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Emotion recognition in depression: An investigation of performance and response confidence in adult female patients with depression

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ABSTRACT

Abnormalities in emotion recognition are frequently reported in depression. However, emotion recognition is not compromised in some studies, and confidence judgments, which are essential for social interaction, have not been considered to date. Due to the high prevalence rate of depression in women, and sex differences in emotion recognition, the aim of the present study was to investigate emotion recognition and confidence judgments in women with depression. A sample of female patients with depressive disorders ($n=45$) was compared with female healthy controls ($n=30$) in their ability to correctly identify facial emotion expressions along with confidence judgments. Groups performed similarly on emotional face recognition and showed no difference regarding confidence ratings. A negative correlation between self-assessed depression and response confidence was found. While some limitations of the study must be taken in consideration (e.g., small number of items per emotion category, low severity of depression), abnormalities in emotion recognition do not seem to be a major feature of depression. As self-assessed depression is accompanied by low response confidence for emotional faces, it is crucial to further examine the role of confidence judgments in emotion recognition, as underconfidence may foster interpersonal insecurity in depression.

1. Introduction

With a lifetime prevalence of about 14%, Major Depression (MD) is one of the most frequent psychiatric disorders (Kessler et al., 2012). Women experience episodes of MD twice as often as men (van de Velde et al., 2010), and have higher relapse or non-remission rates (for a review see Essau et al., 2010).

In addition to known emotional and cognitive biases, for example, a pessimistic attribution style for negative events (Strunk et al., 2006) and a well-established memory bias for negative information (Howe and Malone, 2011), impaired processing of interpersonal cues, like facial emotional expressions (FEE), is frequently found in individuals with depression. The ability to correctly recognize emotional content from faces represents one major component of nonverbal communication and is instrumental for interpersonal engagement and social functioning (Adolphs, 2001). Impairments in identifying FEE may foster deficits in social interactions in individuals with depression (Joormann and Gotlib, 2006), which in turn may play an important role in the maintenance and exacerbation of depressive symptoms (Joiner and Timmons, 2009). To date, a large body of research exists pertaining to biased facial emotion detection in depression (for reviews see Bistricky et al., 2011, and Bourke et al., 2010), but no conclusive pattern has emerged as to whether this bias encompasses the entire range of emotions or concerns only specific emotional aspects. For instance, a lower sensitivity for happy FEE and a tendency to judge them as neutral was found by Gollan et al. (2008) as well as Yoon et al. (2009), whereas other studies revealed deficits in identifying neutral FEE in depression (Leppänen et al., 2004; Liu et al., 2012). Regarding the ability to identify negative FEE in depression, findings are also heterogeneous: Some studies demonstrated an improved performance for negative FEE (Gollan et al., 2010; Joormann and Gotlib, 2006), whereas others revealed a comparable (Gollan et al., 2008) or even worse performance (Mikhailova et al., 1996; Surguladze et al., 2004) compared to healthy controls.

In addition to the ability to identify facial emotional expressions, the confidence with which such a judgement is made is of great importance. False judgements that are made with high confidence may be associated with more severe behavioural consequences than those made with some doubt (Moritz and Van Quaquebeke, 2014; Moritz and Woodward, 2006). In everyday life, it is often impossible to correctly decide the emotional state of one's counterpart based on FEE alone. Additional information, for example about situational factors, is needed. Therefore, it may be necessary to exercise caution when making a judgement to avoid

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misinterpretation. On the other hand, if confidence in one's judgements is very low, negative consequences may occur, like overcautious behavior, delayed decision-making, and enhanced uncertainty in social interactions. Experimental tasks, as well as self-report data, such as that from the Cognitive Confidence subscale of the Metacognitions Questionnaire (MCQ; Wells and Cartwright-Hatton, 2004), suggest that patients with depression are underconfident (Cangas et al., 2006; Moore and Fresco, 2012; Moritz et al., 2010). To the best of our knowledge, no study exists on confidence judgements for emotion recognition in patients with Depressive Disorders (DD). However, preliminary findings from studies examining other psychiatric disorders, such as borderline personality disorder (Schilling et al., 2012), have demonstrated that patients show a heightened response confidence in the judgement of emotional states compared to healthy controls on the "Reading the Mind in the Eyes-Test" (Baron-Cohen et al., 2001). In contrast, overconfidence in errors is well-established in schizophrenia using both memory (e.g., Moritz et al., 2008) and social cognition tasks (Moritz et al., 2012).

In the present study, we compared a female sample with DD with a female healthy control group. We only included women in the present study for the following two reasons: First, the well documented higher prevalence of depression in women (Kessler et al., 2012) may partly relate to differences in cognitive styles, such as biased emotion recognition, that are associated with the onset and maintenance of depression; and second, sex differences in emotion identification, which have been identified across different studies (Donges et al., 2012; Hall and Matsumoto, 2004). The aim of our study was to compare the probability for a false response dependent on the different emotional categories. According to prior findings, we firstly hypothesized that patients with depression would perform worse in their overall ability to recognize emotions. In case of false responses, we then assumed that patients with depression would differ from healthy controls with regard to the emotional quality they decide upon, as studies indicate, for example, that neutral faces are more often identified as negative (Douglas and Porter, 2010; Leppänen et al., 2004). Given findings of lowered confidence judgements in depression, and the fact that depression is characterized by rumination and indecisiveness (McClintock et al., 2013), we finally expected that patients with depression would show higher rates of underconfident judgements of emotion recognition compared with healthy controls.

2. Methods

2.1. Recruitment

Forty-five women diagnosed with a depressive disorder were recruited with the help of the psychosomatic outpatient clinic of the Reha-Centrum in Hamburg, Germany. Patients were screened for study inclusion by experienced hospital staff (psychologists or a psychiatrist). Subsequently, inclusion criteria were verified in a diagnostic interview. Patients were included if a diagnosis of single episode or recurrent major depression and/or dysthymia according to DSM-IV was fulfilled (verified via the Mini International Neuropsychiatric Interview [MINI]; Sheehan et al., 1998). In addition, the Suicidal Behaviors Questionnaire-Revised (SBQ-R; Osman, 2002) was used to assess suicidal behavior, and a multiple choice vocabulary test (MWT-B, Lehrl, 1995) was used to estimate premorbid intelligence level. Exclusion criteria included <18 or >65 years of age, current or lifetime psychotic and/or bipolar disorder, current alcohol and/or substance dependence as assessed with the MINI, severe neurological diseases, acute suicidality, and an IQ <70. Severity of depression was assessed in patients with the 17-item version of the Hamilton Depression Rating Scale (HDRS; Hamilton, 1960) and the Beck-Depression Inventory (BDI; Beck, 1995).

Table 1
Sociodemographic characteristics and psychopathology measures: means and standard deviations (in brackets).

	Depression ($n=45$) *M (SD)*	Healthy ($n=30$) *M (SD)*	Statistics
Sociodemographic characteristics			
Age (in years)	44.22 (9.6)	41.90 (17.85)	$t(73)=0.73$; $p=0.518$
Verbal intelligence	29.59 (4.47)	31.00 (2.22)	$t(65)=1.42$; $p=0.16$
Years of school education	10.51 (1.63)	12.34 (1.43)	$t(73)=1.39$; $p=0.17$
Psychopathology			
HDRS	15.45 (4.98)	–	–
BDI	25.19 (9.36)	–	–

HDRS = Hamilton Depression Rating Scale; BDI = Beck Depressions Inventory.

Thirty healthy controls were recruited from an established participant pool as well as leaflets posted throughout the community and electronic newsletters. For healthy participants, any current psychiatric diagnosis (as verified with the MINI) or lifetime psychiatric treatment led to exclusion from the study. The study was approved by the ethics commission of the German Psychological Society (DGPs). All participants gave written informed consent prior to study participation. Demographic and psychopathological data is displayed in Table 1.

2.2. Procedure

Demographic and psychopathological instruments (MINI, HDRS, BDI, SBQ-R), as well as the experimental task (EMPACT; Köther and Moritz, 2013) were administered to the patients shortly after admission. Assessment of healthy controls took place by arranging an individual appointment.

2.3. Stimuli and material

2.3.1. Emotional Perception and Confidence Task (EMPACT)

Emotion recognition ability and confidence ratings were assessed with the Emotional Perception and Confidence Task (EMPACT; Köther and Moritz, 2013), a computer-based paradigm using the software package SuperLab®4.0 (Cedrus Corporation, 2006). The EMPACT aims to assess identification of facial expression and confidence simultaneously. The task is comprised of 63 coloured photographs (divided in three parallel versions à 21 photographs) of facial expressions (31 male, 32 female) taken from the Karolinska Directed Emotional Faces data base (KDEF; Lundqvist et al., 1998). All faces were shown at a 45° angle to ensure a naturalistic situation and to avoid ceiling and bottom effects. Participants were given one of three parallel versions; the versions were administered in a randomized order across participants. Pictures displayed the six basic emotions according to Ekman et al. (1972), in addition to neutral expressions. Instructions were read aloud from the computer screen by the experimenter. For each picture, the response options and the corresponding buttons on the keyboard were displayed on the screen. Participants were instructed to decide which facial emotion expression was depicted by pressing the appropriate button on the keyboard. If the participant was unsure about her decision, she was instructed to choose the most probable response option. After that, the participant had to make the confidence ratings by pressing one of four buttons (1 = '100% sure',