



# Images of the Self and Self-Esteem: Do Positive Self-Images Improve Self-Esteem in Social Anxiety?

Natalie Hulme<sup>1</sup>, Colette Hirsch<sup>2,3</sup> and Lusia Stopa<sup>1</sup>

<sup>1</sup>*School of Psychology, University of Southampton, Southampton, UK;* <sup>2</sup>*King's College London, London, UK;* <sup>3</sup>*University of Western Australia, Perth, Australia*

**Abstract.** Negative self-images play an important role in maintaining social anxiety disorder. We propose that these images represent the working self in a Self-Memory System that regulates retrieval of self-relevant information in particular situations. Self-esteem, one aspect of the working self, comprises explicit (conscious) and implicit (automatic) components. Implicit self-esteem reflects an automatic evaluative bias towards the self that is normally positive, but is reduced in socially anxious individuals. Forty-four high and 44 low socially anxious participants generated either a positive or a negative self-image and then completed measures of implicit and explicit self-esteem. Participants who held a negative self-image in mind reported lower implicit and explicit positive self-esteem, and higher explicit negative self-esteem than participants holding a positive image in mind, irrespective of social anxiety group. We then tested whether positive self-images protected high and low socially anxious individuals equally well against the threat to explicit self-esteem posed by social exclusion in a virtual ball toss game (Cyberball). We failed to find a predicted interaction between social anxiety and image condition. Instead, all participants holding positive self-images reported higher levels of explicit self-esteem after Cyberball than those holding negative self-images. Deliberate retrieval of positive self-images appears to facilitate access to a healthy positive implicit bias, as well as improving explicit self-esteem, whereas deliberate retrieval of negative self-images does the opposite. This is consistent with the idea that negative self-images may have a causal, as well as a maintaining, role in social anxiety disorder. *Key words:* social anxiety; social anxiety disorder; imagery; self-concept; social exclusion

Received 27 April, 2011; Accepted 3 February, 2012

Correspondence address: Lusia Stopa, School of Psychology, University of Southampton, Southampton, UK. Tel: + 44 2380 596897. Fax: + 44 2380 592606 E-mail: l.stopa@soton.ac.uk

## Introduction

Imagery is a key maintaining factor in current cognitive models of social anxiety disorder (Clark & Wells, 1995; Hofmann, 2007; Moscovitch, 2009; Rapee & Heimberg, 1997). Individuals with social anxiety disorder frequently generate negative images of themselves performing poorly in feared social situations (e.g. Hirsch & Clark, 2004). These images are usually distorted, generally encapsulate negative meanings about the self, and are often linked to aversive early memories such as being bullied (Hackmann, Clark, & McManus, 2000). Manipulation of positive

and negative images in analogue samples with different levels of social anxiety<sup>1</sup> demonstrates that negative images can increase anxiety and impede social performance (e.g. Hirsch, Mathews, Clark, Williams, & Morrison, 2006; Hirsch, Meynen, & Clark, 2004; Stopa & Jenkins, 2007).

We propose that self-images, and their associated memories, are part of a Self-Memory System (SMS; Conway & Pleydell-Pearce, 2000) that provides a way to understand the complexity and dynamic nature of self. The SMS stores conceptual knowledge (e.g. beliefs about the self such as “I am kind/boring/confident”) and autobiographical information

(memories of lifetime periods, e.g. "being at school," and specific event memories, e.g. "my 21st birthday party"). According to the model, individuals have a stable long-term self, which results from an interaction between conceptual and autobiographical knowledge, and a working self, which is constructed in response to situational demands. The working self contains a subset of the total information held about the self and is constrained by information contained in the long-term self.

We hypothesise that negative self-images reported by patients with social anxiety disorder reflect a working self that is retrieved in response to social threat and which is characterised by low self-esteem, uncertainty about the self, and fear of negative evaluation by others. Repeated self-focused attention to negative self-images probably increases the accessibility of this negative working self, and reduces the accessibility of more positive competing self-representations, particularly in social situations. This paper examines the impact of positive and negative self-imagery on the working self in an analogue population of high and low socially anxious participants using self-esteem as a proxy for the working self. The first part of the study examines the effects of manipulating positive and negative self-imagery on implicit and explicit self-esteem. The second part investigates whether positive self-images protect individuals from a threat to explicit self-esteem by manipulating social exclusion.

In order to study the working self, we need to operationalise it. This is challenging because the experience of self is the result of multiple processes (Stopa, 2009) and an experimental study needs to both capture this complexity and select measures that can realistically be administered in the study. We chose self-esteem because it represents an active evaluative attitude towards the self and comprises both explicit (conscious and deliberate) and implicit (automatic, non-conscious) components (Demo & Savin-Williams, 1992; Rosenberg, 1965). As such, the construct of self-esteem captures a number of aspects of the working self and is relatively easy to measure. Explicit self-esteem is generally lower in people with social anxiety disorder than in non-clinical participants (e.g. Westenberg, 1998). There are no studies that look at implicit self-esteem in people with social

anxiety disorder, but de Jong (2002) and Tanner, Stopa, and De Houwer (2006) found reduced positive implicit self-esteem in high socially anxious participants. This suggests that the normal automatic positive implicit bias towards the self, observed in healthy individuals (Greenwald & Farnham, 2000), may be reduced in social anxiety disorder.

Implicit and explicit self-esteem are not usually highly correlated (e.g. Bosson, Brown, Zeigler-Hill, & Swann, 2003) and may represent two distinct, but related constructs that have different developmental pathways (Hetts & Pelham, 2001). Implicit self-esteem is thought to be formed primarily through non-conscious automatic processing (Greenwald & Banaji, 1995) and acceptance of evaluative feedback. As a result, it may be relatively insensitive to conscious correction (Hetts & Pelham, 2001), which could explain why implicit self-esteem remains positive, albeit reduced, in socially anxious individuals. By comparison, explicit self-esteem may reflect the conscious interpretation of experiences (Zeigler-Hill, 2006). We hypothesised that when participants held a negative self-image in mind they would report less positive implicit self-esteem, less positive and more negative explicit self-esteem (main effect of image condition). We also expected a main effect of group based on the evidence summarised above (high socially anxious participants would have lower implicit and explicit positive self-esteem and higher negative explicit self-esteem). We did not predict any interactions between image condition and group.

If holding negative and positive self-images in mind is associated with retrieval of different working selves, then the retrieval of a more positive working self should confer some benefits. In the second part of the study, participants held either a positive or a negative self-image in mind and took part in a computerised ball game called Cyberball (Williams, Cheung, & Choi, 2000), in which we manipulated social exclusion. Social exclusion is inherently aversive and reduces explicit self-esteem in healthy individuals (e.g. Zadro, Boland, & Richardson, 2006; Zadro, Williams, & Richardson, 2004). We used a partial exclusion manipulation in which the participant was excluded from the game by two of the three other virtual players to create a standardised social threat manipulation.

To date, the effect of exclusion has been measured in terms of its impact on positive affect and on four fundamental need scores (self-esteem, control, belonging, and meaningful existence) which contribute to psychological well-being (see Williams, 2001, for a review of these need scores). Our principal hypothesis concerned explicit self-esteem and we did not have a theoretical basis for deriving hypotheses about the other variables. Following Clark and Wells' (1995) model, we hypothesised that social exclusion would activate a negative view of self in socially anxious participants who would report lower explicit self-esteem than the low socially anxious group (main effect of group). However, if positive self-images are associated with a more positive working self, then they should protect against the threat to explicit self-esteem posed by social exclusion. Therefore, we hypothesised that participants in the positive self-image condition would report higher explicit self-esteem than those in the negative condition (main effect of condition). We also predicted an interaction between group and condition because we thought that high socially anxious participants would be both more affected by social threat and less protected by the activation of positive self-representations.

## Method

### Participants

Students from a local university were screened with the Social Interaction Anxiety Scale (SIAS; Mattick & Clarke, 1998) and invited to participate if they scored above 29 or below 9 [one standard deviation above and below

Mattick and Clarke's (1998) undergraduate mean (19)]. Two participants were excluded because their SIAS scores fell outside the cut-offs at the time of testing. The final sample comprised 44 participants in the low social anxiety group (10 males, 34 females) and 44 in the high social anxiety group (18 males, 26 females). There were no significant gender differences between the groups ( $\chi^2 = 3.35$ ,  $df = 1$ ,  $p = .067$ ), or between the self-imagery conditions ( $\chi^2 = 0.21$ ,  $df = 1$ ,  $p = .65$ ). Table 1 presents mean ages. There were no main effects of group or image-valence on age, and no interactions (lowest  $p = .29$ ). Participants took part in the study for either course credits or a payment of £6.00 (US\$10.00).

### Measures and instruments

*Screening measure.* We used the SIAS (Mattick & Clarke, 1998) to screen participants and then re-administered it at the beginning of the experiment. The SIAS is a 19-item self-report scale that assesses fear of social interaction. Its internal consistency in the current sample was excellent (Cronbach's  $\alpha = .97$ ).

*Descriptive measures.* We administered the following measures of trait self-esteem, anxiety and depression at the beginning of the study. The Rosenberg Self-Esteem Scale (RSES; Rosenberg, 1965) is a 10-item self-report measure of explicit self-esteem. Higher total RSES scores reflect higher self-esteem. The State-Trait Anxiety Inventory-Trait (STAI-T; Spielberger, Gorsuch, Lushene, Vagg, & Jacobs, 1983) is a 20-item scale that measures trait anxiety. The Depression Anxiety Stress Scale-21 (DASS-21; Lovibond & Lovibond, 1995) is a 21-item self-report scale consisting of three subscales measuring

Table 1. Mean scores and standard deviations (in parentheses) for descriptive measures and age by group and image-valence condition

| Variable | High socially anxious |                | Low socially anxious |                |
|----------|-----------------------|----------------|----------------------|----------------|
|          | Negative image        | Positive image | Negative image       | Positive image |
| SIAS     | 42.05 (5.99)          | 40.23 (7.85)   | 6.18 (2.32)          | 6.18 (2.59)    |
| RSES     | 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)   |

Note. SIAS, Social Interaction Anxiety Scale; RSES, Rosenberg Self-Esteem Scale; STAI-T, State-Trait Anxiety Inventory-Trait; DASS-D, Depression Anxiety Stress Scale-21 Depression subscale.

depression, anxiety, and general distress. High levels of social anxiety are often associated with elevated levels of depression (e.g. Fava et al., 2000) and therefore we only report the depression subscale. All three measures had excellent internal consistency in the current study (RSES  $\alpha = .93$ ; STAI-T  $\alpha = .93$  DASS-D  $\alpha = .87$ ). We expected high socially anxious participants to have higher scores on all three measures, but wanted to ensure that there were no differences between image conditions within the groups.

*Measure of implicit self-esteem.* The Implicit Association Test (IAT; Greenwald, McGhee, & Schwartz, 1998) is a computerised reaction time task which tests the strength of the association between two different concepts. The self-esteem IAT (Greenwald & Farnham, 2000) uses "self" (*I, me, mine, and the first name of the participant*) and "other" (*them, them, his, hers*) words as one category, and positive (*secure, likeable, clever, interesting, confident, accepted, loveable, worthy*) and negative words (*boring, stupid, worthless, incompetent, disliked, ridiculous, inferior, useless*) as the other category. The self-esteem IAT has reasonable test-retest reliability ranging from  $r = .52$  (Greenwald & Farnham, 2000) to  $r = .69$  (Bosson, Swann, & Pennebaker, 2000) over intervals ranging from a few hours to several weeks. The words selected for this study were taken from Tanner et al.'s (2006) study.

Words were presented individually in a fixed position on the screen and participants responded as quickly as possible by pressing one of two buttons on a response box. The IAT consisted of seven stages, which are given in Table 2. Within each phase, words were presented in a random order. The presentation of blocks 3–4 and 6–7 was counterbalanced within groups. The IAT's underlying assumption

is that participants respond more quickly to congruent than to incongruent stimuli. In the self-esteem IAT, congruent stimuli are conceptualised as *self + positive* and *other + negative* words, whereas incongruent stimuli are conceptualised as *self + negative* and *other + positive*.

The difference score derived from the congruent and the incongruent blocks, the IAT-D effect, provides a measure of implicit self-esteem. Positive IAT-D scores reflect positive implicit self-esteem, whereas negative IAT-D scores reflect negative implicit self-esteem (Greenwald et al., 1998; Greenwald, Nosek, & Banaji, 2003). Greenwald et al. (2003) have convincingly demonstrated that the IAT-D effect is superior to other methods of scoring the IAT.

*Measure of explicit self-esteem.* The SSES (McFarland & Ross, 1982) comprises 12 items measuring explicit state self-esteem (proud, competent, confident, smart, resourceful, effective, efficient, inadequate, incompetent, stupid, worthless, and shameful) that are rated on a 1 (not at all) to 11 (extremely) scale. Positive and negative explicit self-esteem represent different factors and subscales are created by summing positively and negatively worded items separately. Internal consistency was high for both subscales (positive  $\alpha = .95$  and negative  $\alpha = .94$ ).

*Social threat task.* Cyberball (Williams et al., 2000) is a computerised ball-toss game that manipulates the degree of social ostracism. In this study, participants were told that they were playing with three other people via a network, whereas all other players were computer simulated. A computerised player started the game. After receiving the ball twice, participants did not receive any further throws from two out of the three other players. The game lasted for 40 throws

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 + negative words              | Other + positive words              |
| 4. 40 trials | Test     | Self + negative words              | Other + positive words              |
| 5. 16 trials | Practice | Other words                        | Self words                          |
| 6. 16 trials | Practice | Other + negative words             | Self + positive words               |
| 7. 40 trials | Test     | Other + negative words             | Self + positive words               |

(approximately 5 min). 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>.

*Cyberball Social Exclusion Questionnaire (CSEQ)*. The CSEQ is a self-report scale that measures four fundamental needs associated with psychological well-being (see Baumeister & Leary, 1995; Williams et al., 2000). There are three items per subscale (self-esteem item example: "I felt good about myself") that are answered on a 1 (*not at all*) to 9 (*very much so*) scale, as well as two scales that assess enjoyment and anger. As explained in the introduction, we were interested only in self-esteem, which had high internal consistency within this sample ( $\alpha = .82$ ; Zadro et al., 2004).

*Manipulation checks*. The CSEQ also contains two manipulation check questions ("What percent of the throws were thrown to you?" and "To what extent were you included by other participants during the game?") The latter is measured on a 1 (accepted) to 9 (rejected) scale. Both groups overestimated the percentage of throws that they had received during Cyberball (high socially anxious  $M = 71.02$ ,  $SD = 11.34$ ; low socially anxious  $M = 69.77$ ,  $SD = 10.28$ ; actual percentage of throws received = 9%), but there was no difference between them,  $t(86) = 0.5$ ,  $p = .59$ . Nor were there any differences between the groups (high socially anxious  $M = 4.32$ ,  $SD = 1.57$ ; low socially anxious  $M = 4.84$ ,  $SD = 1.94$ ) in how much they thought they had been included in the game by the other participants,  $t(86) = 1.39$ ,  $p = .17$ .

Prior to debriefing, we also asked the participants "During the game did you believe that you were playing against other participants?" The majority answered "yes" (34 participants in each social anxiety group); three individuals in the high and two in the low social anxiety group answered "no", and seven high and eight low participants were unsure. Chi square tests showed no differences ( $p = .88$ ).

*Positive and negative self-imagery inductions*. Participants in each group were allocated alternately to either the positive or the negative self-image condition. We used Hirsch, Clark, Mathews, and Williams' (2003) structured interview to elicit the positive and negative images. Participants

recalled a memory of a social situation in which they had felt significantly relaxed (positive) or significantly anxious (negative). Once an image was brought to mind, participants closed their eyes and described it in detail. Questions focused on how the participants looked, felt, and sounded in the situation. Participants held the image in mind during the subsequent tasks and the experimenter reminded them to do so before each new task.

*Manipulation checks for self-images*. Participants rated image vividness on a 0 (*not at all*) to 10 (*extremely*) scale. At the end of the session, participants rated the percentage of time they held the image in mind on a 0% (*none of the time*) to 100% (*all of the time*) scale. There were no significant main effects of social anxiety ( $F(1,84) = 0.01$ ,  $p = .93$ ), or image-valence ( $F(1,84) = 3.27$ ,  $p = .07$ ), on image-vividness, and no interactions ( $F(1,84) = 0.34$ ,  $p = .57$ ). There were no main effects of social anxiety ( $F(1,84) = 0.30$ ,  $p = .59$ ), or image-valence ( $F(1,84) = 2.37$ ,  $p = .13$ ), on time images were held in mind, and no interactions ( $F(1,84) = 0.06$ ,  $p = .81$ ).

## Procedure

Each participant was tested individually. First, the participant completed the RSES, STAI-T, and the DASS-21, (counterbalanced within each social anxiety group). This was followed by the experimenter-led self-imagery exercise. Next, the participant completed the IAT followed by the SSES, and then played Cyberball. At the end of Cyberball, the participant completed the Cyberball questionnaire and manipulation checks, and was then debriefed.

## Results

An  $\alpha$  level of .05 was used for all statistical tests. In tests of the primary hypotheses, the effects of, and interactions between, image-valence (positive vs. negative) and social anxiety group (high vs. low) were explored using a series of two-way independent analyses of covariance (ANCOVAs) with depression entered as a covariate to control for the potential impact of depression on self-esteem.



### Participant characteristics

Table 1 presents the mean scores for the SIAS, RSES, STAI-T and the Depression subscale of the DASS-21. A multivariate analysis of variance with two-between subject factors (group and image-valence) revealed a significant multivariate effect for social anxiety group,  $F(3,82) = 218.35, p < .001, \eta_p^2 = .98$ , but no effect of image-valence,  $F(3,82) = 0.39, p = .76, \eta_p^2 = .01$ , and no group by image-valence interaction,  $F(3,82) = 0.35, p = .79, \eta_p^2 = .01$ . Univariate analyses of variance showed that high socially anxious participants had higher SIAS, STAI-T, and depression (DASS-21) scores, but lower RSES scores (all  $ps < .001$ ). There were no differences between the two image-valence conditions (smallest  $p = .14$ ) and no interactions (smallest  $p = .35$ ).

### Implicit self-esteem

All participants responded significantly faster to congruent ( $M = 891.78, SD = 257.06$ ) compared to incongruent word pairings on the IAT ( $M = 1179.79, SD = 306.69$ ),  $t(87) = 9.58, p < .001$ . This supports the underlying assumption that congruent stimuli are responded to faster than incongruent stimuli. Table 3 gives the IAT-D effect scores. An ANCOVA with two between-subjects factors (group and image-valence) showed that there was a main effect of image-valence,  $F(1,83) = 8.86, p < .005, \eta_p^2 = .10$ . Participants in the negative self-image condition had less positive implicit self-esteem ( $M = 0.60, SD = 0.82$ ) than those in the positive self-image condition ( $M = 1.09, SD = 0.70$ ). There was no main effect of group,  $F(1,83) = 0.16, p = .69, \eta_p^2 = .002$ , no group by condition interaction,  $F(1,83) = 1.00, p = .32, \eta_p^2 = .012$ , and no effect of depression,  $F(1,83) = 0.96, p = .33, \eta_p^2 = .01$ .

### Explicit state self-esteem

The positive and negative subscales of the SSES represent different factors (McFarland & Ross, 1982) and were therefore analysed separately. The means and standard deviations are given in Table 3.

*Positive explicit state self-esteem.* An ANCOVA with two between subject factors (group and image-valence) showed that there were significant main effects of image valence,  $F(1,83) = 45.93, p < .001, \eta_p^2 = .36$ , and social anxiety group,  $F(1,83) = 10.83, p < .001, \eta_p^2 = .12$  on positive explicit state self-esteem. Both the negative self-image condition and high social anxiety led to lower positive explicit state self-esteem than the positive self-image condition and low social anxiety. However, there was no image-valence by group interaction,  $F(1,83) = 1.5, p = .21, \eta_p^2 = .02$ , and no effect of depression,  $F(1,83) = 1.08, p = .30, \eta_p^2 = .01$ .

*Negative explicit state self-esteem.* There were main effects of image-valence,  $F(1,83) = 41.08, p < .001, \eta_p^2 = .33$ , and social anxiety group,  $F(1,83) = 12.60, p < .001, \eta_p^2 = .13$ . Both the negative self-imagery condition and high social anxiety led to higher negative explicit state self-esteem than the positive self-imagery condition and low social anxiety. There was also an interaction between image-valence and group,  $F(1,83) = 5.20, p < .05, \eta_p^2 = .06$ . Although inspection of the interaction suggested that there was a bigger difference between the two groups in the negative than in the positive self-imagery condition,  $t$ -tests revealed significant differences in both conditions (positive self-imagery  $t(42) = 2.87, p < .01$ ; negative self-imagery  $t(42) = 3.87, p < .001$ ). There was no effect of depression,  $F(1,83) = 1.07, p = .30, \eta_p^2 = .01$ .

Table 3. Mean scores and standard deviations (in parentheses) of self-concept measures

| Measure       | High socially anxious |                | Low socially anxious |                |
|---------------|-----------------------|----------------|----------------------|----------------|
|               | Negative image        | Positive image | Negative image       | Positive image |
| IAT-D effect  | 0.42 (0.74)           | 1.10 (0.86)    | 0.77 (0.88)          | 1.09 (0.52)    |
| Positive SSES | 32.73 (13.09)         | 52.77 (12.25)  | 46.77 (10.73)        | 60.41 (9.74)   |
| Negative SSES | 28.14 (13.37)         | 12.09 (6.19)   | 15.32 (7.89)         | 7.82 (3.26)    |

Note. IAT-D, Implicit Association Task Difference Effect; Positive SSES, Positive Subscale of State Self-Esteem Scale; Negative SSES, Negative Subscale of State Self-Esteem Scale.

### ***Explicit self-esteem and social exclusion: Cyberball***

The mean scores for explicit self-esteem during Cyberball were as follows: high socially anxious positive image  $M = 5.61$  ( $SD = 1.58$ ); high socially anxious negative image  $M = 4.32$  ( $SD = 1.32$ ); low socially anxious positive image  $M = 6.70$  ( $SD = 1.47$ ); low socially anxious negative image  $M = 5.91$  ( $SD = 2.00$ ). An ANCOVA with depression as a covariate showed a significant main effect of image-valence,  $F(1,83) = 8.68$ ,  $p < .005$ ,  $\eta_p^2 = .10$ . Participants who held a positive image in mind reported higher explicit self-esteem immediately following the exclusion task. There was a main effect of social anxiety group,  $F(1,83) = 4.96$ ,  $p < .05$ ,  $\eta_p^2 = .06$ ; high socially anxious participants reported lower explicit self-esteem than low anxious participants, but no image-valence by social anxiety group interaction ( $p = .58$ ). There was also a main effect of depression,  $F(1,83) = 6.1$ ,  $p < .05$ ,  $\eta_p^2 = .07$ ; participants with higher levels of depression reported lower explicit self-esteem,  $r(88) = -.41$ ,  $p < .001$ . When the analysis was re-run excluding participants who either did not believe that they were playing with real participants or were unsure, the main effect of image-valence ( $p < .005$ ) and of depression ( $p < .05$ ) remained, but the main effect of social anxiety was no longer significant ( $p = .15$ ).

## **Discussion**

This study had two aims. The first was to examine the effect of positive and negative self-imagery on implicit and explicit self-esteem in high and low socially anxious participants. The second was to investigate whether positive self-images would buffer the negative impact of social exclusion on explicit self-esteem, and if it did, whether high socially anxious participants would benefit as much from this buffering effect as low socially anxious participants. In terms of the first aim, we found that when participants held a negative self-image in mind, they demonstrated less positive implicit self-esteem, and reported lower positive explicit and higher negative explicit state self-esteem irrespective of group membership. We found a main effect

of social anxiety group for explicit, but not for implicit self-esteem. In terms of the second aim, we found that positive self-imagery did protect individuals against the effect of exclusion as participants in the positive self-imagery condition reported higher explicit self-esteem after ostracism than those in the negative self-imagery condition. We obtained the predicted main effect of social anxiety (high anxious reported lower explicit self-esteem than low anxious) when all participants were included, but not when we excluded those who did not believe, or were unsure about whether they were playing against a real person. We did not obtain the predicted interaction between social anxiety and image-valence with either the full data set or after excluding participants.

To our knowledge, this is the first study to directly examine the impact of self-imagery on aspects of the self. The results are consistent with our argument, derived from the SMS model (Conway & Pleydell-Pearce, 2000), that self-images may represent working selves. According to this model, activation of a negative self-representation should be associated with a more negative self-view than activation of a more positive self-representation, which is what we found. Low levels of self-esteem are proposed to be a diathesis for the emergence of negative self-evaluative cognitions (de Jong, 2002), which are then likely to reinforce the negative self-beliefs that are key maintaining factors in social anxiety disorder (Clark & Wells, 1995; Rapee & Heimberg, 1997). By comparison, positive self-esteem is associated with good psychological functioning (Kernis, 2005).

The potential roles of explicit and implicit self-esteem may differ. It is notable that positive and negative self-imagery influenced explicit self-esteem even though we found main effects of social anxiety in the expected direction. This suggests that holding negative self-images in mind is detrimental for both high and low socially anxious participants, which is consistent with the suggestion that imagery may have a causal role in the development of social anxiety (see Hirsch et al., 2003a, 2006). The converse is also true: holding positive self-images is associated with higher positive explicit self-esteem, lower negative explicit self-esteem, and the preservation or initiation of the healthy implicit

positive self-bias, which is generally characteristic of low anxious individuals.

We did not find the predicted main effect of social anxiety group on implicit self-esteem. Although this conflicts with the two current studies on implicit self-esteem in social anxiety (de Jong, 2002; Tanner et al., 2006), it is consistent with the broader, albeit small, evidence base on implicit self-esteem in other disorders where positive implicit self-esteem is sometimes reduced, sometimes preserved, and on some occasions higher than in non-clinical groups (e.g. Cockerham, Stopa, Bell, & Gregg, 2009; Franck, De Raedt, Dereu, & Van den Abbeele, 2007). The more interesting finding here is that negative self-imagery reduces positive implicit self-esteem in both high and low socially anxious participants. Again, this is consistent with the idea that in the negative self-image condition participants access a more negative working self. However, it is somewhat at odds with the idea that implicit self-esteem is the result of automatic, non-conscious, and highly practised self-evaluations and therefore likely to be temporally stable (e.g. Greenwald & Banaji, 1995). Further research that manipulates different ways of accessing the working self, and that includes a wider range of measures to sample the working self may help to resolve this issue.

The demonstration that manipulation of self-images directly affects both implicit and explicit self-esteem is very encouraging because it suggests that when patients are asked to develop a more realistic and generally more positive image of self in treatment, this may be helping them to access a more positive working self in which the self-favouring bias is preserved, at least at the implicit level, and explicit self-esteem is also improved. If it is possible to reduce self-esteem in low socially anxious participants with a single experience of imagery manipulation, constant retrieval of a working self that is characterised by high negative explicit state self-esteem and reduced positive implicit and explicit self-esteem in patients with social anxiety disorder is likely to reinforce negative unconditional beliefs about the self that maintain the disorder (Clark & Wells, 1995). Heightened self-focused attention may further increase the weight given to these internal representations as a true view of self (e.g. Heinrichs & Hofmann, 2001) and repeated

activation of these self-representations will strengthen their accessibility (see Brewin, 2006). Future research needs to examine individuals with social anxiety disorder to test whether the current results can be generalised to a clinical population, as one of the limitations of this study is its use of an exclusively analogue sample. It would also be preferable to randomly assign participants to the two image conditions, rather than simply alternating assignment to each condition, in order to avoid the possibility of a systematic bias.

The second aim of the study was to see whether positive self-images could buffer the negative effects of social exclusion on explicit self-esteem. The results demonstrated that positive self-imagery preserved explicit self-esteem even in the face of social exclusion. When participants who did not believe that they were playing against real players or were unsure about this were removed, there was no longer a difference between the two social anxiety groups, but the effect of the imagery manipulation remained. We did not find the predicted interaction between social anxiety and image-valence. This was surprising because we expected high socially anxious participants to be more vulnerable to social exclusion. One possibility is that our use of a single global measure of explicit self-esteem was not sufficiently sensitive to register a difference between the groups. This seems unlikely as there was a clear difference between the two image conditions. However, the single measure did not allow us to tease apart positive and negative explicit self-esteem and we had no measure of implicit self-esteem. More sophisticated measures of self-esteem might reveal the expected interaction effect. Alternatively, if our hypothesis about the retrieval of positive working self is correct, then the absence of an interaction may be due to the fact that accessing a more positive self-representation is genuinely self-protective.

The protective, or buffering, effect of positive self-images during Cyberball is consistent with experimental studies that demonstrate reduced anxiety and improved performance when participants hold positive images (e.g. Hirsch et al., 2003b, 2004; Stopa & Jenkins, 2007; Vassilopoulos, 2005). This study extends these findings by looking directly at one self-variable, namely explicit



self-esteem. However, in addition to the limitation of using a single global measure of explicit self-esteem, another possible limitation was that all participants under-estimated the degree of social exclusion. This might have meant that high socially anxious participants did not find Cyberball as threatening as we had expected. However, this seems unlikely as participants still reported exclusion rates of about 80%, and given that even mild social exclusion is aversive, these rates suggest that Cyberball was successful in creating a socially threatening situation.

The construction of more positive (and less negatively-biased) self-images forms an important part of current treatment protocols (e.g. Clark et al., 2006). In terms of the SMS model (Conway & Pleydell-Pearce, 2000), this study provides preliminary evidence that targeting negative self-images and promoting positive ones in social anxiety disorder might be effective because these techniques help patients to access a more positive working self. If, as Brewin (2006) suggests, multiple representations of self compete for retrieval, then the repeated activation of positive self-images in therapy should increase the accessibility of positive self-representations, thereby increasing their likelihood of winning the retrieval competition (at the expense of negative self-representations). The increased accessibility of positive representations may influence the accessibility of information that could 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. Future research in this area would benefit from combining experimental studies on both analogue and patient groups with further examination of potential change mechanisms in therapy.

## Acknowledgements

Preparation of this paper was supported by a Wellcome Trust Grant to L. Stopa and C. R. Hirsch (WT079794MF).

## Note

1. Social anxiety is a ubiquitous human experience but does not necessarily reach clinically severe levels. We use the term social anxiety disorder to denote the

clinical disorder and the term social anxiety to describe non-clinical levels of social anxiety.

## References

- Baumeister, R. F., & Leary, M. R. (1995). The need to belong: Desire for interpersonal attachments as a fundamental human motivation. *Psychological Bulletin*, *117*, 497–529, doi:10.1037/0033-2909.117.3.497.
- Bosson, J. K., Brown, R. P., Zeigler-Hill, V., & Swann, W. B. (2003). Self-enhancement tendencies among people with high explicit self-esteem: The moderating role of implicit self-esteem. *Self and Identity*, *2*, 169–187, doi:10.1080/15298860309029.
- Bosson, J. K., Swann, W. B., & Pennebaker, J. W. (2000). Stalking the perfect measure of implicit self-esteem: The blind men and the elephant revisited? *Journal of Personality and Social Psychology*, *79*, 631–643, doi:10.1037/0022-3514.79.4.631.
- Brewin, C. R. (2006). Understanding cognitive behaviour therapy: A retrieval competition account. *Behaviour Research and Therapy*, *44*, 765–784, doi:10.1016/j.brat.2006.02.005.
- Clark, D. M., Ehlers, A., Hackmann, A., McManus, F., Fennell, M., Grey, N., Waddington, L., & Wild, J. (2006). Cognitive therapy versus exposure and applied relaxation in social phobia: A randomized controlled trial. *Journal of Consulting and Clinical Psychology*, *74*, 568–578, doi:10.1037/0022-006X.74.3.568.
- Clark, D. M., & Wells, A. (1995). A cognitive model of social phobia. In R. G. Heimberg, M. R. Liebowitz, D. A. Hope, & F. R. Schneier (Eds.), *Social phobia: Diagnosis, assessment and treatment* (pp. 69–93). New York: Guilford Press.
- Cockerham, E., Stopa, L., Bell, L., & Gregg, A. (2009). Implicit self-esteem in bulimia nervosa. *Journal of Behavior Therapy and Experimental Psychiatry*, *40*, 265–273, doi:10.1016/j.jbtep.2008.12.003.
- Conway, M. A., & Pleydell-Pearce, C. W. (2000). The construction of autobiographical memories in the self-memory system. *Psychological Review*, *107*, 261–288, doi:10.1037/0033-295X.107.2.261.
- de Jong, P. J. (2002). Implicit self-esteem and social anxiety: Differential self-favouring effects in high and low anxious individuals. *Behaviour Research and Therapy*, *40*, 501–508, doi:10.1016/S0005-7967(01)00022-5.
- Demo, D. H., & Savin-Williams, R. C. (1992). Self-concept stability and change during adolescence. In R. P. Lipka & T. M. Brinthaup (Eds.), *Self-perspectives across the life span* (pp. 116–148). Albany, NY: State University of New York Press.
- Fava, M., Rankin, M. A., Wright, E. C., Alpert, J. E., Nierenberg, A. A., Pava, J., & Rosenbaum, J. F. (2000). Anxiety disorders in major depression. *Comprehensive Psychiatry*, *41*, 97–102, doi:10.1016/S0010-440X(00)90140-8.

- Franck, E., De Raedt, R., Dereu, M., & Van den Abbeele, D. (2007). Implicit and explicit self-esteem in currently depressed individuals with and without suicidal ideation. *Journal of Behavior Therapy and Experimental Psychiatry*, *38*, 75–85, doi:10.1016/j.jbtep.2006.05.003.
- Greenwald, A. G., & Banaji, M. R. (1995). Implicit social cognition: Attitudes, self-esteem, and stereotypes. *Psychological Review*, *102*, 4–27, doi:10.1037/0033-295X.102.1.4.
- Greenwald, A. G., & Farnham, S. D. (2000). Using the implicit association test to measure self-esteem and self-concept. *Journal of Personality and Social Psychology*, *79*, 1022–1038, doi:10.1037/0022-3514.79.6.1022.
- Greenwald, A. G., McGhee, D. E., & Schwartz, J. L. K. (1998). Measuring individual differences in implicit cognition: The Implicit Association Test. *Journal of Personality and Social Psychology*, *74*, 1464–1480, doi:10.1037/0022-3514.74.6.1464.
- Greenwald, A. G., Nosek, B. A., & Banaji, M. R. (2003). Understanding and using the Implicit Association Test: I. An improved scoring algorithm. *Journal of Personality and Social Psychology*, *85*, 197–216, doi:10.1037/0022-3514.85.2.197.
- Hackmann, A., Clark, D. M., & McManus, F. (2000). Recurrent images and early memories in social phobia. *Behaviour Research and Therapy*, *38*, 601–610, doi:10.1016/S0005-7967(99)00161-8.
- Heinrichs, N., & Hofmann, S. G. (2001). Information processing in social phobia: A critical review. *Clinical Psychology Review*, *21*, 751–770, doi:10.1016/S0272-7358(00)00067-2.
- Hetts, J. J., & Pelham, B. W. (2001). A case for the nonconscious self-concept. In G. B. Moskowitz (Ed.), *Cognitive social psychology: The Princeton symposium on the legacy and future of social cognition* (pp. 105–123). Mahwah, NJ: Lawrence Erlbaum Associates.
- Hirsch, C. R., & Clark, D. M. (2004). Mental imagery and social phobia. In J. Yiend (Ed.), *Cognition, emotion and psychopathology: Theoretical, empirical and clinical directions* (pp. 232–250). New York: Cambridge University Press.
- Hirsch, C. R., Clark, D. M., Mathews, A., & Williams, R. (2003a). Self-images play a causal role in social phobia. *Behaviour Research and Therapy*, *41*, 909–921, doi:10.1016/S0005-7967(02)00103-1.
- Hirsch, C. R., Mathews, A., Clark, D. M., Williams, R., & Morrison, J. (2003b). Negative self-imagery blocks inferences. *Behaviour Research and Therapy*, *41*, 1383–1396, doi:10.1016/S0005-7967(03)00057-3.
- Hirsch, C. R., Mathews, A., Clark, D. M., Williams, R., & Morrison, J. A. (2006). The causal role of negative imagery in social anxiety: A test in confident public speakers. *Journal of Behavior Therapy and Experimental Psychiatry*, *37*, 159–170, doi:10.1016/j.jbtep.2005.03.003.
- Hirsch, C. R., Meynen, T., & Clark, D. M. (2004). Negative self-imagery in social anxiety contaminates social interactions. *Memory*, *12*, 496–506, doi:10.1080/09658210444000106.
- Hofmann, S. G. (2007). Cognitive factors that maintain social anxiety disorder: A comprehensive model and its treatment implications. *Cognitive Behaviour Therapy*, *36*, 193–209, doi:10.1080/16506070701421313.
- Kernis, M. H. (2005). Measuring self-esteem in context: The importance of stability of self-esteem in psychological functioning. *Journal of Personality*, *73*, 1569–1605, doi:10.1111/j.1467-6494.2005.00359.x.
- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: Comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, *33*, 335–343, doi:10.1016/0005-7967(94)00075-U.
- Mattick, R. P., & Clarke, J. C. (1998). Development and validation of measures of social phobia scrutiny fear and social interaction anxiety. *Behaviour Research and Therapy*, *36*, 455–470, doi:10.1016/S0005-7967(97)10031-6.
- McFarland, C., & Ross, M. (1982). Impact of causal attributions on affective reactions to success and failure. *Journal of Personality and Social Psychology*, *43*, 937–946, doi:10.1037/0022-3514.43.5.937.
- Moscovitch, D. A. (2009). What is the core fear in social phobia? A new model to facilitate individualized case conceptualization and treatment. *Cognitive and Behavioral Practice*, *16*, 123–134, doi:10.1016/j.cbpra.2008.04.002.
- Rapee, R. M., & Heimberg, R. G. (1997). A cognitive-behavioural model of anxiety in social phobia. *Behaviour Research and Therapy*, *35*, 741–756, doi:10.1016/S0005-7967(97)00022-3.
- Rosenberg, M. (1965). *Society and adolescent self-image*. Princeton, NJ: Princeton University Press.
- Spielberger, C. D., Gorsuch, R. R., Lushene, R. E., Vagg, P. R., & Jacobs, A. G. (1983). *State-Trait Anxiety Inventory test manual*. Palo Alto, CA: Consulting Psychologists Press.
- Stopa, L. (Ed.). (2009). *Imagery and the threatened self*. London: Routledge.
- Stopa, L., & Jenkins, A. (2007). Images of the self in social anxiety: Effects on the retrieval of autobiographical memories. *Journal of Behavior Therapy and Experimental Psychiatry*, *38*, 459–473, doi:10.1016/j.jbtep.2007.08.006.
- Tanner, R. J., Stopa, L., & De Houwer, J. (2006). Implicit views of the self in social anxiety. *Behaviour Research and Therapy*, *44*, 1397–1409, doi:10.1016/j.brat.2005.10.007.
- Vassilopoulos, S. (2005). Social anxiety and the effects of engaging in mental imagery. *Cognitive Therapy and Research*, *29*, 261–277, doi:10.1007/s10608-005-2993-4.
- Westenberg, H. G. M. (1998). The nature of social anxiety disorder. *Journal of Clinical Psychiatry*, *59*, 20–26, doi:10.4088/JCP.v59n0105.

- Williams, K. D. (2001). *Ostracism: The power of silence*. New York: Guilford Press.
- Williams, K. D., Cheung, C. K. T., & Choi, W. (2000). Cyberostracism: Effects of being ignored over the Internet. *Journal of Personality and Social Psychology*, *79*, 748–762, doi:10.1037/0022-3514.79.5.748.
- Zadro, L., Boland, C., & Richardson, R. (2006). How long does it last? The persistence of the effects of ostracism in the socially anxious. *Journal of Experimental Social Psychology*, *42*, 692–697, doi:10.1016/j.jesp.2005.10.007.
- Zadro, L., Williams, K. D., & Richardson, R. (2004). How low can you go? Ostracism by a computer is sufficient to lower self-reported levels of belonging, control, self-esteem, and meaningful existence. *Journal of Experimental Social Psychology*, *40*, 560–567, doi:10.1016/j.jesp.2003.11.006.
- Zeigler-Hill, V. (2006). Discrepancies between implicit and explicit self-esteem: Implications for narcissism and self-esteem instability. *Journal of Personality*, *74*, 119–143, doi:10.1111/j.1467-6494.2005.00371.x.