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RESEARCH PAPER

Associations between improvements in aversive reactions to negative emotions and increased quality of life in the unified protocol

Sohayla A. Elhusseini^{1,*}, Lauren E. Cravens,
Matthew W. Southward, Shannon Sauer-Zavala

Department of Psychology, University of Kentucky, Lexington, Kentucky

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Abstract Emotional disorders are thought to be maintained by the transaction between frequent experiences of strong, negative emotions (i.e., neuroticism) and aversive reactions to those emotions. The Unified Protocol (UP) is an efficacious treatment for transdiagnostic emotional disorders designed to target specific forms of aversive reactivity to negative emotions. In addition to symptom change, the UP has also been shown to lead to increases in quality of life. However, it remains unclear which specific mechanisms targeted in the UP are related to improvements in quality of life. We explored the relations between changes in five aspects of aversive reactivity included in the UP (i.e., non-acceptance of emotions, [lack of] mindfulness, cognitive rigidity, behavioral avoidance, and anxiety sensitivity) and overall quality of life during treatment. Person-specific regression slopes revealed that improvements in emotional non-acceptance, behavioral avoidance, and mindfulness were each significantly associated with increases in quality of life over the six sessions of treatment. Although in the expected direction, improvements in anxiety sensitivity and cognitive flexibility were not significantly associated with increases in quality of life. These findings generally suggest a model of equifinality in which improvements in most aspects of aversive reactivity are similarly related to changes in quality of life.

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* Corresponding author. Department of Psychiatry, VA Palo Alto Healthcare System, 795 Willow Road (NC-PTSD 334), Menlo Park, CA 94025, USA

E-mail address: sael226@stanford.edu (S.A. Elhusseini).

¹ Sohayla Elhusseini is now located at the National Center for PTSD and Stanford University.

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Neuroticism, defined as the propensity to experience frequent and intense negative emotions in response to stress (Barlow, Ellard, Sauer-Zavala, Bullis, & Carl, 2014), is a costly personality dimension (Cuijpers et al., 2010) with far-reaching impacts on mental health and quality of life (Widiger & Oltmanns, 2017). One potential mechanism through which neuroticism may be maintained or exacerbated is the tendency to respond to negative emotions with aversive reactivity (Sauer-Zavala, Southward, & Semcho, 2020). Aversive reactivity refers to adverse appraisals of emotional experiences (Bullis, Boettcher, Sauer-Zavala, Farchione, & Barlow, 2019), including beliefs that emotions are dangerous (e.g., "I'm going crazy"), connote weakness (e.g., "I'm being such a baby"), or are unbearable (e.g., "I can't stand this feeling"). Aversive reactivity has been shown to prompt efforts to control or suppress emotional experiences (Campbell-Sills, Barlow, Brown, & Hofmann, 2006), which paradoxically increases the frequency and intensity of negative affect (i.e., neuroticism) and emotional disorder symptoms (Wegner, Schneider, Carter & White, 1987; Abramowitz, Tolin, & Street, 2001).

Emerging research suggests that several established constructs (e.g., experiential and behavioral avoidance, emotional non-acceptance, anxiety sensitivity) may fit within the umbrella of aversive reactivity (Conway, Naragon-Gainey, & Harris, 2021; Naragon-Gainey & Watson, 2018; Spinhoven, van Hemert, & Penninx, 2017). Indeed, aversive reactivity may manifest in a number of key ways, such as the inclination to avoid emotions (experiential avoidance), to think in limited and inflexible ways about emotional experiences (cognitive rigidity), to pull oneself away from the present experience (lack of mindfulness), to refrain from accepting one's negative emotions (emotional non-acceptance), and to experience a sensitivity toward physical manifestations of anxiety (anxiety sensitivity). Reductions in aversive reactivity have been shown to precede and predict improvements in symptoms of emotional disorders (e.g., Eustis et al., 2020), emphasizing the importance of characterizing how this functional mechanism changes in treatment.

The Unified Protocol for Transdiagnostic Treatment of Emotional Disorders (UP; Barlow et al., 2018) is an efficacious cognitive-behavioral treatment developed to manipulate specific aspects of aversive reactivity in order to reduce neuroticism more broadly (Barlow et al., 2017; Sauer-Zavala et al., 2022). The UP consists of five core modules that each teach discrete skills designed to reduce aversive reactions to emotions. Specifically, the Understanding Emotions module targets emotional non-acceptance by encouraging patients to consider the adaptive function of each emotion. The Mindful Emotion Awareness module addresses mindlessness by instructing patients to apply a nonjudgmental, present-focused stance toward emotional experiences. The Cognitive Flexibility module targets cognitive rigidity by encouraging patients to view their automatic thoughts as first impressions and to generate as many alternative interpretations as possible. The Countering Emotional Behaviors module targets behavioral avoidance by encouraging approach-oriented behaviors that enables patients to learn that affective experiences can be tolerated. Finally, the Confronting Physical Sensations module addresses anxiety sensitivity by exposing patients to the physiological

component of emotional experiences (e.g., racing heart, heaviness in the limbs) to teach patients to tolerate these experiences. These modules have been shown to lead to similar improvements across a range of constructs theorized to be represented by aversive reactivity (Southward & Sauer-Zavala, 2022).

Targeting aversive reactivity may reduce reliance on the avoidant coping strategies that exacerbate the frequency and intensity of negative emotions; when these changes in emotionality become sustained over time, this may constitute decreases of trait neuroticism (Magidson, Roberts, Collado-Rodriguez, & Lejuez, 2014; Sauer-Zavala et al., 2022). Indeed, the UP's transdiagnostic approach addressing aversive reactivity is associated with reductions in neuroticism (Carl, Soskin, Kerns, & Barlow, 2013; Sauer-Zavala et al., 2022), along with symptom reduction for a range of emotional disorders across various formats and settings (Cassello-Robbins, Southward, Tirpak, & Sauer-Zavala, 2020). Importantly, reductions in aversive reactivity and avoidant coping strategies may similarly influence other treatment outcomes, such as quality of life and life satisfaction. Prior research has demonstrated that increases in acceptance- and approach-oriented behaviors toward negative emotions and decreases in avoidant coping strategies are associated with improvements in overall quality of life and well-being (Ford, Lam, John, & Mauss, 2018; Frydenberg & Lewis, 2009).

The Unified Protocol and Quality of Life

Historically, clinical researchers have focused predominantly on reducing problematic cognitive, emotional and behavioral patterns (i.e., symptoms of psychiatric disorders). In recent years, however, there has been a shift toward a complementary approach that emphasizes the importance of positive psychological functioning in fostering mental health. An emphasis on positive qualities is important because mental *health* does not merely entail a lack of mental *illness*, but rather a fulfillment of multiple domains of well-being (e.g., life satisfaction and meaning in life). Positive characteristics (e.g., supportive relationships, career satisfaction, autonomy, meaning) may buffer the impacts of life stress by promoting an individual's ability to cope in effective ways (Fusar-Poli et al., 2020) and may prevent depression, anxiety, and suicidality (Fergusson et al., 2015). Given the various impacts of positive functioning, it is critical that mental health interventions promote psychological flourishing in addition to mitigating symptoms of mental health disorders.

Several researchers have evaluated the UP's effect on well-being. First, there is evidence that the UP leads to increases in positive emotions (Carl, Soskin, Kerns, & Barlow, 2013; Wilner Tirpak et al., 2019). Additionally, the UP led to increases in quality of life using global measures that capture satisfaction in several domains of functioning (e.g., social, occupational; Gallagher et al., 2013; Wilner et al., 2020). Gallagher and colleagues (2013) further demonstrated that increases in life satisfaction throughout treatment were associated with reductions in symptoms of depression and anxiety. Notably, life satisfaction more strongly predicted functional impairment at the end of treatment than diagnostic severity. This pattern of results

underscores the importance of attending to changes in life satisfaction throughout the course of the UP .

Current Study

Although there is evidence that the UP leads to improvements in quality of life, relatively less attention has been paid to the relation between changes in the core mechanisms targeted by the UP and improvements in quality of life. Given that the UP was developed to target aversive reactivity, we analyzed data from a completed randomized clinical trial (Sauer-Zavala et al., 2022) to investigate whether changes in unique aspects of aversive reactivity were associated with improvements in quality of life during treatment. The unique aspects of aversive reactivity we examined were non-acceptance of emotions (associated with the Understanding Emotions module), mindfulness (Mindful Emotion Awareness Module), cognitive flexibility (Cognitive Flexibility Module), behavioral avoidance (Countering Emotional Behaviors module) and anxiety sensitivity (Confronting Physical Sensations module). Previous research suggests that each UP module is associated with improvements in its associated aspect of aversive reactivity (Sauer-Zavala et al., 2017) and that these aspects are associated with positive functioning (Ford, Lam, John, & Mauss, 2018; Gallagher et al., 2013; Machell, Goodman, & Kashdan, 2015). We aimed to clarify the associations between changes in the various facets of aversive reactivity and improvements in quality of life.

Materials & methods

Participants

Participants were 70 community-dwelling adults with a range of emotional disorders. On average, participants were 33.74 ($SD=12.64$) years old. The majority of the sample identified as female ($n=47$; 67.1%) and white ($n=49$; 70.0%). Potential participants were deemed eligible if they were 18 years old or older and were determined to have at least one of the following emotional disorders using Diagnostic and Statistical Manual-5 (American Psychiatric Association, 2013) criteria: panic disorder, generalized anxiety disorder, social anxiety disorder, obsessive-compulsive disorder, posttraumatic stress disorder, major depressive disorder, or persistent depressive disorder. Participants were diagnosed using the Diagnostic Interview for Anxiety, Mood, and Obsessive-Compulsive and Related Neuropsychiatric Disorders (DIAMOND), a structured interview conducted by clinical psychology doctoral students who were trained to reliability on the measure. In addition, participants were excluded if their symptoms warranted alternative treatment. Specifically, participants who had experienced one or more manic episodes within the past year, endorsed suicidal ideation with acute intent, met criteria for substance use disorder in the past three months, or exhibited psychotic symptoms were excluded. Participants were asked to refrain from receiving psychotherapy outside of the study protocol and remain on their current dosages of psychotropic medications throughout the study. Participants provided informed consent prior to all research activities. The local university Institutional Review Board approved all study procedures.

Procedures

The parent study of the current analysis was a sequential multiple assignment randomized trial (SMART), in which participants underwent two randomizations (Sauer-Zavala et al., 2022). First, before beginning treatment, participants were randomized to receive the five core UP modules in one of three orders: (1) the standard, published order ($n=26$; 37.1%; Barlow et al., 2018), (2) an order that prioritized the participant's relative skill deficits ($n=21$; 30.0%; compensation condition), or (3) an order that prioritized the participant's strengths ($n=23$; 32.9%; capitalization condition). These modules were delivered as part of once weekly, individual outpatient therapy sessions that were 50 to 60 minutes in duration. Each module consisted of two consecutive sessions except for Countering Emotional Behaviors, which consisted of four consecutive sessions. Study therapists included a licensed clinical psychologist, a post-doctoral fellow, and two clinical psychology graduate students, all of whom were certified in their use of the UP by a co-developer of the treatment (SSZ). Therapists demonstrated high levels of competence with regards to fidelity to treatment protocol and therapeutic skill (Sauer-Zavala et al., 2022).

In the second-stage randomization, which took place following the fifth session, patients were randomly assigned to either discontinue treatment following the sixth session ($n=35$; 50.0%; brief treatment condition) or following the twelfth session ($n=35$; 50.0%; full treatment condition). Due to this randomization, not all participants received all core UP modules. Participants completed major assessments that included a clinician-rated diagnostic assessment (conducted by one of two advanced graduate students certified in the DSM-5 Diagnostic Interview for Anxiety, Mood, and OCD and Related Neuropsychiatric Disorders [DIAMOND; (Tolin et al., 2018) and self-report battery at baseline, after their fifth session, and after the twelfth session (or 12 weeks following their first session for those assigned to the brief treatment condition).

Measures

Demographics

Participants completed a demographics form at baseline. Participants self-reported their age, gender, racial/ethnic background, and family income.

Aspects of Aversive Reactivity

Beliefs about Emotions Scale. The Beliefs about Emotions Scale (BES; Rimes & Chalder, 2010) is a 12-item self-report measure designed to assess the strength of beliefs that experiencing or expressing negative emotions is unacceptable. Items are rated from 0 (*totally disagree*) to 6 (*totally agree*) and summed to calculate a total score. The BES was administered before each session, and BES items exhibited good-to-excellent internal consistency at each session (ω : .89–.95).

Southampton Mindfulness Questionnaire. The Southampton Mindfulness Questionnaire (SMQ; Chadwick et al., 2008) is a 16-item self-report measure designed to

assess nonjudgmental awareness to distressing thoughts or images. Items are rated from 0 (*disagree totally*) to 6 (*agree totally*) and summed to calculate a total score. The SMQ was administered before each session, and SMQ items demonstrated good-to-excellent internal consistency at each session (ω s: .86–.96).

Unified Protocol—Cognitive Skills Questionnaire. The Unified Protocol—Cognitive Skills Questionnaire (UP-CSQ; Sauer-Zavala et al., 2017) is a 7-item self-report measure designed to assess the frequency of cognitive skill use over the past week. Items are rated from 1 (*never*) to 5 (*always or when needed*) and summed to calculate a total score. The UP-CSQ was administered before each session, and UP-CSQ items demonstrated good-to-excellent internal consistency at each session (ω s: .87–.94).

Multidimensional Experiential Avoidance Questionnaire—Behavioral Avoidance subscale. The Multidimensional Experiential Avoidance Questionnaire—Behavioral Avoidance subscale (MEAQ-BA; Gámez et al., 2011) is an 11-item self-report measure designed to assess overt, situational avoidance of distressing emotions or situations. Items are rated from 1 (*strongly disagree*) to 6 (*strongly agree*) and summed to calculate a total score. The MEAQ-BA was administered before each session, and MEAQ-BA items demonstrated excellent internal consistency at each session (ω s: .92–.95).

Anxiety Sensitivity Index. The Anxiety Sensitivity Index (ASI; Reiss et al., 1986) is a 16-item self-report measure designed to assess beliefs about the somatic consequences of anxiety symptoms. Items are rated from 0 (*very little*) to 4 (*very much*) and summed to calculate a total score. The ASI was administered before each session, and ASI items demonstrated good internal consistency at each session (McDonald's ω s: .83–.89).

Quality of Life

The Quality of Life Enjoyment and Satisfaction Questionnaire (Q-LES-Q; Endicott et al., 1993) is a 16-item self-report measure designed to provide an index of global life satisfaction during the past week. Levels of satisfaction in various domains (e.g., physical health, mood, work) are rated from 1 (*very poor*) to 5 (*very good*) and summed to calculate a total score. The Q-LES-Q was administered prior to session 1, prior to session 6, and at the end of the treatment period, and Q-LES-Q items demonstrated good-to-excellent internal consistency at each timepoint (ω s: .84–.91).

Data Analytic Method

We first examined descriptive statistics for our demographics and variables of interest. We compared scores on our primary variables of interest in the current sample to those from a relatively large, unselected undergraduate sample for reference (Sauer-Zavala et al., 2019). We then explored correlations among demographics and variables of interest using *proc corr* in SAS Version 9.4. We planned to include any variables that were significantly correlated with our predictors of interest (i.e., aspects of aversive reactivity) at baseline.

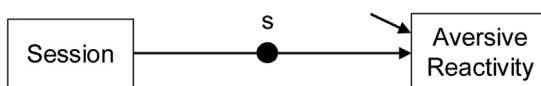
We used hierarchical linear modeling to explore patterns of change in the five aspects of aversive reactivity

and quality of life with *proc mixed* in SAS Version 9.4. We focused on the first six sessions of treatment to enhance the power of our between-person analyses because half of participants were randomized to discontinue treatment after session six. To explore whether aspects of aversive reactivity and quality of life changed during these sessions, we entered session number as a fixed effect predictor of each outcome in separate models. We also entered fixed effects of a dummy-coded indicator variable representing the therapist and a dummy-coded indicator variable representing the sequencing randomization condition to account for these effects. We included a fixed-effects therapist indicator variable rather than a random effect of therapists because modeling four therapists as fixed effects may produce less biased parameter estimates than modeling them as random effects (McNeish & Stapleton, 2016), although we note how this strategy limits the generalizability of our results. We included random intercepts and used an autoregressive lag-1 covariance structure for the residuals, given the temporal nature of these models. Of note, because quality of life was only measured at major assessment time points, the model testing change in quality of life over time did not converge when the repeated measures residual covariance structure was specified. Thus, this model includes random intercepts only. We used restricted maximum likelihood estimation and the Kenward-Roger method to calculate denominator degrees of freedom in all models.

To test the relation between changes in aspects of aversive reactivity and quality of life, we examined five multilevel structural equation models using Mplus Version 7.0 (Muthén & Muthén, 2008-2012). We estimated the latent person-specific slopes of each aspect of aversive reactivity across sessions 1–5 at Level-1 and used these slopes to predict Level-2 residualized change in quality of life ratings at Assessment 2, controlling for quality of life ratings at Assessment 1 (Fig. 1). In line with the HLM models above, we also included dummy-coded indicator variables representing therapist and sequencing condition in the Level-2 part of the model. All models used full information maximum likelihood to account for missing data. Finally, we applied the Benjamini-Hochberg procedure to this family of 11 tests (six HLMs and five SEMs) using a false discovery rate of 5%. Code for all primary analyses is available at: https://osf.io/s9uwf/?view_only=811777e7720749759f54ce0026b96f97.

Of note, three manuscripts have been published and two further manuscripts have been submitted for review using data from this randomized clinical trial. Southward and Sauer-Zavala (2020) described changes in distress aversion subscale of the MEAQ and anxiety in three exemplar participants but did not formally analyze these associations. Hood et al. (2021) compared changes in distress aversion, anxiety, and depression between participants with and without trauma exposure. Southward and Sauer-Zavala (2021a) analyzed how within-person UP skill use predicted session-to-session changes in anxiety and depression. Sauer-Zavala et al., 2022 reported on changes in clinical severity, anxiety, and depression among participants randomized to module-sequencing conditions. Finally, Southward and Sauer-Zavala (2021b) tested whether UP modules exerted similar or differential effects on session-to-session changes in anxiety, depression, and the five aspects of aversive reactivity measured here.

Within-Person (Level-1)



Between-Person (Level-2)

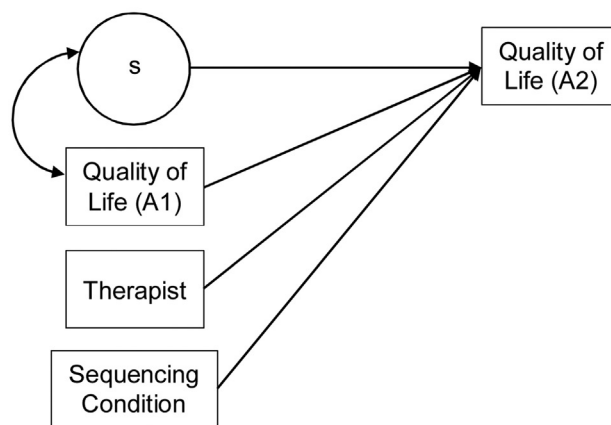


Figure 1 General multilevel structural equation model of changes in aversive reactivity predicting changes in quality of life.

Results

Ten participants failed to report Q-LES-Q scores at Assessment 2 and one participant failed to report Q-LES-Q scores at Assessment 1. There was no other missing data. Participants in the current sample reported significantly higher BES, $t(524.5)=5.96, p < .01, 95\% \text{ CI } [6.78, 13.46], d = .76$; MEAQ-BA, $t(77.3)=3.24, p < .01, 95\% \text{ CI } [1.80, 7.50], d = .48$; and ASI scores, $t(554.5)=2.53, p < .01, 95\% \text{ CI } [.86, 6.80], d = .32$; significantly lower SMQ scores, $t(78.5)=3.69, p < .01, 95\% \text{ CI } [3.25, 10.87], d = .54$; but not significantly

different UP-CSQ scores, $t(79.2)=1.45, p = .15, 95\% \text{ CI } [-.36, 2.30], d = .21$, than the unselected student sample. Demographic characteristics were not significantly related to any aspect of aversive reactivity, $p > .15$ (Table 1). Interestingly, the only aspects of aversive reactivity that were significantly associated with Q-LES-Q scores at baseline were behavioral avoidance, $r = -.25, p = .04$, and cognitive flexibility, $r = .36, p < .01$ (Table 1).

All aspects of aversive reactivity significantly changed during the first six sessions of treatment (Tables S1–S6, Supplemental Online Materials). BES, $B = -1.65, SE = .33$,

Table 1 Means, standard deviations, and correlations among study variables at baseline.

	1	2	3	4	5	6	7	8	9	10
1. Age	–									
2. Gender	.14	–								
3. Racial Background	-.07	-.18	–							
4. Income	.02	-.09	-.02	–						
5. ASI	-.17	-.06	-.02	.01	–					
6. BES	-.06	.17	.05	-.13	.24*	–				
7. MEAQ-BA	-.03	.05	-.05	-.04	.30*	.22	–			
8. SMQ	.09	.12	-.10	-.09	-.46**	-.28*	-.35**	–		
9. UP-CSQ	-.09	.14	.10	.03	-.10	.12	-.27*	.23	–	
10. Q-LES-Q	-.10	< .01	-.06	.36**	-.16	-.17	-.25*	.15	.36**	–
<i>M/n</i>	33.74	47	49	\$50,000-	27.07	43.81	40.29	40.14	22.97	43.01
<i>SD/%</i>	12.64	67.1	70.0	99,999	10.81	11.91	11.48	15.24	5.32	8.64

Gender: female=0, male=1. Racial Background: White=0, non-White=1; MEAQ-BA=Multidimensional Experiential Avoidance Questionnaire-Behavioral Activation; ASI=Anxiety Sensitivity Index; BES=Beliefs about Emotions Scale; SMQ=Southampton Mindfulness Questionnaire; UP-CSQ=Unified Protocol-Cognitive Skills Questionnaire; Q-LES-Q=Quality of Life Enjoyment and Satisfaction Questionnaire. All correlations with Income are Spearman’s ρ .

* $p < .05$.
** $p < .01$.

$p < .01$, 95% CI [-2.32, -.99], MEAQ-BA, $B = -.85$, $SE = .34$, $p = .01$, 95% CI [-1.53, -.17], and ASI scores, $B = -1.90$, $SE = .27$, $p < .01$, 95% CI [-2.45, -1.35] all significantly decreased while SMQ, $B = 1.43$, $SE = .43$, $p < .01$, 95% CI [.58, 2.28] and UP-CSQ scores, $B = .79$, $SE = .15$, $p < .01$, 95% CI [.49, 1.09] significantly increased. Q-LES-Q scores also significantly increased from Assessment 1 to Assessment 2, $B = 3.24$, $SE = .92$, $p < .01$, 95% CI [1.40, 5.08].

Participants with steeper decreases in BES scores, $B = -1.23$, $SE = .42$, $p < .01$, 95% CI [-2.06, -.41], and MEAQ-BA scores, $B = -1.31$, $SE = .49$, $p = .01$, 95% CI [-2.27, -.35]; and steeper increases in SMQ scores, $B = 1.46$, $SE = .59$, $p = .01$, 95% CI [.30, 2.62], demonstrated steeper increases in Q-LES-Q scores during the first-stage randomization (Tables S7–S11). Although in the expected directions, decreases in ASI scores, $B = -1.51$, $SE = .81$, $p = .06$, 95% CI [-3.09, .07], and increases in UP-CSQ scores, $B = 6.20$, $SE = 4.76$, $p = .19$, 95% CI [-3.13, 15.52] were not significantly related to changes in Q-LES-Q scores (Tables S7–S11).

Discussion

The aim of this study was to examine associations between changes in five aspects of aversive reactivity (i.e., non-acceptance of emotions, mindlessness, cognitive rigidity, behavioral avoidance, and anxiety sensitivity) and changes in quality of life during the UP. Consistent with prior research, quality of life significantly improved over the first six sessions of treatment (Gallagher et al., 2013). Furthermore, mindfulness and cognitive flexibility significantly increased, while non-acceptance of emotions, behavioral avoidance, and anxiety sensitivity decreased. Increases in quality of life over the first six sessions of treatment were associated with improvements in non-acceptance of emotions, mindfulness, and behavioral avoidance, marginally associated with improvements in anxiety sensitivity, and not significantly associated with improvements in cognitive flexibility.

Findings suggest a model of relative equifinality, in which improvements in multiple distinct mechanisms of aversive reactivity are similarly related to improvements in quality of life. Specifically, increases in mindfulness and decreases in non-acceptance of emotions and behavioral avoidance were similarly associated with improvements in quality of life over the first half of treatment in line with prior intervention research. In a recent meta-analysis, mindfulness was a key mechanism in the association between mindfulness-based interventions and improvements in quality of life (Gu et al., 2015). Cross-sectionally, experiential avoidance has been related to lower quality of life among people with panic symptoms (Kirk et al., 2019). In a daily diary study, greater levels of experiential avoidance predicted lower positive affect, event enjoyment, and meaning in life (Machell et al., 2015). Finally, positive beliefs about emotions have been shown to be predictive of higher life satisfaction (King & dela Rosa, 2019).

Interestingly, improvements in anxiety sensitivity were only marginally associated with improvements in quality of life and improvements in cognitive flexibility were not significantly associated with improvements in quality of life. Given that quality of life encompasses multiple broad

domains, it is possible that anxiety sensitivity and cognitive flexibility are more narrow constructs than behavioral avoidance, non-acceptance of emotions, and mindfulness (Sauer-Zavala et al., 2017). Alternatively, improvements in quality of life may indicate a greater openness to emotional experiences that is more strongly indicated by approach- and acceptance-based constructs. We encourage future researchers to continue investigating the nomological network of aspects of aversive reactivity and quality of life.

This study extends previous findings regarding the efficacy of the UP for reducing symptoms of emotional disorders by providing support for the UP's role in improving aspects of aversive reactivity and quality of life. The finding that improvements in several aspects of aversive reactivity were associated with improvements in quality of life suggests that the UP may exert relatively broad effects, both on transdiagnostic mechanisms and positive psychological functioning. Clinically, improvements in patients' reactions to their emotions, especially those that are approach- and acceptance-based, may be useful indicators of improvements in their quality of life. It is also possible that the inverse relation is true: improvements in quality of life (which may be influenced by symptom change or other therapeutic mechanisms) may indicate improvements in patients' reactions to their emotions). We encourage future researchers to test the temporal relations between these constructs to determine if one set of constructs precedes and predicts the other (Southward & Sauer-Zavala, 2020).

Our findings should be interpreted in light of the study's limitations. First, given that assessments of aversive reactivity and quality of life were made over the same time period, we cannot determine a causal effect between them. By measuring these variables more frequently, future researchers may be better able to establish temporal precedence and generate causal conclusions about the relation between quality of life and the facets of aversive reactivity. Second, it is possible that several variables such as symptom change, therapeutic alliance, and homework completion simultaneously influenced changes in quality of life and the aspects of aversive reactivity. Third, our results pertain to the first six sessions of the UP, rather than the full treatment protocol, limiting their generalizability, and highlighting more immediate changes in these constructs early in treatment. Fourth, whereas measures of aversive reactivity were administered prior to each therapy session, the Q-LES-Q was administered only at baseline, after session 5, and at the end of treatment. As such, quality of life could only be analyzed at two time points rather than at every session. Future research should prioritize the analysis of session-by-session changes in aversive reactivity and quality of life. Lastly, not all participants received all 5 UP modules. Although each module is thought to act on a specific target mechanism, the transdiagnostic nature of the UP promotes broad and general effects across a range of domains and outcomes. Emerging evidence suggests that the UP modules can influence module-specific change processes in a generalized, rather than unique manner (Southward & Sauer-Zavala, 2022). Thus, while patients may not have been presented with each UP module by session 6, it is likely that the modules taught to them by this stage in treatment exerted influences on not only their target outcomes, but on the general constructs of aversive reactivity overall.

To our knowledge, this is the first study to examine associations between unique aspects of aversive reactivity and quality of life in the UP. We found that improvements in non-acceptance of emotions, mindfulness, and behavioral avoidance were significantly linked to increases in quality of life, whereas improvements in anxiety sensitivity and cognitive flexibility were not significantly associated with improvements in quality of life. These results replicate previous findings showing that the UP is efficacious for improving quality of life as well as emotional disorder symptoms, highlighting its utility as a transdiagnostic treatment.

Disclosure of interest

Shannon Sauer-Zavala receives royalties from Oxford University Press in her role as an author of the Unified Protocol. Sohayla A. Elhusseini, Lauren E. Cravens and Matthew W. Southward declare that they have no competing interests.

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Appendix A. Supplementary data

Supplementary data associated with this article can be found, in the online version, at <http://doi.org/10.1016/j.jbct.2021.12.001>.

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