social phobia. It was hypothesised that participants in the negative self-imagery condition would demonstrate a more negative working self-concept, as demonstrated by less positive implicit self-esteem, higher explicit negative and lower explicit positive self-esteem, and less self-concept clarity, than those in the positive self-imagery condition. Participants in the negative imagery condition were also expected to report lower feelings of self-esteem, belonging, control and meaningful existence and less positive affect, following a social exclusion task (Cyberball). As well as the main effect of image valence, we also predicted a main effect of group, such that high socially anxious participants would demonstrate a more negative working self-concept, and that following a social exclusion task (Cyberball), they would demonstrate lower feelings of self-esteem, belonging, control and meaningful existence and less positive affect.

## **Method**

### *Participants and Design*

Eighty-eight participants (28 males and 60 females) aged 18-55 (78.40% aged 18-21) were recruited from a university ( $n=82$ ) and local community ( $n=6$ ) population. Participants were assigned to a positive or negative self-imagery condition in a 2(Social Anxiety: High Social Anxiety, Low Social Anxiety) X 2(Image Valence: Positive Self-image, Negative Self-image) between-subjects design. Participants were screened for a number of studies using the Social

Interaction Anxiety Scale (Mattick & Clarke, 1998)<sup>5</sup>. Forty-four high socially anxious participants, who scored 29 or above ( $M=41.14$ ,  $SD=8.71$ ) and 44 low socially anxious participants who scored nine or below ( $M=6.18$ ,  $SD=2.43$ ) took part in this study. The two groups did not differ significantly in terms of mean age,  $t(86) = -.326$ ,  $p = .745$ , or gender ratio,  $\chi^2(1) = 3.352$ ,  $df = 1$ ,  $p = .067$ . The levels of social anxiety reported by the high socially anxious group indicates a clinical level of social phobia in our non-clinical sample (mean average for a clinical population of socially phobic individuals,  $M=34.6$ ,  $SD=16.4$ ; Mattick & Clarke, 1998).

### *Imagery Manipulation*

An image script developed by Hirsch, Clark, Mathews, and Williams (2003) was used to assist each participant in the construction of a positive or negative self-image (see Appendix C). Once an image was brought to mind, participants closed their eyes and were asked to describe, in detail, the type of image they had; what it looked like and how it might be viewed by other people. At the end of the script, participants rated the vividness of the image on a scale of 0 (*not at all vivid*) to 100 (*extremely vivid*). Where the vividness of the self-image was rated as less than 60, the script was repeated once in order to gather additional details and reinforce the image generated. The data from participants who continued to rate the vividness of the image as less than 60 ( $n=1$ ) were excluded from analysis. Participants were instructed to keep the image in mind as they completed the various experimental tasks. They were given a reminder to do so, following the Implicit Association Task and prior to the Cyberball task. At the end of the experimental session, a

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<sup>5</sup> It was anticipated that most of the participants would be university students therefore inclusion cut-off's on the Social Interaction Anxiety Scale were based on one standard deviation above or below Mattick and Clark's (1998) mean for an undergraduate sample.

manipulation check recorded the extent to which participants kept the image in mind on a scale of 0 (*not at all*) to 100 (*all the time*). Participants unable to keep the image in mind for at least 50% of the time were excluded from analysis ( $n=3$ ).

### *Questionnaire Measures*

*Social Anxiety.* The Social Interaction Anxiety Scale (*SIAS*; *Mattick & Clarke, 1998*) is a 19-item self-report designed to assess fear of social interaction. Items are rated on a five-point scale from 0 (*not at all characteristic of me*) to 4 (*extremely characteristic or true of me*). The SIAS (*Mattick & Clarke, 1998*) has high internal consistency ( $\alpha = .94$ ) and good test-retest reliability ( $r = .92$  over both 4 and 12 weeks) and discriminates well between individuals with and without social phobia (*E. J. Brown et al., 1997; Brown, Chorpita, Korotitsch, & Barlow, 1997*). Participants completed the SIAS at screening and at the beginning of the experimental session. Participants who did not fall within the defined cut-offs at testing were excluded ( $n=3$ ). The SIAS demonstrated strong internal consistency in the current sample ( $\alpha = .97$ ).

*Explicit Self-Esteem.* The Rosenberg Self-Esteem Scale (*RSE*; *Rosenberg, 1965*) is a 10-item self-report measure of explicit self-esteem. Items are rated on a 4-point Likert scale. Higher total RSE scores reflect higher self-esteem when items 3, 5, 8, 9 and 10 are reverse scored. The RSE demonstrates good internal reliability ( $\alpha = .92$ ) and a two-week test-retest reliability coefficient of .88 (*Corcoran & Fischer, 1987*). The RSE is commonly used in clinical practice (*Blascovich & Tomaka, 1991*) and is a well-validated measure of self-esteem (*Winters, Myers, & Proud, 2002*). The RSE demonstrated high internal consistency in the current sample ( $\alpha = .93$ ).

*Anxiety.* The Spielberger State-Trait Anxiety Inventory (*STAI; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983*) is a 40-item Likert scale that measures separate dimensions of State (STAI-S; items 1-20) and Trait (STAI-T; items 21-40) anxiety. The STAI is commonly used in research and clinical settings. The internal consistency of this measure within a student sample exceeds .90 (Spielberger et al., 1983). Participants completed the STAI-T before the imagery manipulation. Participants also completed the STAI-S to assess anxiety levels following the imagery manipulation. The internal consistency of the STAI-S and STAI-T was high within the current sample ( $\alpha$ s > .93).

*Depression.* The Depression and Anxiety Stress Scale-21 (*DASS21; Lovibond & Lovibond, 1995*) is a 21-item self-report scale consisting of three subscales measuring depression, anxiety, and general distress. The DASS21 has good psychometric properties (e.g., Antony, Bieling, Cox, Enns, & Swinson, 1998; T. A. Brown et al., 1997; P. F. Lovibond, 1998). This questionnaire was used to assess participants' level of depressive symptoms and therefore only the depression subscale, DASS-D, will be reported. High levels of social anxiety are often associated with elevated levels of depression (e.g., Fava et al., 2000). The depression subscale had moderate internal consistency within the current sample ( $\alpha = .87$ ).

Although it was expected that high socially anxious participants would demonstrate higher scores on the STAI-T, DASS-D and lower scores on the RSE, these were included to ensure that there were no differences between the two imagery conditions within each social anxiety group.

*State Self-Esteem.* The State Self-Esteem Scale (*SSES; McFarland & Ross, 1982*) is a 12-item measure of explicit state self-esteem. The SSES incorporates the

12 items that loaded onto one self-esteem factor in McFarland & Ross' (1982) factor analysis: proud, competent, confident, smart, resourceful, effective, efficient, inadequate, incompetent, stupid, worthless and shameful. Participants use a Likert scale to indicate how much each item represents their current feelings about themselves. Two subscales can be calculated by summing positively and negatively worded items separately, which McFarland and Ross identify as elements of positive and negative self-esteem. The items developed by Ross and McFarland (1982) successfully measure changes attributable to self-esteem (Baumgardner, Kaufman, & Levy, 1989). The SSES was used to measure positive and negative state self-esteem following the imagery manipulation. The positive and negative subscales demonstrated high internal consistency within the current sample ( $\alpha = .95$  and  $\alpha = .94$  respectively).

*Self-Concept Clarity.* The Self-Concept Clarity Scale (SCCS; Campbell et al., 1996) is a 12-item measure of the temporal stability, consistency, and clarity of self-beliefs. The SCCS has a test-retest reliability of between .70 and .79 and the internal consistency of the measure in a university sample is above .85 (Campbell et al., 1996). Additionally, the SCCS predicts unique variance in the stability and consistency of self-descriptors which indicates good validity (Campbell et al., 1996). The SCCS was used to assess the extent to which self-beliefs are clearly and confidently defined following the imagery manipulation. The internal consistency of the measure in the current sample was good ( $\alpha = .90$ ).

*Self-Esteem, Feelings of Belonging, Control, Meaningful Existence, and Positive Affect.* Feelings of belonging, self-esteem, control and a sense of meaningful existence are associated with general psychological well-being (see Baumeister &

Leary, 1995; Williams et al., 2000). The Cyberball questionnaire (Zadro et al., 2004; see Appendix D) is a self-report scale designed to measure these fundamental needs. It consists of 12 items (three questions for each need subscale) assessing the effects of ostracism on belonging (e.g., *“I felt like an outsider”*), self-esteem (e.g., *“I felt good about myself”*), control (e.g., *“I felt like I had control over the course of the interaction”*) and meaningful existence (e.g., *“I felt nonexistent”*). Items are answered on a 9-point scale from 1 (*not at all*) to 9 (*very much so*). Cronbach’s alpha coefficients have suggested reasonable internal consistency for each subscale (belonging=.74; control=.72; self-esteem=.70; and meaningful existence=.66) (Zadro et al., 2004). Within the current sample, the internal consistency of the four scores was poorer than in previous research, with the exception of the self-esteem subscale (self-esteem=.82; control=.67 belonging=.53; and meaningful existence=.48). The questionnaire also contains two manipulation checks for inclusion/ostracism (e.g., *“What percent of throws were thrown to you?”* and *“To what extent were you accepted by the other participants?”*). Mood is assessed by four 9-point bipolar scales (*good-bad, happy-sad, relaxed-tense, not aroused-aroused*). A total mean score is calculated as a mean average of these four ratings, with a lower score indicating less positive affect. The questionnaire also contains two 9-point scales ranging from 1 (*not at all*) to 9 (*very much so*) assessing feelings of enjoyment and anger whilst playing the game. This questionnaire has been used in a number of published studies investigating the effects of ostracism using the Cyberball game (e.g., Krill, Platek, & Wathne, 2008; Zadro et al., 2006; Zadro et al., 2004).



## *Experimental Tasks*

*Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998).* The IAT (Greenwald et al., 1998) is a computerised reaction time task designed to test the relative strength of association between two concept categories. Categories in this experiment were self and other, and positive and negative. Table 1 shows the words used in each category; the positive and negative words were taken from a previous study assessing implicit views of the self in socially anxious individuals (Tanner et al., 2006). Although it measures associations rather than beliefs, it is argued that as associations are likely to be part of beliefs, the IAT offers an indirect index of the existence of dysfunctional evaluative beliefs free from many of the demand characteristics limiting self-report measures (De Houwer, 2002).

Table 1.

*Word used within the Implicit Association Task to represent each concept category*

Self	Other	Positive	Negative
I	Them	Secure	Boring
Me	They	Likeable	Stupid
Mine	His	Clever	Worthless
First name of participant	Hers	Interesting	Incompetent
		Confident	Disliked
		Accepted	Ridiculous
		Loveable	Inferior
		Worthy	Useless

The underlying assumption of this experiential paradigm is that congruent stimuli are responded to more quickly than incongruent stimuli. The relative

congruence and incongruence between categories are inferred from reaction time comparisons. Within the self-esteem version of this task, stronger associations between *self + positive words* (relative to *self + negative words*) are indicated by more positive IAT-D effect scores (Greenwald, Nosek, & Banaji, 2003). Stronger associations are proposed to reflect more positive implicit self-esteem (Greenwald et al., 1998; Greenwald et al., 2003). As a measure of associations, the IAT (assessing implicit view of self) has reasonable test-retest reliability and internal validity ranging from 0.52 (Greenwald & Farnham, 2000) to 0.69 (Bosson, Swann, & Pennebaker, 2000). During the IAT participants were asked to respond as fast as possible by pressing one of two buttons on a response box when a word appeared in a fixed position on the screen. The IAT used within this study consisted of seven stages which are shown in Table 2.

Table 2.

*Implicit Association Task Procedure*

Block	Function	Item assigned to left key response	Item assigned to right key response
1: 16 trials	Practice	Self words	Other words
2: 16 trials	Practice	Negative words	Positive words
3: 16 trials	Practice	Self words + Negative words	Other words + Positive words
4: 40 trials	Test	Self words + Negative words	Other words + Positive words
5: 16 trials	Practice	Other words	Self words
6: 16 trials	Practice	Other words + Negative words	Self words + Positive words
7: 40 trials	Test	Other words + Negative words	Self words + Positive words

The presentation of the congruent block first (self + *positive* and *other* + *negative*) can produce a larger IAT-D effect score (Farnham, Greenwald, Banaji, Abrams, & Hogg, 1999). The presentation of blocks three and four, and six and seven, was therefore counterbalanced within groups of participants to avoid order effects. During each phase the words were presented in a random order. The same items were never presented on two or more consecutive trials and the correct response was never the same on four or more consecutive trials. The IAT was presented on a laptop with a 60Hz refresh rate. Each item was presented in white capital letters 7mm high and 5mm wide on a blue background. When a participant incorrectly categorised an item, a red X appeared beneath the word until the participant entered the correct response. Participants could take a self-terminated break after each block of trials. The task lasted approximately 5 minutes. The scoring procedure is discussed in the data screening and analysis section.

*Social Threat Activation Task: Cyberball.* This task is a computer programme that allows the experimenter to create various interactive scenarios using a virtual ball-tossing game. In the game, participants engage with three other players whom they believe are real, and are connected through a network. The game begins with one of the computerised players throwing the ball to the participants. Participants are instructed to throw the ball to one of the other players each time they receive it. In this study, the behaviour of the three other players was pre-determined by a computer programme. After participants had received the ball twice, they were excluded from the game by two of the three other participants (i.e., they never received the ball from these two people again). In order to enhance believability, participants were informed that they would be playing online with three other people. The experimenter left the

room twice to check on the attendance and progress of the ‘other participants’<sup>6</sup>. Participants were not allowed to begin playing until the experimenter received a (staged) phone call to indicate that the ‘others’ were ready to begin. Prior to debriefing, participants were asked, “During the game did you believe that you were playing against other participants?” Responses were categorised as “yes”, “no” or “unsure”. The game lasted for 40 throws (approximately five minutes). The game was downloaded with the permission of the developers (Williams et al., 2000) at: <http://www.psy.mq.edu.au/staff/kip/Announce/Cyber-ball>.

### *Materials*

The IAT and the Cyberball tasks were administered via a laptop computer connected to the university’s internet network. The laptop logged participants’ responses to the IAT via a response box connected via a USB port.

### *Procedure*

Participants who met the inclusion criteria following screening were invited to attend the experimental session and were allocated to either the positive or the negative self-imagery condition. After giving their informed consent (Appendices E and F), participants completed the RSE, STAI-Trait, DASS-21 and the SIAS. Throughout the study, where several questionnaires were administered, the order was counterbalanced to avoid order effects. Participants were then guided through the self-imagery exercise. Next, the IAT was administered followed by the STAI-State, SCCS and SSES. Participants then played Cyberball and completed the Cyberball

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<sup>6</sup> Participants were told the research was being undertaken jointly with other researchers who were testing participants in separate rooms.

questionnaire and were debriefed (Appendix G). Given the possible distressing impact of the negative imagery manipulation and/or the social threat activation task, a 5-minute positive imagery exercise was offered.

### *Ethics*

The study was awarded ethical approval by the University of Southampton's School of Psychology Ethics Committee (Appendices H and I).

## **Results**

Statistical analysis was conducted using SPSS version 16.0. An a priori power calculation, based on data from Tanner et al. (2006), indicated that in order to achieve a power level ( $1-\beta$ ) of 0.95, a sample size of 80 would be required. In total data from 95 participants were collected. However, seven participants were excluded from the analysis; at testing two participants fell outside the threshold on the SIAS and five were unable to generate or hold in mind the image required within the study<sup>7</sup>. Data from 44 high socially anxious (HSA) and 44 low socially anxious (LSA) participants were included in the final analysis. A minimum statistical level of .05 was set for all tests.

### *Data Screening and Analysis*

Data from the HSA and LSA groups were screened for normality of distribution and homogeneity of variance. Where data did not meet assumptions, either log or square root transformations were undertaken. For all variables with the

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<sup>7</sup> There were no significant differences on trait measures of self-esteem, depression or anxiety between included and excluded participants (lowest  $p=.107$ ).

exception of SIAS, transformations resulted in homogeneity of variance. The transformed data was therefore used in analysis<sup>8</sup>. Unfortunately, transformation did not result in normal distributions for age, DASS-D, RSE, negative state self-esteem, and the control and self-esteem subscales of the Cyberball questionnaire<sup>9</sup>. Awareness of this will be important when interpreting data analysis, although analyses of variance (ANOVA) are reported to be robust even when assumptions are violated; this is especially true for violation of the normality assumption described above (Howell, 2004).

The effects of, and interactions between, imagery valence and social anxiety were explored using a series of two-way independent ANOVAs or ANCOVAs (where analysis of the impact of covariates was necessary). As depression may influence responding on self-esteem and self-concept clarity measures, and levels of depression are often high in people with high levels of social anxiety (e.g., Fava et al., 2000), depression was entered as a covariate in analysis of these variables. IAT data was scored using Greenwald et al's (2003) improved algorithm. The improved algorithm was developed following a systematic evaluation of a number of statistical options for managing problems that occur in using latency measures, e.g., spurious responses that appear as extreme outliers (see Greenwald et al., 2003). The algorithm was developed to minimise the impact of such problems, and as such generates data that better reflects underlying association strength. It also provides increased power to detect statistically significant differences in comparison to the conventional

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<sup>8</sup> Mean scores and standard deviations reported in Tables and Figures represent untransformed scores.

<sup>9</sup> Although Kolmogorov-Smirnov tests were significant for these variables ( $p > .05$ ). Skew and kurtosis z scores indicated the distribution of the data did not differ significantly from a normal distribution (Howell, 2004) for all variables with the exception of negative state self-esteem.

algorithm. It is therefore suggested that the new algorithm is valid with smaller sample sizes (Greenwald et al., 2003). Data from blocks 3, 4, 6 and 7 were used. Trials with response latencies over 10 000ms were excluded. Participants who responded more quickly than 300ms on over 10% of trials should have been excluded; however, no participants met this exclusion criterion. The mean correct latency was calculated for each block and incorrect latencies were replaced by the mean block latency. The means of each block were calculated and the difference obtained from the practice-incongruent block minus the practice-congruent block, and the test-incongruent block minus the test-congruent block. The resulting scores were divided by the pooled standard deviations to calculate the IAT-D effect. Finally, a two-way independent ANCOVA was used to explore the effects of imagery and social anxiety on the IAT-D effect scores.

### *Participant Characteristics*

Table 3 shows the age and gender composition of the positive and negative self-imagery conditions within the HSA and LSA groups, as well as the means and standard deviations for scores on the SIAS, RSE, STAI-T, and the DASS-D. Chi-squared analysis indicated no significant differences in the gender composition of participants between,  $\chi^2 = 3.35$ ,  $df = 1$ ,  $p = .067$ , or within, HSA:  $\chi^2 = 0.38$ ,  $df = 1$ ,  $p = .540$ ; LSA:  $\chi^2 = 0.00$ ,  $df = 1$ ,  $p = 1.00$ , groups. There was no main effect of social anxiety or image valence on age, and no interactions were noted (lowest  $p = .287$ ).

There were main effects of social anxiety for SIAS,  $F(1,84) = 648.95$ ,  $p < .001$ ; RSE,  $F(1,84) = 85.79$ ,  $p < .001$ ; STAI-T,  $F(1,84) = 124.35$ ,  $p < .001$ ; and DASS-D,  $F(1,84) = 28.70$ ,  $p < .001$ . As expected, the HSA group reported higher levels of social

anxiety, trait anxiety and depression, and lower levels of explicit self-esteem, compared to the LSA group. However, there were no main effects of imagery and no interactions between imagery and social anxiety ( $p$  values ranged from .12 to .91), which indicates that within each social anxiety group there were no differences between the two imagery conditions prior to the imagery manipulation.



Table 3.

*Mean Scores and Standard Deviations (in Parentheses) of Scores on the SIAS, RSE, STAI-T, DASS-D, and Age and Gender composition of participant groups*

	High Socially Anxious		Low Socially Anxious	
	Negative Image (n=22)	Positive Image (n=22)	Negative Image (n=22)	Positive Image (n=22)
SIAS	42.05 (5.99)	40.23 (7.85)	6.18 (2.32)	6.18 (2.59)
RSE	1.51 (0.50)	1.70 (0.45)	2.47 (0.40)	2.48 (0.40)
STAI-T	52.41 (8.10)	49.95 (10.01)	34.05 (6.69)	31.64 (5.34)
DASS-D	6.45 (4.58)	5.50 (4.57)	1.91 (2.45)	2.00 (1.49)
Age	21.64 (5.99)	22.64 (7.85)	20.68 (3.75)	22.68 (7.80)
Gender	<i>N (%)</i>		<i>N (%)</i>	
Male	8 (36.4%)	10 (45.5%)	5 (23.0%)	5 (23.0%)
Female	14 (64.6%)	12 (54.5%)	17 (77.0%)	17 (77.0%)

#### *Imagery Manipulation Check*

There were no significant main effects of social anxiety or image valence and no interactions for the vividness of the self-image generated during the experimental task ( $p$  values ranged from .13 to .81). The overall mean vividness rating for self-images generated was 80.30% ( $SD=11.84$ ). There were no main effects of social anxiety or image valence and no interactions for the percentage of time that

participants held the image in mind during the task ( $p$  values ranged from .07 to .93). The mean percentage of time participants held the self-images in mind was 70.40% ( $SD=10.73$ ).

There was a main effect of social anxiety,  $F(1,84) = 25.95$ ,  $p < .001$ , and a main effect of image valence,  $F(1,84) = 51.59$ ,  $p < .001$  on state anxiety following the imagery manipulation. These effects were not mediated by an interaction,  $F(1,84) = 0.20$ ,  $p = .655$ . Participants in the HSA group reported significantly higher levels of state anxiety ( $M=42.77$ ,  $SD=11.04$ ) than participants in the LSA group ( $M=34.23$ ,  $SD=10.89$ ). Additionally, participants who held in mind a negative self-image reported significantly higher levels of anxiety ( $M=44.95$ ,  $SD=11.48$ ) compared to participants who held in mind a positive self-image ( $M=32.05$ ,  $SD=7.79$ ).

### *Self-Concept Measures*

Following the imagery manipulation, implicit and explicit self-measures were administered to explore the effect of image valence and social anxiety on different aspects of self-concept.

*Implicit Self-Esteem.* Initially, a paired samples  $t$ -test was conducted to assess whether the underlying assumption of the IAT paradigm, i.e., that congruent stimuli are responded to faster than incongruent stimuli, was met. In line with this assumption there was a significant difference in response times to congruent ( $M=891.78$ ,  $SD=257.06$ ) compared to incongruent ( $M=1179.79$ ,  $SD=306.69$ ) word pairings,  $t(87) = 9.575$ ,  $p < .001$ , with participants responding more quickly to congruent word presentations. The improved algorithm (Greenwald et al., 2003) was

then used to score the IAT. Table 4 shows the IAT-D effect for the HSA and LSA group.

Both groups exhibited a positive implicit self-esteem bias as demonstrated by positive IAT-D effect scores. In order to investigate whether there were any differences in implicit self-esteem and whether depression contributed to these differences, IAT-D scores were analysed using a 2(level of social anxiety) x 2(image valence) ANCOVA with depression scores as a covariate. There was no main effect of social anxiety,  $F(1,83) = .162, p=.688$ , partial  $\eta^2=.002$ , or of depression,  $F(1,83) = .964, p=.329$ , partial  $\eta^2=.011$ , on IAT-D effect scores. However, there was a main effect of image valence,  $F(1,83)= 9.267, p=.003$ , partial  $\eta^2=.09$ , with participants in the negative self-imagery condition exhibiting less positive implicit self-esteem ( $M=0.60, SD=0.82$ ) than those in the positive self-imagery condition ( $M=1.09, SD=0.70$ ). There was no interaction between imagery and social anxiety,  $F(1, 84)=1.16, p=.280$ , partial  $\eta^2=.012$ .

Table 4.

*Mean Scores and Standard Deviations (in Parenthesis) of Self-Concept Measures*

	High Socially Anxious		Low Socially Anxious	
	Negative Image ( <i>n</i> =22)	Positive Image ( <i>n</i> =22)	Negative Image ( <i>n</i> =22)	Positive Image ( <i>n</i> =22)
IAT-D effect	0.42 (0.74)	1.10 (0.86)	0.77 (0.88)	1.09 (0.52)
Explicit positive self-esteem	32.73 (13.09)	52.77 (12.25)	46.77 (10.73)	60.41 (9.74)
Explicit negative self-esteem	28.14 (13.37)	12.09 (6.19)	15.32 (7.89)	7.82 (3.26)
Self-concept clarity	32.18 (5.25)	33.36 (9.39)	40.05 (8.34)	47.73 (7.81)

*Explicit Self-Esteem and Self-Concept Clarity.* Table 4 shows the means and standard deviations for the explicit self-concept measures. There were main effects of social anxiety on positive,  $F(1,83) = 10.83, p=.001$ , partial  $\eta^2=.115$ , and negative state self-esteem,  $F(1,83) = 14.22, p<.001$ , partial  $\eta^2=.146$ . There were also main effects of imagery on positive,  $F(1,83) = 45.93, p<.001$ , partial  $\eta^2=.356$ , and negative state self-esteem,  $F(1,83)=47.69, p<.001$ , partial  $\eta^2=.365$ . Participants in the HSA group reported lower positive self-esteem and higher negative self-esteem than LSA

participants. Additionally, participants holding in mind a negative self-image reported lower positive self-esteem and higher negative self-esteem than those holding in mind a positive self-image. There was no main effect of depression (lowest  $p=.301$ ) and no interactions between image valence and social anxiety for either variable (lowest  $p=.22$ ).

There were significant main effects of depression,  $F(1,83) = 15.10$ ,  $p<.001$ , partial  $\eta^2=.154$ , social anxiety,  $F(1,83) = 18.08$ ,  $p<.001$ , partial  $\eta^2=.179$ , and image valence,  $F(1,83) = 6.84$ ,  $p=.011$ , partial  $\eta^2=.076$ , on self-concept clarity. There was also a significant interaction (illustrated in Figure 1) between social anxiety and image valence on self-concept clarity,  $F(1,83) = 5.69$ ,  $p=.019$ , partial  $\eta^2=.064$ . Post hoc analysis indicated that participants in the LSA group holding a negative self-image in mind reported significantly lower clarity than those holding in mind a positive self-image,  $t(42) = -3.15$ ,  $p=.003$ . However, there was no significant difference for those in the HSA group holding in mind a positive versus a negative self-image,  $t(32.97) = -0.52$ ,  $p=.61$ .

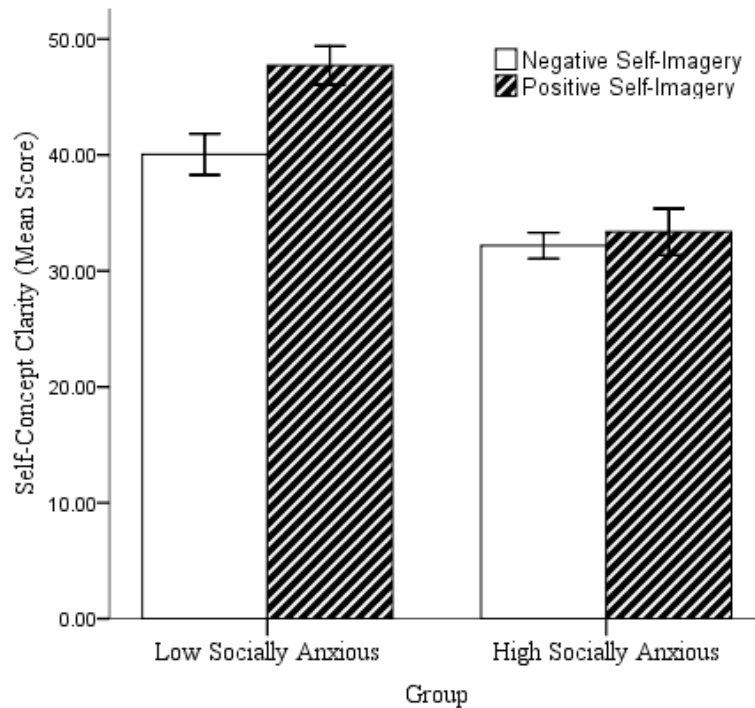


Figure 1. Mean self-concept clarity (+SE) for low socially anxious ( $n=44$ ) and high socially anxious ( $n=44$ ) groups in negative and positive self-imagery conditions.

### *Social Threat Task: Cyberball*

Table 5 displays means and standard deviations for the Cyberball questionnaire which assessed participants' experiences of a period of social exclusion and self-reported feelings of self-esteem, belonging, control and meaningful existence following this experience. The effects of social anxiety and image valence on participants' sense of belonging and meaningful existence cannot be reliably reported due to the poor internal consistency obtained within this study for the subscales used to measure these variables.

Table 5.

*Mean Scores and Standard Deviations (in Parentheses) of the Psychological Needs Cyberball Questionnaire Measure (scores range between 1 (not at all) to 9 (very much so); Some Items are Reversed Scored)*

	High Socially Anxious		Low Socially Anxious	
	Negative Image (n=22)	Positive Image (n=22)	Negative Image (n=22)	Positive Image (n=22)
<b>The Cyberball experience</b>				
Percentage of throws received	18.09 (7.35)	22.55 (9.95)	21.82 (9.33)	24.95 (10.15)
I felt accepted by the other participants	4.00 (1.69)	4.64 (1.40)	5.23 (2.14)	4.45 (1.68)
I enjoyed playing the Cyberball game	4.23 (1.93)	4.86 (1.98)	5.77 (2.25)	5.27 (1.52)
I felt angry during the Cyberball game	3.82 (2.22)	3.14 (1.98)	3.18 (2.13)	2.27 (1.72)
<b>Fundamental needs</b>				
Self-esteem	4.32 (1.32)	5.61 (1.58)	5.91 (2.00)	6.70 (1.47)
Control	3.90 (1.51)	4.27 (1.49)	4.33 (2.11)	4.71 (1.45)
Belonging	-	-	-	-
Meaningful existence	-	-	-	-
Positive affect	5.25 (0.87)	5.50 (0.95)	5.23 (1.20)	5.58 (0.84)

Note. Dashes indicate the means and standard deviations were not reported due to the poor internal reliability of the subscale within the current sample.

*Experience of Exclusion.* Both HSA ( $M=20.32\%$ ,  $SD=8.93$ ) and LSA ( $M=23.39\%$ ,  $SD=9.76$ ) participants overestimated their degree of involvement in the game with estimate involvement close to equal participation (actual percentage of the throws received was nine percent). Despite this, participants did not report feeling completely accepted by other participants: HSA participants rated feelings of acceptance on a scale of 1 (*not at all accepted*) to 9 (*very much accepted*) as 4.32 ( $SD=1.57$ ) and LSA participated rated feeling of acceptance as 4.84 ( $SD=1.94$ ). There were no significant main effects, or interactions, of social anxiety or image valence on the perceived percentage of throws received during the game or on the degree to which participants felt included in the game ( $p$  values ranged from .058 to .855).

There was a significant main effect of social anxiety on the degree to which participants enjoyed playing the game,  $F(1,84)=5.61$ ,  $p=.02$ , partial  $\eta^2=.063$ , with participants in the LSA group reporting more enjoyment than those in the HSA group. There was no main effect of imagery,  $F(1,84)=0.03$ ,  $p=.869$ , partial  $\eta^2 < .001$ , and no interactions were noted,  $F(1,84)=1.90$ ,  $p=.172$ , partial  $\eta^2=.022$ . There were no main effects of imagery or social anxiety and no interactions noted for the degree to which participants felt angry during the game ( $p$  values ranged from .069 to .793).

*Self-Esteem and Control*<sup>10</sup>. There were significant main effects of social anxiety,  $F(1,84) = 12.75$ ,  $p=0.001$ , partial  $\eta^2=.132$ , and image valence,  $F(1,84) =$

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<sup>10</sup> A number of studies (e.g., Krill et al., 2008; Zadro et al., 2004) have found that ostracism using the Cyberball task results in a decrease in self-esteem, control, belonging and meaningful existence, irrespective of whether participants believe they are playing against real players. In order to explore this, the analysis was repeated including only those who believed ( $n=68$ ). This analysis yielded an identical pattern of results. Therefore both believers and non-believers were included in the analysis reported in the main paper.



10.08,  $p < .002$ , partial  $\eta^2 = .107$ , on self-esteem immediately following exclusion. There was no interaction between social anxiety and imagery,  $F(1,84) = 0.56$ ,  $p = .456$ , partial  $\eta^2 = .007$ . However, as levels of depression can influence self-esteem, the analysis was repeated using depression scores as a covariate. The analysis indicated that there was a main effect of depression on self-esteem following exclusion, and the main effect of social anxiety was no longer statistically significant,  $F(1,83) = 3.72$ ,  $p = .056$ , partial  $\eta^2 = .043$ <sup>11</sup>. There were no significant main effects of depression ( $p = .284$ ), social anxiety ( $p = .748$ ) or image valence ( $p = .181$ ) on control, and no interactions between social anxiety and image valence ( $p = .692$ ) following the game.

*Positive Affect.* There were no significant main effects of depression, social anxiety, or imagery on positive affect immediately following exclusion (lowest  $p = .135$ ), and no interaction between social anxiety and imagery ( $p = .719$ ).

## Discussion

The first aim of this study was to investigate the effects of manipulating positive and negative self-imagery on two aspects of the self-concept, namely self-esteem and self-concept clarity. The results demonstrated that holding a negative self-image in mind was associated with significantly less positive implicit self-esteem, lower levels of explicit positive self-esteem, and higher levels of explicit negative self-esteem, in comparison with holding a positive self-image in mind. However, negative imagery was only associated with reduced self-concept clarity in low socially anxious participants. The second aim of the study was to investigate

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<sup>11</sup> In order to investigate whether trait levels of self-esteem contributed to the observed effects, the analysis was repeated using RSE scores as a covariate. The pattern of results remained the same indicating that trait differences in self-esteem were not significantly contributing to results.

whether positive and negative self-images differentially affected the experience of self during a social threat task (Cyberball). The results demonstrated that holding a negative self-image in mind was associated with lower levels of self-esteem during social threat activation, compared to holding a positive self-image in mind. There was no main effect of image valence on feelings of control, and due to the poor reliability of the belonging and meaningful existence subscales, analysis of these variables could not be reliably reported. The results of this study will be discussed in more detail with reference to each specific hypothesis.

The first hypothesis proposed that there would be a main effect of both image valence and social anxiety on self-esteem and self-concept clarity. The main effect of image valence on both implicit and explicit self-esteem is in line with the proposition that holding a positive or negative self-image is linked to the activation of a particular working self. As proposed, negative self-images were associated more with the activation of a working self that was characterised by lower self-esteem, than the working self associated with positive self-images. The lack of an interaction between social anxiety and imagery suggests that the effects of negative self-imagery on self-esteem are present in both high and low socially anxious participants.

The finding that one experience of imagery manipulation influences levels of implicit self-esteem is intriguing. Implicit self-esteem is proposed to result from automatic, non-conscious and highly practiced self-evaluations (e.g., Greenwald & Banaji, 1995). If this is true, it suggests that implicit self-esteem should be associated with a considerable degree of temporal stability and not be easily amenable to acute manipulation. This conceptualisation is somewhat in contrast to the findings within the current study which suggest a potentially transient nature to this self construct. It

is therefore important to consider the possible mechanisms which may account for the influence of imagery on implicit self-esteem. One explanation may lie in the potential relationship between imagery and the working self. As previously highlighted, the experience of self is the end result of multiple processes not all of which are available through conscious awareness (Stopa, 2009). If images of the self do function within a SMS where they are able to directly influence the construction of the self, then we would hypothesise that these images would have the power to influence both conscious and non-conscious self-related processes, and therefore the power to influence implicit attitudes to self. However, future research attempting to replicate and extend the findings of the current study will be important in order to clarify the extent to which implicit attitudes are stable or in fact amenable to change.

How can these results contribute to our understanding of how imagery exerts its effect in social anxiety? Firstly, the results provide indirect support for the causal role of negative self-imagery in social anxiety. As higher levels of self-esteem appear to differentiate low from high socially anxious individuals (e.g., Bouvard et al., 1999), and there was no significant difference in the levels of self-esteem reported by the low group prior to the imagery manipulation, these findings are consistent with the idea that negative self-images may be involved in the development of low self-esteem. Clark and Wells (1995) propose that negative self-images play a causal role in social phobia, by increasing anxiety and maintaining negative beliefs about appearance and social performance. Low levels of self-esteem are proposed to be a diathesis for the emergence of negative self-evaluative cognitions (de Jong, 2002) which are likely to reinforce these negative self-beliefs in social phobia. Therefore the relationship between negative self-images and more negative self-esteem found

in this study, provides some indirect support for the causal role of these images in social phobia (which is consistent with the findings of Hirsch, Clark et al., 2003; Hirsch, Mathews, Clark, Williams, & Morrison, 2006).

Secondly, if, as this study suggests, it is possible to induce a reduction in self-esteem in low socially anxious participants using only one experience of imagery manipulation, then it is important to consider how the repeated activation of negative self-images may function to maintain social anxiety. The repeated activation of a working self characterised by low self-esteem, in addition to the occurrence of the negative image itself, is likely to contribute to and reinforce the individual's unconditional negative beliefs about the self, and feed into his or her inability to cope with the perceived danger inherent in social situations (Clark & Wells, 1995). The individual could then become trapped in a vicious cycle in which the negative self-image and negative working self both represent, and serve as evidence for, the validity of the other. Increased self-focused attention (Clark & Wells, 1995) is likely to increase the weight given to these internal representations as true representations of self, because other forms of information are missed or subjected to biased interpretation (e.g., Heinrichs & Hofman, 2001). Additionally, the repeated activation of these negative self-representations is likely to strengthen their accessibility (see Brewin, 2006). Therefore, in situations when self-representations are competing for retrieval (e.g., in social situations when the individual is internally focused and attempting to assess aspects of self and performance), these negative representations are more likely to be retrieved in comparison to more positive representations.

The retrieval of negative representations may also impact on the accessibility of other components of self. This proposition is in line with the findings of the current study in which negative images appeared to facilitate the retrieval of more negative self-esteem. It is also possible that the retrieval of these negative images may inhibit the retrieval of competing positive self-representations. Initial support for this suggestion comes from evidence demonstrating the inhibitory effect of negative self-images on the retrieval of positive autobiographical memories in high socially anxious participants (Stopa & Jenkins, 2007). This mechanism may prevent access to information that may challenge the negative self-view characteristic in social phobia. The mechanisms proposed above all provide possible insight into the way in which negative self-images exert their effects in social phobia.

The main effect of social anxiety on explicit self-esteem replicates the results of previous research demonstrating self-reported low levels of self-esteem in social anxiety (e.g., Bouvard et al., 1999; de Jong, 2002) and suggests an important role for negative self-evaluative cognitions in the maintenance of social anxiety (in line with the cognitive models; Clark & Wells, 1995; Rapee & Heimberg, 1997). The identification of a positive implicit self-esteem bias in both high and low socially anxious participants is in line with previous research (de Jong, 2002; Tanner et al., 2006); however, the absence of a reduced positive implicit self-esteem bias in high compared to low socially anxious participants is inconsistent. One explanation for this inconsistency is that the reduced implicit self-esteem bias observed in the previous studies (de Jong, 2002; Tanner et al., 2006) was eliminated in the current study by the imagery manipulation. If holding a positive self-image in mind led to an increase in implicit self-esteem in the high socially anxious group, and holding a

negative self-image in mind led to a reduction in implicit self-esteem in the low socially anxious group, then this might have eliminated any differences between the two groups. However, the absence of a main effect of social anxiety on implicit self-esteem is consistent with the absence of a difference found between clinical and non-clinical groups in some other areas of psychopathology (e.g., depression, De Raedt et al., 2006; post-traumatic stress disorder, Lee, 2009).

One possible explanation for the differences found in explicit but not implicit self-esteem is offered when we consider the potentially different processes underlying their development. Zeigler-Hill (2001) proposes the possibility that implicit self-esteem reflects accumulated social evaluations, whereas explicit self-esteem may reflect the conscious interpretation (or even re-interpretation) of these experiences. If this is true, we might expect high and low socially anxious participants to differ in terms of explicit self-esteem, because it is likely to be affected by the biased information processing (e.g., post-event processing and rumination) that maintains social anxiety, but does not characterise low socially anxious individuals (e.g., Mellings & Alden, 2000). However, if the processing of information contributing to implicit self-esteem is not subject to the same level of interpretation or re-interpretation, we could hypothesise that difference between high and low socially anxious individuals would be less likely. These ideas are clearly a theoretical supposition and research is essential to examine this hypothesis.

The effect of image valence on self-concept clarity is more complex. The main effect of social anxiety on self-concept clarity is consistent with previous research (Moscovitch et al., 2009; Stopa et al., in prep; Wilson & Rapee, 2006); high socially anxious participants demonstrated lower levels of clarity, compared to low

socially anxious participants. This reduced clarity in the high socially anxious group indicates that uncertainty of self-concept has a potentially maintaining role in social anxiety. However, we also found an interaction between social anxiety and imagery which indicated that negative imagery was associated with reduced self-concept clarity, but only in low socially anxious participants. A number of studies have highlighted a relationship between self-esteem and self-concept clarity, such that low self-esteem is associated with lower clarity of self-concept than high self-esteem (e.g., Campbell, 1990; Campbell, Chew, & Scratchley, 1991; Campbell & Fehr, 1990). Therefore, this finding is difficult to explain in light of the effect of image valence on self-esteem in this study. One possible explanation is that high socially anxious individuals are characterised by chronically low levels of self-concept clarity which may be more resistant to change than in low socially anxious individuals. It is possible that longer-term training in the generation of positive images in high socially anxious individuals may produce effects similar to that observed in the low socially anxious group. An alternative explanation can be offered by considering the effects of the specific images themselves. If negative images reduce clarity, but positive images do not increase clarity, it is possible that the lack of difference between the imagery conditions for high socially anxious participants may be due to a floor effect, i.e., participants' levels of clarity could not be reduced enough to show a significant difference between groups. The lack of a neutral imagery condition precludes a test of this proposition, which is merely speculative at this stage.

If manipulation of imagery does not influence self-concept clarity in high socially anxious individuals, we need to consider possible clinical implications of this finding. Self-concept clarity appears to differentiate between high and low

socially anxious individuals, with lower levels of clarity found in high socially anxious participants (Stopa et al., in prep; Wilson & Rapee, 2006). If low levels of clarity play a maintaining role in social anxiety they may require targeting in treatment. Recent treatment advances targeting the distorted self-images in social phobia (e.g., video feedback and imagery rescripting) appear to be effective, but we do not know whether they impact on self-concept clarity. If, as this study suggests, it may not be possible to increase clarity through manipulation of self-imagery, then identification of treatment techniques that do influence this component of self could be important. Further research is needed to assess the influence of this component of self on the persistence of social anxiety and it would be useful to begin to assess the impact of current treatment techniques on this potential vulnerability factor. In addition, there is a need for future research to consider the extent to which the clarity of self-concept (i.e., low clarity versus high clarity) interacts with the content of self-concept (i.e., a primarily positive versus a primarily negative self-concept). For example, in what way might an unstable and unclear self-concept (proposed to be characteristic in social phobia) be more maladaptive than a stable but negative self-concept? One way to begin to unpick this issue would be for future studies to attempt to measure both clarity and content of the self, and to explore the interaction between these constructs on a range of outcome variables including cognitive, affective, behavioural and personality factors associated with psychological well-being and distress.

The second aim of this study was to investigate whether positive and negative self-images affect the experience of self during a social threat task (Cyberball). The results suggest that participants did not feel completely accepted by the other players



in the game, indicating that the experience of Cyberball contained an element of rejection. This provides some support for its use as a social threat activation task and highlights the potential utility of this task as a useful research tool for examining social evaluative concerns and/or behaviours that may be reinforced online (e.g., through social networking sites and online gaming). The experience of self was measured using participants' feelings of self-esteem, control, sense of belonging and meaningful existence (Zadro et al., 2006). Unfortunately, due to the poor reliability of the belonging and meaningful existence subscales, analysis of these variables could not be reliably reported. The main effect of social anxiety on explicit self-esteem during social threat activation is consistent with the findings in the first part of this study. Both before and during social threat activation, high socially anxious participants demonstrated lower levels of self-esteem, compared to low socially anxious participants. However, it appeared that the difference observed could be explained by differences in participants' levels of depression. Depression was used as a covariate so that the contribution of social phobia on levels of self-esteem could be explored separately from depression. However, as social phobia shares high levels of comorbidity with depressive symptomology (e.g., Kessler, Stang, Wittchen, Stein, & Walters, 1999; Merikangas & Angst, 1995), the experience of depression and social phobia may not be entirely distinct. Therefore, it could be argued that it is somewhat artificial, and not clinically relevant, to statistically separate them (Miller & Chapman, 2001). In interpreting the effects of depression and social anxiety in isolation, we may be in danger of losing clinically relevant information.

The main effect of imagery on explicit self-esteem is also consistent with the results within the first part of the study and provides some support for the proposition

that the increase in self-esteem associated with positive imagery can be maintained in the face of social threat<sup>12</sup>. The differential impact of image valence provides indirect support for Clark and Wells' suggestion that self-images are one form of information used by individuals with social phobia to evaluate performance (i.e., more positive images were associated with more positive self-evaluations during threat activation). Although this is an important finding, given the proposed maintaining role of post-event processing in contributing to individuals' negative evaluations and judgements of performance (e.g., Clark & Wells, 1995; Mellings & Alden, 2000; Rapee & Heimberg, 1997), it would seem even more important to now explore the stability of these effects (i.e., measuring self-esteem immediately following threat activation and following a time delay).

The lack of main effect of either social anxiety or image valence on participants' sense of control during social threat is in contrast to our initial hypotheses. We therefore need to consider why we failed to find these effects. One possible explanation is offered by a recent study exploring the factors underlying the observed effects of the Cyberball task. Preliminary findings by Jacoby and Sassenberg (2009) indicated that once the social aspect of the Cyberball task had been removed, the effects of exclusion on self-esteem and belonging were no longer

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<sup>12</sup> There were significant correlations between explicit negative self-esteem ( $r = -.508, p < .001$ ) and explicit positive self-esteem ( $r = .399, p < .001$ ), and levels of explicit self-esteem following social threat. This provides some support for the proposition that the increase in explicit self-esteem associated with positive imagery prior to social threat activation continues in the face of social threat e.g., higher levels of explicit self-esteem, prior to Cyberball, were associated with higher levels of explicit self-esteem following Cyberball. There was no significant correlation between implicit self-esteem and explicit self-esteem following social threat ( $r = .144, p = .181$ ). This is perhaps unsurprising given evidence indicating a low correlation between implicit and explicit self-esteem (Bosson, Swann, & Pennebaker, 2000). Future studies should examine the extent to which individual differences in response to positive imagery predicts self-esteem.

present, although the effects on control and meaningful existence remained. They therefore suggest that only the effects of ostracism on self-esteem and belonging are determined by the social aspect of exclusion inherent in the task. If this is true, we might not propose a difference in feelings of control, although we would anticipate a main effect of social anxiety on self-esteem (due to its association with the social threat implicit in the task). It is also worth noting that previous research has highlighted the universal effects of total exclusion. To date, none of the factors investigated<sup>13</sup>, including social anxiety (Zadro et al., 2006), have been found to moderate the immediate effect of total exclusion on self-esteem, control, belonging and meaningful existence. In this study, a less severe form of exclusion was used and results indicate that social anxiety may potentially moderate the effects of exclusion on self-esteem. It is possible that we have established a baseline condition where other variables (i.e., social anxiety) are beginning to influence the effects of exclusion. The effects of partial exclusion may not be universal and self-esteem, control, belonging and meaningful existence may all be differently affected by the experience.

We also failed to find main effects for social anxiety or image valence on positive affect, which is again inconsistent with our hypothesis and is in contrast to previous research which reported a relationship between negative images and an increase in negative affect (e.g., state anxiety, Hackmann, Surawy, & Clark, 1998; Hirsch, Meynen et al., 2004). It is possible that the use of a general measure of positive affect rather than a specific measure of anxiety (as used within the other

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<sup>13</sup> Research has so far found that self-esteem (Williams et al., 2000), attribution for ostracism, and the identity of the source of ostracism (Gonsalkorale & Williams, 2007; Zadro et al., 2004), do not moderate the effects of exclusion.

studies) may account for these differences. We chose to remain consistent with the previous Cyberball social anxiety research and measured the effects of exclusion on the experience of self using the Cyberball questionnaire (Zadro et al., 2004).

However, although this allows us to contribute to the limited evidence base on the effects of exclusion on social anxiety, it precludes direct comparison of the findings of this study with research exploring the role of negative self-images in social anxiety. It would have been useful to repeat the measures of state anxiety, self-esteem and self-concept clarity used to capture the experience of self prior to social threat activation. This would align this study with the literature on imagery and social anxiety and allow us to examine more consistently whether the effects of imagery on the experience of self were maintained in the face of social threat.

Inevitably, this study has a number of limitations. The use of a non-clinical sample limits generalisability to a socially phobic population. The use of a between-subjects design introduces the possibility that uncontrolled individual differences between groups may have accounted for observed effects. As participants were screened using the SIAS they may not have been fully blind to the subject of the study which may have influenced their response to self-report tasks that are subject to self-presentational concerns and impression management strategies (Farnham et al., 1999). In addition, the poor internal consistency of two of the fundamental need score scales prevent full exploration of the hypotheses in the second part of the study. The study would have benefited from asking participants to rate how much they were able to keep their self-image in mind during specific tasks such as the IAT and Cyberball. This would have provided the opportunity to explore the degree to which the presence of the self-image was impacting on the individual tasks in more detail.

Inclusion of a neutral imagery condition would have been beneficial and would have allowed the assessment of the individual contribution of positive and negative image valence on the observed results. Finally, a strength of this study was that we were able to induce negative self-images in participants who were extremely low in social anxiety (SIAS < 9). However, it is possible that the images generated by these participants, although equivalent in vividness and duration held, were not comparable to those generated by high socially anxious participants in terms of image valence<sup>14</sup>. To assess this criticism it would have been useful to formally examine the equivalence of imagery content and valence (in addition to duration and vividness).

### **Conclusion**

Notwithstanding these limitations, the results of this study have some potentially important implications for clinical practice. It appears that positive self-images, which can be successfully manipulated and held in mind by highly socially anxious participants, are associated with more positive implicit self-esteem. They also appear to be associated with more positive and less negative explicit self-esteem than the negative images commonly reported in social phobia, an association that may remain in the face of social threat. These findings support the validity of targeting negative, and promoting positive, self-images in social phobia, as well as offering one possible explanation for the success of imagery rescripting in reducing symptomology in social phobia (see Wild, Hackmann, & Clark, 2007, 2008).

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<sup>14</sup> Within the current study, participants were asked to generate images based on events during which they rated their feelings of anxiety or relaxation at 60 or more on a scale of 0-100, where 0 represented either not at all anxious or not at all relaxed and 100 represented extremely anxious or extremely relaxed. However, exact ratings of anxiety or relaxation were not recorded and so it was not possible to formally compare the images generated in terms of affective valence.

Imagery rescripting involves a set of related processes directed at modifying a self-image that represents a memory of a distressing and traumatic social event. It is possible that the positive self-images developed and rehearsed in therapy trigger a more positive working self. If, as Brewin (2006) suggests, multiple representations of self compete for retrieval, then the repeated activation of positive self-representations associated with manipulation of positive imagery in therapy is likely to increase the accessibility of these positive representations, thereby increasing their likelihood of winning the retrieval competition (in favour of negative self-representations). The increased accessibility of positive representations may influence the accessibility of information that has the potential to contradict and challenge the individual's negative sense of self, and therefore has the potential to break one of the vicious cycles proposed to maintain social anxiety.

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## **Appendix A: Clinical Psychology Review Guide for Authors**

## Guide for Authors

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## **Appendix B: Behaviour Research and Therapy Guide for Authors**

## Guide for Authors

An International Multi-Disciplinary Journal

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## **Appendix C: Imagery Script**

**Negative Self-Imagery Script**

In a minute I am going to be asking you if you ever get anxious in social situations? Is that something that ever happens to you? Usually when people are very anxious a mixture of thoughts and images or fleeting pictures go through their minds. I'm going to try and help you get hold of the image and general sense of yourself you have when you are anxious.

<p>Can you think of a time when you felt particularly anxious in a social situation?</p> <p>Ensure it is a social anxiety (i.e. not anxiety experienced alone must be a social aspect). May have to probe to clarify – what was it that you were anxious about in that situation if ambiguous.</p>	
<p>How anxious were you at the worst moment on a scale of 0 not at all to 100 extremely anxious?</p> <p>Choose another situation if it is not above 60%</p>	
<p>Did you have an image or picture going through your mind at that time?</p> <p>Yes/No</p>	
<p>If not then ask: - Did you have a negative sense of yourself in the situation?</p> <p>Yes/No</p> <p>If no then identify another situation.</p>	

**When identified (Note: you are now looking to recreate the image of the situation now)**

Please could you close your eyes and try to recall the situation and then recreate the image you have of yourself [or the sense of yourself] in the situation, making it as vivid as possible. (Allow about 30 seconds)

<p>Have you got it now? When they say “yes” ask: - I am going to ask you about the situation and the image/ sense of yourself. What’s happening?</p>	
<p>What are you doing?</p>	
<p><i>Summarise</i></p>	
<p>What do you look like to other people?</p> <p>Describe. If focussed on appearance probe for details of</p> <p>posture, facial aspects, other parts of the body, general appearance, any change in size.</p> <p>Account must be detailed enough for a film director to recreate the image. Summarise and check if each bit is right and get more detail on each aspect.</p>	
<p>What do you sound like to other people? (<i>voice characteristics, pronunciation etc...</i>).</p>	

Do you have any sensations in your body?	
So you have got this image in your mind's eye. How are you feeling?	
How do you think you are coming across to other people?	
Do full summary of all. Vignette of it all 'you are a red faced person who looks anxious and awkward.....	

How vivid is the image/ strong is the sense of yourself on a scale of 0 to 100 (0 = not at all vivid/not at all strong; 100 = extremely vivid/strong)

If less than 60% go back and get more detail.

Please keep hold of the image/ sense of yourself and open your eyes. I'd like you to try to keep hold of the image in your mind as you are completing all the other tasks. I will prompt you as we go through the task to remind you. Also if you notice the image fading away try to bring it back to mind.



**Positive Self-Imagery Script**

In a minute I am going to be asking you about times when you have felt relaxed in a social situation. Usually when people are very relaxed people have a positive sense of themselves or an image of themselves in their mind while they are in the situation. I'm going to try and help you get hold of the image and general sense of yourself you have when you are relaxed.

<p>Can you think of a time when you felt particularly relaxed in a social situation?</p> <p>Prompt if they say no this may be when you have been with friend or family.</p>	
<p>How relaxed were you at your most relaxed moment on a scale of 0 not at all to 100 extremely relaxed?</p> <p>Choose another situation if it is not above 60%</p>	
<p>Did you have an image or picture going through your mind at that time?</p> <p>Yes/No</p>	
<p>If not then ask: - Did you have a positive sense of yourself in the situation?</p> <p>Yes/No</p> <p><i>If no then identify another situation.</i></p>	

**When identified (Note: you are now looking to recreate the image of the situation now)**

Please could you close your eyes and try to recall the situation and then recreate the image you have of yourself [or the sense of yourself] in the situation, making it as vivid as possible. (Allow about 30 seconds)

<p>Have you got it now? When they say “yes” ask: - I am going to ask you about the situation and the image/ sense of yourself. What’s happening?</p>	
<p>What are you doing?</p>	
<p><i>Summarise</i></p>	
<p>What do you look like to other people?</p> <p>Describe. If focussed on appearance probe for details of</p> <p>posture, facial aspects, other parts of the body, general appearance, any change in size.</p> <p>Account must be detailed enough for a film director to recreate the image. Summarise and check if each bit is right and get more detail on each aspect.</p>	
<p>What do you sound like to other people? (<i>voice characteristics, pronunciation etc...</i>).</p>	

Do you have any sensations in your body?	
So you have got this image in your mind's eye.  How are you feeling?	
How do you think you are coming across to other people?	
Do full summary of all. Vignette of it all 'you are relaxed person who is part of the group and looks relaxed and happy.....	

How vivid is the image/ strong is the sense of yourself on a scale of 0 to 100 (0 = not at all vivid/not at all strong; 100 = extremely vivid/strong)

If less than 60% go back and get more detail.

Please keep hold of the image/ sense of yourself and open your eyes. I'd like you to try to keep hold of the image in your mind as you are completing all the other tasks. I will prompt you as we go through the task to remind you. Also if you notice the image fading away try to bring it back to mind.

**Appendix D: Cyberball Questionnaire (Zadro, Williams, & Richardson, 2004)**

## Cyberball Questionnaire

1. What percent of the throws were thrown to you?

2. To what extent were you included by the other participants during the game?

<b>Accepted</b>									<b>Rejected</b>
1	2	3	4	5	6	7	8	9	

**Please rate the extent to which the following statements apply to you?**

3. I felt poorly accepted by the other participants

<b>Not at all</b>									<b>Very much so</b>
1	2	3	4	5	6	7	8	9	

4. I felt as though I had made a “connection” or bonded with one or more of the participants during the Cyberball game

<b>Not at all</b>									<b>Very much so</b>
1	2	3	4	5	6	7	8	9	

5. I felt like an outsider during the Cyberball game

<b>Not at all</b>									<b>Very much so</b>
1	2	3	4	5	6	7	8	9	

6. I felt that I was able to throw the ball as often as I wanted during the game

<b>Not at all</b>									<b>Very much so</b>
1	2	3	4	5	6	7	8	9	

7. I felt somewhat frustrated during the Cyberball game

<b>Not at all</b>									<b>Very much so</b>
1	2	3	4	5	6	7	8	9	

8. I felt in control during the Cyberball game

<b>Not at all</b>								<b>Very much so</b>
1	2	3	4	5	6	7	8	9

9. During the Cyberball game, I felt good about myself

<b>Not at all</b>								<b>Very much so</b>
1	2	3	4	5	6	7	8	9

10. I felt that the other participants failed to perceive me as a worthy and likeable person

<b>Not at all</b>								<b>Very much so</b>
1	2	3	4	5	6	7	8	9

11. I felt somewhat inadequate during the Cyberball game

<b>Not at all</b>								<b>Very much so</b>
1	2	3	4	5	6	7	8	9

12. I felt that my performance [e.g., catching the ball, deciding whom to throw the ball to] had some effect on the direction of the game

<b>Not at all</b>								<b>Very much so</b>
1	2	3	4	5	6	7	8	9

13. I felt non-existent during the Cyberball game

<b>Not at all</b>								<b>Very much so</b>
1	2	3	4	5	6	7	8	9

14. I felt as though my existence was meaningless during the Cyberball game

<b>Not at all</b>								<b>Very much so</b>
1	2	3	4	5	6	7	8	9

15. I felt.....

<b>Bad</b>								<b>Good</b>
1	2	3	4	5	6	7	8	9

<b>Happy</b>								<b>Sad</b>
1	2	3	4	5	6	7	8	9

<b>Tense</b>								<b>Relaxed</b>
1	2	3	4	5	6	7	8	9

<b>Aroused</b>								<b>Not aroused</b>
1	2	3	4	5	6	7	8	9

16. I felt angry during the Cyberball game

<b>Not at all</b>								<b>Very much so</b>
1	2	3	4	5	6	7	8	9

17. I enjoyed playing the Cyberball game

<b>Not at all</b>								<b>Very much so</b>
1	2	3	4	5	6	7	8	9

## **Appendix E: Participant Information Sheet**



## Information Sheet

### IMAGERY STUDY

*You are being invited to take part in a research study. Before you decided whether or not to take part, it is important for you to understand why the research is being done and what is involved. Please take time to read the following information carefully and discuss it with the researcher if you wish. Do not hesitate to ask if there is anything which is not clear, or if you would like more information. Take time to decide whether or not you wish to take part. Thank you for reading this.*

I am *Natalie Hulme*, a Trainee Clinical Psychologist at the University of Southampton. I am requesting your participation in a study which is investigating imagery and mental visualisation.

#### **Do I have to take part?**

It is entirely up to you whether or not to take part. Your participation is voluntary and you may withdraw your participation at any time. If you agree to participate you will be asked to sign a consent form. If you choose to take part you are still free to withdraw at any time and without giving reason. A decision to withdraw or a decision not to take part will not affect your grades or treatment as a student in the psychology department.

#### **What will happen to me if I decide to take part?**

If you decide to take part you will be asked to participate in a guided imagery exercise during which the researcher will help you to generate and describe an image held in your mind. You will also be asked to complete a series of short questionnaires and a computer based word sorting task. The final part of the study involves playing an online computer game with three other participants. The whole study will take up to one hour.

#### **Will my taking part be kept confidential?**

Yes. Personal information will not be released to or viewed by anyone other than researcher involved in this project. All data will be stored in an anonymous format and the results of this study will not include your name or any other identifying characteristics.

#### **What will happen to the results of the research?**

The results of this study will be written up and submitted as part of my doctorate. A brief summary of the results can also be sent to you on request. It is also hoped that the results will be written up for publication in a psychological journal.

**Who has reviewed the study?**

This study has been reviewed by the School of Psychology Research Ethics Committee, University of Southampton.

If you have any questions please ask them now, or contact me *Natalie Hulme* on [nlh106@soton.ac.uk](mailto:nlh106@soton.ac.uk)

Signature

Date

Name        *Natalie Hulme*

*Version 1 (22/02/08)*

## **Appendix F: Participant Consent Form**

## STATEMENT OF CONSENT: IMAGERY STUDY

I \_\_\_\_\_ (*print name*) have read the above information sheet.

- I understand that I may withdraw my consent and discontinue participation at any time without penalty or loss of benefit to myself.
- I understand that data collected as part of this research project will be treated confidentially, and that published results of this research project will maintain my confidentiality.
- In signing this consent letter, I am not waiving my legal claims, rights, or remedies.
- A copy of this consent letter will be offered to me.

### Please circle Yes or No to the following items

- |   |  |     |    |
|---|--|-----|----|
| 1 | I confirm that I have read and understand the information sheet for the above named study dated 22/02/08 (Version 1) | Yes | No |
| 2 | I give consent to participate in the above study   | Yes | No |

Signature \_\_\_\_\_

Date \_\_\_\_\_

Name (please print) \_\_\_\_\_

I understand that if I have questions about my rights as a participant in this research, or if I feel that I have been placed at risk, I can contact the Chair of the Ethics Committee, Department of Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: (023) 8059 5578.

*Version 1 (22/02/08)*

## **Appendix G: Participant Debriefing Statement**

## DEBRIEFING STATEMENT

### Imagery and the Self

#### Aims of the Study

Research suggests that imagery plays a critical role in the development (Hirsch, Matthews, Clark, Williams & Morrison, 2006) and maintenance of social anxiety (Clark & Wells, 1995). The aim of this study was to investigate the relationship between imagery and the self in relation to social anxiety.

The study included individuals who expressed both above and above average levels of anxiety in relation to social situations. You were asked to participate as you expressed *above/below* average levels of anxiety as measured by the initial screening questionnaire (Social Interaction Anxiety Scale: Mattick & Clark, 1998).

Within the study, half of the people participating were asked to generate and describe a positive self-image and the other half were helped to generate a negative self-image. The aim was to assess the impact of the use of positive and negative imagery on attitudes to self and on reaction to a socially ambiguous task (i.e., a game in which you were not sure how much you were being included by the other players).

The questionnaires and word sorting task were designed to measure attitudes to self. We were specifically interested on the impact of the imagery on self-esteem (which represents an evaluative attitude to oneself) and self-concept clarity (which represents the consistency with which to attitudes to oneself are held). Lower self-esteem and self-concept clarity have both been found to be associated with social anxiety.

The computer game was designed to evoke feelings of social ambiguity and potential social isolation. The other 'participants' were in fact computer generated characters who were programmed to only include you a certain percentage of the time. It is expected that positive imagery may result in more positive attitudes to the self (so higher self-esteem) and increase the consistency with which these attitudes are held. Additionally, it is predicted that positive imagery may act as a buffer against the negative impact of perceived social threat.

Your data will help our understanding of the relationship between imagery and the self in individuals who express above and below average anxiety in relation to social situations. Techniques specifically targeting negative self-images in socially anxious individuals show promising results. Preliminary evidence supports the use of rescripting negative images (a therapeutic technique) as a means of reducing image associated distress, modifying beliefs about the self encapsulated by the image and reducing anxiety (Wild, Hackmann, & Clark, 2007). However, it is not clear how imagery rescripting works. It is therefore critical to expand our understanding of the role of imagery within social anxiety as this may have implication for clinical practice.

#### Confidentiality

Once again results of this study will not include your name or any other identifying characteristics. The research did use a degree of deception in that the exact nature of the study was not fully explained. This was done in order to prevent any response bias in

participant behaviour. If you wish to withdraw your data from this study you may do so without cause or penalty. Please simply inform the researcher now or contact them using the details below.

### **Results**

The results will be written up and submitted as part of my doctorate. It is also hope that the study will be written up and submitted for publication in a peer review journal. The data relating to self-compassion will be written up as an undergraduate dissertation at Brunel University. Findings will be summarised and will not identify any individual. A brief summary of the findings will be available on request. This will be available from July 2009 and can be requested by leaving a message for Natalie Hulme on 02380 595 321, or by emailing [nlh106@soton.ac.uk](mailto:nlh106@soton.ac.uk). If you have any further questions please contact me using the number or email address above.

### **Your Response to Testing**

If anything that you have been asked to do has caused you to experience strong, negative emotions which you are having difficulty coping with, there are a number of sources of support to which you can turn:

1. Contact your general practitioner (GP)
2. You can contact the University of Southampton counselling service at 28 University Road, Highfield, Southampton, SO17 1BJ. Tel: 02380593719 (internal 23719) Email: [counser@soton.ac.uk](mailto:counser@soton.ac.uk)
3. Social anxiety is a normal experience. Some people have higher levels of social anxiety than others. If you feel that it is a significant problem for you, for example, if you feel that your anxiety prevents you from doing things on a regular basis, then there are various forms of help that you can access:
  - a. Butler, G. (1999). *Overcoming Social Anxiety: A Self-help Guide Using Cognitive Behavioural Techniques*. This is a self-help guide to understanding and overcoming social anxiety.
  - b. [www.social-anxiety.org.uk](http://www.social-anxiety.org.uk) is a website which provides information about social anxiety and support available.
  - c. [www.phobics-society.org.uk](http://www.phobics-society.org.uk) is a website for the largest charity (The Phobic Society) which provides support and help for people with social anxiety.
  - d. Triumph over Phobia (TOP) runs a national network of self-help groups to help people with (social) phobia (and obsessive compulsive disorder) to overcome their problems using graded self-exposure. There is a TOP self-help group in Southampton. For information on TOP, try [www.triumphoverphobia.com](http://www.triumphoverphobia.com), telephone 08456009601, or e-mail [info@triumphoverphobia.com](mailto:info@triumphoverphobia.com).

Thank you for your participation in this research.

Signature \_\_\_\_\_ Date \_\_\_\_\_

Name \_\_\_\_\_

If you have questions about your rights as a participant in this research, or if you feel that you have been placed at risk, you may contact the Chair of the Ethics Committee, Department of Psychology, University of Southampton, Southampton, SO17 1BJ. Phone: (023) 8059 5578.



**Appendix H: School of Psychology Ethics Committee Approval Letter**

## Your Ethics Form approval

Psychology.Ethics.Forms@ps1.psy.soton.ac.uk  
[Psychology.Ethics.Forms@ps1.psy.soton.ac.uk]

**Sent:** 25 April 2008 12:23

**To:** hulme n.i. (nh106)

---

This email is to confirm that your ethics form submission for "Imagery and the self in social anxiety" has been approved by the ethics committee

Project Title: Imagery and the self in social anxiety  
Study ID : 422  
Approved Date : 2008-04-25 12:23:51

[Click here to view Psychobook](#)

The University of Southampton's Research Governance procedures now require you to submit the following documents:

- School Ethics Application form and, when available, approval letter
- Insurance and Research Governance Application

and either

- School Ethics Application form

or

- Protocol
- Participant Information sheet
- Consent form
- Risk assessment

Please note that everything other than the the approval letter and the IRGA should have already been uploaded to, and reviewed by, the Ethics Committee.

For more information about the documents we require, forms and downloadable templates, please consult our website:

<http://www.resource1.soton.ac.uk/legalservices/rgo/regprojs/uosethics.html> (You will be prompted to log into sussed.)

Documents are to be presented to:

Research Governance Office  
University of Southampton  
George Thomas Building, Room 4007  
Highfield  
Southampton  
SO16 1BJ

Please note that you cannot begin your research before you have had positive approval from the University of Southampton Research Governance Office (RGO) and Insurance Services. You should receive this by letter in a maximum of two working weeks from submission of valid documentation.

<https://www.outlook.soton.ac.uk/owa/?ac=Item&t=IPM.Note&id=RgAAACwIM1Q...> 06/04/2010

**Appendix I: Research and Development Department Approval Letter**

Ms Natalie Hulme  
School of Psychology  
University of Southampton  
University Road  
Highfield  
Southampton  
SO17 1BJ

14 March 2008

Dear Ms Hulme

RGO Ref: 5694

**Project Title Imagery and the Self in social Anxiety**

I am writing to confirm that the University of Southampton is prepared to act as sponsor for this study under the terms of the Department of Health Research Governance Framework for Health and Social Care (2nd edition 2005).

The University of Southampton fulfils the role of Research Sponsor in ensuring management, monitoring and reporting arrangements for research. I understand that you will be acting as the Principal Investigator responsible for the daily management for this study, and that you will be providing regular reports on the progress of the study to the Research Governance Office on this basis.

I would like to take this opportunity to remind you of your responsibilities under the terms of the Research Governance Framework, and the EU Clinical Trials Directive (Medicines for Human Use Act) if conducting a clinical trial. We encourage you to become fully conversant with the terms of the Research Governance Framework by referring to the Department of Health document which can be accessed at:

<http://www.dh.gov.uk/assetRoot/04/12/24/27/041224>

In this regard if your project involves NHS patients or resources please send us a copy of your NHS REC and Trust approval letters when available.

Please do not hesitate to contact me should you require any additional information or support. May I also take this opportunity to wish you every success with your research.

Yours sincerely



Dr Martina Prude  
Head of Research Governance  
Tel: 023 8059 5058  
email: [rgoinfo@soton.ac.uk](mailto:rgoinfo@soton.ac.uk)