The Interactive Effect of Emotional Reactivity and Maladaptive Metacognitive Beliefs on Anxiety

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Abstract

Emotional reactivity has been implicated in the development and maintenance of anxiety. The metacognitive model suggests that maladaptive metacognitive beliefs (i.e., beliefs about thinking) may increase the impact of emotional reactivity on anxiety. As such, the purpose of the present study was to examine maladaptive metacognitive beliefs as a moderator of the relationship between emotional reactivity and anxiety in an undergraduate student sample ($N = 78$). Participants completed a battery of self-report measures and a negative emotion induction procedure during a single laboratory session. As predicted, higher levels of maladaptive metacognitive beliefs strengthened the relationship between emotional reactivity and anxiety. This effect was found in relation to negative (e.g., “My thoughts are uncontrollable”), but not positive (e.g., “Worrying will keep me safe”), metacognitive beliefs. Study results support the proposal that maladaptive metacognitive beliefs potentiate the effect of emotional reactivity on anxiety and suggest that preemptive efforts to reduce negative metacognitive beliefs may be beneficial among individuals prone to emotional reactivity.

Keywords: anxiety, emotional reactivity, metacognition, metacognitive beliefs, emotion regulation
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Anxiety disorders are the most prevalent health disorder in the United States (US), as well as in much of the developed world (Bandelow & Michaelis, 2013). In the US, approximately 18% of the population will be afflicted with an anxiety disorder in a given year and over 30% will experience an anxiety disorder at some point during their lifetime (Kessler et al., 2005). In addition to the severe emotional suffering associated with anxiety, individuals with anxiety disorders experience poorer physical health, a diminished quality of life, and impairments in occupational, social, and family functioning (Hoffman, Dukes, & Wittchen, 2008). Additionally, the economic impact of anxiety is staggering, exceeding 40 billion dollars per year in the US (DuPont et al., 1996; Kessler & Greenberg, 2002) and over 40 billion euros per year in the European Union (Andlin-Sobocki & Wittchen, 2005). The staggering costs of anxiety disorders, in both human suffering and economic burden, have resulted in a wealth of research geared toward identifying vulnerability and protective factors that may aid in the development of primary, secondary, and tertiary prevention efforts.

Emotional reactivity is one such vulnerability factor that has been implicated in anxiety and related disorders (e.g., McLaughlin et al., 2010). Dragan, Dragan, Kononowicz, and Wells (2012) defined emotional reactivity as “the tendency to react intensively to emotion-generating stimuli, expressed in high emotional sensitivity and low emotional endurance.” Research and theory suggest that emotional reactivity is biologically based and appears early in infancy (e.g., Corr, 2004; Oniszczenko, & Dragan, 2005). Among individuals with anxiety disorders, some evidence suggests that emotions are more easily triggered, rise rapidly to a high level, and last significantly longer than in nonanxious individuals (Mennin, Heimberg, Turk, & Fresco, 2005).
Those with a predisposition toward emotional hyper-reactivity are thought to be at risk for developing threat-related information processing biases (i.e., the tendency to evaluate ambiguous stimuli as threatening; Wilson, MacLeod, Mathews, & Rutherford, 2006). Similarly, cues that may be evaluated as relatively benign by those who do not have an anxiety disorder serve as indicators of impending threat for those with an anxiety disorder. For individuals with an anxiety disorder, the stimulus value of these cues triggers a coordinated set of response tendencies, which includes a subjective negative emotional experience, as well as behavioral (e.g., avoidance, crying) and physiological responses (e.g., racing heart; Carthy et al., 2010).

Evidence of the link between emotional reactivity and anxiety has been shown in cross-sectional, experimental, and longitudinal studies. For example, participants with generalized anxiety disorder (GAD) reported significantly greater emotional reactivity in response to a negative emotion induction procedure (i.e., a proxy measure of dispositional emotional reactivity) compared to control participants without an anxiety disorder (Srivastava, Sharma, & Mandal, 2003). In a similar laboratory study, Mennin and colleagues (2005) found that participants with GAD, compared to control participants, reported greater intensity of emotions in general, but also displayed significantly greater emotional reactivity following a negative mood induction procedure in which sadness- or anxiety-inducing music was used. A significant difference in emotional reactivity was not observed between these groups in response to a neutral mood induction. Similar results have been observed among individuals with social anxiety disorder in response to laboratory-based social-threat induction procedures (Goldin, Manber, Hakimi, Canli, & Gross, 2009).

In addition to the cross-sectional and quasi-experimental laboratory studies described above, research has been conducted to clarify the temporal nature of relations between emotional
reactivity and anxiety. Specifically, evidence suggests that greater emotional reactivity in adolescence increases one’s risk of developing an anxiety disorder in adulthood (McLaughlin et al., 2010). Also of note, although symptoms of anxiety and depression commonly co-occur (Rivas-Vazquez, Saffa-Biller, Ruiz, Blais, & Rivas-Vazquez, 2004), some evidence suggests that heightened emotional reactivity may be more specific to anxiety. Using ecological momentary assessment, Heller, Fox, and Davidson (2018) found that relatively higher levels of trait anxiety were associated with greater day-to-day fluctuations in both positive and negative emotional expression. In contrast, higher levels of depressive symptoms were associated with mean levels of positive and negative emotions rather than emotional reactivity. This finding suggests that emotional reactivity might be particularly important for understanding the pathogenesis of anxiety-related pathology.

Although prospective evidence suggests emotional reactivity as a vulnerability factor in the pathogenesis of anxiety (e.g., McLaughlin et al., 2010), it is not entirely clear under what conditions emotional reactivity relates to anxiety. Some have suggested that metacognitive beliefs may influence the relationship between emotional reactivity and anxiety (Dragan et al., 2012). The Self-Regulatory Executive Function (S-REF) model proposed by Wells and Mathews (1994; 1996) suggests that emotional disorders arise as a function of one’s beliefs about thoughts and cognitive experiences (i.e., metacognitive beliefs), and subsequent activation of the cognitive attentional syndrome (CAS: i.e., heightened self-focused attention and threat monitoring, as well as the use of worry and other forms of avoidant coping). Two types of metacognitive beliefs are thought to be important for understanding the role that metacognitive beliefs play in activating the CAS and in the development of anxiety (Wells, 1995; Wells, 2006). Positive metacognitive beliefs emphasize the value of engaging in the CAS (e.g., “Worrying helps me cope”). Negative
metacognitive beliefs, on the other hand, emphasize the uncontrollability and danger of thoughts (e.g., “If I could not control my thoughts, I would not be able to function”) and are thought to increase attention toward thought processes (e.g., monitoring of thought content) and the likelihood that internal experience will be perceived as distressing. As such, negative metacognitive beliefs may be particularly important for understanding the relationship between emotional reactivity and anxiety. Specifically, individuals with relatively greater emotional reactivity may be more likely to evaluate fluctuations in emotions negatively if they over-attend to these experiences (i.e., CAS-related self-focused attention). It stands to reason that high emotional reactivity in combination with negative metacognitive beliefs about the danger and uncontrollability of internal experiences would result in elevated risk for anxiety.

Research supports the notion that negative metacognitive beliefs are particularly relevant to anxiety symptoms. Among the domains of metacognitive beliefs, negative metacognitive beliefs about the uncontrollability and danger of thoughts are most strongly associated with trait, social, and health anxiety (Cartwright-Hatton & Wells, 1997). Negative metacognitive beliefs are also useful for identifying probable cases of GAD. Davis and Valentiner (2000) used the Negative Metacognitive Beliefs Scale of the Metacognitive Questionnaire-30 (MCQ-30: Wells & Cartwright-Hatton, 2004) in combination with the Beck Anxiety Inventory (Beck, Epstein, Brown, & Steer, 1988) to create a discriminant function that correctly classified 80% of participants into one of three groups (i.e., GAD, non-worried anxious, non-anxious).

Metacognitive beliefs have been shown to prospectively predict anxiety symptoms (e.g. Nordahl, Hjemdal, Hagen, Nordahl & Wells, 2019). In a student sample, negative metacognitive beliefs, measured via the MCQ-30, predicted anxiety symptoms at a three-month follow-up (Hjemdal, Stiles & Wells, 2013). In addition, higher scores on the uncontrollability and danger
subscale of the MCQ-30 have been shown to prospectively predict greater anxiety symptoms while controlling for changes in emotion due to stressful life events (Yılmaz, Gençöz, & Wells, 2011). Finally, metacognitive beliefs about the uncontrollability and danger of thoughts are related to treatment outcomes. Over the course of treatment for social anxiety disorder, reductions in negative metacognitive beliefs about the uncontrollability and danger of thoughts predicted reductions in anxiety symptoms (Nordahl, Nordahl, Hjemdal, & Wells, 2017). Taken together, these data point to the influence of metacognitive beliefs, particularly beliefs about the uncontrollability and danger of thoughts (i.e., negative metacognitive beliefs), on the development and maintenance of anxiety pathology.

Emotional hyperactivity and maladaptive metacognitive beliefs have been identified as prospective predictors of anxiety (e.g., McLaughlin et al., 2010). As described, the strength of the relationship between emotional reactivity and anxiety may depend on the degree to which one holds maladaptive metacognitive beliefs about the danger and uncontrollability of thoughts. As such, the purpose of the present study was to examine negative metacognitive beliefs as a moderator of the relationship between negative emotional reactivity and anxiety. We predicted that the magnitude of the positive association between negative emotional reactivity and anxiety would become significantly stronger as negative metacognitive beliefs about the danger and uncontrollability of thoughts increased.

In contrast to the large magnitude correlations that have been observed between negative metacognitive beliefs and anxiety, correlations between positive metacognitive beliefs and anxiety are consistently small to medium in size (e.g., Cartwright-Hatton & Wells, 1997; Dragan et al., 2012). As such, the role of positive metacognitive beliefs in the pathogenesis of anxiety has received far less attention in the extant literature. Theory suggests that positive metacognitive
beliefs activate the CAS, which promotes the rigid application of avoidant coping in response to internal experience (e.g., large fluctuations in emotion), thus preventing adaptive learning (Wells, 2011). Following from this logic, we tentatively hypothesized that the magnitude of the positive association between negative emotional reactivity and anxiety would become significantly stronger as positive metacognitive beliefs increased (i.e., a moderation effect).

Method

Participants

Undergraduate participants from a Southeastern university were recruited via an online recruitment system. Recruitment was limited to participants between the ages of 18-64. One participant did not complete the emotion induction measure of emotional reactivity (see below), and thus, was removed from the sample. The final sample \( (N = 78; \ 76\% \ \text{female}) \) had an average age of 19.10 years \( (SD = 2.49, \ range = 18-39) \). The majority of the sample reported their race as White (85.9%), followed by Black or African American (9%), and Asian (5.1%). A minority of the sample reported their ethnicity as Hispanic or Latino (3.8%).

Measures

The Positive and Negative Affective Schedule (PANAS; Watson, Clark, & Tellegen, 1988) was used to assess negative emotional reactivity to the emotion manipulation procedure. The PANAS is a self-report measure which assesses both positive and negative affect. Participants rate 20 emotions on a 5-point scale \( (1 = \text{very slightly or not at all} \ to \ 5 = \text{extremely}) \) on the basis of the extent to which they are currently experiencing each emotion. The negative affect scale of the PANAS (i.e., PANAS-NA) – the PANAS scale of interest in the present study – contains 10 items (e.g., afraid, distressed, jittery) and has shown adequate psychometric properties in prior studies, including internal consistency and convergent validity (Crawford &
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Henry, 2004; Watson et al., 1988). The measure was administered both before (Time 1 [T1]) and after (Time 2 [T2]) the emotion manipulation procedure. Internal consistency for the PANAS-NA scale was adequate at both time points (T1: $\alpha = .82$, $M = 14.18$, $SD = 4.80$; T2: $\alpha = .85$, $M = 18.82$, $SD = 6.37$).

The Metacognitions Questionnaire 30 (MCQ-30; Wells & Cartwright-Hatton, 2004) is a 30-item measure that assesses domains of metacognitive beliefs, including negative metacognitive beliefs about the uncontrollability and danger of thoughts, positive metacognitive beliefs about CAS-based coping, cognitive confidence, need for control, and cognitive self-consciousness. Items of the MCQ-30 are rated on a 4-point scale (1 = do not agree to 4 = agree very much). Higher scores indicate higher levels of maladaptive metacognitive beliefs. The MCQ-30 has exhibited adequate psychometric properties, including internal consistency, retest reliability, construct validity, and measure invariance between men and women (Fergus & Bardeen, 2017; Spada et al., 2008; Wells & Cartwright-Hatton, 2004). Internal consistency of the positive and negative beliefs scales, the MCQ-30 scales of interest in the present study, was adequate (Positive: $\alpha = .91$, $M = 10.04$, $SD = 4.21$; Negative: $\alpha = .88$, $M = 11.76$, $SD = 4.75$).

The Depression Anxiety Stress Scales (DASS-21; Lovibond & Lovibond, 1995) was used to assess anxiety symptoms. The seven items of the DASS-21 Anxiety Scale (e.g., “I felt I was close to panic”) are rated on a 4-point scale from (0 = Did not apply to me at all to 3 = Applied to me very much, or most of the time). Participants rate the degree to which each statement applies to them over the past week. The DASS-21 has exhibited adequate psychometric properties, including internal consistency and construct validity (Antony, Bieling, Cox, Enns, & Swinson, 1998; Lovibond & Lovibond, 1995). Importantly, individuals with an anxiety disorder score significantly higher than non-clinical control participants on the DASS-21 Anxiety Scale.
(Antony et al., 1998), and convergent validity of this scale has been established with other measures of anxiety (e.g., Beck Anxiety Inventory; Beck, Epstein, Brown, & Steer, 1988; Lovibond and Lovibond, 1995). Internal consistency of the DASS-21 Anxiety Scale was adequate in the present study ($\alpha = .88, M = 3.08, SD = 3.99$).

**Negative Emotion Induction**

Forty images (e.g., man with knife, bloody face, plane crash) from the International Affective Picture System (IAPS; Lang, Bradley, & Cuthbert, 2005) were used to elicit negative emotion. IAPS images were originally rated on dimensions of valence and arousal using 9-point rating scales (Lang et al., 2005). The image set used in the present study have been used to elicit negative emotion in prior studies (e.g., Bardeen, 2015); images for this set were chosen based on ratings indicating negative valence and high arousal ($M = 2.17$ and $6.52$, respectively). Each image was presented on a computer for five seconds, with a one and a half second pause between images (Pretz, Totz, & Kauffman, 2010). To ensure that participants attended to the images, they were told that they would have to complete a task later in the session in which they would have to recall some of the images that were presented during this induction procedure.

**Procedure**

Prior to data collection, study procedures were approved by the local institutional review board. Upon arriving for the study session, participants were escorted to a private room where they provided informed consent and completed a battery of self-report measures (e.g., demographics form, MCQ-30, DASS-21). Next, participants completed the T1 PANAS followed by the negative emotion induction procedure (Bardeen, 2015; Pretz et al., 2010). Participants were told to pay attention to the images on the screen (i.e., IAPS images; Lang et al., 2005), as they would later be asked to remember some of the images. Following the negative emotion
induction procedure, participants completed the T2 PANAS to assess emotional reactivity. This is a commonly used method of assessing emotional reactivity (e.g., Bardeen, 2015; Tull, Kiel, McDermott, & Gratz, 2013). Participants were debriefed and provided with compensation in the form of course credit and $5.

Results

Manipulation Check

To ensure that the induction procedure provoked emotional distress, we conducted a dependent t-test to examine changes in PANAS-NA from T1 to T2. Participants reported a significant increase in negative emotion from T1 ($M = 14.18$, $SD = 4.80$) to T2 ($M = 18.82$, $SD = 6.37$; $t(77) = -6.81$, $p < .001$, Cohen’s $d = .77$). This suggests that the emotion induction procedure effectively altered emotional experience in the expected direction.

Data Analytic Plan

A hierarchical regression was conducted to test the hypothesis that maladaptive metacognitive beliefs (i.e., both positive and negative) would moderate the relationship between emotional reactivity and anxiety. Consistent with Aiken and West (1991), the predictor (i.e., negative emotional reactivity) and moderator variables (i.e., positive and negative metacognitive beliefs) were mean centered and interaction terms were calculated as the product of the predictor and moderator variables. T1 and T2 PANAS-NA, as well as negative and positive metacognitive beliefs were entered into the first step of the model. To model emotional reactivity (the change from baseline to post-induction), rather than simply examining one’s level of post-induction negative emotions in relation to anxiety, it was necessary to include T1 PANAS-NA in the model. The interaction terms were entered into the second step of the model (T2 PANAS-NA by negative and positive metacognitive beliefs). Significant interaction effects were explored using
simple slopes analysis (Aiken & West, 1991). Simple slopes analysis is conducted by testing the
effects of the predictor variable (T2 PANAS-NA) at high (+1SD) and low (-1SD) values of the
proposed moderators (i.e., negative and/or positive metacognitive beliefs).

Analysis

In the first step of the regression model (adjusted $R^2 = .49$, $p < .001$), negative
metacognitive beliefs and T2 PANAS-NA significantly predicted DASS-21 Anxiety ($\beta$s = .40
and .30, respectively, $ps < .001$), whereas positive metacognitive beliefs and T1 PANAS-NA did
not ($\beta = .13$, $p = .17$ and $\beta = .16$, $p = .12$, respectively). In the second step of the model ($\Delta R^2 =
.06$, $p = .01$), the interaction between negative metacognitive beliefs and T2 PANAS-NA
significantly predicted DASS-21 Anxiety ($\beta = .25$, $p = .01$), but the interaction between positive
metacognitive beliefs and T2 PANAS-NA did not ($\beta = .02$, $p = .87$). Simple slopes analysis
revealed a positive association between T2 PANAS-NA and DASS-21 Anxiety that was
significant at higher ($\beta = .45$, $p < .001$), but not lower ($\beta = -.01$, $p = .94$), levels of negative
metacognitive beliefs (see Figure 1).

Discussion

The primary purpose of the present study was to examine negative metacognitive beliefs
about the uncontrollability and danger of thoughts as a moderator of the relationship between
negative emotional reactivity and anxiety. As hypothesized, the relationship between negative
emotional reactivity to a negative emotion induction procedure and anxiety was significant at
high, but not low, levels of negative metacognitive beliefs. This is consistent with theory (Wells
& Mathews, 1994; Wells & Mathews, 1996) suggesting that negative metacognitive beliefs
promote attention allocation toward internal experiences and increase the likelihood that these
experiences (e.g., fluctuations in emotion) will be perceived negatively. Avoidant coping is then
used to provide short-term relief from these negatively evaluated internal experiences, thereby strengthening negative metacognitive beliefs and maintaining anxiety symptoms.

As described, the role of positive metacognitive beliefs has received far less attention in the extant literature in comparison to examinations of negative metacognitive beliefs in the pathogenesis of anxiety. However, based on theory that suggests that positive metacognitive beliefs promote rigid application of avoidant coping in response to internal experiences, thus preventing adaptive learning, we tentatively hypothesized that positive metacognitive beliefs would also moderate the relationship between negative emotional reactivity and anxiety. This hypothesis was unsupported by the results of the present study; when accounting for the interaction between negative metacognitive beliefs and negative emotional reactivity on anxiety, there was not a main or interactive effect of positive metacognitive beliefs on anxiety. One explanation for this null finding is that negative metacognitive beliefs accounted for a large portion of the variance in the model, such that the smaller influence of positive metacognitive beliefs on anxiety was attenuated. Had the sample size been larger, the effect of positive metacognitive beliefs on anxiety may have been significant.

Another explanation for our null finding related to the hypothesized interaction between positive metacognitive beliefs and negative emotional reactivity on anxiety is that this effect may depend on avoidant coping, which was not measured in the present study. That is, as described above, the influence of positive metacognitive beliefs on anxiety is thought to be a function of the rigid application of avoidant coping in response to aversive internal experience. To test this model, one would need to assess avoidant coping and examine it as a mediator of the relationship between the proposed interaction effect (i.e., positive metacognitive beliefs by negative emotional reactivity) and anxiety. Another possible explanation is that the negative valuation of
internal experience (e.g., fluctuations in emotion) is driving the observed interaction between maladaptive metacognitive beliefs and anxiety. This aspect of the model (i.e., negative valuation of internal experience) is central to negative, but not positive, metacognitive beliefs. Thus, it seems that negative metacognitive beliefs may hold more weight when considering the effect of maladaptive metacognitive beliefs on the relation between negative emotional reactivity and anxiety.

The results of this study suggest that it is important to consider individual differences in negative metacognitive beliefs when examining the impact of emotional reactivity on anxiety. Still, the model proposed by Wells and Mathews (1994, 1996) is fairly complex, and the processes through which negative metacognitions lead to the development and maintenance of anxiety requires further exploration. For example, it was beyond the scope of the present study to examine the development of metacognitive beliefs, the coping strategies that are triggered in response to activation of negative metacognitive beliefs, and how these factors interact to predict anxiety. Therefore, in order to better understand this relatively complex model, it will be important to assess these constructs and include them in future examinations in this line of research. This more holistic depiction of the metacognitive model might help clarify the avenues through which anxiety symptoms develop and are maintained.

This study is not without limitations. As noted, the relatively small sample size may have impacted our ability to detect small effects. Although one strength of this study is its use of a laboratory-based emotion induction procedure, there is some debate as to the ecological validity of laboratory manipulations of emotion. It might be beneficial to conduct real-world assessment of emotional reactivity (i.e., ecological momentary assessments) in future studies. Moreover, this study relied on self-report measures to assess changes in emotion, metacognitive beliefs, and
anxiety symptoms. Due to our self-report method of assessment, the magnitude of relations among study variables may have been inflated. However, correlated measurement error, which often occurs with monomethod assessment, tends to attenuate interaction effects rather than producing spurious interactions (Evans, 1985). As such, this assessment limitation is not likely responsible for the significant interaction effect between negative metacognitive beliefs and emotional reactivity, but may have attenuated the proposed interaction between positive metacognitive beliefs and emotional reactivity.

Although the DASS-21 Anxiety Scale score was used in a manner consistent with a dimensional model of anxiety (Crawford, Henry, Crombie, & Taylor, 2001), it may be important to assess for anxiety disorders (i.e., DSM-5; American Psychiatric Association, 2013) in this line of research in the future. Doing so will increase confidence that study findings will generalize to clinical samples. Despite using an undergraduate student sample in the present study, it is noteworthy that considerable variability in DASS-21 Anxiety Scale scores was observed. Approximately 1/3 of the sample reported anxiety symptoms that were not in the “normal” range (Lovibond & Lovibond, 1995). In addition to using diagnostic clinical interviews in this line of research, it may be beneficial to replicate study findings using measures of emotional reactivity that are more objective (e.g., psychophysiological assessment). However, self-reported assessments of emotional reactivity should not be devalued, as they provide a direct window into the subjective emotional experience of participants and are more easily compared across studies due to their more frequent use (Larsen & Prizmic-Larsen, 2006; Silvers et al., 2012).

To our knowledge, the present study is the first to provide evidence that negative metacognitive beliefs moderate the association between negative emotional reactivity and anxiety. Specifically, findings from the present study suggest that negative emotional reactivity,
in the absence of maladaptive metacognitive beliefs, may not increase one’s risk of developing anxiety-related pathology. If future research continues to support the observed interaction effect, preemptive efforts to reduce negative metacognitive beliefs may be beneficial among individuals prone to negative emotional reactivity. Negative metacognitive beliefs may be targeted by means of treatments such as Metacognitive Therapy (Wells, 2011) and empirical evidence supports this approach. Metacognitive therapy has been shown to be more effective in treating individuals with GAD than cognitive-behavioral therapy, which is typically considered the gold standard treatment for GAD (Nordahl et al., 2018). Additionally, interventions that simultaneously target dispositional emotional reactivity and negative metacognitive beliefs may be particularly useful in treating individuals with anxiety-related pathology. For example, acceptance-based therapy for GAD encourages clients to be accepting of fluctuations in emotion while non-judgmentally labelling metacognitive beliefs (Roemer & Orsillo, 2007).
References


Gainesville, FL: University of Florida.


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Footnote

1We tested the interactions between emotional reactivity and both positive and negative metacognitive beliefs in our primary analysis because these are the two types of maladaptive metacognitive beliefs implicated in the development of generalized anxiety (Wells, 1995). At the request of an anonymous Reviewer, who was interested in whether the three other subscales of the MCQ-30 (i.e., cognitive self-consciousness, cognitive confidence, and need for control) moderated the relationship between emotional reactivity and anxiety, we reran our primary analytic model, this time including five interaction terms (i.e., Time 2 PANAS NA interacting with each of the five MCQ-30 subscales). Consistent with our primary analysis, negative metacognitive beliefs was the only MCQ-30 subscale to interact with emotional reactivity to significantly predict DASS-21 Anxiety ($\beta = .31$, $p = .02$). Significant interaction effects were not observed for interaction terms that included positive beliefs about worry ($\beta = .05$, $p = .66$), cognitive confidence ($\beta = -.14$, $p = .26$), cognitive self-consciousness ($\beta = -.06$, $p = .55$), or need for control ($\beta = .04$, $p = .73$).
Figure 1. Moderating effect of negative metacognitive beliefs (MCB) on the relationship between emotional reactivity and anxiety.