

Episodic memory for emotional and non-emotional words in individuals with anhedonia

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Abstract

Anhedonia is a symptom that plays a significant role in theories of illness such as depression and schizophrenia. Some previous research suggests that participants who report high levels of social/physical anhedonia also show deficits in both self-report and physiological measures of emotional processing, particularly for measures of emotional valence as compared with emotional arousal. Little is known about memory for emotionally valenced information or how this might be related to emotional processing in anhedonia. Participants were 391 undergraduate students participating for course credit. We administered an incidental encoding task that required participants to rate emotional words on both valence and arousal dimensions. We then administered surprise recall and recognition tasks to all participants. Results indicated that higher levels of physical and social anhedonia were associated with attenuated valence ratings of emotional words but did not influence arousal ratings or the memory pattern for emotionally valenced information. These findings suggest that there is some reduction in emotional experience in individuals with anhedonia, but that this reduction does not appear to produce a deficit in memory performance, perhaps due to the intact experience of arousal. © 2005 Elsevier Ireland Ltd. All rights reserved.

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1. Introduction

Anhedonia, the inability to experience pleasure, is a symptom that plays a significant role in many theories of illnesses such as depression and schizophrenia. For example, in Meehl's theory of schizotaxia, primary anhedonia is thought to play a crucial role in increasing susceptibility to developing psychosis (Meehl, 1962). According to Meehl, the ability to experience and anticipate pleasure serves as a buffer of sorts to the development of a psychotic disorder, potentially by protecting against the negative influences of stress. As

a result of an inability to feel pleasure, Meehl contends that anhedonia leads to an "aversive drift" or the tendency to view events as negative or threatening (Meehl, 1962) given the absence of positive hedonic cues. Despite the prominent role of anhedonia in theories such as Meehl's, relatively little empirical work has focused on understanding the specific nature of emotional processing disturbances in individuals who self-report high levels of anhedonia. The goal of the current study is to address the following three questions: (1) What are the subjective emotional responses of individuals who report anhedonia to affect-eliciting stimuli? (2) Do individuals with anhedonia have differential deficits in the valence versus the arousal dimensions of emotion? and (3) Do individuals with anhedonia experience disturbances in memory for affective stimuli?

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Anhedonia is typically rated based on the individual's self-report of emotional experience, usually during a clinical interview or on a questionnaire. However, relatively little is known about how individuals who report being socially or physically anhedonic actually respond to emotion eliciting stimuli. A few studies have examined the relationship between self-reports of anhedonia and other aspects of emotional processing in individuals with manifest schizophrenia. For example, a study by Berenbaum and Oltmanns (1992) found that patients with schizophrenia did not differ from controls in their self-reports of emotion in response to emotional stimuli, despite the fact that the patients reported higher levels of social and physical anhedonia in a clinical interview. Blanchard et al. (1994) found that individuals with schizophrenia who reported higher levels of physical anhedonia also reported less positive affect when watching both positive and negative film clips. However, these reduced positive affect reports among patients may have simply reflected baseline reductions in positive affect, given that patients showed a clear increase in positive affect in response to the positive as compared to negative film clips and the reduced positive effect reports were present in all valence conditions. Recent research by Mathews and Barch (2004) found that individuals with schizophrenia had intact self-reports of emotional valence and arousal in response to affectively valenced words, despite again having higher clinical ratings of anhedonia than controls. Thus overall, the existing research on schizophrenia, anhedonia, and emotional processing suggests that although patients may report high levels of anhedonia, they appear to self-report experiencing the same levels of positive emotion in response to affect eliciting stimuli.

Several additional studies have examined anhedonia in individuals without a clinical diagnosis of any form of psychopathology. These studies have typically examined individuals who score highly on scales such as the Chapman social and physical anhedonia scales (Chapman et al., 1980). These individuals are of interest to psychopathology researchers, given the theorists who have argued that high levels of anhedonia constitute a vulnerability for psychosis (Meehl, 1962; Rado, 1962). Further, studies by Chapman et al. have shown that individuals who score more than two standard deviation above the mean are at an increased risk for the later development of psychotic disorders (Kwapil et al., 1997). A number of these studies examined the relationships between self-reports of anhedonia on questionnaires and self-reports of emotion in response to affect eliciting stimuli. Many of these studies have

found that participants with high levels of anhedonia report and rate stimuli as less positive or less interesting than controls (Ferguson and Katkin, 1996; Fiorito and Simons, 1994; Fitzgibbons and Simons, 1992; Gooding et al., 2002; Putnam, 1997; Simons et al., 1982), though one study reported no difference between high anhedonic individuals and controls (Berenbaum et al., 1987). Several studies have also examined facial expressiveness in individuals with high ratings of anhedonia, with mixed results (Berenbaum et al., 1987; Putnam, 1997; Ferguson and Katkin, 1996; Fitzgibbons and Simons, 1992).

A number of previous studies have also examined heart rate while participants viewed emotional stimuli and have consistently found that when processing emotional and neutral stimuli, individuals who report high anhedonia show reduced changes in their heart rate response when processing emotional stimuli as compared to controls (Ferguson and Katkin, 1996; Fitzgibbons and Simons, 1992; Fiorito and Simons, 1994; Simons et al., 1982). In contrast, a number of the previous studies have also looked at skin conductance in individuals rated highly on anhedonia scales and have not found skin conductance differences between individuals who self-report high versus low anhedonia (Ferguson and Katkin, 1996; Fitzgibbons and Simons, 1992; Fiorito and Simons, 1994; Putnam, 1997). In addition, two studies looked at emotion modulated startle responses in anhedonics and concluded that high and low anhedonic individuals demonstrated similar changes in startle as a function of exposure to emotional stimuli (Putnam, 1997; Gooding et al., 2002).

In summary, the studies examining the relationships between self-reports of anhedonia on questionnaires and various indices of emotional responding to affect-eliciting stimuli among individuals without clinically diagnosed psychopathology suggest a mixed, but potentially informative picture. Many theories of emotional processing (Russell, 1980; Larsen and Diener, 1992) distinguish between valence (positive versus negative) and arousal (high versus low) aspects of subjective emotional responses, as research suggests that these may be partially independent aspects of emotional processing that are mediated by different neural systems (Bradley, 2000). Further, the literature on physiological indices of emotional processing in individuals reporting high levels of anhedonia suggests that there may be an important dissociation between the processing of valence versus arousal aspects of emotional responding. Previous work has suggested that heart rate tends to track the valence of emotional stimuli (e.g., positive

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