Published in final edited form as:

J Anxiety Disord. 2015 August ; 34: 53–62. doi:10.1016/j.janxdis.2015.05.012.

Predicting Short-Term Positive Affect in Individuals with Social Anxiety Disorder: The Role of Selected Personality Traits and Emotion Regulation Strategies

Jaclyn S. Weisman, Thomas L. Rodebaugh, Michelle H. Limⁱ, and Katya C. Fernandezⁱⁱ

Department of Psychology, Washington University in St. Louis, St. Louis, MO, USA

Abstract

Recently, research has provided support for a moderate, inverse relationship between social anxiety and dispositional positive affect. However, the dynamics of this relationship remain poorly understood. The present study evaluates whether certain personality traits and emotion regulation variables predict short-term positive affect for individuals with social anxiety disorder and healthy controls. Positive affect as measured by two self-report instruments was assessed before and after two tasks in which the participant conversed with either a friend or a romantic partner. Tests of models examining the hypothesized prospective predictors revealed that the paths did not differ significantly across diagnostic group and both groups showed the hypothesized patterns of endorsement for the emotion regulation variables. Further, a variable reflecting difficulty redirecting oneself when distressed prospectively predicted one measure of positive affect. Additional research is needed to explore further the role of emotion regulation strategies on positive emotions for individuals higher in social anxiety.

Keywords

social anxiety; positive affect; extraversion; neuroticism; emotion regulation

Correspondence should be addressed to: Jaclyn S. Weisman, 1 Brookings Dr., Campus Box 1125, Psychology Building, St. Louis, MO 63130, USA; weismanj@wustl.edu; (p) 314-935-8631.

ⁱPresent address: Brain and Psychological Sciences Centre, Swinburne University of Technology, Victoria, Australia

ⁱⁱPresent address: Tolman Hall-Fisher Laboratory, University of California, Berkeley, California, USA

¹Several alternative models were tested using latent trajectory analyses (Curran & Bollen, 2001) to estimate slope and intercepts of the positive affect factor scores for each measure. However, all models failed to adequately fit either the SAM or PANAS data.

²In light of converging evidence of a tendency for RMSEA values to be inflated in smaller samples (e.g., Curran, Bollen, Chen, Paxton, & Kirby, 2003; Hu & Bentler, 1999), the Swain correction (Boomsma & Herzog, 2013) was employed for models resulting in borderline RMSEA indices. However, because the correction is not suitable for multiple-group models, it was used for the GSAD and NOSAD data separately. The majority of the corrections improved RMSEA values by < .015 across both groups, which we interpreted to indicate that the original multiple-group RMSEA indices are sufficiently informative (i.e., the correction is not particularly useful in this case).

Publisher's Disclaimer: This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final citable form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

1. Introduction

Although it was initially proposed that diminished positive affect was specific to depression and differentiated the Axis I mood and anxiety disorders of the Diagnostic and Statistical Manual of Mental Disorders, (DSM-IV-TR; American Psychiatric Association, 2000), a growing body of work has indicated that this affective pattern may also characterize individuals with social anxiety disorder (e.g., Brown, Chorpita, & Barlow, 1998; Watson, Clark, & Carey, 1988). In a meta-analysis evaluating the magnitude, consistency, and specificity of the relationship between social anxiety symptoms and positive affect, Kashdan (2007) found a moderate, inverse relationship between the constructs ($r = -.36$; 95% CI: $-.31$ to $-.40$). Additionally, comorbidity with depressive symptoms or other emotional disturbances did not account for this result (Kashdan, 2007). In addition to lower levels of dispositional positive affect, higher social anxiety is also associated with less frequent, lower intensity, and less lasting positive experiences, as well as fear responses to overtly positive social experiences and lower self-reported expression of positive emotions as compared to lower social anxiety (Kashdan, Weeks, & Savostyanova, 2011; Turk, Heimberg, Luterek, Mennin, & Fresco, 2005).

Collectively, the extant literature has provided support for a link between excessive social anxiety and reduced hedonic activity. In one such study, Eisner, Johnson, and Carver (2009) found that even after controlling for lifetime depressive symptoms, tendencies to endorse strategies aimed at diminishing or discouraging positive affective states (i.e., dampening) were positively related, whereas endorsement of strategies aimed at enhancing and sustaining positive affective states (i.e., savoring) was inversely related, to symptoms of social anxiety disorder. Eisner and colleagues' findings provided initial evidence that people with social anxiety disorder are not only characterized by lower trait positive affect, but may also employ maladaptive emotion regulation strategies that are detrimental to maintaining this affect. Furthermore, there has been some research showing that individuals higher in social anxiety tend to use strategic thought suppression, a form of emotional response regulation that involves inhibiting ongoing expressive behavior (Gross, 1998) and has been linked to the dampening of positive emotions (Gross & John, 2003; Gross & Levenson, 1997; Spokas, Luterek, & Heimberg, 2009). Werner, Goldin, Ball, Heimberg, and Gross (2011) reported that in addition to greater use of avoidance and expressive suppression, individuals with social anxiety disorder reported less success in implementing cognitive reappraisal and expressive suppression strategies during a laboratory speech task and two social anxiety-evoking situations. Moreover, it has been proposed that people with excessive social anxiety are characterized by deficits in understanding of, and negative reactivity to, emotions (e.g., Turk, Heimberg, Luterek, Mennin, & Fresco, 2005).

Taken together, these studies have laid the groundwork for further investigation into how the relationship between social anxiety and positive experiences may vary as a function of how people manage their emotions in everyday life. To our knowledge, there have only been two studies directly examining short-term positive affect variation in individuals with excessive social anxiety. In the first, an experience-sampling assessment of positive emotions and events over a 21-day period, Kashdan and Steger (2006) found that individuals higher in trait social anxiety reported fewer positive events on days when they experienced greater

social anxiety and used emotional suppression; however, this effect was not present for individuals lower in trait social anxiety. Further, participants generally reported the most intense positive emotions on days when they were both least socially anxious and most accepting of emotional experiences irrespective of dispositional social anxiety.

Similarly, Kashdan and Breen (2008) found support for interactions between social anxiety and the emotion regulation tendencies of suppression, positive emotional expression, and negative emotional expression in predicting changes in positive emotions over 12 weeks. Whereas less suppression and greater expression (regardless of valence) predicted greater changes in positive emotions for individuals with lower social anxiety, none of these variables significantly predicted change in positive emotions for individuals with higher social anxiety. Notably, the presence of a relationship between suppression and positive emotions exclusively for those lower in social anxiety directly contradicts the findings of Kashdan and Steger (2006). However, the combination of relatively low social anxiety along with tendencies to be more accepting and expressive of emotions led to the highest levels of positive emotions, which is consistent with Kashdan and Steger (2006). Despite conflicting findings involving suppression, the results of this pair of studies with regard to emotional expression are consistent with research suggesting that greater tendencies to accept and openly express emotions are integral to the increased positive psychological functioning seen in individuals lower in social anxiety (e.g., Hayes, Luoma, Bond, Masuda, & Lillis, 2006; Hayes, Wilson, Gifford, Follette & Strosahl, 1996).

As an extension of this budding literature, initial work has supported a relationship between emotion regulation strategies and personality traits that, in turn, may have an interactive effect on both positive and negative affective experiences. Collectively, the available research has provided consistent support that neuroticism is associated with maladaptive emotion regulation strategies, and extraversion is associated with adaptive strategies (e.g., Davies, Stankov, & Roberts, 1998; Wood, Heimpel, & Michela, 2003). Likewise, neuroticism correlates positively with increases in negative emotions in response to unpleasant stimuli, whereas extraversion correlates positively with increases in positive emotions in response to pleasant stimuli (Gross, Sutton, & Ketelaar, 1998). Furthermore, research has provided evidence of relationships between social anxiety disorder and these personality traits, with low neuroticism and high extraversion being significantly related to the disorder in epidemiological as well as nonclinical samples (Bienvenu et al., 2001; Bienvenu et al., 2004; Trull & Sher, 1994). Finally, a recent investigation into the facets of extraversion/positive emotionality (E/PE; e.g., sociability) revealed that social anxiety was broadly related to all facets of E/PE after controlling for the higher-order internalizing factor and the overlap among the individual facets (Naragon-Gainey, Watson, & Markon, 2009; Naragon-Gainey & Watson, 2011).

In sum, there is a well-established relationship between diminished positive affect and social anxiety disorder, but the dynamics of this relationship are not well understood. The present study offers an extension of previous work by evaluating whether certain emotion regulation and personality trait variables prospectively predict changes in state positive affect for individuals with social anxiety disorder as well as demographically equivalent control participants. Positive affect was assessed before and after two behavioral tasks in which the

participant conversed with either a friend or a romantic partner. The content of the interactions was controlled to elicit emotional responses; the first task was aimed at promoting social support, whereas the second task was aimed at promoting conflict within the dyad. It is important to note that the current study focused specifically on interpersonal relationships that elicit emotions as opposed to the relationships themselves. For examinations of relationship quality in this sample, please see Rodebaugh et al. (2013, 2014).

Our first hypothesis was that extraversion would prospectively predict positive affect after the support task, but not necessarily after the conflict task. This hypothesis reflects research showing that individuals are characterized by higher positive affect when acting more extraverted (Fleeson, Malanos, & Achille, 2002). We also proposed that whereas the social support task would lead to increased expression of extraversion to expand positive affect, the conflict task would involve a greater focus on retaining positive affect, indirectly resulting in fewer opportunities for the expression of extraversion. That is, given that the conflict task was aimed to be contentious, increased positive affect seemed unlikely. Our second hypothesis was that difficulties in emotion regulation and the personality trait of neuroticism would prospectively predict positive affect after the conflict task. Taken together, the first two hypotheses predict not only that the magnitudes of these predictive relationships will differ significantly across assessments, but also that the selected variables will be significant predictors of positive affect at specific time points as a consequence of the behavioral tasks. We did not generate hypotheses concerning positive affect fluctuations between the post-support and pre-conflict measurements, a break period that lacked a systematic intervention and therefore would likely be characterized by substantial error variance.

Thirdly, we predicted that the diagnostic groups would show differential endorsement of the emotion regulation variables based on theoretical adaptiveness, although we did not expect the relationships between the predictors and positive affect to differ across diagnosis. Our fourth and final hypothesis was related to relationship type (i.e., friend or romantic partner). We theorized that the romantic relationship would magnify all effects, such that having an emotionally salient interaction with one's significant other would result in greater fluctuations in positive affect regardless of the nature of the conversation (i.e., social support or conflict). Accordingly, we hypothesized that there would be an interaction between relationship type and each of the emotion regulation and personality variables in predicting positive affect, regardless of whether the individual variables are significant prospective predictors of positive affect following the behavioral tasks.

2. Method

2.1. Participants

The present study used a subsample of participants from a larger project conducted in the Anxiety and Psychotherapy Laboratory of Washington University in Saint Louis. The full sample has been previously reported on with regard to friendships (Rodebaugh et al., 2014). A portion of the larger sample of participants ($n = 20$) was excluded from the present study because they did not bring in a friend or romantic partner. Two additional participants were

excluded from the present study due to missing positive affect data. Primary participants were 114 community members recruited from Washington University's Volunteers for Health Participant Pool and Psychological Service Center, the Anxiety Disorders Center of the Saint Louis Behavioral Medicine Institute, and various advertisements throughout the greater Saint Louis metropolitan area.

The majority of participants were women ($n = 82$; 71.9%) and White ($n = 64$; 56.1%), with a mean age of 39.06 ($SD = 13.75$). Other reported races were Black ($n = 40$; 35.1%), Multiracial ($n = 6$; 5.3%), Asian ($n = 3$; 2.6%), and American Indian or Alaskan Native ($n = 1$; .9%). With regard to ethnicity, three participants self-identified as Hispanic (2.6%). The control group was recruited to be as demographically equivalent to the social anxiety group as possible based on gender, age, and race. There were no statistically significant differences between the diagnostic groups on these demographic variables (all $ps > .138$). Participants were compensated \$15 for each hour of participation based on the number and duration of visits attended, up to a maximum of \$150 for primary participants and \$45 for friends and romantic partners. Exclusion criteria for primary participants included cognitive impairment, recent substance abuse or dependence, and active suicidality, mania, psychosis, or any other severe condition requiring immediate treatment.

For each of the primary participants described above, a friend ($n = 54$) or romantic partner ($n = 60$) of each primary participant was also recruited. Given that close interpersonal relationships are the major purpose of the larger project from which this subsample was selected, participants were required to state that a friend or romantic partner would be interested in participating prior to the first study visit. Specifically, the larger study design provided for two separate visits in which primary participants could bring in a friend (Visit 2) *as well as* a romantic partner (Visit 3), with the goal of collecting data regarding both types of interaction partner for all primary participants. However, participants ultimately varied in the number of visits attended such that some individuals brought in both a friend and a romantic partner, whereas others brought in only one of these close others. For the present study, each participant was included in the data set only once, irrespective of number of visits attended. Please see the **Procedure** section for a detailed explanation of the current study's relationship selection procedure.

2.2. Measures

2.2.1. Interviews—Diagnosis was derived from a two-stage process as described above using the following interviews.

Structured Clinical Interview for the DSM-IV-TR (First, Spitzer, Gibbon, & Williams, 2002): The SCID is a semi-structured interview that assesses current and lifetime DSM-IV disorders. It is designed to be administered by a trained clinician and is considered to be the gold-standard instrument for the assessment of DSM-IV Axis I psychopathology. The SCID is divided into separate modules corresponding to categories of diagnoses (e.g., mood disorders) and most sections begin with an entry question that allows the interviewer to move to the next section if the associated criteria are not met. Symptoms are coded as absent, subthreshold, or present for all diagnoses. The SCID has shown adequate to

excellent inter-rater reliability for DSM-IV diagnoses (Martin, Pollock, Bukstein, & Lynch, 2000; Zanarini et al, 2000). Please see the *Diagnostic Reliability* section regarding interrater reliability of this interview for the present study.

Liebowitz Social Anxiety Scale (LSAS; Liebowitz 1987): The LSAS is a 24 item, clinician-administered interview measuring anxiety and avoidance related to various social situations on a Likert-type scale from 0 to 3. Situations involving social interaction (e.g., meeting strangers) and performance (e.g., giving a report to a group) are rated from *None* to *Severe* for anxiety and *Never* to *Usually* for avoidance. The LSAS has shown excellent internal consistency as well as convergent validity with other instruments assessing fear of scrutiny and social interaction anxiety (Heimberg et al., 1999). The discriminant validity of the LSAS has been supported to the extent that its correlations with other measures of social anxiety and avoidance are higher than its correlations with measures of depression (Heimberg et al., 1999).

Diagnostic reliability: In order to evaluate interrater reliability of diagnoses for the larger study from which the current sample was chosen, the first author viewed video footage of the original diagnostic interviews for 17 randomly-selected cases while completely blind to diagnosis and under the direction of the second author. These cases constituted approximately 10% of the full sample for the larger study and could include individuals who were excluded from the study for being rated as not meeting criteria for either diagnostic group (i.e., generalized social anxiety disorder or no social anxiety disorder). Agreement on diagnostic group was 100%.

2.2.2. Self-Report Questionnaires-Dispositional Measures—Participants completed measures of emotion regulation and personality traits as detailed below.

The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a 36-item self-report questionnaire designed to assess multiple aspects of emotion dysregulation. Respondents rate how often each statement applies to them using a Likert-type scale from 1 (*almost never, 0–10%*) to 5 (*almost always, 91–100%*), with higher scores indicating greater difficulties in emotion regulation. Given that the measure aims to assess emotion regulation strategies in times of distress, the majority of items begin with the phrase *When I'm upset*. Two of the five subscales, nonacceptance of emotional responses and difficulties engaging in goal-directed behavior, were used in the present study. Examples of items from these subscales are *When I'm upset, I feel like I am weak* and *When I'm upset, I have difficulty concentrating*, respectively. Gratz and Roemer (2004) report high internal consistency, good test-retest reliability, and adequate construct and predictive validity for this instrument. The two scales used in the current study demonstrated excellent internal consistency (α s = .90 and .91).

The Five Factor Mindfulness Questionnaire (FFMQ; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) is a five-subscale measure of mindfulness strategies employed in everyday life. Participants rate how much each statement applies to them using a Likert-type scale from 1 (*never or very rarely true*) to 5 (*very often or always true*). For all subscales, greater scores indicate higher levels of mindfulness. The present study employed the nonreactivity

to inner experience subscale, which is comprised of items such as *I perceive my feelings and emotions without having to react to them*. Baer and colleagues report good internal consistency and significant relationships in the predicted directions with a variety of constructs related to mindfulness (2006). In the present study, the nonreactivity subscale showed good internal consistency ($\alpha = .81$).

The Mini-International Personality Item Pool (Mini-IPIP; Donnellan, Oswald, Baird, & Lucas, 2006) is a 20-item short form of the International Personality Item Pool Five-Factor Model measure (Goldberg, 1999). Respondents rate how accurately each item describes them on a Likert-type scale from 1 (*very inaccurate*) to 5 (*very accurate*). There are four items per Big Five trait that are subsequently summed to create a subscale score. The Mini-IPIP scales have demonstrated acceptable internal consistency and a comparable pattern of convergent, discriminant and criterion-related validity with other Big Five measures (Donnellan, Oswald, Baird, & Lucas, 2006). The extraversion and neuroticism scales demonstrated adequate to good internal consistency in the current study (α s = .86 and .72, respectively).

2.2.2. Self-Report Questionnaires-State Measures—Participants completed measures of affect as detailed below.

The Positive and Negative Affect Schedule (PANAS; Watson, Clark, & Tellegen, 1988) is a measure of positive (e.g., *excited; proud*) and negative activated affect (e.g., *upset; scared*). Each type of activated affect is assessed through ten items on a 5-point Likert-type scale from 1 (*very slightly or not at all*) to 5 (*extremely*). Participants were instructed to rate each adjective “*to what extent to you feel this way at this moment.*” Watson et al. (1988) report good internal consistency, as well as good convergent and discriminant validity for this scale. In the present study, the positive affect scale showed excellent internal consistency across the four measurements (i.e., time points) analyzed in the current study ($\alpha = .96$).

The Self-Assessment Manikin (SAM; Bradley & Lang, 1994) is a three-item measure assessing broad components of affective experience (valence, arousal, and dominance). The SAM is comprised of five graphic depictions of increasing intensity to represent each of the affective dimensions. Participants were instructed to make a mark under or between the figures, resulting in a 9-point rating scale. The present study used the valence item as a measure of positive affect, which depicts figures ranging from smiling and happy (1) to frowning and unhappy (9). The SAM has been used to measure emotional responses to a variety of situations, including reactions to pictures, images, sounds, and painful stimuli (e.g., Bradley, 1994; Lang, Greenwald, Bradley, & Hamm, 1993; McNeil & Brunetti, 1992; Miller et al., 1987). The SAM demonstrated good internal consistency ($\alpha = .85$).

2.3. Procedure

Experimental sessions were conducted by trained graduate or postdoctoral level study staff at the laboratory. Participants invited to participate in the study subsequent to an initial screening came into the laboratory for a full diagnostic interview. Participants were classified into either the generalized social anxiety disorder (GSAD; $n = 65$) or no social anxiety disorder (NOSAD; $n = 49$) group with the SCID-IV-TR serving as the instrument of

diagnosis. The LSAS was used to verify subtype using cut-offs established by Mennin and colleagues (2002). Participants were assigned to the GSAD group if they received a DSM-IV diagnosis of generalized social anxiety disorder and administration of the LSAS yielded a score of 60 or greater. Participants assigned to the NOSAD group did not receive a diagnosis of social anxiety disorder and LSAS administration yielded a score below 30. Prospective participants who failed to meet both criteria for group inclusion (e.g., no social anxiety disorder diagnosis coupled with an LSAS score between 30 and 60) were excluded from the study ($n = 27$).

After enrollment in the study, primary participants completed a self-report questionnaire battery including measures of psychopathology, trait-like constructs such as extraversion and neuroticism, and general interpersonal relationships. This questionnaire packet was most often taken home after Visit 1, although infrequently participants completed it in the laboratory during Visit 1 or Visit 2. Participants also completed an additional packet of self-report instruments during Visit 2 or Visit 3 that included assessments of emotion regulation tendencies and mindfulness as detailed above. The additional packet was only administered at either Visit 2 or Visit 3 for most participants, although a minority of individuals completed the packet twice due to an experimenter error. For these participants, the data associated with the visit selected for the present study were analyzed.

During Visit 1, primary participants were asked to bring in a friend for the second visit scheduled approximately one week later. During Visit 2, the pair completed a social support task (as described in Pasch, Harris, Sullivan, & Bradbury, 2004), followed by a conflict task (as described in Pasch & Bradbury, 1998), followed by an identical second social support task. State positive affect was assessed before and after each of these three tasks, resulting in a total of six measurements. However, data from the second support task were not analyzed in the present study, as we posited that carryover effects from the conflict conversation coupled with fatigue from completing two tasks beforehand and other unknown factors related to the order of the tasks may have had an unintended influence on positive affect. The dyad was given a ten minute break between all tasks.

In the social support tasks, primary participants and friends were asked to identify a personal problem unrelated to their friend relationship that they would like to change. Both individuals had the opportunity to play the role of the support giver and recipient during one of these tasks, with random assignment providing counterbalanced order across participants. In the conflict task, primary participants were asked to identify a problem in the relationship. Consistent with the aims of the current study, both tasks have been shown to evoke emotional reactions (e.g., positive and negative affect; Pasch & Bradbury, 1998; Verhofstadt et al., 2008). Further, the tasks are considered the standard marital interaction paradigms used for assessing marital intimacy and support as well as communication behavior and affect (Cohan & Kleinbaum, 2002; Neff & Karney, 2005; Snyder, Heyman & Hayes, 2005; Verhofstadt, Buysse & Ickes, 2007) in research settings. Given that we were primarily interested in whether the tasks had the theorized effect (i.e., evocation of emotions as manifested by short-term affective fluctuations), a detailed description of the dyads is beyond the scope of the present study.

Primary participants were invited to bring a romantic partner into the laboratory for Visit 3, which occurred approximately two weeks after the completion of Visit 1. The third visit consisted of the same behavioral tasks as Visit 2 (in the same order), with the aforementioned assessments of positive affect before and after each task. However, Visits 2 and 3 were not counterbalanced due to the expectation that an increased lag between the Visit 1 and the friendship part of the study might result in decreased retention regarding friends in particular.

A subsample of participants was selected for inclusion in the present study as follows: For primary participants who attended both Visits 2 and 3 with a friend and romantic partner ($n = 37$), respectively, Visit 3 data was used for all analyses. This selection approach afforded us more power to test our hypothesis that emotionally-salient interactions with romantic partners would result in greater fluctuations in positive affect as compared to those with friends. In the case of primary participants who completed only Visit 2 ($n = 55$) or Visit 3 ($n = 22$), data from that visit were selected for analysis. Participants who failed to bring in either a friend or romantic partner were excluded from all analyses in the present study.

2.3.1. Data Analytic Procedure—We included positive affect measurements before and after the initial support task (T1 and T2, respectively) and the conflict task (T3 and T4) in our analyses. PANAS positive affect scale scores and the SAM valence ratings for T1–T4 were analyzed separately using the Mplus program (version 7, Muthén & Muthén, 1998–2014). We tested prospective predictors of short-term fluctuations in positive affect using a structural equation modeling (SEM) alternative to separate multiple regressions. Specifically, we employed a simple autoregressive model to explore whether the selected personality trait or emotion regulation variables predict affective changes resulting from the behavioral tasks. In subsequent analyses, we determined which, if any, parameters varied between the GSAD and NOSAD groups as well as between time points (e.g., extraversion prospectively predicting T2 as compared to T4). Progressive constraints were tested across groups with the goal of arriving at optimally-constrained models without substantial decrement to fit. This SEM approach allowed us to evaluate the predictor effects concurrently in one model with a single set of global fit indices. We used the robust maximum likelihood (MLM) estimator because it does not require multivariate normality, which allowed us to conduct analyses with fewer assumptions.

In determining model fit, global model fit was evaluated using the following: Tucker-Lewis Index (TLI; Tucker & Lewis, 1973), comparative fit index (CFI; Bentler, 1990), and the root mean square error of approximation (RMSEA; Steiger & Lind, 1980). The magnitudes of these indices were evaluated with the aid of recommendations by Hu and Bentler (1999). For the TLI and CFI, values of .90 and above were considered adequate, whereas values of .95 or above were considered very good; for the RMSEA, values of .08 and below were considered adequate and .05 or below very good. Chi-square difference tests were used to test whether constraining particular predictor paths resulted in significantly worse model fit.

2.3.2. Missing data—Due to the delayed addition of the DERS to the self-report battery, missing data occurred for 48 participants (42.1% of the sample). To address this, we conducted multiple imputation using AMELIA II (Honaker, King, & Blackwell, 2009).

Multiple imputation involves generating values for all missing items in an incomplete data set, thereby greatly reducing the biases, inefficiencies and inaccurate uncertainty estimates that may result from excluding partially observed data from analysis. Specifically, the program replaces each missing item with a set of plausible values which are subsequently averaged to properly reflect uncertainty about the missing data. In this case, 5 imputed data sets were generated and then combined for analysis in Mplus.

3. Results

3.1. Tests for Differential Endorsement Across Groups

To test our hypotheses regarding differential endorsement of the emotion regulation variables between the GSAD and NOSAD groups, we conducted a chi-square difference test comparing a model in which the means of these variables were constrained (to be the same value) across group to a model in which the means were unconstrained. Consistent with prediction, the constraints resulted in significant decrement to fit ($p < .001$), indicating that the diagnostic groups differed substantively in their endorsement of the emotion regulation tendencies. All effects were in the expected direction, with the GSAD group showing higher scores on the nonacceptance of emotional responses and difficulties engaging in goal-directed behavior factors of the DERS compared to the NOSAD group, and the NOSAD group showing higher scores on the nonreactivity subscale of the FFMQ relative to the GSAD group. See Table 1 for descriptive statistics across diagnostic group.

3.2. Tests of Initial Autoregressive Models

The first set of multiple-group models incorporated three different regressions aimed at prospective prediction of positive affect at T2, T3, and T4. We regressed each individual time point on the previous time point (known as an autoregressive parameter) as well as the hypothesized emotion regulation and personality trait predictor variables. Additionally, to reflect the likelihood that positive affect at time points prior to a task would be related to one another and that positive affect at time points following a task would also be related to one another, T1 was allowed to correlate with T3 and T2 was allowed to correlate with T4. All predictor variables were also allowed to correlate with one another as well as T1.

Tests of this original hypothesized model for the PANAS resulted in suboptimal fit indices, particularly the RMSEA (CFI = .96, TLI = .93, RMSEA = .13). After conducting follow-up tests aimed at addressing the inflated RMSEA, we found that allowing T1 to correlate with T4 markedly improved model fit (CFI = .99, TLI = .98, RMSEA = .07). Parallel tests using the SAM data yielded a similar pattern of results (original: CFI = .95, TLI = .92, RMSEA = .07; revised: CFI = .96, TLI = .94, RMSEA = .07). Accordingly, subsequent analyses testing constraints across group and time point included this path.

3.3. Tests Constraining Parameters-PANAS

3.3.1. Constraints across diagnostic group—These analyses were conducted to test our hypothesis regarding a lack of differential predictive relationships between the emotion regulation and personality trait variables and positive affect across diagnostic group. We conducted chi-square difference tests comparing models in which all predictor paths were

constrained across group to models in which these paths were unconstrained in order to examine whether the predictive relationships between the variables and state positive affect vary based on diagnosis. For the PANAS data, these tests resulted in nonsignificant p-values in all five of the imputed data sets ($ps > .213$). This set of findings can be interpreted to reflect that the constraints did not lead to significantly worse model fit, consistent with our hypothesis that the predictive relationships would not differ across group. Accordingly, we retained all constraints across group in the analyses detailed below, reflecting our data analytic strategy to constrain parameters as much as possible until there is a reliable indication that model fit has worsened substantially.

3.3.2. Constraints across time point—The next set of chi-square difference tests compared models in which all predictor paths were constrained across time point (in addition to the aforementioned constraints across diagnostic group) to models in which these paths were allowed to vary by time point. In other words, these analyses tested whether the predictive relationship between each of the emotion regulation and personality trait variables and positive affect differs in magnitude at a particular time point relative to the others. Chi-square difference tests comparing models in which all predictor paths were constrained across time point to models in which these paths were unconstrained were nonsignificant for all five imputed data sets (all $ps > .087$). This finding demonstrates that, against expectation, all of the emotion regulation and personality trait variables were not significantly stronger prospective predictors of positive affect at any one particular time point. As such, all constraints across group and time point were retained for the final PANAS model.

3.4. Tests Constraining Parameters-SAM

3.4.1. Constraints across diagnostic group—For the SAM data, chi-square difference tests comparing models in which all predictor paths were constrained across diagnostic group to models in which these paths were unconstrained were not significant for all five imputed data sets ($ps > .060$). This pattern of findings can be taken to suggest that, consistent with expectation, all parameters are similar enough for the GSAD and NOSAD groups that constraining them does not result in significantly worse fit. Accordingly, we proceeded with all constraints across group in subsequent analyses.

3.4.2. Constraints across time point—Constraining all parameters across time point in addition to the aforementioned constraints across group yielded nonsignificant chi-square difference tests for two of the imputed data sets ($ps > .290$), with significant results in the remaining three data sets ($ps < .048$). This set of findings can be interpreted to reflect an inability to state for certain that constraining these paths does *not* lead to substantial decrement in fit. Put differently, this pattern suggests that there may be differential relationships between the predictors and positive affect across the four time points, consistent with hypothesis. Please see below regarding interpretation of the final model, in which only the constraints across diagnostic group were retained in accordance with these results.

3.5. Final Model Interpretation

3.5.1. PANAS—The resulting model in which all predictor paths were constrained both across group and across time point showed very good fit for the PANAS data (CFI = .99, TLI = .99, RMSEA = .05). Autoregressive parameters in which PANAS positive affect at each time point was regressed on positive affect at the previous time point significantly predicted positive affect at T2, T3, and T4 ($ps < .001$). Further, difficulties engaging in goal-directed behavior was a significant predictor of positive affect at all three time points ($p = .032$). This result indicates that higher scores on difficulties with goal-directed behavior prospectively predict lower positive affect as hypothesized.

Subsequent to finding that difficulties with goal-directed behavior was the only significant predictor of positive affect, we examined the collective influence of the remaining predictors by testing a model in which these predictive paths were removed. That is, we were interested in determining if it is necessary for the nonsignificant predictive paths to be included in the model, with the alternative hypothesis that their inclusion provides a less parsimonious account of the data. Tests of this post hoc theory revealed that removing the nonsignificant paths did not result in significant decrement to fit for all five data sets ($ps > .178$). Please see Figure 1 for a depiction of this model. It should be noted that because the size of the variance of positive affect was allowed to vary by group and time point (and the standard deviation of some predictors also varied), there are small differences in the numerical value of the standardized coefficient in each group at each time point. Because the unstandardized parameters could be constrained across both group and time point, these differences should not be meaningful.

3.5.2. SAM—The final constrained model showed very good fit (CFI = .99, TLI = 1.00, RMSEA = .03). In line with the aforementioned models, autoregressive parameters were significant at all three time points ($ps < .009$). In contrast to the final PANAS model, none of the emotion regulation or personality trait variables were significant prospective predictors of positive affect as measured by the SAM (all $ps > .127$). Although it is partially consistent with hypothesis that the predictive paths differed significantly in magnitude across time point, the fact that none of the variables was a significant predictor of positive affect at any particular assessment is against expectation.

3.6. Tests of an Interaction Between Relationship Type and Predictors

Finally, we evaluated our hypothesis that there would be a differential impact of emotionally-salient interactions with a romantic partner on positive affect, which we theorized would be reflected in an interaction between relationship type and each of the predictors. To this end, we tested models similar to the ones above, except that group was used as a predictor and relationship type served as the grouping variable. Further, all constraints across time point were retained. For both the PANAS and the SAM data, all five chi-square difference tests comparing models in which all predictive paths were unconstrained across relationship type to models in which these paths were constrained yielded nonsignificant results (all $ps > .106$). These findings indicate that, against expectation, the relationships between the predictors and positive affect did not differ between romantic partner relationships and friendships.

4. Discussion

This study examined prospective predictors of short-term positive affect in individuals with and without social anxiety disorder over the course of two conversations with a friend or romantic partner. We found that the predictive paths could be constrained across group for both measures, indicating that the relationships between each of the emotion regulation and personality trait variables and positive affect did not differ significantly in strength based on diagnosis as hypothesized. Whereas these paths could also be constrained across time point without significant decrement to fit for the PANAS, this was not the case for the SAM. Although the latter result is partially consistent with our hypothesis regarding differential predictive relationships based on time point, the final SAM model failed to provide support for our theory that certain variables would significantly predict positive affect at particular assessments. Finally, consistent with hypothesis, an emotion regulation variable reflecting trouble staying focused when distressed was a significant prospective predictor of PANAS positive affect at all time points.

As hypothesized, the diagnostic groups did differ significantly in their endorsement of the selected emotion regulation strategies. Specifically, the GSAD group showed significantly higher scores than the NOSAD group on scales reflecting difficulty focusing on other things when upset and nonacceptance of emotional responses, both of which are considered maladaptive strategies for modulating one's emotions. Additionally, the NOSAD group was characterized by significantly higher scores than the GSAD group on a mindfulness scale measuring nonreactivity to inner experience, which has been characterized as an adaptive response to one's emotions (e.g., Baer et al., 2008). Collectively, these findings are consistent with the extant literature linking social anxiety disorder to emotion regulation strategies (e.g., Fehm and Margraf, 2002; Werner, Goldin, Ball, Heimberg, and Gross, 2011). Further, the patterns of differential endorsement may indicate that tendencies to respond maladaptively to one's emotional experiences contribute to the attenuated dispositional positive affect seen in individuals with the disorder. In other words, although subsequent analyses revealed that only one of the emotion regulation variables was a significant prospective predictor of *state* positive affect, it remains plausible that the chronic use of strategies such as suppression may play a role in maintaining diminished *trait* positive affect for people with social anxiety disorder.

Consistent with hypothesis, the predictive relationship between each of the emotion regulation and personality trait variables and positive affect did not differ between participants in the GSAD and NOSAD groups for both measures of positive affect. This finding indicates that even though the groups differed on their likelihood of endorsing these variables, high scores on a particular scale would be predicted to have the same influence on state positive affect for a person with the disorder as a person without it, all other factors being equal. Interestingly, this finding stands in contrast to the experience sampling studies of Kashdan and Steger (2006) as well as Kashdan and Breen (2008), both of which showed a relationship between suppression and positive emotions exclusively for participants either high or low in social anxiety, respectively. One possible explanation for the somewhat conflicting results is the intentionally shorter time span for the present study, suggesting that the differential impact of emotion regulation strategies based on level of social anxiety may

not have emerged in such a short-term examination of affect. Taken together, these contrasting results point to a need for future research examining short-term affect modulation in individuals with varying levels of social anxiety.

Against expectation, the predictive relationships also did not differ for the PANAS based on when positive affect was measured (i.e., time point) with regard to the behavioral tasks. For the SAM, the results of constraint testing suggested that these paths may indeed differ in magnitude based on time point. However, given that none of the variables significantly predicted SAM positive affect at any assessment, it appears that the decrement to fit with constraints may be attributable to general variation in these nonsignificant relationships as opposed to the hypothesized effects being present at selected time points and not others. Our hypotheses were grounded in the notion that the emotion regulation variables would be relevant exclusively to the conflict conversation due to an increased likelihood of the task eliciting distress, and extraversion would be more closely tied to positive affect after the support conversation. Instead, our results suggest that these trait-like constructs may be involved in the modulation of positive affect in response to emotionally-evocative experiences more generally, regardless of the nature of a particular experience. Further testing is needed to determine if these measures do indeed tend to capture one's general style of reactivity to emotional stimuli irrespective of valence. With regard to extraversion's prediction of positive affect, the lack of significant difference between the post-support and post-conflict measurements was inconsistent with our tentative theory regarding the expression of extraversion across situations. Given that the personality trait was not a significant predictor of positive affect at either time point, it may instead be the case that neither conversation offered an opportunity for the expression of extraversion. That is, perhaps having a conversation with a familiar individual (i.e., a friend or romantic partner) was associated with a decreased likelihood of extraversion being expressed for both types of task.

For the optimally-constrained final PANAS model, difficulties engaging in goal-directed behavior was a significant prospective predictor of positive affect at all three time points as hypothesized. It is worth noting that the influence of this variable on positive affect did not differ by diagnosis, which indicates that the significant predictive relationship is not unique to individuals with the disorder. That being said, it may be meaningful to interpret this finding in light of the aforementioned differential patterns of endorsement across diagnostic group. Perhaps, difficulties engaging in goal-directed behavior have a robust relationship with state positive affect regardless of psychopathology, but the increased likelihood of individuals with social anxiety disorder showing this tendency coupled with diminished trait positive affect should lead us to focus more closely on this population.

Taken together, the PANAS findings reflect that a combination of positive affect at the previous time point and amount of difficulty engaging in goal-directed behavior may be at least partially involved in prospective prediction of state positive affect at a particular time point. For example, our results indicate that, after previous levels of positive affect have been taken into account, having less trouble focusing when upset predicts higher positive affect at a specific time point relative to having more trouble. This set of results is particularly noteworthy in terms of potential clinical applications. Specifically, if this

emotion regulation tendency does indeed have a critical impact on state positive affect as our results suggest, developing interventions aimed at increasing the use of more adaptive strategies (e.g., accepting and openly expressing emotions) may have far-reaching implications for treatment of social anxiety disorder. Such interventions could potentially be beneficial not only for augmenting positive affect in the short term, but also for addressing attenuated dispositional positive affect that may result from the sustained use of maladaptive emotion regulation strategies in the long term.

A final result that merits attention is the nonexistent relationship between state positive affect at T2 and T4 for the GSAD group, which stands in contrast to the significant relationship between these time points for the NOSAD group. This finding is also noteworthy in light of the fact that positive affect at T1 and T3 was significantly related for the GSAD group. Perhaps, then, participants with social anxiety disorder were able to approach the beginning of both conversations similarly, but their positive affect was more discordant between the time point immediately following the support conversation and the one following the conflict conversation due to heightened affective reactivity to the latter task. In line with this post hoc theory, it is plausible that, alternatively, the NOSAD group approached the two post-conversation time points in a similar manner (i.e., simply as the conclusion of a conversation with a close other).

In contrast to the PANAS, none of the emotion regulation or personality trait variables significantly predicted short-term positive affect as measured by the SAM. This finding is entirely against expectation, as we predicted that all of the selected emotion regulation and personality trait variables would serve as prospective predictors of state positive affect for at least one time point. One possible explanation for the somewhat inconsistent findings across measures of positive affect is that the two measurement tools are capturing different components of positive affect. The PANAS assesses activated positive affect, a conflation of valence and arousal (Barrett & Russell, 1998). Watson, Clark and Tellegen (1988) described high positive affect as “a state of high energy, full concentration, and pleasurable engagement” (p.1063). Consistent with this notion, PANAS items such as *excited* and *enthusiastic* reflect both the pleasant quality of positive affect as well as a high level of activation. On the other hand, the present study employed solely the valence item of the SAM, which is purposefully differentiated from the item that assesses arousal. Therefore, it is possible that the somewhat contradictory results may simply reflect that the short-term trajectories of valence (i.e., unidimensional happiness-unhappiness) and activated positive affect (i.e., a bidimensional conflation of valence and arousal) differed over the duration of the two interpersonal tasks. If variability in short-term positive affect does indeed differ based on whether it is treated as unidimensional or bidimensional, it would provide further evidence that the distinction is integral to our understanding of the construct and call for a more comprehensive assessment of positive affect (including proposed components not discussed here, such as anticipatory positive affect). It is also worth noting that the lack of prediction for the SAM may be attributable to the limited power and range associated with using a one-item measure. Regardless of the mechanisms underlying the conflicting findings, our results underscore the importance of conducting further tests of bidimensional valence and arousal theory with regard to positive affect.

Against prediction, the relationships between the prospective predictor variables and state positive affect did not differ based on whether participants were interacting with a friend or a romantic partner. This result runs counter to our prediction that emotionally-salient interactions with a romantic partner would magnify all effects. Rather, it may be the case that the behavioral tasks had a similar influence on positive affect as long as the interaction partner was someone close to the participant whose opinion was valued. Given that friends of primary participants typically spent approximately 1 to 3 hours in the laboratory as part of the study, it would make intuitive sense for this particular sample of friends to be characterized by higher levels of closeness with the primary participants than would necessarily be the case for a random sample of friend pairings. Finally, it may also have been the case that primary participants were more accustomed to having direct communications regarding the types of stimuli associated with each task (i.e., conflict and social support) in the context of a romantic relationship as compared to a friendship, thereby blunting any heightened emotional salience elicited by the conversations.

These results should be interpreted in light of the study's limitations. With regard to measurement, it would have been preferable for all participants to complete all measures at the same time point, which was not plausible due to the late addition of the DERS and the fact that friend and romantic partner interactions occurred during different visits. Moreover, it is worth noting that the instruments we used to measure emotion regulation tendencies are subject to the biases typically associated with self-report, although we are not aware of any measures of similar constructs for which this is not the case. Additionally, recruiting more participants would have allowed for larger groups to compare in analyses of interactions. Finally, it is worth noting that we were only able to get good global fit with a model that allowed positive affect at T1 to correlate with positive affect at T4, which is not consistent with what we would expect based on the nature of the behavioral tasks.

There are several noteworthy strengths of the present study that offset the limitations. To begin, this is the first study to our knowledge that examines state-level fluctuations in positive affect for individuals with social anxiety disorder over the course of hours as opposed to several days or weeks. Additionally, the fact that the interactions were aimed to elicit emotional responses allowed us to assess affective reactivity to both positive and negative stimuli. Traditional experience-sampling designs do not necessarily allow researchers to assess reactivity to stimuli of differing valences due to the naturalistic nature of such designs. Furthermore, there have been few investigations of the effects of social anxiety and emotion regulation strategies on positive emotions and events (e.g., Kashdan & Breen, 2008, Kashan & Steger, 2006).

In sum, the present study takes an initial step forward in understanding the relationships between maladaptive social anxiety, emotion regulation strategies, and personality traits as well as the collective impact they have on the short-term trajectory of positive affect. This study contributes to the limited extant literature exploring the interactive effect of social anxiety and emotional expression strategies on positive emotions and provides an extension of this work by examining this effect over a shorter time span than previous studies. The finding that a measure of difficulties engaging in goal-directed behavior was a significant prospective predictor of PANAS positive affect is especially notable in providing a potential

target for social anxiety disorder treatment. Interventions aimed at improving one's ability to remain focused when distressed may prove to be efficacious not only for increasing positive affect in the short term, but also for addressing the diminished trait positive affect characterizing individuals with the disorder. Finally, the somewhat contrasting results for the PANAS and SAM with regard to prospective predictor variables suggest that the two instruments may be capturing different components of positive affect and warrant additional exploration informed by bidimensional valence and arousal theory. The dynamic relationships between each of the constructs discussed herein and their collective impact on state positive affect are clearly an area in need of further research.

Acknowledgments

This research was supported by grants from the National Institute of Mental Health (grant number MH090308) to Thomas L. Rodebaugh and the National Institute of Health (grant number UL1 RR024992) to Washington University. The authors would like to thank the many research assistants who helped conduct this research, with particular thanks to Andrea Temkin and Marilyn Piccirillo.

References

- Baer RA, Smith GT, Hopkins J, Krietemeyer J, Toney L. Using self-report assessment methods to explore facets of mindfulness. *Assessment*. 2006; 13:27–45.10.1177/1073191105283504 [PubMed: 16443717]
- Baer RA, Smith GT, Lykins E, Button D, Krietemeyer J, Sauer S, Walsh E, Duggan D, Williams JMG. Construct validity of the five facet mindfulness questionnaire in meditating and nonmeditating samples. *Assessment*. 2008; 15:329–342.10.1177/1073191107313003 [PubMed: 18310597]
- Barrett LF, Russell JA. Independence and bipolarity in the structure of affect. *Journal of Personality and Social Psychology*. 1998; 74:967–984.10.1037/0022-3514.74.4.967
- Bentler PM. Comparative fit indexes in structural models. *Psychological Bulletin*. 1990; 107:238–246.10.1037/0033-2909.107.2.238 [PubMed: 2320703]
- Bienvenu OJ, Nestadt G, Samuels JF, Howard WT, Costa PT, Eaton WW. Phobic, panic, and major depressive disorders and the five-factor model of personality. *Journal of Nervous and Mental Disease*. 2001; 189:154–161. [PubMed: 11277351]
- Bienvenu OJ, Samuels JF, Costa PT, Reti IM, Eaton WW, Nestadt G. Anxiety and depressive disorders and the five-factor model of personality: A higher-and lower-order personality trait investigation in a community sample. *Depression and Anxiety*. 2004; 20:92–97.10.1002/da.20026 [PubMed: 15390211]
- Bradley, MM. Emotional memory: A dimensional analysis. In: Van Goozen, S.; Van de Poll, NE.; Sergeant, JA., editors. *The emotions: Essays on emotion theory*. Hillsdale, NJ: Erlbaum; 1994. p. 97-134.
- American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 4. Washington, DC: Author; 2000. text rev
- Bradley MM, Lang PJ. Measuring emotion: The self-assessment manikin and the semantic differential. *Journal of Behavior Therapy and Experimental Psychiatry*. 1994; 25:49–59.10.1016/0005-7916(94)90063-9 [PubMed: 7962581]
- Brown TA, Chorpita BF, Barlow DH. Structural relationships among dimensions of the DSM-IV anxiety and mood disorders and dimensions of negative affect, positive affect, and autonomic arousal. *Journal of Abnormal Psychology*. 1998; 107:179–192.10.1037/0021-843X.107.2.179 [PubMed: 9604548]
- Cohan J, Kleinbaum S. Toward a greater understanding of the cohabitation effect: Premarital cohabitation and marital interaction. *Journal of Marriage and Family*. 2002; 64:180–193. stable : <http://www.jstor.org/stable/3599786>.

- Curran, PJ.; Bollen, KA. The best of both worlds: Combining autoregressive and latent curve models. In: Collins, LM.; Sayar, AG., editors. *New methods for the analysis of change*. Washington, D.C: American Psychological Association; 2001. p. 105-136.
- Curran PJ, Bollen KA, Chen F, Paxton P, Kirby JB. Finite sampling properties of the point estimates and confidence intervals of the RMSEA. *Sociological Methods & Research*. 2003; 32:208–252.10.1177/0049124103256130
- Davies M, Stankov L, Roberts RD. Emotional intelligence: In search of an elusive construct. *Journal of Personality and Social Psychology*. 1998; 75:989–1015.10.1037/0022-3514.75.4.989 [PubMed: 9825531]
- Donnellan MB, Oswald FL, Baird BM, Lucas RE. The mini-IPIP scales: tiny-yet-effective measures of the Big Five factors of personality. *Psychological Assessment*. 2006; 18:192–203.10.1037/1040-3590.18.2.192 [PubMed: 16768595]
- Eisner LR, Johnson SL, Carver CS. Positive affect regulation in anxiety disorders. *Journal of Anxiety Disorders*. 2009; 23:645–649.10.1016/j.janxdis.2009.02.001 [PubMed: 19278820]
- Fehm L, Margraf J. Thought suppression: Specificity in agoraphobia versus broad impairment in social phobia? *Behaviour Research and Therapy*. 2002; 40:57–66.10.1016/S0005-7967(01)00002-X [PubMed: 11762427]
- First, MB.; Spitzer, RL.; Gibbon, M.; Williams, JB. Structured clinical interview for DSM-IV-TR axis I disorders, Research Version. New York: Biometrics Research, New York State Psychiatric Institute; 2002.
- Fleeson W, Malanos AB, Achille NM. An intraindividual process approach to the relationship between extraversion and positive affect: is acting extraverted as “good” as being extraverted? *Journal of Personality and Social Psychology*. 2002; 83:1409–1422.10.1037/0022-3514.83.6.1409 [PubMed: 12500821]
- Goldberg, LR. A broad-bandwidth, public domain, personality inventory measuring the lower-level facets of several five-factor models. In: Mervielde, I.; Deary, I.; De Fruyt, F.; Ostendorf, F., editors. *Personality psychology in Europe*. Vol. 7. Tilburg, The Netherlands: Tilburg University Press; 1999. p. 7-28.
- Gratz KL, Roemer L. Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the difficulties in emotion regulation scale. *Journal of Psychopathology and Behavioral Assessment*. 2004; 26:41–54.10.1007/s10862-008-9102-4
- Gross JJ. Antecedent-and response-focused emotion regulation: Divergent consequence experience, expression, and physiology. *Journal of Personality and Social Psychology*. 1998; 74:224–237.10.1037/0022-3514.74.1.224 [PubMed: 9457784]
- Gross JJ, John OP. Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology*. 2003; 85:348–362.10.1037/0022-3514.85.2.348 [PubMed: 12916575]
- Gross JJ, Levenson RW. Hiding feelings: The acute effects of inhibiting negative and positive emotion. *Journal of Abnormal Psychology*. 1997; 106:95–103.10.1037/0021-843X.106.1.95 [PubMed: 9103721]
- Gross JJ, Sutton SK, Ketelaar T. Relations between affect and personality: Support for the affect-level and affective-reactivity views. *Personality and Social Psychology Bulletin*. 1998; 24:279–288.10.1177/0146167298243005
- Hayes SC, Luoma J, Bond F, Masuda A, Lillis J. Acceptance and Commitment Therapy: Model, processes, and outcomes. *Behaviour Research and Therapy*. 2006; 44:1–25.10.1016/j.brat.2005.06.006 [PubMed: 16300724]
- Hayes SC, Wilson KG, Gifford EV, Follette VM, Strosahl K. Experiential avoidance and behavioral disorders: A functional dimensional approach to diagnosis and treatment. *Journal of Consulting and Clinical Psychology*. 1996; 64:1152–1168.10.1037/0022-006X.64.6.1152 [PubMed: 8991302]
- Heimberg RG, Horner KJ, Juster HR, Safren SA, Brown EJ, Schneier FR, Liebowitz MR. Psychometric properties of the Liebowitz Social Anxiety Scale. *Psychological Medicine*. 1999; 29:199–212. <http://dx.doi.org/10.1017/S0033291798007879>. [PubMed: 10077308]

- Hu LT, Bentler PM. Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*. 1999; 6:1–55.10.1080/10705519909540118
- Kashdan TB. Social anxiety spectrum and diminished positive experiences: Theoretical synthesis and meta-analysis. *Clinical Psychology Review*. 2007; 27:348–365. <http://dx.doi.org/10.1016/j.cpr.2006.12.003>. [PubMed: 17222490]
- Kashdan TB, Breen WE. Social anxiety and positive emotions: A prospective examination of a self-regulatory model with tendencies to suppress or express emotions as a moderating variable. *Behavior Therapy*. 2008; 39:1–12. <http://dx.doi.org/10.1016/j.beth.2007.02.003>. [PubMed: 18328865]
- Kashdan TB, Steger MF. Expanding the topography of social anxiety: An experience-sampling assessment of positive emotions, positive events, and emotion suppression. *Psychological Science*. 2006; 17:120–128. [PubMed: 16466419]
- Kashdan TB, Weeks JW, Savostyanova AA. Whether, how, and when social anxiety shapes positive experiences and events: A self-regulatory framework and treatment implications. *Clinical Psychology Review*. 2011; 31:786–799.10.1016/j.cpr.2011.03.012 [PubMed: 21529701]
- Lang PJ, Greenwald MK, Bradley MM, Hamm AO. Looking at pictures: Affective, facial, visceral, and behavioral reactions. *Psychophysiology*. 1993; 30:261–273.10.1111/j.1469-8986.1993.tb03352.x [PubMed: 8497555]
- Liebowitz MR. Social Phobia. *Modern Problems of Pharmacopsychiatry*. 1987; 22:141–173. [PubMed: 2885745]
- Martin CS, Pollock NK, Bukstein OG, Lynch KG. Inter-rater reliability of the SCID alcohol and substance use disorders section among adolescents. *Drug and Alcohol Dependence*. 2000; 59:173–176.10.1016/S0376-8716(99)00119-2 [PubMed: 10891630]
- McNeil DW, Brunetti DG. Pain and fear: A bioinformational perspective on responsivity to imagery. *Behavior Research and Therapy*. 1992; 30:513–520.10.1016/0005-7967(92)90035-F
- McIntyre CW, Watson D, Cunningham AC. The effects of social interaction, exercise, and test stress on positive and negative affect. *Bulletin of the Psychonomic Society*. 1990; 28:141–143.10.3758/BF03333988
- Mennin DS, Fresco DM, Heimberg RG, Schneier FR, Davies SO, Liebowitz MR. Screening for social anxiety disorder in the clinical setting: Using the Liebowitz Social Anxiety Scale. *Journal of Anxiety Disorders*. 2002; 16:661–673.10.1016/S0887-6185(02)00134-2 [PubMed: 12405524]
- Miller GA, Levin DN, Kozak MJ, Cook EW III, McLean A, Lang PJ. Individual differences in imagery and psychophysiology of emotion. *Cognition and Emotion*. 1987; 1:367–390.10.1080/02699938708408058
- Naragon-Gainey K, Watson D. Clarifying the dispositional basis of social anxiety: A hierarchical perspective. *Personality and Individual Differences*. 2011; 50:926–934.10.1016/j.paid.2010.07.012
- Naragon-Gainey K, Watson D, Markon KE. Differential relations of depression and social anxiety symptoms to the facets of extraversion/positive emotionality. *Journal of Abnormal Psychology*. 2009; 118:299–310.10.1037/a0015637 [PubMed: 19413405]
- Neff LA, Karney BR. Gender differences in social support: a question of skill or responsiveness? *Journal of Personality and Social Psychology*. 2005; 88:79–90.10.1037/0022-3514.88.1.79 [PubMed: 15631576]
- Pasch LA, Bradbury TN. Social support, conflict, and the development of marital dysfunction. *Journal of Consulting and Clinical Psychology*. 1998; 66:219–230.10.1037/0022-006X.66.2.219 [PubMed: 9583325]
- Pasch, LA.; Harris, KW.; Sullivan, KT.; Bradbury, TN. The Social Support Interaction Coding System (SSICS). In: Kerig, PK.; Baucom, DH., editors. *Couple Observational Coding Systems*. Mahwah, N.J: Lawrence Erlbaum Associates; 2004. p. 319-334.
- Rodebaugh TL, Lim MH, Fernandez KC, Langer JK, Weisman JS, Tonge N, Levinson CA, Shumaker EA. Self and friend's differing views of social anxiety disorder's effects on friendships. *Journal of Abnormal Psychology*. 2014.10.1037/abn0000015
- Snyder DK, Heyman RE, Haynes SN. Evidence-based approaches to assessing couple distress. *Psychological Assessment*. 2005; 17:288–307.10.1037/1040-3590.17.3.288 [PubMed: 16262455]

- Spokas M, Luterek JA, Heimberg RG. Social anxiety and emotional suppression: The mediating role of beliefs. *Journal of Behavior Therapy and Experimental Psychiatry*. 2009; 40:283–291.10.1016/j.jbtep.2008.12.004 [PubMed: 19135648]
- Steiger, JH.; Lind, JC. Statistically Based Tests for the Number of Factors. Paper presented at the annual spring meeting of the Psychometric Society; Iowa City, IA. 1980 May.
- Trull TJ, Sher KJ. Relationship between the five-factor model of personality and Axis I disorders in a nonclinical sample. *Journal of Abnormal Psychology*. 1994; 103:350–360.10.1037/0021-843X.103.2.350 [PubMed: 8040504]
- Tucker LR, Lewis C. A reliability coefficient for maximum likelihood factor analysis. *Psychometrika*. 1973; 38:1–10.10.1007/BF02291170
- Turk CL, Heimberg RG, Luterek JA, Mennin DS, Fresco DM. Emotion dysregulation in generalized anxiety disorder: A comparison with social anxiety disorder. *Cognitive Therapy and Research*. 2005; 29:89–106.10.1007/s10608-005-1651-1
- Verhofstadt LL, Buysse A, Ickes W. Social support in couples: An examination of gender differences using self-report and observational methods. *Sex Roles*. 2007; 57:267–282.10.1007/s11199-007-9257-6
- Verhofstadt LL, Buysse A, Ickes W, Davis M, Devoldre I. Support provision in marriage: The role of emotional similarity and empathic accuracy. *Emotion*. 2008; 8:792–802.10.1037/a0013976 [PubMed: 19102590]
- Watson, D. Mood and temperament. New York: Guilford; 2000.
- Watson D, Clark LA, Carey G. Positive and negative affectivity and their relation to anxiety and depressive disorders. *Journal of Abnormal Psychology*. 1988; 97:346–353.10.1037/0021-843X.97.3.346 [PubMed: 3192830]
- Watson D, Clark LA, Tellegen A. Development and validation of brief measures of positive and negative affect: The PANAS scales. *Journal of Personality and Social Psychology*. 1988; 47:127–144.10.1037/0022-3514.54.6.1063
- Werner KH, Goldin PR, Ball TM, Heimberg RG, Gross JJ. Assessing emotion regulation in social anxiety disorder: The Emotion Regulation Interview. *Journal of Psychopathology and Behavioral Assessment*. 2011; 33:346–354.10.1007/s10862-011-9225-x
- Wood JV, Heimpel SA, Michela JL. Savoring versus dampening: Self-esteem differences in regulating positive affect. *Journal of Personality and Social Psychology*. 2003; 85:566–580.10.1037/0022-3514.85.3.566 [PubMed: 14498791]
- Zanarini MC, Skodol AE, Bender D, Dolan R, Sanislow C, Schaefer E, Morey LC, Grilo CM, Shea MT, McGlashan TH, Gunderson JG. The Collaborative Longitudinal Personality Disorder Study: Reliability of axis I and II diagnoses. *Journal of Personality Disorders*. 2000; 14:291–299. [PubMed: 11213787]

Highlights

- Tested personality trait and emotion regulation predictors of state positive affect
- Difficulty redirecting oneself when upset significantly predicted positive affect
- Need further research on the dynamics of positive affect in highly socially anxious

Figure 1.

Multiple-group autoregressive model of PANAS positive affect as predicted by difficulties engaging in goal-directed behavior. The remaining predictors were nonsignificant and thus these prediction paths are not modeled. GSAD = generalized social anxiety disorder group; NOSAD = no social anxiety disorder group. All covariances among potential predictor variables included. Prediction paths are fully standardized parameters. Because of different standard deviations across groups, there are small numerical differences between groups at each time point. Accordingly, the GSAD parameters are presented for all paths that are constrained across group. Error terms are not modeled in this figure for simplicity.

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 1
Frequencies and Descriptive Statistics for Social Anxiety Disorder (GSAD) and No Social Anxiety Disorder (NOSAD) Participants

	GSAD group (<i>n</i> = 65)	NOSAD group (<i>n</i> = 49)
Age	40.72 (13.70)	36.86 (13.63)
Women	47 (72.3%)	35 (71.4%)
Race and Ethnicity		
White	35 (53.8%)	29 (59.2%)
Asian	2 (3.1%)	1 (2.0%)
Black	22 (33.8%)	18 (36.7%)
Multiracial	5 (7.7%)	1 (2.0%)
American Indian	1 (1.5%)	0 (0%)
Hispanic	1 (1.5%)	2 (4.1%)
Difficulty in Emotion Regulation Scale (DERS)		
Nonacceptance of Emotional Responses	14.84 (5.95)	9.23 (2.62)
Difficulties Engaging in Goal-Directed Behavior	15.26 (4.92)	10.38 (4.38)
The Five Factor Mindfulness Questionnaire (FFMQ)		
Nonreactivity to Inner Experience	20.10 (4.49)	23.98 (4.96)
Mini-International Personality Item Pool (Mini-IPIP)		
Extraversion	8.19 (3.03)	15.23 (3.01)
Neuroticism	13.66 (3.33)	8.85 (3.08)
Positive and Negative Affect Schedule (PANAS)		
Trait assessment	28.30 (8.25)	36.73 (6.86)
Pre-support (T1)	28.30 (9.15)	30.53 (9.65)
Post-support (T2)	30.05 (9.95)	31.67 (10.07)
Pre-conflict (T3)	29.32 (10.26)	30.71 (10.54)
Post-conflict (T4)	30.05 (11.19)	32.45 (10.51)
Self-Assessment Manikin (SAM)		
Pre-support (T1)	3.91 (1.71)	3.13 (1.41)
Post-support (T2)	3.49 (1.90)	2.90 (1.65)
Pre-conflict (T3)	3.77 (1.83)	3.14 (1.65)
Post-conflict (T4)	3.86 (2.28)	3.18 (1.68)

Note: Table 1 is reflective of the complete data and thus does not include values obtained through multiple imputation.

Author Manuscript

Author Manuscript

Author Manuscript

Author Manuscript