



# What good are positive emotions for treatment? Trait positive emotionality predicts response to Cognitive Behavioral Therapy for anxiety



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## ABSTRACT

**Objective:** Cognitive behavioral therapy (CBT) is empirically supported for the treatment of anxiety disorders; however, not all individuals achieve recovery following CBT. Positive emotions serve a number of functions that theoretically should facilitate response to CBT – they promote flexible patterns of information processing and assimilation of new information, encourage approach-oriented behavior, and speed physiological recovery from negative emotions. We conducted a secondary analysis of an existing clinical trial dataset to test the a priori hypothesis that individual differences in trait positive emotions would predict CBT response for anxiety.

**Method:** Participants meeting diagnostic criteria for panic disorder (n = 28) or generalized anxiety disorder (n = 31) completed 10 weekly individual CBT sessions. Trait positive emotionality was assessed at pre-treatment, and severity of anxiety symptoms and associated impairment was assessed throughout treatment.

**Results:** Participants who reported a greater propensity to experience positive emotions at pre-treatment displayed the largest reduction in anxiety symptoms as well as fewer symptoms following treatment. Positive emotions remained a robust predictor of change in symptoms when controlling for baseline depression severity.

**Conclusions:** Initial evidence supports the predictive value of trait positive emotions as a prognostic indicator for CBT outcome in a GAD and PD sample.

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Cognitive Behavioral Therapy (CBT) is an empirically supported and widely used treatment for anxiety disorders (Hofmann & Smits, 2008; Norton & Price, 2007; Olatunji, Cisler, & Deacon, 2010). A fundamental assumption underlying CBT is that anxiety is maintained by maladaptive cognitive and behavioral factors (Barlow, 2004; Beck, Emery, & Greenberg, 2005), including exaggerated appraisals of danger and the use of avoidance behaviors intended to minimize the occurrence of perceived threat. Accordingly, CBT involves identifying and tolerating negative thoughts and emotions with the goal of reducing avoidance, modifying threat-

related cognitions, and facilitating new, fear-inconsistent learning (Craske et al., 2008). Despite the efficacy of CBT for anxiety disorders (Hofmann & Smits, 2008; Norton & Price, 2007; Olatunji et al., 2010), not all individuals display adequate treatment response and a significant portion continue to experience residual symptoms that impair functioning and quality of life (Loerinc et al., 2015; Pollack et al., 2008). Examining factors that predict response to CBT may (1) identify new intervention targets that have the potential to increase treatment efficacy; (2) identify individuals who may not need a long-term course of CBT, i.e., those who show rapid response; and/or (3) identify individuals who may demonstrate superior response to CBT compared to other interventions.

The search for predictors of response to CBT for anxiety is not new (for a comprehensive review see Schneider, Arch, & Wolitzky-Taylor, 2015). Consistent with the historical focus of anxiety

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disorder assessment and treatment on negative emotions, cognitions, and behaviors, prior investigations into predictors of treatment response focused almost exclusively on variables along the negative affect dimension (e.g., presence of depression or other comorbid disorders, symptom severity, threat-related cognitive biases; see Schneider et al., 2015 for a review of findings). However, there is growing recognition that the positive affect system may play an important yet underexplored role in the pathophysiology of anxiety (Kashdan, Weeks, & Savostyanova, 2011; Nawijn et al., 2015). Although low positive affect was initially hypothesized to distinguish depression from anxiety (i.e., tripartite model; Clark & Watson, 1991), numerous studies found that at least some forms of anxiety are characterized by dysregulation of biobehavioral systems governing the experience and regulation of positive emotions, in addition to heightened negative emotions (e.g., Brown, Chorpita, & Barlow, 1998; Eisner, Johnson, & Carver, 2009; Kashdan, 2007; Rosellini, Lawrence, Meyer, & Brown, 2010; Watson & Naragon-Gainey, 2010). Research also suggests that positive and negative emotions are not merely opposite ends of a single continuum, but rather fall along separate, partially orthogonal, dimensions (Davidson, Jackson, & Kalin, 2000; Diener & Emmons, 1984). Thus, a given individual experiencing high levels of negative affect (e.g., anxiety) may simultaneously experience high or low levels of positive affect, and considerable individual variability in positive emotions may occur within clinically anxious individuals.

The Broaden and Build theory of positive emotions (Fredrickson, 2001, 2013) is a conceptual framework that may facilitate understanding of how positive emotions could support better response to CBT. According to this theory, positive emotions, including subjective experiences such as joy, contentment, and interest, expand one's awareness and repertoire of thoughts and action urges – encouraging novel, varied, and exploratory patterns of thinking and behavior. In support of this perspective, research demonstrates that positive emotions widen attentional scope (Fredrickson & Branigan, 2005; Johnson, Waugh, & Fredrickson, 2010; Wadlinger & Isaacowitz, 2006), increase cognitive flexibility (Isen & Daubman, 1984), promote openness to new information and patterns of information processing (Estrada, Isen, & Young, 1997; Isen, Daubman, & Nowicki, 1987; Johnson & Fredrickson, 2005), speed cardiovascular recovery during negative affective experiences (Fredrickson, Tugade, Waugh, & Larkin, 2003; Tugade & Fredrickson, 2004), and increase behavioral exploration and curiosity (Kahn & Isen, 1993; Kashdan, Rose, & Fincham, 2004). Those findings suggest that positive emotions may facilitate some of the core processes implicated in recovery from anxiety via CBT, for example, helping the individual to tolerate negative emotions during exposure exercises and promoting the assimilation of new, threat-inconsistent information in memory (Craske et al., 2008). Thus, variability in the propensity to experience positive emotions across individuals with clinically elevated anxiety symptoms may predict who is most likely to benefit from cognitive and behavioral interventions.

Emotions can be conceptualized and measured along dimensions of activation (low vs. high) as well as according to whether they reflect transient fluctuations in mood (i.e., state) versus a more stable individual difference in the propensity to experience certain types of affect (i.e., trait/personality). The current study used a measure of positive emotions subsumed within the extraversion domain of personality, which reflects positive activation (i.e., positive valence and high activation; Smillie, DeYoung, & Hall, 2015). While other measures exist that assess a broader array of discrete positive emotions (Fredrickson et al., 2003) or were created to examine positive affect within structural models of anxiety and depression (e.g., tripartite model; Watson & Clark, 1991), few extant

treatment studies for anxiety included sensitive measures of positive emotion. Thus, examining positive emotions measured as a facet of personality (cf. other assessment approaches) represents an initial step toward elucidating the predictive power of positive emotions for CBT response for anxiety.

Several studies examined the broad personality dimension of extraversion as a predictor of response to CBT for anxiety (see Schneider et al., 2015 for a comprehensive review of personality traits as predictors of CBT outcomes). Extraversion predicted better treatment response to both CBT and acceptance and commitment therapy (ACT) for social anxiety disorder (SAD), but did not moderate response across interventions (Craske et al., 2014). In contrast, low extraversion predicted superior response to CBT augmented with D-cycloserine (DCS) relative to CBT plus placebo for PTSD (De Kleine, Hendriks, Smits, Broekman, & van Minnen, 2014); however, extraversion did not predict nor moderate response to CBT with or without DCS for SAD (Smits et al., 2013). In contrast to extant studies that examined extraversion as a broad, atheoretical predictor of response to CBT for anxiety, the current study examined positive emotionality, a specific facet of extraversion, as an a priori predictor of treatment outcomes informed by theory and prior research (e.g., Fredrickson, 2013).

To our knowledge, only one study has examined the role of positive emotions in predicting CBT response for anxiety (Niles, Mesri, Burklund, Lieberman, & Craske, 2013). In a sample of individuals meeting diagnostic criteria for SAD, state positive emotional reactivity measured in response to viewing positively valenced emotional images did not predict treatment outcomes. It is notable that positive emotional reactivity differences were not found between the SAD group and non-anxious control subjects, which stands in contrast to prior studies supporting a link between low positive affect and social anxiety (see Kashdan, 2007).

## 1. Current study

We drew on prior literature regarding the function of positive emotions (Fredrickson, 2013) to test the a priori, theory-driven hypothesis that individual differences in trait positive emotions would predict response to a cognitive and behavioral treatment program for anxiety disorders. Our research question was examined through a secondary analysis of treatment outcomes in the context of a CBT clinical trial for generalized anxiety disorder (GAD) and panic disorder (PD; ClinicalTrials.gov Identifier: NCT00947570; Ball, Stein, Ramsawh, Campbell-Sills, & Paulus, 2014). Participants completed pre-treatment measures of trait positive emotions (subsumed within a larger personality assessment inventory), depression, and transdiagnostic anxiety severity and impairment. Assessment of anxiety symptoms was also conducted following every other treatment session through the end of treatment. Longitudinal analytic models were used to test the hypothesis that greater trait positive emotions would be associated with a larger reduction in symptoms and lower symptom levels at the end of treatment. Given that depression often co-occurs with anxiety (Kessler, Chiu, Demler, Merikangas, & Walters, 2005) and is characterized by blunted positive affect (Brown et al., 1998), a supplemental sensitivity analysis was also conducted by re-analyzing the models while controlling for baseline symptoms of depression.

## 2. Method and materials

### 2.1. Participants

Participants were 61 adults aged 18–55 recruited from the San Diego community via public flyers and online advertisements, as well as from mental health outpatient clinics and primary care

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