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Effects of alcohol on ratings of emotional facial expressions in social phobics

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Abstract

Social phobics have an increased risk of alcoholism. The mechanism behind this co-morbidity is not well understood. According to the appraisal–disruption model [Sayette, M. A. (1993). An appraisal–disruption model of alcohol's effects on stress responses in social drinkers. *Psychological Bulletin, 114*, 459–476], alcohol disrupts appraisal of threat stimuli unless the stimuli are easy to process. We investigated whether alcohol alters the judgment of emotional facial expressions in social phobics and controls. We also tested the judgment of emotionally ambiguous faces which should be more difficult to process.

Forty social phobics and controls rated faces depicting five emotional expressions on an animosity rating scale. For two ambiguous facial expressions, angry, respectively, happy faces were blended with neutral faces. Half of the participants consumed alcohol.

Socially phobic participants rated neutral and happy facial expressions as less friendly than controls, irrespective of alcohol consumption. In both groups, consuming alcohol reduced the perceived rejection of angry faces.

In line with current theories of social phobia, patients interpreted neutral facial expressions as more rejecting than controls. The rejection perceived in explicitly angry facial expressions was less after drinking alcohol. This reduction of the adversity of socially threatening stimuli by alcohol might act as negative reinforcement and thus contributes to alcohol problems.

Keywords: Social anxiety disorder; Alcohol; Self-report; Judgment bias; Emotional facial expressions

Adequate interpretation of emotional facial expressions is an important human skill necessary to establish and maintain satisfying relationships. Emotions are rarely communicated verbally, but via changes in emotional expressions that deliver information of the current affective state or attitude of a person (Patterson, 1999). Difficulties in extracting the correct meaning of facial expressions may contribute to the maintenance of psychiatric disorders like addiction (Kornreich et al., 2002, 2003; Philippot et al., 1999) or schizophrenia (Ross et al., 2001; Streit et al., 2001). In social phobics, interpretations of facial emotions are of particular interest. Cognitive models of social phobia (Clark & Wells, 1995; Rapee & Heimberg, 1997) propose that negative interpretation of neutral social information contributes to elevated social anxiety in interaction situations.

Biases in information processing of social phobics have been studied with different methods (for an overview see Heinrichs & Hofmann, 2001). Several studies examined biases in early attentional processes (Mogg, Philippot, & Bradley, 2004; Pishyar, Harris, &

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Menzies, 2004), explicit and implicit memory (for an overview see Coles & Heimberg, 2002) and in interpreting ambiguous social situations or sentences (Amir, Foa, & Coles, 1998; Mathews & Mackintosh, 2000). In this paper we will focus on explicit judgment of emotionality of facial expressions in social phobics compared to controls.

So far, results of studies looking at explicit evaluative biases for facial expressions do not support the view that social phobics misinterpret facial expressions. Merckelbach, Van Hout, van den Hout, and Mersch (1989) did not find differences between social phobics and controls rating angry, neutral, and joyful faces with respect to their pleasantness on a visual analog scale. However, the authors analyzed a sample of only nine social phobics and nine controls. Consequently, the statistical power to detect differences in this study is questionable. Philippot and Douilliez (2005) compared 20 social phobics, 20 patients diagnosed with other anxiety disorders and 39 controls on their ratings of faces depicting five different emotions. Intensity of the displayed emotions was manipulated with a morphing program. Faces were rated on seven emotion scales for emotion quality and intensity and participants had to indicate how difficult the ratings were. Although statistical power was sufficient, the authors did not find differences on any dependent measure between groups. They conclude that "...if they exist, evaluative biases in social anxiety should be implicit and automatic and might be determined by the relevance of the stimulus to the persons' concern rather than by the stimulus valence" (Philippot & Douilliez, 2005). Melfsen and Florin (2002) presented joyful, neutral and angry faces to socially anxious and non-anxious children for 60 ms and asked them to indicate the valence of the faces. Anxious children did neither interpret neutral nor positive faces as more negative than controls. Also, they were not better at decoding negative expressions than controls.

In their studies of memory bias in social phobia, Coles and Heimberg (2004) and Lundh and Öst (1996) asked social phobics and controls, how accepting or critical they perceived neutral faces. Participants were instructed to "catch their immediate impression of the person" as "either accepting or critical towards ones own faults". This instruction focused on a perceived attitude towards an individual and did not ask for a correct identification of emotional quality or intensity. No difference in the explicit evaluation of faces was found between the groups, although social phobics recognized faces better which had been rated as critical in both studies. In an event-related functional magnetic resonance imaging study, Cooney, Atlas, Joormann, Eugene, and Gotlib (2006) examined brain responses to neutral facial expressions and oval-shaped control stimuli of social phobics and healthy controls. Patients exhibited greater right amygdala activation to the contrast of neutral faces versus oval control stimuli, whereas controls exhibited left amygdala activation. The authors interpreted these results in two ways: Firstly, neutral stimuli can elicit emotional responses in both groups, which has to be considered when they are used as baseline cues. Secondly, relatively right-sided amygdala activity in social phobics reflects higher threat sensitivity in their threat detection system. The lack of experimental evidence for an explicit evaluation bias in self-report tasks is surprising, as misinterpretation of social information is a key feature in most theoretical accounts of social phobia and neural correlates of misinterpretation of neutral facial cues were shown (Cooney et al., 2006). Whereas ratings of emotional quality and intensity do not show promise for future findings, the direct examination of the perception of the social meaning of facial expressions may help to better understand the role of facial social information in the maintenance of social phobia.

Epidemiologic studies show substantial associations between social phobia and alcohol related disorders (e.g., Davidson, Hughes, George, & Blazer, 1993; Lepine & Pelissolo, 1998; Schneier, Martin, Liebowitz, Gorman, & Fyer, 1989). The causal mechanism behind this association is not well understood. The Self Medication Hypothesis (SMH) states that anxiety patients use alcohol to cope with anxiety symptoms, leading to negative reinforcement of alcohol consumption (e.g., Carrigan & Randall, 2003). In contrast to the predictions of the SMH, Allan (1995) and Holle, Heimberg, Sweet, and Holt (1995) could not find higher levels of general alcohol consumption in social phobics compared to non-anxious controls. A different approach to identify key processes of the link between social phobia and alcoholism may be found in cognitive theories of the effects of alcohol on stress. Based on network theories of memory (Bower, 1981), the "appraisal–disruption model" by Sayette (1993) proposes an indirect influence of alcohol on anxiety by influencing cognitive processes. Sayette suggests that alcohol disrupts initial appraisal of anxiety provoking stimuli, inhibiting the spread of activation in the previously established threat memory network. A necessary condition for this effect is that alcohol will be consumed before the threatening event is known to occur. Also, if a stressor is easily or especially efficiently appraised, the anxiolytic effects will be diminished. In a test of the predictions of the model, Gerlach, Schiller, Wild, and Rist (2006) found that