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The misattribution of salience in delusional patients with schizophrenia☆

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Abstract

Introduction: Delusions may arise from abnormalities in emotional perception. In this study, we tested the hypothesis that delusional schizophrenia patients are more likely than non-delusional schizophrenia patients and healthy participants to assign affective meanings to neutral stimuli.
Methods: Unpleasant, pleasant, and neutral words were randomly presented to three subject groups—patients with schizophrenia with prominent delusions, patients with schizophrenia without delusions, and healthy participants. Participants performed three tasks: one in which they decided whether a letter string was a word or a non-word (lexical decision) and two affective classification tasks in which they judged whether words were 1) neutral or unpleasant, or 2) neutral or pleasant.
Results: While there were no significant between-group differences in lexical decision performance, patients with delusions showed selective performance deficits in both affective classification tasks. First, delusional patients were significantly more likely than non-delusional patients and healthy participants to classify words as unpleasant. Second, delusional patients took significantly longer than both other groups to correctly classify neutral words in both affective classification tasks.
Conclusions: Taken together, these findings suggest that delusions are associated with the explicit misattribution of salience to neutral stimuli.

Keywords: Schizophrenia; Delusion; Emotion; Salience; Word; Language

1. Introduction

The nature of the cognitive abnormality underlying delusions in schizophrenia has been much debated (Bentall et al., 2001; Blackwood et al., 2001; Freeman

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et al., 2002; Green and Phillips, 2004; Hemsley and Garety, 1986; Maher, 1999). One hypothesis is that delusional patients are highly sensitive to emotionally laden information, exhibiting an "affective attentional bias." In support of this view, several studies have reported that, relative to non-delusional patients, patients with delusions preferentially attend to emotional (Bentall and Kaney, 1989; Fear et al., 1996; Kinderman, 1994) words. Also, patients with persecutory delusions demonstrate higher recall of threat-related words (Bentall et al., 1995) and propositions (Kaney et al., 1992).

An alternative hypothesis is that delusions stem from the misattribution of affective meaning to neutral or ambiguous information—an "affective misattribution bias." Consistent with this view is evidence that patients with persecutory delusions have difficulty correctly identifying neutral facial expressions (Kohler et al., 2003) and are slower than patients without persecutory delusions to assess scenes with ambiguous content (Phillips et al., 2000).

The current study was designed to test both of these hypotheses. By using two types of tasks with identical stimuli, we compared measures of incidental and explicit affective processing in the same participants. To focus our study on delusions, we studied three groups: healthy individuals and patients with schizophrenia with and without delusions. This design controlled for the potential confounds of general cognitive impairment and overall slowing of reaction times found in schizophrenia, as well as for the effects of antipsychotic medication. During three experiments, participants viewed affectively valenced and neutral words. In the first experiment, they performed a lexical decision task, deciding whether a letter string (an affectively valenced, neutral or nonsense word) was a real word or nonsense word. In healthy individuals, affective valence facilitates semantic processing of words (Strauss, 1983; Wurm and Vakoch, 2000). An affective attentional bias in delusional patients would predict a further increase of this facilitation, resulting in shorter reaction times for the emotional words in the delusional relative to the comparison groups. In two additional experiments, participants made explicit affective judgments about words; an affective misattribution bias in delusional patients would predict an increased tendency to misclassify neutral words as affectively valenced (with the potential for longer reaction times for neutral vs. emotional words) in the delusional relative to the non-delusional and healthy groups.

2. Methods

2.1. Participants

In accordance with institutional review boards of the Massachusetts General Hospital (MGH) and the Commonwealth of Massachusetts Department of Mental Health, written informed consent was obtained from all participants.

32 outpatients with schizophrenia, diagnosed using DSM-IV criteria, without histories of major neurological illness, were recruited from the MGH Schizophrenia Program. All patients were on stable doses of antipsychotic medications (5 receiving conventional and 27 receiving atypical antipsychotics). On the day of the study, patients were evaluated using the Schedule for the Assessment of Positive Symptoms (SAPS) (Andreasen et al., 1995), the Schedule for the Assessment of Negative Symptoms (SANS) (Andreasen, 1989) and the Positive and Negative Syndrome Scale (PANSS) (Kay et al., 1987). Patients with a score of ≥ 2 on the SAPS global delusion item were assigned to the delusional group; patients with scores of 0 or 1 on this item were assigned to the non-delusional group. 14 of the 16 delusional patients had predominantly persecutory delusions, while one patient had religious delusions and another had the delusion of thought insertion.

16 healthy control participants were recruited from the community via advertisement. Individuals with a first language other than English, a DSM-IV defined psychiatric disorder, or a neurologic disorder were excluded. The three groups were matched with respect to gender, race, and handedness; see Table 1.

The following were assessed in all participants: Premorbid I.Q. (the National Adult Reading Test (NART) (Blair and Spreen, 1989), letter and semantic fluency (Goldberg et al., 1998)), levels of depressive symptoms (the Beck Depression Inventory (BDI) (Beck and Steer, 1993)) and delusional thinking (the Peters et al. Delusions Inventory (PDI) (Peters et al., 1999).