Impaired emotional facial expression recognition in alcoholics:
Are these deficits specific to emotional cues?

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Abstract

Previous studies have repeatedly linked alcoholism is to impairment in emotional facial expression decoding. The present study aimed at extending previous findings while controlling for exposure times of stimuli. Further, a control task was added on the decoding of non-emotional facial features. Twenty-five alcoholic participants were compared to 26 control participants matched for age, sex and educational level. Participants performed two computer tasks consisting of presentation of photographs of faces for either 250 or 1000 ms. The first task required "yes" or "no" responses as rapidly as possible to questions regarding non-emotional features of the face (gender, age range and cultural identity). The second task involved a different set of photographs implicating emotional facial expression decoding, with the same exposure times. Again, rapid "yes" or "no" responses to trials combining 32 emotional facial expressions by eight emotional labels (happiness, sadness, fear, anger, disgust, surprise, shame, and contempt) were required from participants. Reaction times were recorded for both tasks. Alcoholic and control participants showed similar results in both tasks in terms of response accuracy. Yet, in the emotional facial expression task, alcoholic participants' responses matched more negative emotional labels, especially sadness. Further, alcoholics were slower than control participants specifically to answer emotional questions on emotional facial expression. No differences appeared on reaction times in the control task. Contrary to expectations, no interaction of stimulus time exposure and group was observed. Overall, these findings replicate and extend previous results on emotional facial expression decoding ability: Alcoholics are specifically impaired on emotional non-verbal behavior information processing: They are slower to correctly identify an emotion.
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1. Introduction

Alcoholics have impairment in cognitive processing of emotional signals. Indeed, studies of recovering alcoholics found deficits in the recognition of emotional facial expressions (EFE) (Oscar-Berman et al., 1990; Philippot et al., 1999; Kornreich et al., 2001a,b; Frigerio et al., 2002) as well as in the identification of affective prosody, a non-verbal aspect of speech (Monnot et al.,

2001, 2002; Uekermann et al., 2005). More specifically, studies on the ability to decode emotional facial expressions have systematically revealed that alcoholics decode emotional facial expressions less accurately than normal controls (Oscar-Berman et al., 1990; Philippot et al., 1999; Kornreich et al., 2001a,b; Frigerio et al., 2002) and, to a lesser degree, than opiate dependent patients (Kornreich et al., 2003). In addition, recovering alcoholics overestimate the intensity of emotional facial expression (Philippot et al., 1999; Kornreich et al., 2001a,b). They also need a greater intensity of nonverbal signals to perceive an expression as being present (Frigerio et al., 2002), and they display different patterns of interpretation of emotion as compared to controls, with a specific bias towards perceiving expressions as hostile (Philippot et al., 1999; Frigerio et al., 2002; Townshend and Duka, 2003).

Such difficulties in the ability to recognize the emotions felt by others may have an important impact on sociability. Indeed, satisfying and successful interpersonal relationships are partly determined by the ability to accurately interpret non-verbal signals from interaction partners (Carton et al., 1999), among which emotion is a very important factor (Patterson, 1999). Concerning alcohol dependence specifically, it is well known that alcoholics are confronted with severe interpersonal problems in their daily functioning (Nixon et al., 1992; Duberstein et al., 1993), which are partly mediated by emotional facial expression decoding deficits (Kornreich et al., 2002).

In everyday life, facial expressions of emotion rarely last more than 1 s (Ekman, 1984). Further, even with 30 to 50 ms exposure time, emotional facial expression decoding accuracy rates in a normal population remains above chance level (Kirouac and Doré, 1984). In sum, in real life, facial expressions of emotion are displayed for a very short time and are recognized very rapidly. While results from earlier studies systematically evidenced impairments in the decoding of emotional information conveyed by the face, the true depth and nature of this deficit in alcoholics may have been hidden by the design used in these studies: Indeed, participants had the possibility to pace themselves and look at stimuli as long as they pleased, which does not correspond to real life conditions.

Further, although the emotional facial expression decoding deficit observed in alcoholism has been well documented, its scope remains nevertheless unclear. It may be the result of a more general impairment in facial or visual perception. Few of the past studies used a control recognition task. Townshend and Duka (2003) included cognitive control tasks on pattern and spatial recognition in their methodology. Alcoholic patients made more errors than control participants in the pattern recognition task, but not in the spatial recognition task. Frigerio et al. (2002) used a control task with animated facial stimuli changing from masculine to feminine: Participants had to indicate when the gender changed. No difference emerged between control and alcoholic participants on this 'perception of face gender' task. Apart from this specific study, none of the previous studies included a control-decoding task on facial perception.

In order to extend and replicate previous data, the present study used a different approach to control these methodological difficulties and to approach real life conditions: It investigates emotional facial expression decoding in alcoholics while controlling for the exposure time of the stimuli (1000 or 250 ms). Reaction times of the participants were recorded. Further, a new control task on the perception of non-emotional features of the face was designed: Each face stimulus was associated with three questions on gender, ethnicity and age. Again exposure times of stimuli were controlled for (1000 or 250 ms) and reaction times responses of the participants were recorded. We hypothesized that compared to normal controls, recovering alcoholics would demonstrate difficulties in the processing of emotional features of the face, but would not display problems in the processing of non-emotional features.

2. Methods

2.1. Participants

Twenty-five inpatients diagnosed with alcohol dependence according to DSM-IV criteria were recruited in a psychiatric ward of a large university hospital in Brussels, Belgium. Alcoholic participants were in their third week of detoxification, and were not given any medication. Abstinence for recovering alcoholics was ensured both by the staff's clinical supervision and by frequent alcohol breath test controls. The presence of a psychotic disorder or of a history of coma led to exclusion from the study. Further, to avoid testing demented patients, all inpatients were screened for overt cognitive dysfunction through the clinical observation of the staff (nursing observation as well as medical and psychological evaluation) regarding their ability to correctly function during their hospitalization (ability to find their way, to be oriented in time, to express themselves properly and to retain information).

Alcoholic participants were matched for age (±5 years), gender, and education with 26 control participants who