Journal of Anxiety Disorders 23 (2009) 482–488

Contents lists available at ScienceDirect

Journal of Anxiety Disorders

Interpreting facial expressions: The influence of social anxiety, emotional valence, and race

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ARTICLE INFO

Article history:
Received 18 March 2008
Received in revised form 8 October 2008
Accepted 8 October 2008

Keywords:
Social anxiety
Social phobia
Faces
Race
Skills deficits
Social skills
Information processing

ABSTRACT

Social anxiety is posited to be linked to interpersonal skills deficits, including accurate interpretation of emotional social cues, such as facial expressions. However, empirical support for an interpersonal skills deficit model of social anxiety is lacking. Studies of information processes indicate that socially anxious individuals may be more accurate at identifying threatening facial expressions in particular. In the present study, undergraduates who self-identified as Caucasian ($N = 158$) completed a task assessing facial expression accuracy. Relevant parameters such as emotional valence as well as race of the target were assessed. As predicted, socially anxious individuals were overall *more* accurate at identifying facial expressions. Whereas participants were more accurate overall at identifying Caucasian faces, there were differences in the extent of this discrepancy based on emotional valence. Implications for integration of information processing data and evolutionary models of social anxiety are discussed.

1. Introduction

Social anxiety is among the most common types of anxiety (Kessler et al., 2005) and is characterized by persistent fear and avoidance of social situations involving possible negative evaluation by other people (American Psychiatric Association, 1994). Such high prevalence rate is particularly problematic given that social anxiety tends to be a chronic condition with an early age of onset and low rates of recovery (Davidson, Hughes, George, & Blazer, 1993). Further, social anxiety is associated with other serious conditions including suicidal ideation and suicide attempts, depression, and problematic substance use (Buckner, Bernert, Timpano, Joiner, & Schmidt, 2008; Buckner, Mallott, Schmidt, & Taylor, 2006; BucknerS et al., 2008; Davidson et al., 1993; Grant et al., 2005; Kessler et al., 1997; Kessler, Stang, Wittchen, Stein, & Walters, 1999). Individuals with social anxiety experience marked impairment in multiple domains of functioning (e.g., education, employment, interpersonal relationships; Schneier et al., 1994; Stein, Torgrud, & Walker, 2000) and the dysfunction experienced by those with social anxiety result in substantial public health costs (Schneier, Johnson, Hornig, Liebowitz, & Weissman, 1992). Identifying cognitive processes implicated in the etiology and maintenance of this prevalent and debilitating condition remains an important research and clinical aim, particularly given that psychotherapies that include cognitive techniques are efficacious for the treatment of pathological social anxiety (Butler, Chapman, Forman, & Beck, 2006; Taylor, 1996).

Some models of social anxiety emphasize the role of interpersonal skills deficits (e.g., misinterpreting the emotional valence of facial expressions) in the etiology and/or maintenance of this condition (Rapee & Heimberg, 1997; Schlenker & Leary, 1982). For instance, individuals with high social anxiety are thought to be more likely to misinterpret vague or neutral social cues (e.g., facial expressions) as negative (Rapee & Heimberg, 1997). Recurrences of such misinterpretations are posited to increase social anxiety and avoidance. Similarly, Rapee and Spence (2004) suggest that repeated experiences of interpersonal failure, partially caused by social skill deficits (including the misinterpretation of facial expressions), can increase social anxiety. Empirical examinations of facial recognition accuracy in children and adults with high social anxiety have thus far produced mixed findings. Battaglia et al. (2004) asked Italian second and third graders to identify facial expressions of emotion as either joy, anger, disgust, sadness, fear, surprise, or neutral on pictures of children their own age. Higher observer-rated social anxiety was associated with higher rates of misidentification of emotional expressions. Additionally, higher social anxiety was particularly associated with the identification of

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doi:10.1016/j.janxdis.2008.10.004

non-angry emotions as anger. However, other studies have failed to find deficits in facial expression recognition among socially anxious children (McClure & Nowicki, 2001; Melfsen & Florin, 2002).

Comparably equivocal findings have been reported with adult samples (e.g., Merckelbach, Van Hout, Van den Hout, & Mersch, 1989; Winton, Clark, & Edelmann, 1995). Most recently, Philippot and Douilliez (2005) demonstrated no difference in overall facial expression identification accuracy between people with social anxiety disorder (SAD) compared to people with other anxiety disorders and non-anxious controls. There also were no significant differences between groups based on the valence of the emotion displayed (happiness, anger, sadness, disgust, and fear). Mullins and Duke (2004) found participants with high social anxiety who were engaging in a speech task responded faster to angry and fearful faces than individuals with low social anxiety, suggesting differences between individuals with high and low social anxiety in processing negative emotional expressions. Individuals with SAD also appear more accurate than non-anxious controls in recognizing when a group of faces includes slightly more negative faces than neutral or positive faces (Gilboa-Schechtman, Presburger, Marom, & Hermesh, 2005). In addition, compared to individuals with low social anxiety, those with high social anxiety have been found to be more accurate at identifying negative audience behaviors while giving a speech to a live audience (Perowne & Mansell, 2002; Veljaca & Rapee, 1998).

In sum, despite theoretical models suggesting that social anxiety is associated with deficits in the identification of facial expressions, the data remain equivocal. Disparate findings may be at least in part due to the failure to consistently examine the valence of facial expression in accuracy tasks. Although socially anxious individuals may misinterpret ambiguous or neutral expressions as negative, they may be at least as accurate as those with lower levels of social anxiety in the identification of negative expressions. In fact, accumulating evidence indicates that the valence of the facial expression may be important to consider (Battaglia et al., 2004; Gilboa-Schechtman et al., 2005; Simonian, Beidel, Turner, Berkes, & Long, 2001). There may be no overall differences in accuracy, but there may be differences in emotions that represent threat (in particular anger).

Disparate findings in the accuracy of facial expression recognition in social anxiety may also be, in part, due to differences in study procedures. In particular, studies that reported no differences in facial recognition accuracy between individuals with high and low social anxiety did not limit the amount of time participants viewed the stimuli before making a decision about the emotion displayed (Mullins & Duke, 2004; Philippot & Douilliez, 2005). However, other information processing literature suggests differences in processing emotional stimuli, including identifying threat, are likely to be in the initial interpretation of facial expressions (Battaglia et al., 2004; Gilboa-Schechtman et al., 2005; Simonian et al., 2001). Thus, having unlimited time may obfuscate differences occurring at initial processing of facial expressions.

Another potential limitation to understanding facial expression interpretation in social anxiety is the dearth of research examining how characteristics of the target face may affect accuracy. Yet considerable theory and data suggest race of the target face is an important variable (Elfenbein & Ambady, 2002).[1] According to ecological or evolutionary theories of perception, members of out-groups (e.g., individuals of different races) represent a specific threat warranting special attention (McArthur & Baron, 1983). It has been suggested that it is evolutionarily adaptive to accurately detect threat cues from individuals from different groups (McArthur & Baron, 1983). Given data suggesting that social anxiety may be associated with more accurate identification of social threat cues (Battaglia et al., 2004; Gilboa-Schechtman et al., 2005; Perowne & Mansell, 2002; Simonian et al., 2001; Veljaca & Rapee, 1998) combined with the theory that social threat cues displayed by out-group members represent particularly threatening stimuli (McArthur & Baron, 1983), it follows that individuals with high social anxiety may be especially accurate identifying facial expressions on out-group members, in particular angry or hostile expressions. However, in a meta-analysis describing 97 separate studies, Elfenbein and Ambady (2002) found a significant in-group advantage in the accurate identification of facial expressions of emotion. The majority of the studies cited examined Caucasian and African American people in the United States; yet, whether across or within national borders, participants were more accurate at identifying emotion on same-race target faces than other-race faces.

A dialect or familiarity model of inter-group interactions may explain this in-group advantage in facial expression accuracy. This model posits that because people are less likely to interact with out-group members, they are less familiar with subtle cultural differences in the expression and interpretation of emotion and, as a result, less accurate at identifying out-group facial expressions (Elfenbein, Beaupre, Levesque, & Hess, 2007). It may therefore be the case that individuals with high social anxiety are particularly accurate at identifying negative or threatening facial expressions within their own race, but not necessarily among faces of different races. Yet we know of no studies that have tested this hypothesis.

In sum, it has been suggested that existence of accuracy deficits in the ability to interpret facial expressions contributes to the development, maintenance, and exacerbation of social anxiety (Rapee & Heimberg, 1997; Schlenker & Leary, 1982). The facial recognition literature, however, does not clearly suggest accuracy differences between adults with high and low social anxiety (Merckelbach et al., 1989; Philippot & Douilliez, 2005; Winton et al., 1995). At the same time, some data suggest that rather than deficits in facial recognition, individuals with higher levels of social anxiety respond more quickly than those with low social anxiety to threatening facial expressions (e.g., Gilboa-Schechtman, Foa, & Amir, 1999). Further, it seems that social anxiety is related to *greater* accuracy identifying facial expressions of emotions, especially those that are threatening (Perowne & Mansell, 2002; Veljaca & Rapee, 1998). Equivocal findings in the facial recognition literature may be partially due to the failure to examine accuracy on the level of specific emotions that represent threat, in particular anger. Moreover, we know of no studies that have attempted to assess the impact of both the level of social anxiety and the race of the target face, despite a preponderance of evidence to suggest race affects the accurate recognition of facial expressions (Elfenbein & Ambady, 2002). There is also important overlap in evolutionary theory of anxiety and ecological models of social perception that warrants a combined investigation of these processes.

The present study set out to clarify the role of social anxiety in the ability to interpret facial expressions of emotion in several ways. First, we examined accuracy. Consistent with prior work (Gilboa-Schechtman et al., 1999; Horley, Williams, Gonsalvez, & Gordon, 2004; Veljaca & Rapee, 1998), we expected a main effect of social anxiety such that individuals with high social anxiety would demonstrate greater overall accuracy in overall emotional expression identification. Further, we examined differences in

[1] Ethnicity generally refers to the social–psychological sense of collectiveness, and the term "race" is more conventionally used to describe physical differences (Sue, Kuraski, & Srinivasan, 1999). We will use the word "race" because the study is concerned with group designations based on skin color.