



Contents lists available at ScienceDirect

# Journal of Behavior Therapy and Experimental Psychiatry

journal homepage: [www.elsevier.com/locate/jbtep](http://www.elsevier.com/locate/jbtep)



## Fear of evaluation in social anxiety: Mediation of attentional bias to human faces



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### ARTICLE INFO

*Article history:*

Received 26 February 2014  
Received in revised form  
13 June 2014  
Accepted 27 June 2014  
Available online 5 July 2014

*Keywords:*

Social anxiety disorder  
Social phobia  
Attention bias  
Fear of negative evaluation  
Fear of positive evaluation

### ABSTRACT

Social anxiety disorder (SAD) is a debilitating psychological disorder characterised by excessive fears of one or more social or performance situations, where there is potential for evaluation by others. A recently expanded cognitive-behavioural model of SAD emphasizes that both the fear of negative evaluation (FNE) and the fear of positive evaluation (FPE) contribute to enduring symptoms of SAD. Research also suggests that socially anxious individuals may show biases toward threat relevant stimuli, such as angry faces. The current study utilised a modified version of the pictorial dot-probe task in order to examine whether FNE and FPE mediate the relationship between social anxiety and an attentional bias. A group of 38 participants with moderate to high levels of self-reported social anxiety were tested in groups of two to four people and were advised that they would be required to deliver an impromptu speech. All participants then completed an assessment of attentional bias using angry-neutral, happy-neutral, and angry-happy face pairs. Conditions were satisfied for only one mediation model, indicating that the relationship between social anxiety and attentional avoidance of angry faces was mediated by FPE. These findings have important clinical implications for types of treatment concerning cognitive symptoms of SAD, along with advancing models of social anxiety. Limitations and ideas for future research from the current study were also discussed.

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### 1. Fear of evaluation in social anxiety: mediation of attentional biases to human faces

Social anxiety disorder (SAD) is a debilitating psychological disorder characterised by persistent and excessive fears of one or more social or performance situations, where there is potential of evaluation by others (American Psychiatric Association, 2013; Rapee & Heimberg, 1997). Epidemiological data suggests 12 month prevalence rates of 4.5% for SAD (males 3.0%, females 4.6%; Somers, Goldner, Waraich, & Hsu, 2006). The disorder can be severely incapacitating with significant impairment in educational, occupational and social functioning, often resulting in deterioration of an individual's physical and psychological well-being (APA, 2000; Katzelnick et al., 2001). Despite increasing research interest (Boschen, 2008), further research aimed at identifying the causes and maintenance of social anxiety are of considerable importance.

### 2. Cognitive theories of social anxiety

Cognitive-behavioural models attempt to explain the processes that shape and maintain social anxiety, with emphasis on the preferential allocation of attentional resources to threat, and excessive self-focused attention due to fears of negative evaluation from others (Clark & Wells, 1995; Hirsch & Clark, 2004; Rapee & Heimberg, 1997). Fear of negative evaluation (FNE) is a core component of cognitive-behavioural models of social anxiety with extensive empirical support (Clark & Wells, 1995; Rapee & Heimberg, 1997). More recently, researchers have recognised that fear of evaluation in general is important in social anxiety, including both FNE and fear of positive evaluation (FPE; Weeks, Heimberg, & Rodebaugh, 2008). FPE has also been incorporated into an expanded cognitive-behavioural model of social anxiety (Heimberg, Brozovich, & Rapee, 2010). Given that both attentional bias and fear of evaluation are implicated in the cognitive mechanisms that shape and maintain social anxiety, it is the nature and relationship of these factors that is the focus of the current research.

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### 3. Fear of evaluation

Consistent with psycho-evolutionary models of social anxiety, it has been suggested that FPE and FNE may serve separate and distinct adaptive goals (Gilbert, 2001; Weeks & Howell, 2012). For example, those who view themselves as socially inferior to others may avoid giving a positive impression that could be regarded as a threat by other group members (FPE), whilst also motivated not to appear so socially unfavourable as to be excluded from the social group (FNE; Weeks, Rodebaugh, Heimberg, Norton, & Jakatdar, 2009). According to this theory, social anxiety is a protective mechanism intended to balance the risks of moving up the hierarchy too quickly versus falling out of the hierarchy entirely, suggesting that anxiety should be triggered by concerns of either positive and/or negative evaluation (Gilbert, 2001; Rodebaugh, Weeks, Gordon, Langer, & Heimberg, 2012). Previous research suggests that FPE and FNE are related, but distinct, cognitive components of social anxiety, as shown in both clinical (Weeks, Heimberg, Rodebaugh, Goldin, & Gross, 2012) and undergraduate student samples (Weeks, Heimberg, & Rodebaugh, 2008; Weeks, Heimberg, Rodebaugh, & Norton, 2008). Given that both FPE and FNE represent distinct valences of social evaluation, this expanded notion of social anxiety-related fear has been labelled the bivalent fear of evaluation model (BFOE; Weeks & Howell, 2012). Current interventions which emphasize FNE, cognitive restructuring, and exposure work, typically do so with regards to situations involving apprehension of negative appraisal. As a result, FPE may not be specifically, systematically addressed (Weeks, Heimberg, & Rodebaugh, 2008). Understanding how each of these constructs contributes to aspects of social anxiety may improve understanding of the condition, and lead to more comprehensive treatment packages that address all of the important contributors to the maintenance of the disorder.

### 4. Attentional bias

In an effort to measure attentional bias, many researchers have employed well established research paradigms such as the emotional Stroop task and the dot-probe task. These techniques are the most frequently used paradigms for studying attentional bias in social anxiety (Lee & Telch, 2008), resulting in accumulated evidence for attentional vigilance toward negative stimuli with socially anxious individuals (Mogg & Bradley, 2002).

#### 4.1. Dot-probe task

The dot-probe task is generally preferred to alternative methods of assessing attention bias (e.g., Stroop tasks) as it does not rely on interference effects (Bradley, Mogg, & Millar, 2000). The original version of the dot-probe task developed by MacLeod, Mathews, and Tata (1986) utilised pairs of words (e.g., negative and neutral) which were briefly shown (500 ms) followed by a small dot-probe appearing immediately in the location of one of the words. Consistent with the vigilance-for-threat postulate, anxious individuals respond faster to probes that replace negative compared to neutral stimuli (Broadbent & Broadbent, 1988; MacLeod et al., 1986; Mogg, Bradley, & Williams, 1995).

While many studies have shown biases toward negative stimuli in anxiety (Williams, Watts, MacLeod, & Mathews, 1997), other studies propose that this bias occurs for emotional stimuli in general, including both positive and negative information, termed the “emotionality hypothesis” (Martin, Williams, & Clarke, 1991; Mogg & Marden, 1990). However, evidence for this has mainly come from studies utilising the Stroop task, which has been criticised for its lack of ecological validity (Bradley et al., 2000). As single words are

not representative of naturalistic anxiety-provoking stimuli, pictorial information of facial expressions (e.g., angry faces) appear to be more ecologically valid and salient for humans (Bradley et al., 2000). Thus, Bradley et al. (1997) generated a modified version of the dot-probe task utilising pairs of faces. The modified dot-probe task is suggested to overcome this weakness with studies providing evidence that runs counter to the emotionality hypothesis (Bradley, Mogg, Falla, & Hamilton, 1998; Bradley et al., 2000). For example, by using pictorial stimuli, rather than verbal stimuli, many researchers have provided evidence that the anxiety-related attention bias found is vigilance for angry faces, and avoidance of happy faces (Bradley et al., 1998, 2000; Taylor, Bomyea, & Amir, 2010). Incongruent findings between verbal and pictorial stimuli may be attributable to word stimuli being prone to confound effects between their threat value and subjective frequency of use and also between their degree of personal relevance and subjective word frequency effects (Bradley et al., 1998). Pictorial stimuli avoid such confounds, thus minimising any interpretive difficulties.

#### 4.2. Vigilance for negative, avoidance of positive stimuli pattern

Bradley, Mogg, and Millar (2000) used the modified dot-probe task with a student sample measuring high, moderate and low on state anxiety and found: (1) shorter durations (500 ms) produced an opposing pattern of bias for happy versus angry faces; (2) those with moderate and high levels of state anxiety showed vigilance for angry faces; and (3) as state anxiety increased, the tendency to avoid happy faces increased. These results suggest that a threshold effect appears evident with the transition from low to medium state anxiety resulting in the attentional bias pattern found. Similarly, Bradley et al. (1998) found the same bias pattern as that of Bradley et al. (2000) in a sample measuring high and low on trait anxiety. In comparison to previous studies of attentional bias, it has been suggested that vigilance toward negative stimuli depends on particularly high levels of anxiety implying a somewhat different threshold effect (Broadbent & Broadbent, 1988; MacLeod et al., 1986), however these studies of attentional bias have utilised single words as stimuli which may have relatively mild threat value. It appears that the subjective threat value of a stimulus is a crucial factor in determining attentional biases, with severe or real threats more likely to capture attention (Mogg & Bradley, 1998). Thus, whether an attentional bias is found at moderate levels of anxiety depends on the intensity of the stimuli, with more naturalistic and ecologically valid stimuli (e.g., angry faces) capturing attention at lower levels of anxiety than less salient stimuli such as words (Bradley et al., 2000).

#### 4.3. Avoidance of negative and positive stimuli

Conversely, by using modified dot-probe tasks, several studies have found that social anxiety is associated with the tendency to preferentially orient attention away from both positive stimuli (Chen, Ehlers, Clark, & Mansell, 2002; Mansell, Clark, Ehlers, & Chen, 1999; Pishyar, Harris, & Menzies, 2004), and negative stimuli (Mansell et al., 1999; Mansell, Ehlers, Clark, & Chen, 2002). Furthermore, this pattern of avoidance for both positive and negative stimuli is predominantly observed for those with moderate to high self-reported levels of social anxiety under conditions of concurrent social-evaluative threat (Mansell et al., 1999; Taylor et al., 2010). This type of social stressor typically involves a social threat induction where participants are informed they will be required to deliver an impromptu speech which will be video recorded and rated for its quality (Mansell et al., 1999; Taylor et al., 2010). For example, Mansell et al. (1999) used a sample of high and low socially anxious university undergraduates and found: (1) an

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