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Individual differences in anterior EEG asymmetry between high and low defensive individuals during a rumination/distraction task

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Abstract

The current study examined how reactions to a negative mood manipulation and a rumination/distraction task differed between high defensive (HD) and low defensive (LD) individuals. At baseline, high defensive participants exhibited significantly greater relative left frontal EEG activity than low defensive participants. HD also exhibited greater relative left anterior activity during both the negative mood induction and during the rumination/distraction task, regardless of group assignment. Contrary to predictions, there were no differences in self-reported mood between HD and LD in either the rumination or distraction group. A significant interaction was found between gender and group, indicating that anterior alpha asymmetry patterns differed for men and women during the rumination/distraction task.

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1. Introduction

While most individuals are distressed by negative events, thoughts, and mood states, certain individuals seem to be immune to the effects these situations have on their everyday lives. They seemingly cope with negative events easily, often without acknowledgement of the unpleasant event. These individuals seem to ‘defend’ themselves regularly from unpleasant mood states.

Research has indicated that individuals with a repressive/defensive coping style may be protected from experiencing and developing psychological disorders. Repressors tend to have an avoidant coping response to negative emotions, events, and information (especially negative information about themselves), and report using significantly more distraction strategies than low defensive individuals when faced with negative emotion (Myers, 1998). In fact, these individuals seemingly cope very well with stress and negative emotion, appear to be well adjusted, report little anxiety, depression, or hostility, and do not acknowledge having many stressors in their lives (Jamner & Leigh, 1999). Repressors also tend to deny the experience of distress and negative affect in stressful situations (Jamner & Schwartz, 1986).

A repressive/defensive coping style is also related to greater relative left frontal EEG activity (Kline, Allen, & Schwartz, 1998; Kline, Blackhart, & Joiner, 2002; Kline, Blackhart, & Schwartz, 1999; Kline, Knapp-Kline, Schwartz, & Russek, 2001; Tomarken & Davidson, 1994), which may act as a protective factor against psychological illness. For instance, previous research has suggested that greater relative left frontal EEG activity is related to positive, approach related emotion, while greater relative right frontal EEG activity is related to negative, withdrawal-related emotion (see Davidson, 1998; Davidson, Pizzagalli, Nitschke, & Putnam, 2002, for reviews). Greater relative right anterior EEG activity has also been associated with depression (e.g., Allen, Iacono, Depue, & Arbisi, 1993; Gotlib, Ranganath, & Rosenfeld, 1998; Henriques & Davidson, 1990, 1991; Schaffer, Davidson, & Saron, 1983) and anxiety (Bruder et al., 1997; Nitschke, Heller, Palmieri, & Miller, 1999; Wiedemann et al., 1999).¹

The current study was designed to examine changes in anterior EEG asymmetry patterns and affect when those with a repressive/defensive coping style were asked to endure and process negative emotion. High defensive (HD) and low defensive (LD) individuals were first given a negative mood manipulation, and then completed either a rumination or distraction task afterwards. When asked to dwell on and ruminate about their negative thoughts and feelings, how would HD react to the task?

Several studies have shown that those who engage in a ruminative response task report increased negative affect (e.g., Blagden & Craske, 1996; Lyubomirsky & Nolen-Hoeksema, 1993, 1995; Morrow & Nolen-Hoeksema, 1990; Nolen-Hoeksema & Morrow, 1993; Trask & Sigmon, 1999). Ruminative thoughts are symptom focused and contemplative. They focus attention on one’s emotional state, and inhibit actions that might distract a person from their negative mood (Nolen-Hoeksema, 1991). As a result, ruminative thinking can prolong negative affect and depressive symptoms.

¹ Inconsistencies in this research have been reported. Reid, Duke, and Allen (1998) and Bruder et al. (1997) did not find differences in EEG asymmetry patterns between depressed and non-depressed participants. Additionally, anxious apprehension (worry) has been associated with greater relative left frontal activity (Carter, Johnson, & Borkovec, 1986; Heller, Nitschke, Etienne, & Miller, 1997) or no anterior asymmetry (Nitschke et al., 1999).

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