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The affective tie that binds: Examining the contribution of positive emotions and anxiety to relationship formation in social anxiety disorder

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ABSTRACT

Individuals with social anxiety disorder (SAD) have difficulty forming social relationships. The prevailing clinical perspective is that negative emotions such as anxiety inhibit one's capacity to develop satisfying social connections. However, empirical findings from social psychology and affective neuroscience suggest that *positive* emotional experiences are fundamental to establishing new social bonds. To reconcile these perspectives, we collected repeated measurements of anxiety, positive emotions (pleasantness), and connectedness over the course of a controlled relationship formation encounter in 56 participants diagnosed with SAD (64% female; M_{age} = 23.3, *SD* = 4.7). Participants experienced both increases in positive emotions and decreases in anxiety throughout the interaction. Change in positive emotions was the most robust predictor of subsequent increases in connectedness, as well as a greater desire to engage one's partner in future social activities, above and beyond reductions in anxiety (medium to large sized effects). Those findings suggest that anxiety-based models alone may not fully explain difficulties in relationship formation in SAD, and underscore the potential value of considering positive emotional experiences in conceptual and treatment models of SAD.

1. Introduction

Social relationship impairment is one of the more pernicious effects of social anxiety disorder (SAD). Individuals with SAD tend to have difficulty establishing and maintaining fulfilling relationships with others (e.g., Ledley, Erwin, & Heimberg, 2008; Rodebaugh, 2009; Schneier et al., 1994; see Alden & Taylor, 2004, 2010 for reviews). Given that anxiety represents a core, defining feature of SAD (American Psychiatric Association, 2013), the prevailing view of relational impairments in SAD is that heightened anxiety activated by fears of negative evaluation and rejection fuels avoidance behaviors that inhibit the development of satisfying connections with others. Accordingly, empirically supported treatment approaches for SAD (e.g., exposure-based and cognitive behavioral therapies) target anxiety-related affective processes in the service of reducing social avoidance (Clark et al., 2006; Gordon, Wong, & Heimberg, 2014; Hofmann & Otto, 2008). However, studies of relationship development outside of the clinical psychological science literature suggest that *positive* emotional experiences are fundamental to establishing social bonds, above and beyond negative affective experiences (e.g., Strong & Aron, 2006; see Ramsey & Gentzler, 2015 for a review). Given that positive emotions do not play a central role in current conceptual and treatment models for SAD, an important yet unresolved issue is whether anxiety, positive emotions, or both account for relationship impairments in SAD.

SAD is characterized by inflated appraisals of the likelihood and cost of negative social outcomes (Foa, Franklin, Perry, & Herbert, 1996; Wilson & Rapee, 2005), which activate heightened anxiety and avoidance behaviors intended to curtail predicted negative social outcomes (Clark, 2001; Clark & Wells, 1995; Heimberg, Brozovich, & Rapee, 2014; Hofmann, 2007). Anxiety and avoidance conceivably limit opportunities for establishing relationships with others as well as inhibit one's capacity to connect with others during social encounters due to elevated perceptions of threat. Even positive social encounters activate anxiety, self-protective social goals, and negative predictions about future social events in individuals with SAD (Alden, Mellings, & Laposa, 2004; Alden, Taylor, Laposa, & Mellings, 2008; Wallace & Alden, 1997) – outcomes that would be expected to short-circuit the process of friendship development. By this account, reductions in anxiety should facilitate relationship formation in individuals with SAD. To our knowledge, this hypothesis has yet to be empirically tested.

Although SAD has historically been classified, conceptualized, and treated from an anxiety-focused perspective, studies on relationship development in non-clinical samples suggest that *positive* emotions are critical to

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promoting and strengthening social bonds (Ramsey & Gentzler, 2015). Positive emotions promote openness to new experiences and increased exploratory behavior (Fredrickson, 2013), which may enhance one's capacity to capitalize on new relationship opportunities. Moreover, neural circuits that regulate responses to reward-relevant stimuli (e.g., striatum, orbitofrontal cortex) are also involved in processing *social* rewards (e.g., receiving positive social feedback; Izuma, Saito, & Sadato, 2008), and thus may operate to reinforce our connections with others (Fareri, Niznikiewicz, Lee, & Delgado, 2012; for reviews see, Bhanji & Delgado, 2014; Eisenberger & Cole, 2012; Fareri & Delgado, 2014; Vrticka, 2012). Experimental evidence demonstrates that increases in positive emotions heightened one's desire to engage in social activity (Whelan & Zelenski, 2012) and predicted subsequent increases in feelings of connectedness with others (Fredrickson, Cohn, Coffey, Pek, & Finkel, 2008; Kok et al., 2013). Further, positive emotions experienced towards the beginning of relationships between new roommates correlated with a sense of connectedness between those roommates, whereas negative emotions did not account for connectedness when considered in conjunction with positive emotions (Waugh & Fredrickson, 2006; see also Strong & Aron, 2006). Thus, extant findings suggest that positive emotional experiences are fundamental in supporting the development of new relationships, even above negative emotions.

Although a classical feature of SAD is heightened negative affect (i.e., anxiety) in social situations, SAD is also reliably associated with low levels of positive affect, even when statistically accounting for shared variance with depression and low sociability (Brown, Chorpita, & Barlow, 1998; Kashdan, 2007; Kashdan, Weeks, & Savostyanova, 2011; Naragon-Gainey, Watson, & Markon, 2009; Watson & Naragon-Gainey, 2010). Moreover, individuals with SAD experience fewer positive emotions during everyday social interactions compared to their non-anxious counterparts (Kashdan et al., 2013). In contrast with cognitive behavioral conceptualizations of SAD, the relational literature suggests that low positive emotions that accompany SAD may interfere with developing a sense of connection with others, and may decrease the individual's incentive to seek out opportunities to connect with others following a positive exchange. Given that positive and negative emotions arise from at least partially distinct biobehavioral systems (Davidson, Jackson, & Kalin, 2000; Gable & Berkman, 2008), they may operate independently to influence the development of social connections in SAD. Moreover, cognitive and behavioral models emphasizing anxiety-related processes and relational theories emphasizing positive emotional experiences are not mutually exclusive, leaving open the possibility that *both* affective processes may be important in understanding relationship formation in SAD.

Initial evidence supports the contribution of positive emotions to relationship formation outcomes in socially anxious samples. Kashdan and Roberts (2004) investigated the association between positive and negative affect and interpersonal outcomes during a controlled relationship formation encounter in individuals with high vs. low levels of social anxiety. Across all participants (high and low social anxiety groups), trait positive affect was significantly and positively associated with interpersonal attraction towards one's conversation partner (i.e., partner liking), even after controlling for shared variance with trait negative affect, which itself was not significantly associated with partner liking. Social anxiety group status did not moderate those relationships. Similarly, across the entire sample, participants who experienced greater state positive affect (averaged across the mid- and end-point of the interaction) reported greater attraction and closeness to their partner (medium to large effects), whereas state negative affect was significantly negatively correlated with closeness (small-to-medium effect), but not with interpersonal attraction.

The goal of the current study was to build upon prior research by examining whether changes in positive emotions and anxiety unfolding throughout the course of a relationship formation opportunity in an SAD sample accounted for factors that are important for establishing a new relationship, namely perceived connectedness and future approach motivation (i.e., the drive to seek out and engage in further contact with a target individual). Individuals meeting diagnostic criteria for SAD took part in a controlled laboratory-based relationship-building task previously shown to facilitate interpersonal closeness (Aron, Melinat, Aron, Vallone, & Bator, 1997; Kashdan & Roberts, 2004; Taylor & Amir, 2012). Closeness-generating paradigms represent one type of anxiety-provoking social context that is difficult for individuals with heightened social anxiety (e.g., Meleshko & Alden, 1993). In light of the temporal nature of relationship development, we assessed participants' subjective positive emotions (i.e., pleasantness), anxiety, and connectedness at repeated intervals throughout the task. This approach allowed us to examine the evolution of positive and negative emotional experiences as the relationship formation encounter progressed over time, as well as their relationship to subsequent changes in perceived social connectedness and future approach motivation. Based on prior literature regarding the functions of positive emotions and anxiety, we hypothesized that increases in positive emotions as well as decreases in anxiety would predict subsequent increases in participant-rated connectedness and post-interaction desire to engage their conversation partner in future social activities. We explored the unique contributions of changes in each affective experience to strengthening connectedness and future approach motivation in order to identify emotional processes that may be fundamental in supporting relationship formation in SAD.

2. Method

2.1. Participants

The sample comprised 56 treatment-seeking individuals who met criteria for a principal diagnosis of Social Anxiety Disorder (SAD) as assessed using the SAD module of the Structured Clinical Interview for the Diagnostic and Statistical Manual of Mental Disorders (4th ed.; DSM–IV-TR; American Psychiatric Association, 2000) Axis 1 Disorders (SCID-I; First, Spitzer, Gibbon, & Williams, 2002).[1] Participants were recruited through clinical referrals as well as posted announcements in community and online settings (e.g., ResearchMatch.org). The Mini International Neuropsychiatric Interview (MINI Version 7.0.0; Sheehan et al., 1998).[2] was administered to assess comorbid diagnoses (e.g., other anxiety disorders, major depressive disorder) and exclusionary diagnoses (e.g., psychosis). The MINI was used because of its relative brevity and good inter-rater reliability (Sheehan et al., 1998). Diagnostic assessments were conducted by a PhD-level clinician, a PhD student in clinical psychology, and two post-baccalaureate clinical research coordinators, all of whom received extensive training in the interview protocols. Diagnostic consensus was reached by reviewing completed interviews during team meetings with the first author, with consultation provided by the third author, both of whom possess considerable experience assessing and treating SAD. Exclusionary criteria were: (1) active suicidal ideation with intent or plan; (2) moderate to severe alcohol or marijuana use disorder (past year); (3) all other mild substance use disorders (past year); (4) bipolar I or psychotic disorders; (5) moderate to severe traumatic brain injury with evidence of neurological deficits, neurological disorders, or severe or unstable medical conditions that might be compromised by participation in the study; (6) inability to speak or understand English; (7) concurrent psychotherapy (unless 12-week stability criteria had been met for non-empirically supported therapies only); (8) concurrent psychotropic medication (e.g., SSRIs, benzodiazepines); and (9) characteristics that would com-

[1] Enrollment began prior to the release of the SCID for DSM-5. Interview questions were subsequently scored to reflect DSM-5 criteria for SAD.

[2] We thank David Sheehan for giving us permission to use a preliminary version of the MINI for DSM-5 in this study.