

Emotion recognition and executive functioning in schizophrenia



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Background

For more than 30 years schizophrenia research has been concerned with the question whether there is a deficit in the recognition and interpretation of facial emotion expression in schizophrenia patients. The majority of results supports the existence of such a deficit (e.g. Addington & Addington, 1998; Johnston et al., 2001; Kerr & Neale, 1993) which seems to be strongly related to impaired social functioning (e.g. Mueser et al., 1996). However, it still remains unclear whether the emotion recognition deficit is more related to cognitive or to affective disturbances. Therefore, the aim of this study was to investigate facial emotion recognition, executive functioning and its interrelations in patients and healthy controls.

Since the emotion recognition deficit might be modulated by the intensity and the valence of an emotional expression, the study also focused on the impact of these variables on the recognition performance.

Köhler et al. (2003) found that the intensity of the emotional expression influences the recognition performance of schizophrenic patients since they benefit less from a higher intensity than the healthy controls. In addition, Köhler and colleagues found a negative interpretation bias in schizophrenia patients. In the patient group, neutral expressions were more often confused with negative expressions than in the control group. In the present study, we tried to replicate these findings with emotional stimuli of different intensities.

In the area of cognitive function, executive functions became a main topic in schizophrenia research. Interestingly, comparable to emotional face recognition, they were also described as prerequisite for social functioning (Stuss & Alexander, 2000). Since schizophrenia patients often show deficits in executive functioning (e.g. Morris et al., 1995), it would be interesting whether deficits in emotional face recognition and in executive functions are interrelated.

Methods

Participants:

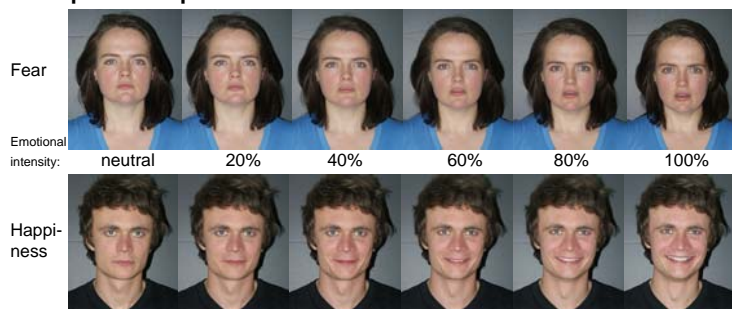
	Schizophrenia (N=20)	Control (N = 20)	Statistics
Sex	10 m, 10 f	10 m, 10 f	
Age (in years)	36.5 (26-52)	37.6 (26-53)	n.s.
Education (in years)	13.8 (10-20; SD 3.1)	14.0 (9-18; SD 2.9)	n.s.
Pre-morbid IQ	104.8 (SD 15.7)	108.6 (SD 12.3)	n.s.

20 patients with schizophrenia and 20 healthy subjects were matched for age, gender, education and estimated pre-morbid IQ. The 20 schizophrenic patients underwent diagnostic examination using the *Scale for the Assessment of Negative Symptoms* (SANS; Andreasen, 1984) and the *Scale for the Assessment of Positive Symptoms* (SAPS; Andreasen, 1983). They were inpatients and relatively stable (SANS: M = 1,4; SD = 0,7; SAPS: M = 0,6; SD = 0,8).

Procedure:

The patient group and the healthy group completed a test battery named Behavioral Assessment of the Dysexecutive Syndrome (BADS; Wilson et al., 1996), which is sensitive to 'everyday' executive impairment. Further more, they completed an emotion recognition test that was constructed in our laboratory. It consisted of 96 morphed stimuli, which represented 5 different intensities of happy, angry, fearful, and disgusted expressions plus neutral faces, all balanced for gender. The morphed stimuli were produced with a computer program that created continua of increasing intensity between the neutral and full expressions of the four emotions.

Example of morphed stimuli:



Results

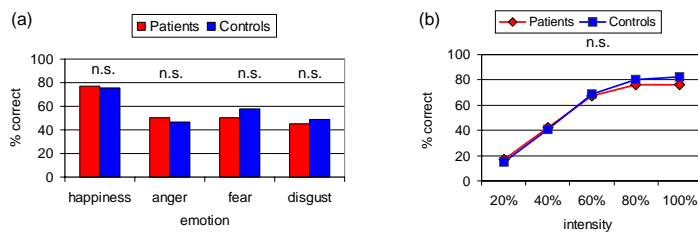


Fig. 1: Percentage of correct responses in emotional face recognition, (a) for the different emotions, (b) for the different emotional intensities, comparisons between patients and controls

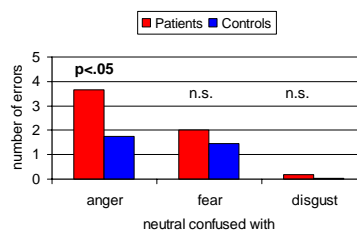


Fig. 2: Error profile of patients and controls for neutral expressions

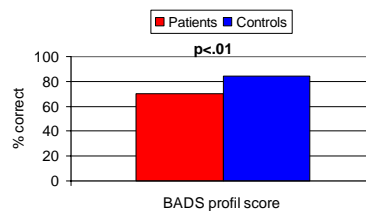


Fig. 3: Percentage of correct responses in executive functioning (overall BADS profil score), comparisons between patients and controls

Conclusions

- Patients performed comparable to control participants on the recognition test. This was observed for all emotions and for neutral faces (Fig. 1a).
- Patients benefited to the same degree as healthy subjects from an increase of emotional intensity (Fig. 1b).
- Contrary to this, in the comparison of patterns of errors patients and healthy subjects differed significantly in misattributions of neutral expressions. Patients overestimated angry expressions (Fig. 2).
- Concerning the performance in the BADS schizophrenic patients also showed impairment compared to healthy controls, which is an indicator for the existence of a dysexecutive syndrome (Fig. 3).
- Empirical findings that reported a deficit of emotional face recognition in patients with schizophrenia could not be replicated in this study. This might be due to the fact that, in contrast to other studies, the patient and the control group in this study were carefully matched for age, gender, education and estimated pre-morbid IQ.
- This result gives evidence for the conclusion that the disturbance in emotional face recognition is not a trait but eventually a state deficit in schizophrenia patients.
- In contrast, the dysexecutive syndrome and the negative interpretation bias seem to be a constant deficit of schizophrenic patients.

References:

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