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Rejection sensitivity, interpersonal rejection, and attention for emotional facial expressions

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ABSTRACT

Background and Objectives: Rejection sensitivity (RS), attention for depression-relevant stimuli, and interpersonal rejection are established risk factors for depression. RS has previously been associated with increased attention for socially threatening faces, but has not been examined in the context of specifically depression-relevant stimuli. The current study examined whether RS influences attention for emotional facial expressions in the context of social rejection or inclusion.

Methods: Participants (n = 180) completed a self-report measure of RS and a free viewing eye tracking task before and after an experimental task (Cyberball) in which participants were randomized to be included or rejected.

Results: Hierarchical linear regressions predicting change in attention to emotional faces revealed significant effects only for sad faces. Higher RS was associated with increased attention for sad faces from pre- to post-Cyberball. Cyberball condition moderated the effect with participants in the rejection condition demonstrating increased attention for sad faces, but with no significant relationship in the inclusion condition.

Limitations: Our sample had relatively low levels of RS and depression.

Conclusions: Consistent with interpersonal and cognitive models of depression, we found that RS was associated with increased attention for sad faces when participants were interpersonally rejected. Results provide preliminary evidence that rejection sensitivity may contribute to depression vulnerability via increased attention to depression-relevant information in the context of interpersonal rejection. Further research including clinically depressed participants and using longitudinal approaches are necessary to confirm this potential relationship.

1. Introduction

Major Depressive Disorder (MDD) is a major health burden in the United States with a lifetime prevalence rate of 16.5% for adults (Kessler et al., 2005). Further, MDD is the leading cause of disability for those between the ages of 15–44 in the United States (World Health Organization, 2004). Therefore, MDD and its related complications comprise a major health concern and use of resources to the United States.

In order to best prevent and treat MDD, it is important to identify potential risk factors contributing to the onset, maintenance and recurrence of depression. Several theories have been developed to help understand the etiology of depression including interpersonal and cognitive models of depression. Interpersonal models of depression suggest that depression vulnerability is increased in the presence of maladaptive social patterns (e.g., Coyne, 1976), whereas cognitive models of depression suggest that depression vulnerability is increased in the presence of maladaptive, negative thinking patterns (e.g., Beck,

1976). This study aimed to examine one such interpersonal risk factor (i.e., rejection sensitivity) in its relationship to one such cognitive risk factor (i.e. attention bias to dysphoric information).

1.1. Interpersonal models and rejection sensitivity

According to interpersonal theories of depression, social rejection is an important interpersonal factor that can lead to increased depressive symptoms (Coyne, 1976). Furthermore, a fear of rejection and increased distress when experiencing rejection may be particularly associated with depression vulnerability. This fear of rejection and increased distress when experiencing rejection has been termed *rejection sensitivity* (Downey & Feldman, 1996).

Rejection sensitivity (RS) is hypothesized to be a broad, stable risk factor for depression (Downey & Feldman, 1996; Downey, Freitas, Michaelis, & Khouri, 1998) and empirical studies have supported this hypothesis. For example, higher RS, among other interpersonal factors, predicts increased depressive symptoms at a 6-month follow up

(Pearson, Watkins, & Mullan, 2010). Additionally, college-aged women high in RS demonstrate increased depressive symptoms after a partner-initiated romantic breakup, compared to those low in RS (Ayduk, Downey, & Kim, 2001). Previous research has investigated how RS may confer risk for depression, and has suggested several potential mediators including stress generation, social problem-solving, and negative interpretation bias (Kraines & Wells, 2017; Liu, Kraines, Massing-Schaffer, & Alloy, 2014; Normansell & Wisco, 2017). Another way in which RS may confer risk for depression is in its relationship to attention biases.

1.2. Attention bias and rejection sensitivity

Beck's original cognitive model of depression posits that negative attentional biases are at the root of depression, and these negative attentional biases become automatic (Beck, 1976). More recent cognitive models of depression implicate information processing more broadly in the onset, maintenance, and course of MDD (Beevers, 2005; Ingram, 1984; Teasdale, 1988), and empirical research has supported these models (e.g., Goeleven De Raedt, Baert, & Koster, 2006; Gotlib, Krasnoperova, Yue, & Joormann, 2004; Leyman, De Raedt, Vaeyens, & Philippaerts, 2011). For example, a study that manipulated attention bias found that training attention away from sad stimuli improved depression symptoms compared to a group that received a no training control (Wells & Beevers, 2010). These results support the role of selective attention as a causal role in the maintenance of depression, not just as a by-product of depression. Furthermore, there is emerging evidence suggesting that this attention bias is a marker for depression vulnerability even in the absence of current depression and that the bias plays a role in the maintenance of depressive symptoms (e.g., Koster, De Raedt, Goeleven, Franck, & Combez, 2005; Soltani et al., 2015). As such, attention for depression relevant information represents an important marker of depression vulnerability and maintenance but has not been studied in the context of rejection sensitivity.

To our knowledge, only two studies to date have examined attention bias in the context of RS. In one study, Berenson et al. (2009) used an emotional Stroop task and a probe detection task to measure attention bias in RS. Specifically, in Study 1, the authors found that RS was related to attentional interference by rejection-related words, but RS did not relate to attentional interference of negative non-rejection related words. In Study 2 the authors used a visual probe task to examine the hypothesis that individuals high in RS would demonstrate a vigilance, then avoidant pattern in their attention, and found partial support for this hypothesis. Specifically, the authors found that those high in rejection sensitivity showed an avoidant pattern in viewing threatening facial expressions. This pattern was not found in highly rejection sensitive individuals for pleasant faces. Combined, studies 1 and 2 demonstrate an association between RS and the deployment of attention, especially in the context of social threat stimuli.

A more recent study examined neural responses (i.e., event related potentials) to a dot-probe paradigm to neutral and rejecting faces (i.e., gaze-averted faces) in a sample of highly rejection sensitive and average rejection sensitive women (Ehrlich, Gerson, Vanderwert, Cannon, & Fox, 2015). Results of the study indicated that average rejection sensitive women showed an attention bias away from rejecting faces, whereas high rejection sensitive women showed an equal hypervigilance to both rejection faces and neutral faces. As such, in this study, higher RS was associated with increased attention to rejecting faces, compared to average RS. However, within the high RS group, there were no differences in attention to neutral and rejecting faces. This study further indicates a relationship between attention and RS, though results are inconsistent with Berenson et al.'s (2009) findings.

Though these two studies indicate a relationship between RS and attention, they used only stimuli that were neutral and threatening, and did not include images containing other emotional stimuli, namely, sad stimuli. Depression-relevant or sad stimuli are particularly salient for

individuals at risk for depression (Joormann & Gotlib, 2007; Joormann, Talbot, & Gotlib, 2007) and RS is a risk factor for depression (Ayduk et al., 2001; Pearson et al., 2010). Given these connections, we examined the relationship between RS and attention for emotional faces, including sad faces.

Though there have been several methodologies used to examine attention biases, eye tracking technology currently serves as a promising methodology to understand and uncover biases present in information processing in which attention is spontaneously directed toward relevant stimuli (Armstrong & Olatunji, 2012). Compared to other methodologies that rely on reaction time (e.g., dot-probe, emotional Stroop task), eye tracking methodology is able to display multiple emotional stimuli simultaneously, has greater external validity, and has lower susceptibility to confounding processes (Armstrong & Olatunji, 2012).

1.3. Interpersonal rejection

Interpersonal rejection is an important risk factor for depression (Slavich, O'Donovan, Epel, & Kemeny, 2010) and is critical for the relationship between RS and depression. Indeed, it is unlikely that RS would result in negative emotional states apart from actual or perceived interpersonal rejection. Thus, it is particularly important to examine the effects of RS on attention in the context of interpersonal rejection. As such, our study utilized Cyberball, which is a computer based task designed to elicit interpersonal rejection or inclusion (Williams & Jarvis, 2006), to examine the relationship between RS and attention in the context of interpersonal rejection.

1.4. Current study

The current study employed eye tracking methodology to examine the relationship between RS and attention for emotional facial expressions (angry, disgust, happy, sad, and neutral) before and after a laboratory task inducing interpersonal rejection or inclusion. The following hypotheses were tested:

1) We predicted a positive relationship between RS and attention for sad emotional faces.
2) We predicted that rejection or inclusion in a laboratory task would moderate the relationship between rejection sensitivity and change in attention for sad faces, such that high RS would be associated with greater attention for sad faces after being rejected condition, but not after being included.
3) Consistent with previous research (Berenson et al., 2009; Ehrlich et al., 2015) we hypothesized that RS would be associated with greater attention to socially threatening faces (i.e., disgust and angry faces).

We did not make a priori hypotheses regarding happy or neutral facial expressions.

2. Materials and methods

2.1. Participants

Participants were 180 undergraduate students recruited from the student participant pool at Oklahoma State University. However, thirteen participants were excluded due to poor quality eye tracking data (i.e., < 70% valid data), resulting in a final sample of 167 participants. All participants were at least 18 years of age (M age = 19.59, SD = 2.04). The majority of participants were female (67.1%) and the remainder were male. Participants were primarily Caucasian (78%), and 6.7% were Black or African American, 6.7% were American Indian or Alaskan Native, 6.1% identified as multiple races, while < 1% identified as Asian and Native Hawaiian or Other Pacific Islander.