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Abnormal valence differentiation in alexithymia

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ABSTRACT

As an at-risk personality trait, alexithymia includes difficulties attending to, distinguishing among, and verbalizing emotions. While these deficits are typically described as extending to both positive and negative emotions, some research suggests a valence-specific pattern such that alexithymic individuals are under-responsive to appetitive stimuli in particular. As this pattern suggests anhedonia, it is important to assess the degree to which alexithymia and anhedonia are confounded as contributors to appetitive hyporeactivity. A nonclinical sample of 96 adults rated word and picture stimuli on dimensions of valence and arousal. Participants were assessed for alexithymia, anhedonia, and mood disturbance with the Toronto Alexithymia Scale, the Chapman Revised Social and Physical Anhedonia Scales, and the Profile of Mood States, respectively. The subset of alexithymic individuals ($n = 12$) under-rated the valence of appetitive but not aversive stimuli relative to non-alexithymic peers ($n = 13$). Arousal ratings for all stimulus types were comparable across groups. Hierarchical regression in the full sample indicated that social anhedonia, which was confounded with alexithymia, contributed negligible variance to appetitive valence ratings. This study adds useful detail to the concept of diminished hedonic capacity in alexithymia by localizing the deficiency to poor affective differentiation rather than to hypoarousal.

1. Introduction

Considering that alexithymia is characterized, in part, by difficulty identifying and describing emotions, it may be surprising that alexithymia is associated with depression in clinical and nonclinical samples (Lee & Guajardo, 2011; Ogrodniczuk, Sochting, Piper, & Joyce, 2012). Indeed, depression emerges as the most powerful individual predictor of alexithymia in the general population, prompting cautionary advice that depression be recognized as a potential confound in alexithymia research (Honkalampi, Hintikka, Tanskanen, Lehtonen, & Viinamäki, 2000). Despite the close relation, factor analysis positions them as distinct constructs (Hintikka, Honkalampi, Lehtonen, & Viinamäki, 2001).

To explain the elevated rate of depression, it is possible that alexithymic, like depressed (Epp, Dobson, Dozois, & Frewen, 2012), individuals are vigilant for and/or overly reactive to aversive cues in the environment. However, research using emotional Stroop paradigms shows that alexithymic individuals have similar levels of attentional interference to general aversive stimuli compared to their non-alexithymic peers (Lundh & Simonsson-Sarnecki, 2002; Mueller, Alpers, & Reim, 2006; Pandey, 1995; Parker, Taylor, & Bagby, 1993), suggesting a normative degree of threat processing. Another possibility is that negative affect in alexithymia is secondary to deficient hedonic capacity (Dubey & Pandey, 2013; Prince & Berenbaum, 1993) such that depression results from a failure to attend to positive stimuli and/or process positive life events. Inattention to appetitive stimuli has previously been demonstrated in depressed individuals. For instance, relative to healthy peers, depressed subjects recall fewer pleasant words despite comparable recall of unpleasant words (Sloan, Strauss, & Wisner, 2001) and are less responsive to rewards (e.g., Pizzagalli, Iosifescu, Hallett, Ratner, & Fava, 2008).

Such lack of reactivity to appetitive stimuli in depression is a more specific characteristic called anhedonia, and the suggestion of reduced appetitive responsivity in alexithymic individuals calls into question the construct boundaries between alexithymia and anhedonia. The little research to address discriminant validity among alexithymia and anhedonia measures presents mixed results. Loas, Fremaux, and Boyer (1997), for example, found no correlation in a nonclinical sample between a physical anhedonia scale and two facets of the Toronto Alexithymia Scale (TAS-20; Bagby, Parker, & Taylor, 1994), even after controlling for physical displeasure and depression. However, Deborde et al. (2006) found that TAS-20 scores were positively correlated with physical anhedonia scores and that the Bermond-Vorst Alexithymia Questionnaire was positively correlated with both physical and social anhedonia among healthy controls. Consistent with this, Prince

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and Berenbaum (1993) found aspects of alexithymia to be associated with social anhedonia, even after controlling for depression and negative affect. It is unclear, however, to what extent anhedonia is confounded with alexithymia in predicting behavioral hyporeactivity to appetitive stimuli.

The purpose of this study was to examine how subjective ratings of valence and arousal for appetitive, neutral, and aversive stimuli vary as a function of alexithymia, while controlling for anhedonia and mood disturbance. Given that few studies have provided evidence of reduced hedonic capacity in alexithymia, it is important to confirm the effect of selective hyporeactivity to appetitive cues and to determine if such an effect generalizes across verbal (word) and nonverbal (picture) stimulus types. A nonclinical sample of young adults was chosen to minimize the effects of confounding variables beyond those of interest. It was hypothesized that (1) high-alexithymic individuals would rate the valence and arousal of appetitive, but not aversive or neutral, verbal and nonverbal stimuli more weakly than would their non-alexithymic counterparts; (2) given that alexithymia and anhedonia are related yet distinct constructs in the general population, it was expected that an inverse relationship between alexithymia and reactivity to appetitive cues would be independent of contributions by anhedonia and/or mood disturbance.

2. Materials and methods

2.1. Participants

The sample included 96 students (59.4% women) who received undergraduate course credit for participation. Participants ranged in age from 18 to 22 (M = 18.9, SD = 1.4) years, with 62% reporting their ethnicity as White, 21% Asian/Asian-American, 12% Latino, 4% Black, and 1% biracial. Individuals were excluded if they reported non-fluency in English, uncorrected vision, current or past diagnosed psychiatric/neurologic illness, or recent use of prescribed (e.g., methylphenidate) or illicit substances (e.g., cannabis) known to affect cognition or emotion.

2.2. Procedure

After providing informed consent, participants completed self-report measures in a pseudorandom order, including the TAS-20, the Profile of Mood States (McNair, Lorr, & Droppleman, 1992), and the Chapman Revised Social (Mishlove & Chapman, 1985) and Physical (Chapman, Chapman, & Raulin, 1976) Anhedonia Scales, and then evaluated affective stimuli.

2.3. Self-report measures

Alexithymia status was determined with the TAS-20, a 20-item scale that assesses difficulty identifying (e.g., "I don't know what's going on inside me") and verbalizing feelings (e.g., "It is difficult for me to find the right words for my feelings") as well as externally-oriented thinking (e.g., "I prefer to analyze problems rather than just describe them") using a 5-point Likert scale. Total scores can range from 20 to 100. In keeping with earlier studies (Hesse & Floyd, 2011; Hesse et al., 2013; Joukamaa et al., 2007), participants with scores $\geqslant$60 (i.e., 60th percentile of the possible total score) were considered alexithymic. Full-scale Cronbach's alpha was .80.

The POMS was included in the protocol to assess and control for potential differences in negative affect between alexithymic and non-alexithymic participants. The POMS contains 65 adjectives, each rated on a 5-point Likert-type scale, that comprise six subscales: Tension/Anxiety (e.g., "nervous"), Depression/Dejection (e.g., "gloomy"), Anger/Hostility (e.g., "peeved"), Vigor/Activity (e.g., "alert"), Fatigue/Inertia (e.g., "sluggish"), and Confusion/Bewilderment (e.g., "muddled"). Total mood disturbance (TMD), calculated by subtracting the Vigor/Activity score from the sum of the other five scores, reflects overall negative affect at the time of testing and was the variable of interest in this study. A TMD z-score was calculated (M = 0, SD = 1) based on sex-related norms (McNair et al., 1992); higher z-scores reflect greater mood disturbance. Cronbach's alpha for TMD was .85.

The Chapman Revised Anhedonia Scales were included in order to track anhedonia levels among alexithymic and non-alexithymic participants. The 40-item Social Anhedonia scale and the 61-item Physical Anhedonia scale assess the ability to experience pleasure from human interaction (e.g., "Having close friends is not as important as many people say") and physical stimuli (e.g., "The beauty of sunsets is greatly overrated"), respectively. In each case, items are presented in true/false format; higher scores reflect greater anhedonia. Cronbach's alpha was 0.78 and 0.82, respectively.

2.4. Affective judgment tasks

Individuals were seated 24 inches in front of a 20-inch computer screen for two tasks run on Dell OptiPlex™ GX520 computers. For each task, participants were asked to evaluate the valence of the stimulus on a Likert scale of 1 (extremely negative) to 9 (extremely positive) followed by the intensity of the stimulus on a Likert-type scale of 1 (not intense at all) to 9 (strongest intensity) and to record their answers in a response booklet. Having stimulus presentation on the computer and the recording of responses on paper allowed participants to freely view each stimulus while deciding how to rank its valence and arousal. Tasks were untimed and self-paced. Half of the participants received the word task first, and the other half received the picture task first, enabling testing for order effects. Trials were presented in a pseudorandom order such that no more than two items from the same stimulus category would be contiguous.

A total of 150 words were selected from the Affective Norms for English Words (ANEW; Bradley & Lang, 1999): 50 appetitive (e.g., ecstasy), 50 neutral (e.g., fabric), and 50 aversive words (e.g., killer). Words ranged from three to eight letters and were balanced across categories for word length, frequency of usage in the English language, and orthographic neighborhood (Table 1). Words were selected based on norms from the original ANEW validation study in which a mixed gender, nonclinical, adult sample rated words for valence and arousal with a similar 1 (low) to 9 (high) scale. Specifically, appetitive words were selected to be of high valence (close to 9) and high arousal (close to 9), aversive words to be of low valence (close to 1) and high arousal (close to 9), and neutral words to be of moderate valence (close to 5) and low arousal (close to 1). The average valence for the appetitive and aversive word sets was equally polarized (i.e., equidistant from the middle of the scale) and arousing. Words were presented individually in capital letters using Calibri 112-point black font atop a white background.

Picture stimuli were drawn from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2005) and included 50 appetitive (e.g., laughing children), 50 neutral (e.g., household objects), and 50 aversive images (e.g., mutilated bodies). Pictures were chosen following the same principles as for the word set (Table 1) and guided by adult, nonclinical, mixed-gender norms from the original IAPS validation study. The appetitive and aversive image sets were equally polarized in valence and equally arousing. Appetitive, aversive, and neutral pictures were comparable in valence and arousal to appetitive, aversive, and neutral words, respectively.