The role of negative affectivity and negative reactivity to emotions in predicting outcomes in the unified protocol for the transdiagnostic treatment of emotional disorders

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ABSTRACT

The present study aimed to understand the contributions of both the trait tendency to experience negative emotions and how one relates to such experience in predicting symptom change during participation in the Unified Protocol (UP), a transdiagnostic treatment for emotional disorders. Data were derived from a randomized controlled trial comparing the UP to a waitlist control/delayed-treatment condition. First, effect sizes of pre- to post-treatment change for frequency of negative emotions and several variables measuring reactivity to emotional experience (emotional awareness and acceptance, fear of emotions, and anxiety sensitivity) were examined. Second, the relative contributions of change in negative emotions and emotional reactivity in predicting symptom (clinician-rated anxiety, depression, and severity of principal diagnosis) reductions were investigated. Results suggested that decreases in the frequency of negative emotions and reactivity to emotions following participation in the UP were both large in magnitude. Further, two emotional reactivity variables (fear of emotions and anxiety sensitivity) remained significantly related to symptom outcomes when controlling for negative emotions, and accounted for significant incremental variance in their prediction. These findings lend support to the notion that psychological health depends less on the frequency of negative emotions and more on how one relates to these emotions when they occur.

The Unified Protocol (UP) for Transdiagnostic Treatment of Emotional disorders is a cognitive-behavioral intervention recently developed to address anxiety, depression and related disorders (somatoform and dissociative disorders), or "emotional disorders" (Barlow et al., 2011). Development of the UP was initiated in response to high rates of comorbidity amongst emotional disorders (Wilamowska et al., 2010) and evidence that psychological treatments targeting a specific emotional disorder often lead to improvements in comorbid disorders (Brown, Antony, & Barlow, 1995; Tsao, Lewin, & Craske, 1998; Tsao, Mystkowski, & Zucker, 2002). Findings from recent research suggest that the various symptoms of emotional disorders are in fact manifestations of common underlying factors. Such underlying factors include prominently the core temperamental dimension of neuroticism, an enduring tendency to experience negative affect (Brown, Chorpita, & Barlow, 1998; Gershuny & Sher, 1998; Kasch, Rottenberg, Arnow,

& Gotlib, 2002; Watson, Clark, & Carey, 1988). The overall aim of the UP is to address the factors that underlie all emotional disorders, such as neuroticism, rather than directly targeting disorder-specific symptoms (e.g. panic attacks in panic disorder, excessive worry in generalized anxiety disorder). Nevertheless, preliminary data have found that focusing on these common underlying factors indeed produces promising reductions in symptoms across emotional disorders (Ellard, Fairholme, Boisseau, Farchione, & Barlow, 2010; Farchione et al., in press).

Emotional disorders are characterized by a tendency to experience steep increases in affect in response to environmental stimuli and, subsequently, interpret these emotional experiences as harmful (Andrews, 1990, 1996; Brown & Barlow, 2009). The UP addresses heightened negative reactivity to emotions by identifying maladaptive responses to emotions and developing more effective strategies to manage these experiences (Ellard et al., 2010). Following motivational enhancement (module 1) and psychoeducation regarding the adaptive function of emotions (module 2), the five core treatment modules of the UP directly target negative reactions associated with the experience of emotions.

First, several modules provide skills for relating to negative emotions as they occur, including: increasing present-focused awareness and acceptance of emotions (module 3), cognitive flexibility about the consequences of emotions (module 4), and attention to behaviors that may function to avoid emotions (module 5). Additionally, several modules facilitate the experience of emotions through interoceptive (module 6) and in vivo exposure exercises (module 7), giving patients the opportunity to practice tolerating emotions using the skills acquired during earlier modules. The central tenet across all modules is the cultivation of reduced negative reactivity to emotions by providing patients with skills to effectively manage and regulate negative emotions as they occur. These strategies were distilled from decades of research on effective cognitive and behavioral treatments for anxiety and mood disorders (see Barlow, 2002) and more recent findings on adaptive emotion regulation (e.g., Campbell-Sills, Barlow, Brown, & Hofmann, 2006; Gross, 1998).

The consequences of experiencing strong negative reactions to one's emotions are well delineated. For example, individuals who deem their emotional responses as unacceptable or inappropriate are more likely to suffer from emotional disorders (Campbell-Sills et al., 2006; Mennin, Heimberg, Turk, & Fresco, 2005). Relatedly, there appear to be maladaptive consequences associated with behavioral manifestations of negative appraisals regarding emotions, such as attempts to change or push away negative emotions. For example, deliberately trying to conceal emotions from others has been associated with less adaptive functioning and reduced well-being (Gross & John, 2003), and suppression of emotion-eliciting thoughts has demonstrated paradoxical consequences known as rebound effects, in which the suppressed thoughts return with greater frequency or intensity (Abramowitz, Tolin, & Street, 2001; Wegner, Schneider, Carter, & White, 1987). In fact, thought suppression has been associated with depression, generalized anxiety disorder, obsessive compulsive disorder, and post-traumatic stress disorder (Purdon, 1999). Further, behaviors such as self-harm, substance abuse, and binge eating, have also been conceptualized as maladaptive negative reactions to emotions with the goal of pushing away this experience (Hayes, Wilson, Gifford, Follette, & Strosahl, 1996). In contrast, acknowledging, understanding, and accepting the full range of internal experience (without attempts to change or reduce it) is thought to be important for symptom reduction (Hayes, Follette, & Linehan, 2004). A hypothesized mechanism through which decreased negative reactivity may lead to improvements in psychological functioning is decreased emotional avoidance. Sustained awareness of distressing emotions (with associated thoughts, sensations, and behaviors) in the absence of any dire consequences and without escape or avoidance, teaches individuals new and less negative associations with emotions, allowing them to pursue goal-directed behavior even when distressed (Bouton, Mineka, & Barlow, 2001; Craske & Barlow, 2007; Lynch, Chapman, Rosenthal, Kuo, & Linehan, 2006).

Given that the UP is posited to address neuroticism, thought to be a stable dimension of personality (Costa & McCrae, 1992), by decreasing reactivity to emotional experience, it is important to clarify what is changing as a function of treatment: the frequency with which patients experience negative emotions, or how they relate to negative emotions when these experiences occur. Additionally, in light of the promising reductions in anxiety and mood disorder symptoms seen as a function of UP participation (Ellard et al., 2010; Farchione et al., under review), it is important to assess whether these outcomes are associated with decreases in trait negative affect or rather increases in the ability to tolerate negative affect when it occurs. This issue has received little empirical attention; however, there is some support for the notion that responding adaptively to negative emotions is more important for psychological health than the frequency with which these experiences occur. Cross-sectional research has revealed that how individuals respond to negative emotions predicts psychological symptoms over and above the contributions of having such experiences (Sauer & Baer, 2009), and that responses to mood shifts in daily life (rather than the moods themselves) have significant impact on the occurrence of depressive symptoms (Segal, Willimans, & Teasdale, 2002). Despite being a central tenet of cognitive-behavioral therapy, the extent to which reductions in psychological symptoms are a function of the frequency of negative emotions or how they are managed has not been studied in the context of a treatment outcome study.

The present study aimed to understand the contributions of both the trait tendency to experience negative emotions and how one relates to such experience in predicting reductions in symptoms during participation in the UP. The first goal of this study was to compare the effect sizes of pre- to post-treatment change in frequency of negative emotions and several variables measuring reactivity to emotional experience (emotional awareness and acceptance, fear of emotions, and anxiety sensitivity). It was expected, given that the tendency to experience negative emotions is considered a stable personality characteristic, that the magnitude of change in emotional reactivity would be greater than change in the frequency of negative emotions. The second goal of this study was to assess whether becoming less reactive to one's emotions as a function of participating in the UP is related to symptom change independently of the contributions of the tendency to experience negative affect. It was hypothesized that decreased reactivity toward emotions would account for additional variance in predicting pre- to post-treatment symptom reductions, beyond that of levels of negative affect.

It is important to emphasize that the constructs of fear of emotions, anxiety sensitivity, and emotional awareness/acceptance are related, yet distinct markers of reactivity to emotion. Thus, it is useful to clarify the meaning of each construct in the present study. Fear of emotions refers to the negative reaction to emotions that occurs based on the belief that the experience of emotions is long-lasting and emotions will spiral out of control. Anxiety sensitivity refers to a fear of bodily sensations related to anxiety due to a belief that symptoms are likely to have harmful consequences (Reiss, Peterson, Gursky, & McNally, 1986). Finally, emotional awareness/acceptance refers to the tendency to notice and willingly experience the full range of emotional experience when it occurs; this construct represents the reverse of negative reactivity to emotions.

Method

Participants

Participants were recruited from a pool of individuals seeking treatment at the Center for Anxiety and Related Disorders at Boston University (CARD). Inclusion criteria included: a principal (most interfering and severe) diagnosis of any anxiety disorder, assessed using the Anxiety Disorders Interview Schedule for *DSM-IV* — Lifetime Version (ADIS-IV-L; Di Nardo, Brown, & Barlow, 1994; see description below); age 18 years or older; fluency in English; ability to attend all treatment sessions and assessments; and ability to provide informed consent. Participants were excluded from participation if they endorsed current suicidal risk necessitating a higher level of care, received a current *DSM-IV* diagnosis of bipolar disorder, schizophrenia, schizoaffective disorder, organic mental disorder, and/or current or recent (within 3 months) history of substance abuse or dependence (with the exception of nicotine, marijuana, and caffeine). Additionally, participants were excluded if they had recently (within the past 5 years) completed a reasonable

course (8 or more sessions) of cognitive-behavioral therapy. Similar to methods used in pharmacotherapy efficacy trials, this was done to further ensure that an individual's response could be more clearly attributed to the dose of therapy received in this course of treatment.

A total of 37 patients consented to treatment and were randomized to either the immediate or delayed-treatment waitlist conditions. The immediate treatment group ($n = 26$) consisted of ten males and 16 females, with a mean age of 29.38 years ($SD = 9.86$, range 19–52 years). The delayed treatment group ($n = 11$) included five males and six females, with a mean age of 30.64 years ($SD = 9.15$, range 19–52). The study sample was primarily Caucasian 94.5% ($n = 35$). As reported by Farchione et al. (in press), no group differences were observed for age or gender. Principal diagnoses included: generalized anxiety disorder (GAD, $n = 7$), social anxiety disorder (SOC, $n = 8$), obsessive compulsive disorder (OCD, $n = 8$), panic disorder with agoraphobia (PDA, $n = 8$), Anxiety Disorder NOS ($n = 2$), and post-traumatic stress disorder (PTSD, $n = 1$). Three participants had co-principal diagnoses (a diagnosis of equal severity): SOC and Anxiety Disorder NOS, GAD and SOC, and OCD and PDA. Participants had an average of 2.16 diagnoses at pre-treatment ($SD = 1.19$; range 1–5 diagnoses); although the majority of comorbid diagnoses were other anxiety disorders, 9 patients were diagnosed with comorbid mood disorders (major depressive disorder, dysthymia, depressive disorder NOS) and 1 patient was diagnosed with Tourette's disorder. Thirty-two out of 37 patients were considered treatment completers (see Procedure section for treatment completer criteria). Sixteen individuals were taking psychotropic medications at the time of enrollment and randomization. All individuals were stable on the same dose for at least 3 months prior to enrolling in the study as a condition for participation in the study, and all agreed to maintain these dosages and medications for the duration of the study (for a description of medication stability compliance, see Farchione et al., in press).

Measures

Diagnosis and clinical severity ratings

Baseline diagnoses were assessed with the Anxiety Disorders Interview Schedule for DSM-IV-Lifetime Version (ADIS-IV-L; Di Nardo et al., 1994). This semi-structured, diagnostic clinical interview focuses on *DSM-IV* diagnoses of anxiety disorders and their accompanying mood states, somatoform disorders, and substance and alcohol use. Principal and additional diagnoses are assigned a clinical severity rating (CSR) on a scale from 0 (*no symptoms*) to 8 (*extremely severe symptoms*), with a rating of 4 or above (*definitely disturbing/disabling*) passing the clinical threshold for *DSM-IV* diagnostic criteria. This measure has demonstrated excellent to acceptable interrater reliability for the anxiety and mood disorders (Brown, Di Nardo, Lehman, & Campbell, 2001).

Positive and negative affect schedule − negative affect (PANAS-NA; Watson, Clark, & Tellegan, 1988)

Frequency of negative affect was measured using the PANAS, which consists of 20 words that describe either positive or negative affect (i.e. interested, distressed, excited, upset). Participants are asked to indicate how often they feel this way on a five-point Likert scale. For the purposes of this study, only negative affect was analyzed. The PANAS allows ratings within several time frames. Participants in this study were asked to rate how they generally feel. In the validation sample, internal consistency and test−retest reliability were high ($\alpha = 0.90$; $r = 0.71$). Additionally, in the validation sample, the PANAS-NA was significantly correlated with the Hopkins Symptoms Checklist (Derogatis, Lipman, Covi, Rickels, &

Ulenhuth, 1970), which has been shown to measure general distress ($r = 0.74$).

Affective control scale (ACS; Williams, Chambless, & Ahrens, 1997)

This 42-item self-report measure assesses affect appraisal and fear across four domains of emotional experience: anger, anxiety, depression, and positive emotions. A total score is derived using the average of all items (scale of 1 [*Very Strongly Disagree*] to 7 [*Very Strongly Agree*]), with higher scores indicating greater fear of emotion. Example items include: "There is nothing I can do to stop anxiety once it has started" and "I am afraid that letting myself feel really angry about something could lead me into an unending rage." The ACS has demonstrated acceptable internal consistency and convergent validity (Williams et al., 1997).

Anxiety sensitivity index (ASI; Reiss et al., 1986; Peterson & Reiss, 1987)

This 16-item self-report measure is commonly used to assess anxiety sensitivity, which refers to beliefs about the dangerousness of anxious symptoms, particularly somatic symptoms, as well as the resulting fear of these symptoms (Reiss, 1980). Example items include: "It scares me when my heart beats rapidly" and "When my stomach is upset, I worry that I might be seriously ill." The ASI has demonstrated good internal consistency and convergent validity (Peterson & Reiss, 1987; Vujanovic, Arrindell, Bernstein, Norton, & Zvolensky, 2007).

Emotion regulation strategies questionnaire (ERSQ; Berking & Znoj, 2008)

This 27-item self-report instrument measures awareness and acceptance when emotions occur. It utilizes a 5-point Likert scale ($0 = not\ at\ all$ to $4 = almost\ always$). Example items include: "I was able to accept my negative feelings," and "I knew what emotions I was feeling in the moment." The ERSQ has demonstrated high internal consistency ($\alpha = 0.90$) and adequate test−retest reliability ($r_{tt} = 0.75$). Additionally, positive associations with well-being and negative associations with psychopathology and emotion-regulation deficits have provided construct validity for this measure (Berking et al., 2008; Berking & Znoj, 2008).

Hamilton depression rating scale (HAM-D; Hamilton, 1960)

The HAM-D was used to evaluate depressive symptoms and administered in accordance with the Structured Interview Guide for the Hamilton Depression Rating Scale (SIGH-D; Williams, 1988). This commonly used measure has demonstrated good levels of interrater and test−retest reliability (Williams, 1988), as well as concurrent validity with similar clinician rated and self-report measures of depression symptoms (Bech et al., 1992).

Hamilton anxiety rating scale (HAM-A; Hamilton, 1959)

The HAM-A was used to assess anxiety symptoms and was administered in accordance with the Structured Interview Guide for the Hamilton Anxiety (SIGH-A; Shear, Vander Bilt, & Rucci, 2001). This commonly used measure has demonstrated good levels of interrater and test−retest reliability, as well as convergent validity with similar clinician rated and self-report measures of depression symptoms (Shear et al., 2001).

Procedure

Data were derived from a randomized controlled trial comparing the UP to a waitlist control/delayed-treatment condition (Farchione et al., in press). Participants randomly assigned to the immediate treatment condition were assessed at pre and post-treatment (negative affect, emotion, and symptom measures).

Wait-list/delayed treatment participants were assessed at the beginning and end of the sixteen week waitlist, the latter serving as their baseline assessment for between group comparisons, as well as at post-treatment. Participants received a maximum of 18 therapy sessions to cover the 8 UP treatment modules. The modules were flexibly linked to sessions in that, depending on the needs of the individual, more or less time could be spent on a given module. Thus, each module could conceivably be covered in a single session, which would result in a treatment that is less than 18 weeks in duration. A participant was considered a treatment completer after 8 sessions because all treatment modules could have been covered in this duration. Independent evaluators who were trained to criterion reliability and blind to randomized condition, conducted semi-structured diagnostic clinical interviews and provided clinical ratings. Therapists for the study were three doctoral students with 2–4 years of experience and one licensed doctoral-level psychologist with seven years of experience. All therapists underwent extensive training and certification prior to treating study patients and treatment adherence was monitored during weekly supervision meetings.

Results

To increase statistical power, analyses were conducted with all treatment completers, including patients originally randomized to the treatment condition and waitlist/delayed treatment participants that completed the UP following initially being placed on a waitlist. Pre- and post-treatment means and mean change scores for the negative affect and emotional reactivity variables can be seen in Table 1. Although change scores were once considered to be highly unreliable, recent research has demonstrated that change scores can be reliable measures of intraindividual change (King et al., 2006). To ensure that the changes scores were reliable in the present study, the reliability of the change scores was calculated (r_{DD}) using the formula specified in King et al. (2006), and was found to be adequate for each variable. All change was in the expected direction; participants in the UP experienced decreased frequency of negative affect (PANAS-NA), fear of emotions (ACS), and sensitivity to anxiety symptoms (ASI) and increased awareness and acceptance of emotions (ERSQ). Effect sizes (Standardized Mean Gain, ESsg) were calculated to determine the magnitude of change from pre- to post-treatment. The standardized mean gain was chosen as the effect size for these analyses as it includes a correction for repeated measures assessments. Results can be seen in Table 2. Change in the emotional reactivity variables targeted by the UP all represented large effects, as did change in negative affect; decreases in fear of emotions were significantly larger than decreases in negative affect.[1]

Correlational analyses were used to examine relationships between changes in negative affect, emotional reactivity variables,

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[1] An additional set of ES$_{sg}$ calculations were completed for individuals in the waitlist/delayed treatment condition. First, the magnitude of pre- to post-*waitlist* effects for these variables was explored to ensure that the large effects found for all treatment completers can be associated with the treatment and not the passage of time. ES$_{se}$ were as follows: PANAS-NA = 0.28 (SE$_{sg}$ = 0.28, 95% CI −28: 0.83) ERSQ = 0.25 (SE$_{sg}$ = 0.42, 95% CI −0.58: 1.08), ACS = −0.04 (SE$_{sg}$ = 0.31, 95% CI −0.64: 0.56), and ASI = −0.74 (SE$_{sg}$ = −0.33, 95% CI −1.39: 0.09). Second, the magnitude of post-waitlist to post-delayed UP treatment for these variables was explored to ensure that the response of the waitlist/delayed treatment participants did not differ from those who received immediate treatment. ES$_{se}$ were as follows: PANAS-NA = −0.35 (SE$_{sg}$ = 0.34, 95% CI −1.03: 0.32), ERSQ = 0.87 (SE$_{sg}$ = 0.46, 95% CI −0.03: 1.77), ACS = −1.17 (SE$_{sg}$ = 0.48, 95% CI −0.2.11: −0.23), and ASI = −0.70 (SE$_{sg}$ = 0.42, 95% CI −1.52: 0.11). All ES$_{sg}$ were in the expected direction and of the expected magnitude with the exception of change in pre- to post-waitlist ASI, which demonstrated a large effect.

and psychological symptoms (the reliability of change scores in symptom variables were calculated and found to be reliable: $r_{DD} = 0.73$ for HAM-D and .77 for HAM-A) during participation in the UP. All variables represent pre- to post-treatment change. Findings can be seen in Table 3. As expected, decreases in level of negative affect (PANAS-NA) were positively correlated with decreases in level of clinician-rated depression (HAM-D) and anxiety (HAM-A); however, decreases in negative affect were not significantly associated with change in clinician-rated symptom severity on the participant's principal diagnosis (CSR). Additionally, as expected, decreases in fear of emotions (ACS) and sensitivity to anxiety (ASI) were associated with decreases on depression, anxiety, and clinical severity scores. Increased awareness and acceptance of emotions (ERSQ) was associated with decreases on depression and anxiety scores, but not on clinical severity scores.

Partial correlations controlling for negative affect were also computed. The purpose of these analyses was to determine if the decreased emotional reactivity resulting from participation in the UP was related to symptom change independently of how often negative emotions occurred. Results can be viewed in Table 3. Decreases in fear of emotions remained significantly associated with decreases in depression and anxiety (but not to clinical severity), while decreases in sensitivity to anxiety remained related to depression and clinical severity (but not to anxiety), after controlling for decreases in negative affect. Unexpectedly, increased awareness and acceptance of emotions was no longer significantly related to any outcome variable when controlling for decreases negative affect.

Three hierarchical regression analyses were conducted to investigate the relative importance of frequency of negative affect and emotional reactivity in the prediction of depression, anxiety, and clinical severity, respectively. Fear of emotions and sensitivity to anxiety were used in these analyses as they remained significant predictors of symptom outcomes after controlling for negative affect in the previous analysis. Again, pre- to post-change scores were used. Results can be seen in Table 4. The first analysis examined change in negative affect, fear of emotions, and anxiety sensitivity in predicting change in depression. Frequency of negative affect was entered at Step 1 and fear of emotions and anxiety sensitivity were entered at Step 2. While change in negative affect accounted for a significant amount of variance in predicting change in depression (22%) the addition of change in fear of emotions and assigned at step 2 accounted for an additional 42% of the variance; in fact, change in negative affect was no longer a significant predictor of change in depression after the inclusion of change in the emotional reactivity variables in the model.

The second hierarchical regression examined the relative importance of negative affect and emotional reactivity variables (fear of emotions and sensitivity to anxiety) in predicting anxiety. Change in negative affect accounted for 26% of the variance in predicting change in anxiety; however, when entered into the model change in fear of emotions and sensitivity to anxiety accounted for significant additional variance (42%) and rendered negative affect no longer significant in the prediction of change in anxiety. These results suggest that decreased emotional reactivity is more important in predicting decreases in anxiety in the UP than decreases in the frequency of negative emotions experienced.

Finally, the third hierarchical regression examined the relative importance of negative affect and emotional reactivity variables (fear of emotions and sensitivity to anxiety) in predicting clinical severity of principal diagnosis. Change in negative affect predicted 10% of the variance in clinical severity ratings but was not a statistically significant predictor. Together, change in fear of emotions and sensitivity to anxiety accounted for an additional 25% of the variance in change in clinical severity; however, fear of emotions

Table 1
Mean pre-post-treatment change scores for negative affect and emotional reactivity variables.

	N	Pre-treatment		Post-treatment		Pre- to post-treatment change		
		M	SD	M	SD	M	SD	r_{DD}
Negative affect (PANAS-NA)	29	25.54	6.20	21.03	5.50	−5.31	5.54	.67
Emotional awareness/acceptance (ERSQ)	21	62.52	17.35	79.07	17.31	18.01	17.70	.89
Fear of emotions (ACS)	29	139.08	28.29	107.00	29.54	−32.10	23.68	.77
Anxiety sensitivity (ASI)	29	28.00	11.60	18.76	12.33	−9.93	10.83	.73

Note: r_{DD} = reliability of the change score.

Table 2
Effect sizes (ES_{sg}) for pre-post-treatment change in negative affect and emotional reactivity in the UP.

	ES_{sg}	SE_{sg}	95% Confidence interval
Negative affect (PANAS)	−0.83	0.20	−0.45:−1.22
Emotional awareness/acceptance (ERSQ)	0.84	0.22	0.40:1.27
Fear of emotions (ACS)	−1.32	0.25	−0.83:−1.80
Anxiety sensitivity (ASI)	−0.90	0.22	−0.48:−1.33

Note. ES_{sg} = Standardized mean gain effect size.

was not a significant predictor of change in clinical severity. These results suggest that decreased reactivity to the experience emotions, particularly decreased beliefs about the dangerousness of anxiety symptoms, is more important in predicting decreased clinical severity ratings in the UP than decreases in the frequency of negative affect experienced.

Discussion

This study investigated the contributions of both frequency of negative emotions as a trait characteristic and reactivity to emotions experience in predicting symptom change in a trans-diagnostic treatment for emotional disorders. The first study aim explored the magnitude of pre-post change in frequency of negative emotions and emotional reactivity during treatment with the UP. As expected, negative reactivity to emotions decreased as a function of participating in the UP. Specifically, acceptance and awareness of emotions increased while fear of emotions and anxiety sensitivity decreased; all change scores for emotional reactivity variables represented large effects. Contrary to our predictions, pre- to post-treatment change in frequency of negative emotions experienced also demonstrated a large effect. Confidence intervals for the change effect sizes for emotional awareness/acceptance, anxiety sensitivity, and negative affect overlapped, suggesting that the magnitude of change for these variables was comparable. The magnitude of change for fear of emotions, however, appeared to be significantly greater than change in negative affect.

Overall, these results suggest that both frequency of negative emotions and the extent to which one reacts strongly to them change to a large degree as a function of treatment with the UP. These observed changes are consistent with the focus and targets of the UP. High frequency and intensity of negative emotions characterize trait neuroticism. Rather than directly focusing on decreasing this quality, the UP largely targets strong negative reactions to emotions that often accompany trait neuroticism through enhancing one's understanding of the importance of emotional experience, increasing cognitive-emotional flexibility, and cultivating a greater willingness to experience and continue to function in the presence of strong emotions. Although the emphasis in the UP is on decreasing reactivity to emotions, with a relatively high degree of impact demonstrated in the present study, significant decreases in negative emotion were also observed. While the correlational nature of this analysis precludes causal interpretations, it is possible that experiencing fewer negative reactions to emotions facilitates decreases in the frequency and intensity of those emotions. This interpretation is consistent with research showing that cognitive and emotional avoidance and control strategies (e.g., suppression, worry, rumination) can lead to significant increases in subsequent distress (e.g., Butler, Wells, & Dewick, 1995; Stewart, Zvolensky, & Eifert, 2002).

The second aim of this study was to investigate relationships between change in important treatment targets and change in symptom outcomes. Change in frequency of negative emotions and reactivity to their occurrence were both significantly associated with change in clinician-rated anxiety, depression, and severity of principal diagnoses. An exception to this finding was that neither frequency of negative emotions nor awareness/acceptance of emotions was significantly related to principal diagnosis severity; this was unexpected, but it is important to note that magnitude of the correlations represented moderate effects. Lack of statistical significance may be due to sample size and/or large observed standard errors for these variables. Overall, these results indicate that decreased levels of negative emotions as well as decreased reactivity to them both contribute to symptom change. Partial correlation coefficients, controlling for change in negative emotions, were also computed. The correlations between fear of emotions and anxiety sensitivity and symptom reductions remained significant; however, the relationship between emotional awareness/acceptance and symptom change was no longer significant. Again, it should be noted that the magnitude of the partial correlations with emotional awareness/acceptance were moderate

Table 3
Changes in negative affect and emotional reactivity correlated with symptom reduction.

	Zero-order correlations			Partial correlations[a]		
	Depression (HAM-D)	Anxiety (HAM-A)	Symptom severity (CSR)	Depression (HAM-D)	Anxiety (HAM-A)	Symptom severity (CSR)
Negative affect (PANAS)	0.46[*]	0.51[**]	0.32	−	−	−
Emotional awareness/acceptance (ERSQ)	−0.51[*]	−0.51[*]	−0.41	−0.31	−0.35	−0.25
Fear of emotions (ACS)	0.62[**]	0.70[**]	0.38[*]	0.49[*]	0.60[**]	0.34
Anxiety sensitivity (ASI)	0.66[**]	0.56[**]	0.55[**]	0.63[**]	0.43	0.51[*]

[*] $p < 0.05$, [**] $p < 0.01$.
[a] Note: Partial correlations control for change in frequency of negative affect.

Table 4
Hierarchical regressions predicting symptom reduction.

DV	Variable entered	B	SE	β	R^2	ΔR^2	p
Depression (HAM-D)							
Step 1	Negative affect (PANAS-NA)	0.56	0.21	0.46	0.22		0.01
Step 2	Negative affect	0.09	0.17	0.07			0.60
	Fear of emotions (ACS)	0.12	0.04	0.43			0.003
	Anxiety sensitivity (ASI)	0.31	0.10	0.50	0.63	0.42	0.001
Anxiety (HAM-A)							
Step 1	Negative affect	0.83	0.27	0.51	0.26		0.005
Step 2	Negative affect	0.25	0.23	0.15			0.29
	Fear of emotions	0.21	0.05	0.53			0.001
	Anxiety sensitivity	0.28	0.11	0.33	0.63	0.42	0.02
Symptom severity (CSR)							
Step 1	Negative affect	0.09	0.05	0.32	0.10		0.09
Step 2	Negative affect	0.01	0.05	0.03			0.86
	Fear of emotions	0.01	0.01	0.22			0.23
	Anxiety sensitivity	0.07	0.03	0.50	0.35	0.25	0.01

Note: ΔR^2 reflects the change in R^2 after including both fear of emotions and anxiety sensitivity in Step 2.

and that the lack of statistical significance could be due to sample size. These results suggest that decreasing negative reactivity to the experience of emotions is important for symptom reduction in the treatment of emotional disorders, even when accounting for decreases in the frequency of experiencing negative emotions.

In addition, the relative contributions of change in the frequency of negative emotions and change in emotional reactivity in predicting symptom change in the UP were investigated. Change in negative emotion was entered in Step 1 of the hierarchical regression analyses based on the *a priori* conception that the tendency to experience negative emotions is a trait construct with temporal precedence over learning new skills to decrease reactivity. With the exception of clinician-rated symptom severity for the participants' primary diagnosis, change in negative emotion significantly predicted pre- to post-treatment change in anxiety and depression levels. However, when change in fear of emotions and sensitivity to anxiety symptoms were entered at Step 2, change in negative emotion was no longer a significant predictor of any outcome indicator, while the emotional reactivity variables accounted for significant incremental variance.

Overall, these findings suggest that how one relates to negative emotion is a more important factor in predicting change in the treatment of emotional disorders than the frequency with which negative emotions occur. This finding complements and strengthens previously described research results and offers support for the UP treatment model. These results show that the UP appears to be effectively targeting one of the key processes it was designed to address − decreased negative reactivity to emotional experiences. Specifically, reductions in fear about losing control over one's emotions and the consequences of the somatic component of an emotional response strongly predicted symptom decrease. It is possible that decreases in emotional avoidance, which is specifically targeted in UP modules 5−7, influence levels of emotional reactivity. Alternatively, reductions in emotional reactivity could also conceivably lead to reduced avoidance of emotions, another hypothesized mechanism of change in the UP. With the current data it is difficult to conclude which modules may be more active in developing decreased reactivity to emotions − early modules that seek to alter appraisals of emotions through acceptance (module 3) and cognitive flexibility about the consequences of emotions (module 4) or more behaviorally-focused modules (5−7) in which patients deliberately face feared situations. It may

also be the case that the UP treatment modules work in concert to produce these effects; however, this remains an empirical question and future research should assess module by module change in these constructs. If module-mechanism specificity is supported, this may aid clinicians in further streamlining and targeting their intervention use.

Several study limitations should be considered when interpreting these findings. First, the sample size was small, which may have rendered important relationships not *statistically* significant. For example, partial correlations between emotional awareness/acceptance and symptom change were moderate, ranging between −0.25 and −0.35; yet, because they did not reach statistical significance, this variable was excluded from subsequent analyses. Additionally, in the hierarchical regression analyses, negative emotions and fear of emotions accounted for 10% and 7% of the variance in principal diagnosis severity rating, respectively, yet these predictors were not statistically significant. Additionally, due to the small sample size, all treatment completers (immediate treatment and post-waitlist delayed treatment participants) were combined into a single sample and the small number of delayed treatment participants limited our ability to compare relationships between these variables in the treatment completers and delayed treatment samples. This affects our interpretation of the findings as delayed treatment participants may conceivably respond differently than immediate treatment participants in such randomized trials. Although a comparison of the effect sizes suggests that the magnitude of change on both frequency of negative affect and the emotional reactivity variables was comparable for all treatment completers and for delayed treatment participants, future research should explore these questions in a larger sample. A second limitation is that data were only collected at pre- and post-treatment, so temporal interpretation is limited. *A priori* assumptions that the tendency to experience negative emotions is a trait-level construct and that strong reactions to emotions leads to symptoms of depression and anxiety shaped the formulation of analyses in this study. It is possible, however, that decreases in symptoms of depression and anxiety may lead to decreased reactivity to emotions such that as individuals may have less negative reactions to their emotions when they are feeling better. Given that all measures were not given at multiple intervals during the course of treatment, it is impossible to assess the precise directionality of change.

This is one of the first studies to show that reductions in psychological symptoms are more a function of how emotions are managed, rather than the frequency/intensity of experience, in the context of a treatment outcome study; despite its merits, additional questions remain. Future research should include repeated measurement of negative (and positive) emotions, negative emotional reactivity, and symptomatology. Repeated measurement, which could be guided by the timing of specific UP modules, would allow for a more direct examination of change mechanisms (e.g., mediation and moderation). To date, investigations of the UP's efficacy have been limited to anxiety and unipolar mood disorders. As such, future research should also be aimed at replicating these findings across diagnostic categories. Given that underlying neuroticism, which is specifically addressed in the UP, is implicated in other emotional disorders (somatoform and dissociative disorders), it seems likely that these disorders would respond to this treatment; this, however, remains to be tested.

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