



Impaired identity recognition of faces with emotional expressions in body dysmorphic disorder

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ABSTRACT

Individuals with body dysmorphic disorder (BDD) are preoccupied with perceived physical defects or flaws, often facial features, which may be due to distorted perception. Previous studies have demonstrated abnormalities in visual processing of faces and figures, and misinterpretations of emotional expressions. The objective of this study was to determine in BDD how viewing faces with emotional expressions affects perception on an identity-matching task. Twelve BDD subjects and 11 healthy controls matched identities of faces with emotional expressions, neutral expressions, and a control task of ovals and circles. The BDD group made twice as many errors relative to controls for identity-matching of faces with emotional expressions but not for neutral faces or ovals/circles. Mean reaction times were slower for the BDD relative to the control group for emotional faces in general, but there was no effect of specific emotion type. These data suggest that individuals with BDD have abnormalities in facial identification for faces with emotional expressions. This could reflect fundamental abnormalities in visual information processing that are more pronounced for emotional expressions in general, and may relate to their perceptual disturbances.

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1. Introduction

Body dysmorphic disorder (BDD) is a severe psychiatric condition in which patients are preoccupied with perceived defects in their appearance, resulting in significant suffering and functional impairment (American Psychiatric Association, 2000). BDD affects 1–2% of the population (Mayville et al., 1999; Otto et al., 2001; Rief et al., 2006), yet is vastly under recognised and under studied. Individuals with BDD tend to be self-conscious of what they perceive to be defective, which is often a facial feature (Phillips, 2005). They also frequently have ideas of reference, believing others are staring at them and judging them negatively because of their appearance (American Psychiatric Association, 2000). They subsequently tend to engage in compulsive and avoidant behaviours such as mirror-checking, covering up with makeup or clothing, or avoiding social situations. BDD can cause significant impairment in social and occupational functioning and can lead to severe depression, hospitalisation, suicide attempts, and high rates of cosmetic surgery (Phillips et al., 1993; Ishigooka et al., 1998; Sarwer et al., 1998; Aouizerate et al., 2003; Phillips et al., 2005a,b).

Previous studies have indicated that individuals with BDD have abnormalities in the processing of faces with emotional expressions. Buhlmann et al. (2004) found that individuals with BDD had difficulty interpreting facial expressions, more often misidentifying faces as being angry than the obsessive-compulsive disorder (OCD) group and healthy controls (Buhlmann et al., 2004). However, there were no differences in general facial feature recognition accuracy for neutral-expression faces. A more recent study by the same researchers found that BDD subjects had difficulty identifying emotional expressions in self-referent scenarios (i.e., they were told to imagine that the person in the photograph that they were viewing was someone who was looking specifically at them). In these situations, they more often interpreted neutral expressions as angry or contemptuous as compared with controls (Buhlmann et al., 2006). In addition, they more often interpreted neutral emotional expressions as contemptuous in self-referent scenarios as compared with other-referent scenarios (i.e., that the person in the photograph was looking at someone else). These studies suggest an abnormality in emotional face processing in BDD that may be related to recognition biases and/or misinterpretation of faces that are perceived as contemptuous or otherwise negative. This, in turn, may contribute to their poor insight and frequent ideas of reference if they believe that these negative emotional expressions are others' reactions to them. Whether these recognition biases or misinterpretations are the result of abnormalities in visual processing is not clear.

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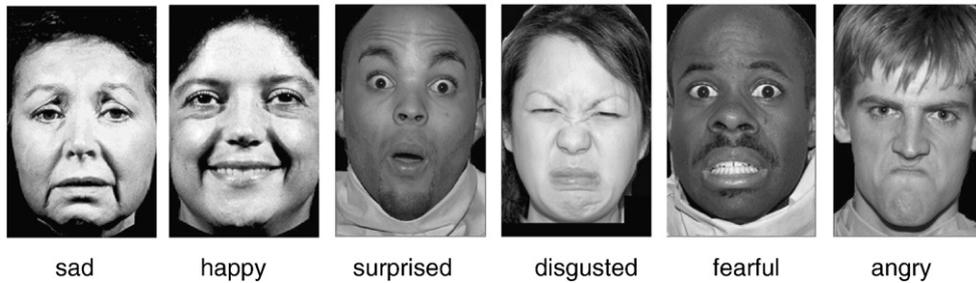


Fig. 1. Example emotional face stimuli.

There is also evidence of abnormal processing of faces with neutral expressions. A recent functional magnetic resonance imaging (fMRI) study using neutral faces as stimuli found greater left-hemisphere activity in the BDD group relative to healthy controls in an extended visual processing network (Feusner et al., 2007). This suggests greater detail and analytic processing relative to holistic and configural processing, as other studies have shown that the left hemisphere predominates for local (or analytic) processing, while the right hemisphere dominates for global (or holistic) processing (Bradshaw et al., 1976; Van Kleeck 1989; Evans et al., 2000). The nature of these abnormalities was similar to what was discovered in a previous neuropsychological test using the Rey–Osterreith Complex Figure Test, in which individuals with BDD overly relied on details to reproduce the figure, as the expense of more global and configural aspects (Deckersbach et al., 2000).

Given these previous findings and the clinical relevance in BDD of face processing, we investigated visual processing of faces with emotional expressions. The objective of this study was to determine how viewing faces with emotional expressions affects perception in BDD (as opposed to interpretation of emotions) on a novel identity-matching task. We designed the experiment with two groups, BDD and healthy controls, and three different stimuli conditions: emotional faces, neutral faces and ovals/circles. This allowed us to compare performance both between and within groups on an emotional face task versus a neutral face task versus a (non-face) control task of ovals and circles. We hypothesised that compared to controls, individuals with BDD would have abnormalities in identity-matching of faces with emotional expressions as reflected in slower reaction times and a higher error rate, but there would be no significant differences for the neutral expression faces or for ovals/circles.

2. Methods

2.1. Subjects

The UCLA Institutional Review Board approved the protocol for the study. We obtained informed consent of the participants after fully explaining the nature of the procedures. We enrolled 12 patients with BDD and 11 healthy controls between the ages of 18 and 64, recruited from the community. The BDD group and controls were matched by gender, age and level of education. All BDD subjects met the Diagnostic and Statistical Manual (DSM-IV) criteria for Body Dysmorphic Disorder, using the Body Dysmorphic Disorder Module (Phillips et al., 1995), a reliable diagnostic module modelled after the Structured Clinical Interview for DSM. In addition to this module, we performed a clinical psychiatric evaluation on all participants and administered the Mini International Neuropsychiatric Inventory (MINI) (Sheehan et al., 1998) to screen for co-morbid diagnoses. All BDD subjects were required to have a Body Dysmorphic Disorder version of the Yale–Brown Obsessive–Compulsive Disorder Scale (BDD-YBOCS) score of ≥ 20 . The BDD-YBOCS is a validated scale that is widely used to evaluate symptom severity in BDD (Phillips et al., 1997). We allowed subjects with delusional beliefs.

Exclusion criteria for subjects and controls included active substance abuse, current neurological disorder, pregnancy and any current medical disorder that might affect cerebral metabolism. We excluded subjects with any concurrent Axis I disorder besides dysthymia, major depressive disorder (MDD) or generalised anxiety disorder (GAD). As depression and anxiety are so frequently co-morbid in this population, we believed it would not be a representative sample to exclude these. However, we excluded other frequently occurring co-morbid disorders such as social phobia because we anticipated these would have more overlap in primary symptoms having to do with face processing; self-consciousness in social situations and sensitivity to others' facial expressions are commonly shared experiences (Wilhelm et al., 1997; Phillips et al., 1998; Stein et al., 2002). BDD symptoms had to be the primary concern in every subject, as determined during the initial clinical psychiatric evaluation and from relative severity on the BDD-YBOCS, Hamilton Anxiety Scale (HAM-A) (Hamilton, 1969) and the 17-item Hamilton Depression Rating Scale (HAM-D) (Hamilton, 1960). We excluded subjects with a HAM-D score > 20 , to minimise the effect of more severe depressive states on the outcomes, and subjects whom the investigator judged were at current risk of suicide. The MINI, BDD-YBOCS, HAM-D and HAM-A were administered to all subjects.

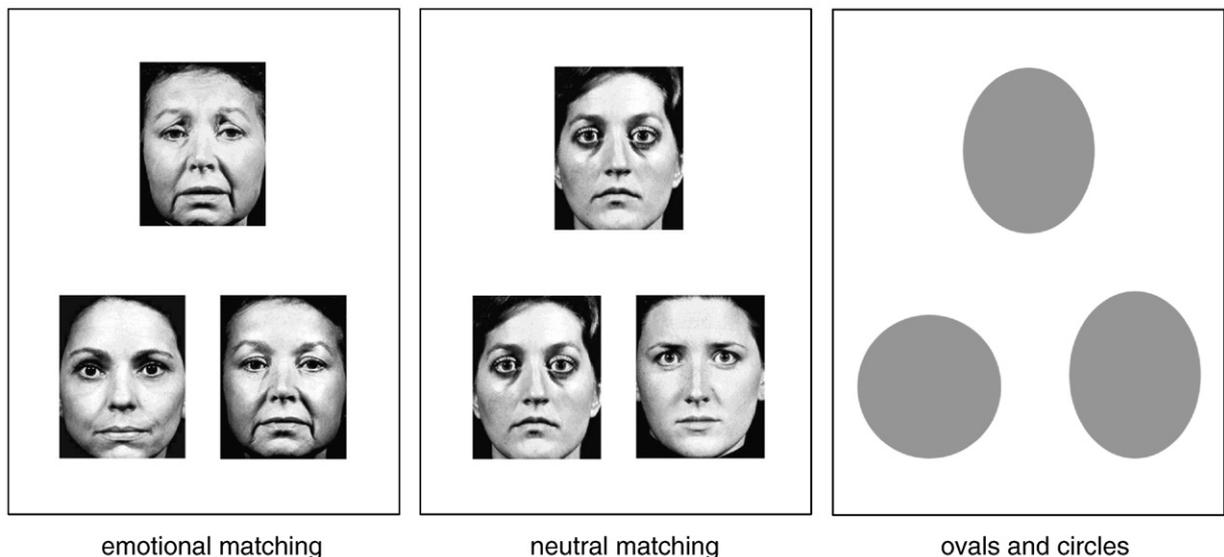


Fig. 2. Example matching tasks.

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