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Aberrantly flattened responsivity to emotional pictures in paranoid schizophrenia

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Abstract

To investigate the nature of emotional experience in schizophrenia, we examined emotional responses to affective stimuli. Twenty-one outpatients with schizophrenia (9 paranoid, 12 nonparanoid) and 20 normal controls rated the arousal and valence that they experienced from the presentation of 60 pictures. Schizophrenia patients displayed less emotional responsivity to the positive stimuli and they displayed diverse responsivity to the negative stimuli, which depended upon arousal level. Further analysis, using schizophrenia subtype, indicated that nonparanoid patients reported increased negative responsivity and decreased positive responsivity, regardless of arousal level. However, paranoid schizophrenia patients showed enhanced self-reported experiences of emotion to the low arousing stimuli and diminished responsivity to the high arousing stimuli. This pattern was robust to the negative stimuli. These findings suggest that paranoid schizophrenia patients might suffer from aberrantly flattened responses to negative emotional stimuli, and that this may account for paranoid tendency and secondary social isolation in paranoid schizophrenia.

Keywords: Schizophrenia; Emotional responsivity; Positive emotion; Negative emotion; Arousal; Valence

1. Introduction

Disturbances of emotional experience have been documented as a characteristic feature of pathology in schizophrenia (Bleuler, 1911/1950; Kraepelin, 1916/1919; Rado, 1953; Meehl, 1962, 1990). Rado (1953) and Meehl (1962, 1990) placed theoretical emphasis on anhedonia, the decreased capacity to experience pleasure. According to Meehl's model of anhedonia, schizophrenia patients exhibit an enhanced experience of negative emotions and a diminished experience of positive emotion compared with normal controls. Empirically, some investigators found that patients with schizophrenia reported more negative emotions and

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fewer positive emotions (Blanchard et al., 1998; DeVries and Delespaul, 1989; Larsen and Diener, 1992; Myin-Germeys et al., 2000). However, others reported that patients with schizophrenia had no increased negative or diminished positive emotional experience (Berenbaum and Oltmanns, 1992; Iwase et al., 1999; Kring et al., 1993; Kring and Neale, 1996). It is possible that methodological problems such as variations of subjects, types of emotional stimuli, and whether evaluations were conducted in real life or lab-based situations have hindered the resolution of inconsistent findings in the relevant studies. A few researchers have expanded on the variations in patients' characteristics. It has been found that no significant difference exists in the emotional experiences of blunted and nonblunted schizophrenia patients (Berenbaum and Oltmanns, 1992; Myin-Germeys et al., 2000; Sweet et al., 1998). Deficit and nondeficit schizophrenia patients reported elevated negative affectivity (Horan and Blanchard, 2003) or responding (Earnst and Kring, 1999). However, deficit and nondeficit schizophrenia patients showed differing positive emotional experiences. Some deficit patients showed positive emotional responding comparable to nondeficit patients and normal controls (Earnst and Kring, 1999). Other deficit patients reported lower positive affectivity relative to nondeficit patients and normal controls (Horan and Blanchard, 2003). In another study, the affectively flat and anhedonic patients were reported to experience less frequent positive emotions, such as joy and interest, relative to normal controls or patients without negative symptoms. All schizophrenia patients felt negative emotions, such as fear and disgust, more often than normal controls (Suslow et al., 2003).

Arousal is another emotional experience that should be considered in the above-mentioned inconsistent findings. Previous findings suggest that the emotional processing of patients with schizophrenia may be influenced by affective arousal related to the emotional stimuli. Patients with schizophrenia demonstrated an impairment responses to fear and anger expressions, and they were less likely to mention the interior state of posers who express joy and anger, all of which were highly arousing emotions (Pilowsky and Bassett, 1980). Schizophrenia patients preferred to interact with, and thus selected, the emotions of happiness and sadness (Mandal and Palchoudhury, 1986). Furthermore, there is increasing evidence that patients with paranoid schizophrenia have an initial automatic attentional bias towards threatening stimuli, such as the highly arousing emotions of fear and anger, but a subsequent controlled attentional bias away from threatening stimuli (Green and Phillips, 2004).

Response patterns of affect have been examined relative to the distribution of affective ratings of positive and negative stimuli in an evaluative space, as defined by arousal and valence (Russell, 1980; Cacioppo and Bernston, 1994; Cacioppo and Gardner, 1999). Some studies used this dimensional model to explore the differences in responding patterns of affect according to subject gender (Bradley and Lang, 2000), age (McManis et al., 2001) and pathology of schizophrenia (Kring et al., 2003). On the basis of affective words and with a multidimensional scaling approach, schizophrenia patients and normal controls were found to have comparable knowledge structures of affective phenomena (Kring et al., 2003), which demonstrated that arousal and valence were basic attributes in schizophrenia as well as in normal controls. Thus, the valence–arousal dimensional model can be applied to schizophrenia. In the evaluative space of affect, the arousal (i.e., the activation of motivational forces) is considered as an input of the evaluative space, and the valence is postulated to be output from the operating evaluative space (Ito et al., 1998). The evaluation of affective responsivity in the normal adult population may be expressed as a linear regression model that consists of arousal (X) and valence (Y) for affective pictures (Ito et al., 1998). The linear regression line of positive responsivity was found to be significantly different from that of negative responsivity, which indicates that underlying motivational system of positive affect is separable from that of negative affect.

To our knowledge, no study has investigated the emotional experience to visually presented emotional pictures in the evaluation space by arousal and valence in schizophrenia patients. Examining affective responsivity according to the level of arousal could provide new insight about the nature of disturbance on the emotional experience in schizophrenia.

The purpose of the present study was to explore the nature of the emotional experience elicited by affective stimuli in patients with schizophrenia, in an evaluative space defined by arousal and valence. Based on previous studies, we hypothesized that patients with schizophrenia would report increased emotional responsivity to negative stimuli and decreased responsivity to positive stimuli, as compared with normal controls. Furthermore, when the arousal elicited by stimuli increased, schizophrenia patients would show dampened responsivity to emotional stimuli, especially stimuli of a negative nature. Also, the diagnostic subtype (paranoid vs. nonparanoid) would be related to the emotional responsivity.