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Positive affectivity and attentional control moderate the link between negative affectivity and depressed mood

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ABSTRACT

Research and theory suggest that deficits in trait positive affectivity (PA) and in capacity for executive control of attention (i.e., attentional control or AC) may each intensify risk for depressive symptoms associated with high trait negative affectivity (NA). In contrast, high levels of PA and AC should protect against that risk. However, prospective tests of such predictions are rare. Furthermore, if PA and AC both modulate NA-related risk, it remains to be seen if those effects are independent and complementary or if they operate in an overlapping manner. This study assessed baseline temperament and change in depressed mood across one month in a sample of 125 adolescents. Results supported both PA and AC as modulators of NA's association with changes in depressed mood. Furthermore, results suggested that these modulating effects are largely non-overlapping and complementary, such that when both PA and AC are low, high NA predicts increases in depressed mood. In contrast, high NA predicts decreases in depressed mood when both PA and AC are high. Limitations of these findings, directions for future research, and implications for prevention are discussed.

1. Introduction

Understanding risk factors for depression in young people is critical for its prevention (Flannery-Schroeder, 2006). Consequently, the etiological roles played by temperament factors in depression have become the focus of considerable attention (e.g., Compas, Connor-Smith, & Jaser, 2004). Interest has focused particularly on two dimensions of emotional reactivity, labeled negative and positive affectivity (NA and PA, respectively; Clark, Watson, & Mineka, 1994) and one self-regulatory dimension, labeled effortful control (EC; Rothbart & Rueda, 2005). Individuals high in NA are prone to experiencing negative mood states reflecting displeasurable engagement with the world, such as distress, sadness, and irritability. Those high in PA tend to experience positive mood states reflecting pleasurable engagement with the world, such as interest, enjoyment, and enthusiasm. The EC dimension encompasses three facets (Rothbart & Rueda, 2005): the capacity for executive control of attention including ability to focus, shift, and sustain attention in service of goal-directed and adaptive behavior (i.e., attentional control [AC]), the capacity to initiate responses in opposition to one's reactive motivation (i.e., activation control), and the capacity to suppress inappropriate motor responses (i.e., inhibitory control).

With regard to temperamental reactivity, high levels of NA (i.e., distress proneness) and low levels of PA (i.e., deficits in the capacity for pleasurable engagement with the world) are associated with depressive symptoms in children, adolescents, and adults both concurrently (e.g., Clark et al., 1994; De Pauw & Mervielde, 2010) and prospectively (e.g., Joiner & Lonigan, 2000; Verstraeten, Vasey, Raes, & Bijttebier, 2009). With regard to self-regulatory aspects of temperament, low levels of EC have consistently been linked concurrently to depressive (and internalizing) symptoms (e.g., Dinovo & Vasey, 2011; Loukas & Roalson, 2006; Verstraeten et al., 2009). Furthermore, of EC's facets, AC appears to be most strongly related to depressive (and internalizing) symptoms (e.g., Lengua, Sandler, West, Wolchik, & Curran, 1999; Muris, Meesters, & Blijlevens, 2007; Muris & Ollendick, 2005). Although several prospective studies have found EC to predict change in internalizing symptoms (e.g., Lemery-Chalfant, Doelger, & Goldsmith, 2008; Oldehinkel, Hartman, Ferdinand, Verhulst, & Ormel, 2007), studies looking specifically at depressive symptoms have so far not found a prospective association (Loukas & Roalson, 2006; Verstraeten et al., 2009). To our knowledge, no prospective study to date has focused specifically on the AC facet.

In addition to their direct associations with symptoms, theory and emerging evidence suggest that PA and AC may each modulate the risk for depressive symptoms that is associated with high levels

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of NA. In the case of PA, evidence suggests that positive emotions can buffer the deleterious effects of negative emotions and stress (e.g., Tugade & Fredrickson, 2004). PA's potential to modulate NA's link to depression is supported by several empirical studies, which demonstrate that an NA × PA interaction predicts depressive symptoms both concurrently and prospectively. For example, in two psychiatric inpatient youth samples Joiner and Lonigan (2000) found that when PA was low, high levels of NA were associated with a concurrent diagnosis of depression and an increase in depressive symptoms across two months whereas when PA was high they were not. This interaction has been replicated in youth samples both cross-sectionally (Loney, Lima, & Butler, 2006) and prospectively (Wetter & Hankin, 2009). However, not all studies have found this pattern. For example, Verstraeten et al. (2009) failed to find the NA × PA interaction either cross-sectionally or prospectively. Given this inconsistency, the first aim of the present study was to provide an additional prospective test of PA as a moderator of the link between NA and depressive symptoms in a youth sample.

AC may also moderate NA-related risk for depressive symptoms. This view is in line with an interactive temperament model proposed by Lonigan and Phillips (2001) and elaborated by Lonigan, Vasey, Phillips, and Hazen (2004). Although that model was focused primarily on anxiety symptoms, the authors also noted its relevance for understanding NA-related risk for depressive symptoms. Specifically, they suggested that an individual with high NA may experience less anxious and depressive symptoms than high NA peers if he or she is high in AC, permitting control of or compensation for NA-driven responses (e.g., intrusive negative thoughts). Muris and Ollendick (2005) similarly emphasize the potential for AC to moderate the link between NA and depressive symptoms. Several studies provide cross-sectional evidence supporting this model (Muris, Meesters, & Blijlevens, 2007; unpublished data by Vasey et al., 2002, described in Lonigan et al., 2004) and several studies report similar results using measures of the broader EC dimension (e.g., Oldehinkel et al., 2007; Verstraeten et al., 2009). Consistent with expectation, in these studies high NA was associated with more depressive symptoms when regulatory capacity was low than when it was high. However, to date this interaction has not been found prospectively. Two studies predicting depressive symptoms (Mezulis, Simonson, McCauley, & Vander Stoep, 2011; Verstraeten et al., 2009) and two others predicting the broader dimension of internalizing symptoms (Eisenberg et al., 2004; Oldehinkel et al., 2007) failed to find that EC moderates the relation between NA and future symptoms when controlling for baseline symptoms. However, these studies used a broadband measure of EC rather than focusing on AC. To our knowledge, no prospective studies examining the NA × AC interaction predicting depressive (or internalizing symptoms) have been conducted. Thus, the second aim of the present study was to provide a further test of the hypothesis that individual differences in AC should serve to modulate the risk for depressive symptoms associated with heightened NA.

The third and final aim of the present study was to test the NA × AC and NA × PA interactions simultaneously to determine if the moderating effects of AC and PA are separate or if they instead operate in an overlapping manner. Although evidence suggests that PA and AC (and EC) are modestly positively correlated, studies also find the two dimensions to have independent associations with depressive symptoms (e.g., Lengua et al., 1999; Verstraeten et al., 2009). Consequently, we hypothesize that the moderating effects of each will not overlap (i.e., the NA × AC and NA × PA interactions should not be redundant with one another). We are aware of only one study of a youth sample that has reported results relevant to this hypothesis. Verstraeten et al. (2009) simultaneously tested the NA × EC, PA × EC, and NA × PA interactions in a regression model predicting depressive symptoms in an unselected sample of adolescents. Only the NA × EC interaction was significant cross-sectionally and none of these interactions was significant predicting change in symptoms across one year. However, given that this study failed to find either an NA × EC or NA × PA interaction, it provided no opportunity to test the independence of these interactions. Consequently, there remains a need for further research.

In sum, the present study tested the following hypotheses prospectively across one month in a youth sample: (1) The NA × PA interaction will predict change in depressed mood over time such that high levels of NA will predict increases in depressed mood more strongly when PA is low versus high; (2) The NA × AC interaction will predict change in depressed mood over time such that high levels of NA will predict increases in depressed mood more strongly when AC is low versus high; (3) Both the NA × AC and NA × PA interactions should be significant when tested simultaneously.

2. Methods

2.1. Participants

Participants were 136 adolescents, ages 11–18 years (M_{age} = 14.4, SD = 1.8; 54% female), who were recruited from dental and orthodontic clinics in central Ohio. Of them 130 (95.6%) had complete data at baseline (i.e., Time 1 [T1]) and 126 (92.6%) completed the 1-month follow-up (i.e., Time 2 [T2]) and thus comprised the final sample. Participants were predominantly Caucasian and from diverse socioeconomic backgrounds.[1]

2.2. Procedures

After obtaining parental consent and adolescent assent, participants completed the Positive and Negative Affect Schedule (PANAS – Trait Form), the Profile of Mood States – Adolescent Version (POMS-A), and the Attentional Control Scale (ACS) at Time 1 [T1], in addition to several measures not relevant to the present study. Participants completed these questionnaires while waiting for their dental or orthodontic appointments. One month later (Time 2 [T2]) participants again completed the POMS-A and returned it by mail. If necessary, they received a reminder telephone call to prompt its return.

2.3. Measures

The PANAS – Trait Form (Watson, Clark, & Tellegen, 1988) is a widely used measure that includes two 10-item scales, one for PA and one for NA. Participants indicate on a 1 (“Very slightly or not at all”) to 5 (“Extremely”) Likert scale the degree to which they generally experience each of 20 affective descriptors (e.g., guilty, excited, distressed, proud). Scores for each scale range from 10 to 50 with higher scores indicating more NA or PA. Alphas in the present sample were .79 for the NA scale and .82 for the PA scale. This measure was developed for adult samples, but it has demonstrated good reliability and validity when used with youth in the age range sampled for the present study (e.g., Lonigan, Phillips, & Hooe, 2003).

The POMS-A (Terry, Lane, Lane, & Keohane, 1999) is a 24-item scale that measures 6 dimensions of mood including anger, confusion, depression, fatigue, anxiety, and vigor. Participants indicate

[1] Due to an oversight, demographic information was not collected from patient files before the data were de-identified and is thus unavailable. However, the clinics from which the sample was drawn serve a predominantly Caucasian population characterized by a wide range of socioeconomic levels.