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Is social anhedonia related to emotional responsivity and expressivity? A laboratory study in women

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ABSTRACT

Social anhedonia is an important feature of schizophrenia and it is a promising indicator of schizotypy. Although social anhedonia is defined as an affective construct (less pleasure derived from social encounters), little is known about the emotional responsivity and expressivity of individuals with high levels of social anhedonia. After screening a large sample of female undergraduate students ($N = 1\,085$), a cohort of psychometrically identified individuals with high levels of social anhedonia ($n = 34$) and normally hedonic controls ($n = 45$) participated in laboratory assessments involving trait affectivity, self-reported dispositional emotional expressiveness, and the expression and experience of emotion in response to neutral, non-affiliative (i.e., comedy) and affiliative film clips. Results revealed that individuals with high levels of social anhedonia are characterized by lower positive affect, both as a trait and in response to emotionally evocative stimuli, and are less facially expressive, both by their own self-report and in response to film clips. Attenuated positive affect was observed across film stimuli, indicating a general reduction in affective response rather than a specific decrease in responsivity for affiliative stimuli. Future work should continue to investigate whether there is a unique role for social stimuli in the emotional lives of individuals with high levels of social anhedonia or whether these individuals tend to experience anhedonia more broadly regardless of social context.

1. Introduction

Disturbances in the experience and expression of emotion have long been considered prominent features of schizophrenia (Bleuler, 1950; Krapelin, 1971). Reflecting these early observations, contemporary assessments of symptomatology within schizophrenia include reduced hedonic capacity (anhedonia) and blunted affect (Andreasen, 1983; Kay et al., 1987). Moreover, a wide range of studies utilizing self-report instruments have provided evidence that, compared to healthy controls, individuals with schizophrenia report high trait anhedonia and high trait negative affect as well as low trait positive affect (e.g., Blanchard et al., 1994; Blanchard et al., 2001; for review see Horan et al., 2008). Additionally, experience sampling studies similarly report reduced intensity and less variability of positive affect in the daily lives of individuals with schizophrenia (Myin-Germeys et al., 2000).

Importantly, a very different picture of emotional responding in schizophrenia emerges when laboratory studies using evocative stimuli (e.g., films, slides, social interactions, or food) are considered. In such studies, although individuals with schizophrenia do show diminished facial expression compared to healthy controls (Aghevli et al., 2003; Berebaum and Oltmanns, 1992; Kring and Earnst, 1999; Kring and Neale, 1996), with some exceptions (e.g., Mathews and Barch, 2010), they report having internal emotional experiences comparable to controls (e.g., Aghevli et al., 2003; Berebaum and Oltmanns, 1992; Dworkin et al., 1996, 1998; Fitzgibbons and Simons, 1994; Horan and Blanchard, 2003b; Horan et al., 2010; Kring,

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and Neale, 1996). Thus, in schizophrenia there is a replicable pattern of elevated anhedonia (as measured either in clinical interview or self-report trait measures), and diminished emotional expression (measured either in clinical interviews or with coding of facial affective expression in laboratory studies), with the seemingly paradoxical finding of preserved self-reported emotional responding to evocative stimuli (see review by Kring and Moran, 2008).

What is currently unclear is whether this same disjunction between self-reported traits and expressivity on the one hand, and intact responding to emotional stimuli on the other, is evident in schizophrenia-spectrum disorders and in those individuals with elevated traits hypothesized to be associated with risk for schizotypy. Such research would allow for a determination of whether emotional alterations in schizophrenia extend across spectrum conditions, and if they relate to particular facets or traits of schizotypy. Furthermore, research in nonclinical populations with schizotypy traits has the advantage of avoiding the medication confounds present in schizophrenia research (Blanchard and Neale, 1992).

Social anhedonia is a promising trait to explore because it is considered a core feature of schizotypy that is associated with risk for the development of this disorder (e.g., Meehl, 1962) and the defining characteristic of this construct is that of diminished experience of pleasure. Cross sectional findings have confirmed a range of clinical characteristics and cognitive deficits in those individuals who are high in social anhedonia (e.g., Blanchard et al., in press; Gooding et al., 1999, 2006; Kwapil et al., 2002; Mishlove and Chapman, 1985), and longitudinal studies have shown that social anhedonia is predictive of the onset of schizophrenia-spectrum disorders (e.g., Gooding et al., 2005; Kwapil, 1998). Interestingly, despite the obvious affective features of the construct of social anhedonia, there is actually very little research that has examined emotion in those identified as high in social anhedonia.

Several studies have now evaluated self-reported trait affectivity and daily emotional experience in nonclinical individuals high in social anhedonia. Compared to healthy controls, social anhedonia groups are characterized by decreased self-reported trait positive affect and increased trait negative affect (Berenbaum et al., 2006; Gooding et al., 2002; Gooding and Tallent, 2003; Ross et al., 2002). This pattern of reduced trait positive affect and higher trait negative affect in social anhedonia has recently been replicated in a large community study (Blanchard et al., in press). In particular, low levels of trait positive affect appear to be more closely linked to negative schizotypy than high trait negative affect (Horan et al., 2008). Studies of emotional experience in daily life have also found that elevated rates of social anhedonia are associated with decreased experience of positive affect (Brown et al., 2007; Kerns et al., 2008). These data would suggest a pattern of emotional experience in social anhedonia groups that parallels that described above for schizophrenia.

Importantly, there have been few laboratory studies utilizing evocative stimuli to examine emotional responding in social anhedonia groups (Gooding et al., 2002; Kerns et al., 2008; Mathews and Barch, 2006). Gooding et al. (2002) found no differences in participants' startle eyeblink modulation in response to positive affect-eliciting pictures from the IAPS. However, this study did not examine either self-reported affective responding to the stimuli nor were assessments of expressivity conducted. Mathews and Barch (2006) found that higher social anhedonia was related to less positive valence ratings of positive words and less negative valence of negative words. Finally, Kerns et al. (2008) report on two studies examining the relationship between social anhedonia and emotional responding. In both studies, social anhedonia was related to decreased positive (but not negative) affect intensity in response to affective pictures (Kerns et al., 2008). Thus, the latter two studies suggest a different pattern of findings from clinical samples; specifically, that emotions elicited in response to stimuli may be less intense in individuals with high levels of social anhedonia compared to controls.

In summary, our understanding of how social anhedonia is related to emotion is currently limited, and there are a number of methodological issues that constrain the interpretability of studies to date. First, of the three studies assessing emotional stimuli in social anhedonia only one directly assessed self-reported emotional responding (Kerns et al., 2008). In the other studies either stimuli (words) were rated and not the participants' own emotional reactions (Mathews and Barch, 2006), or self-report responses were not collected (Gooding et al., 2002). Second, given that social anhedonia does not reflect a pan deficit in emotion but rather a specific deficit in pleasure to social interactions, it is notable that much of the stimulus material that has been used is of a non-social nature (e.g., words, pictures of animals, and nature scenes), and when people are used in pictures such stimuli are not directly affiliative (e.g., sky divers, man on cliff; Blanchard, 1998). Although a few studies have incorporated stimuli containing erotic material, erotic images only capture one aspect of affiliative behavior, and do not directly involve other aspects of social affiliation (e.g., friendships, family relationships, support, emotional sharing, etc.) that may be more directly associated with conceptualizations of social anhedonia. Third, to our knowledge, no laboratory studies have examined facial displays of affect in social anhedonia — an important consideration given that blunted affect is a core feature of schizophrenia and evident in emotion elicitation studies of patient samples. There are some suggestive findings indicating that altered emotional expression might be associated with social anhedonia. Self-reported social anhedonia has been found to correlate with self-reported expressivity such that greater anhedonia is related to less emotional expression (Kring et al., 1994). In a study coding behavioral displays within a clinical interview, compared to controls, individuals with high levels of social anhedonia were found to have greater schizoidia ratings including diminished facial displays of affect (Collins et al., 2005).

The current study sought to examine emotional responding in individuals high in social anhedonia compared to a normally hedonic control group. We measured emotion using multiple methods including trait self-report measures of affect and emotional expression as well as self-reported responses to affect-eliciting film clips. With regard to emotional responses, we provided both a broad assessment of positive affect as well as a more focused assessment of warmth-affiliation. These two domains, though clearly related, may have distinct neural correlates, be differentially influenced by evocative stimuli, and these affective responses may also have differential associations with individual differences in affiliation (Depue and Morrone-Strupinsky, 2005; Morrone-Strupinsky and Depue, 2004). In addition to self-reports of emotional responding, we utilized behavioral coding of facial expressions in response to