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Michelle R. Woidneck
Utah State University

Kate L. Morrison
Utah State University

Michael P. Twohig
Utah State University

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Michelle R. Woidneck

Kate L. Morrison

Michael P. Twohig

Utah State University

Contact Information:

Michael P. Twohig, Ph.D.

Associate Professor

Utah State University, Department of Psychology

2810 Old Main Hill, Logan, Utah 84322-2810

Phone: (435) 797-1402

Fax: (435) 797-1448

E-mail: michael.twohig@usu.edu

Abstract

The number of individuals who meet diagnostic criteria for posttraumatic stress disorder (PTSD) is a small percentage of those exposed to trauma; many youth who do not meet criteria for PTSD continue to experience problematic posttraumatic stress (PTS) symptomology. Acceptance and commitment therapy (ACT) has shown preliminary effectiveness in the treatment of adult PTSD, but its effectiveness in treating PTS in youth is unknown. Using a multiple-baseline design, this study investigated the effectiveness of 10-weeks of ACT to treat PTS in youth. Four adolescents from a community sample and three adolescents from a residential sample participated. The Clinician Administered PTSD Scale for Children and Adolescents, Child PTSD Symptom Scale, and Comprehensive Quality of Life Scale were completed at pretreatment, posttreatement, and 3-month follow-up. Individuals reported baseline data for 7 to 66 days. Symptom and process measures were completed at each session. Results revealed a decrease in PTS symptomology across both samples with mean reductions in self-reported PTS symptomology at posttreatment of 69% and 81% for the community and residential samples, respectively, and an overall 68% and 84% respective reduction at follow-up. Reductions in clinician rated measures of PTSD were observed for all participants with mean reductions of 57% and 61% in the community and residential samples at posttreatment, and 71% and 60% at follow-up, respectively. Results provide preliminary support for ACT as a treatment for adolescent PTS. Empirical and clinical implications as well as limitations and future directions are discussed.

Key Words: Acceptance and Commitment Therapy; Posttraumatic Stress; PTSD; Treatment

Acceptance and Commitment Therapy for the treatment

of posttraumatic stress among adolescents

More than 25% of youth in the United States are exposed to at least one traumatic event

by the age of 16 (Costello, Erkanali, Fairbanks, & Angold, 2002). The prevalence of

posttraumatic stress disorder (PTSD) among youth, however, has been found to be lower, with 6-

month prevalence estimates around 3.7% for boys and 6.3% for girls (Kilpatrick et al., 2003).

Thus, the majority of individuals exposed to traumatic events never go on to meet criteria for

PTSD. However, the *Diagnostic and Statistical Manual of Mental Disorders-TR* (DSM-IV-TR)

diagnostic criteria for PTSD does not currently differ between adolescents and adults, and the

applicability of the DSM's criteria to youth is questionable (American Academy of Child and

Adolescent Psychiatry [AACAP], 2010). Many children and adolescents who are exposed to

trauma develop clinically significant posttraumatic stress (PTS) symptomology, but do not meet

the full diagnostic criteria for PTSD. Nevertheless, research indicates that these individuals

experience functional impairments comparable to those who do meet diagnostic criteria for

PTSD (Carrion, Weems, Ray, & Reiss, 2002; Giaconia et al., 1995). In children and adolescents,

the intensity of avoidance and distress to exposure cues is predictive of functional impairment

while the frequency of these symptoms is not. Other symptoms, such as exaggerated startle, are

predictive of a PTSD diagnosis but not functional impairment. Thus, youth with subthreshold

criteria for PTSD do not differ significantly from youth meeting full diagnostic criteria with

regard to impairment and distress (Carrion, Weems, Ray, & Reiss, 2002). Throughout this paper,

PTS is used to include both individuals meeting the PTSD diagnostic criteria as well as

individuals who fall in the subtreshold criteria but continue to experience clinically significant distress and functional impairment.

Ample research has demonstrated a positive relationship between youth exposed to traumatic event(s) and emotional and behavioral difficulties. For example, longitudinal research has shown that youth who have been exposed to trauma developed significantly more internalizing problems such as anxiety, simple phobias, social phobias, and/or depression; externalizing problems such as aggression, oppositionality, and/or disruptive behavior; alcohol and/or drug dependence, increased suicidality and suicide attempts, greater interpersonal impairment, poorer academic achievement, and decreased physical health and more somatic complaints (Giaconia et al., 1995). Further, youth who were exposed to trauma but did not meet full criteria for PTSD were equally as likely to experience poorer academic achievement, suicidality and suicide attempts, drug and/or alcohol dependence, and decreased physical health as individuals who met diagnostic criteria for PTSD. Similarly, a 10-year longitudinal study with 1,420 youth between the ages of 9 and 16 (Copeland, Keeler, Angold, & Costello, 2007) found that 20.4% of youth previously exposed to one traumatic event and 49.6% of youth exposed to two or more events reported impairment of some kind, including disruption of relationships, school problems, physical problems, and/or increased emotional problems (i.e., anxiety disorders, depressive disorders, or disruptive behavior disorders). Further, individuals exposed to trauma had almost double the rates of psychiatric disorders compared to those who never had been exposed to trauma, with the lifetime occurrence of anxiety, depressive, and disruptive behavior disorders for this sample being 9.6%, 12.1%, and 19.2%, respectively.

Additionally, some adolescent research suggests the presence of a dose-dependent

relationship between trauma exposure and development of psychiatric disorders. For example,

the risk of developing PTSD has been found to become increasingly higher following exposure

to each traumatic event (e.g., Cougle, Resnick, & Kilpatrick, 2009), and higher rates of anxiety,

depressive, and disruptive behavior disorders have been found among adolescents with higher

incidents of trauma exposure (Copeland et al., 2007). Additionally, children and adolescents

who have been exposed to violence and/or abuse have an elevated statistical risk for

revictimization (Classen, Palesh, & Aggarwal, 2005), and the negative impact of trauma can be

long term and is related to multiple negative outcomes in young adulthood (McGloin & Widom,

2001). Among adults, PTSD symptomology is also associated with disruptions in work, social

functioning, and physical health (e.g., Westphal et al., 2011). Such problems can be costly, and

in fact, PTSD has been suggested to be the most costly anxiety disorder in terms of per person

health care expenditures (Greenberg et al., 1999).

In general, cognitive behavioral therapy (CBT) currently possesses the most empirical

support for treatment of childhood/adolescent PTS and PTSD (AACAP, 2010). In a recent meta-

analysis, Silverman et al. (2008) evaluated the effectiveness of 21 methodologically rigorous

RCTs investigating the efficacy of various treatments for youth exposed to traumatic events.

Results revealed that trauma-related therapies possessed an overall effect size of $d = 0.43$ on PTS

symptoms, with type of treatment and type of trauma targeted moderating the treatment effect.

CBT interventions possessed a greater overall effect size ($d = 0.50$) than non-CBT interventions

($d = 0.19$), and treatments that targeted sexual abuse had a greater effect ($d = 0.46$) on PTS

symptoms than treatments that targeted other types of traumas (e.g., physical abuse, neglect,

motor vehicle accidents; $d = 0.38$). Parental involvement was also investigated, and in this meta-

analysis, a parent's involvement in the child's therapy did not significantly impact the treatment effect on PTS symptom reduction. Results also indicated that Trauma-Focused CBT (TF-CBT) met Chambless and colleagues' (1998) criteria for classification as a *well-established treatment,* and School-Based Group CBT was identified as a *probably efficacious treatment*.

While effective treatments for PTSD among youth currently exist, they are not without limitations. First, a number of treatments fall under the label of TF-CBT, and although some purport that there are certain core components to treatments considered TF-CBT, the content and emphasis of individual interventions show considerable variations. For example, a TF-CBT program used by King et al. (2000) placed a large emphasis on exposure, with 70% of the sessions dedicated to graded exposure, while another TF-CBT program used by Cohen and Mannarino (1996) placed a larger emphasis on cognitive reframing, contingency reinforcement, and problem solving. Similarly, the way in which specific techniques are used across programs varies. For example, to target emotional regulation, Cohen and Mannarino (1998) used thought replacement, positive imagery, and relaxation; King et al. (2000) trained the children/adolescents in cue-controlled and differential relaxation and provided them with personalized relaxation tapes to practice with outside of sessions; and Deblinger et al. (1996) taught children to express their emotions more appropriately through verbal, written, or artistic methods. Additionally, the labels used by investigators have varied widely (e.g., Child Cognitive Behavioral Therapy; Cognitive Behavioral Therapy; Sexual Abuse Specific Cognitive-Behavioral Therapy; Child Cognitive-Behavioral Treatment and Family Therapy; etc.) making it difficult to indentify which therapies fall under the classification of TF-CBT and which do not. The length of interventions

has also varied greatly, ranging from a single 30-minute intervention to 25 hours over the course of 30 weeks.

Furthermore, the majority of RCTs have also focused on a specific type of trauma rather than PTS following exposure to trauma generally. Roughly half of the RCTs to date have focused on children who had been sexually abused. Youth who have been sexually abused may be a unique population for a number of reasons. Sexual abuse is likely to occur in the context of the family, is purposeful, and there is a high likelihood of repeated incidents of abuse (Ramchandani & Jones, 2003). Additionally, other factors have been shown to be related to sexual abuse, including high rates of parental conflict, parental psychopathology, and poor parent-child relationships that are not necessarily related to other types of trauma (Fergusson, Lynskey, & Horwood, 1996). Factors such as these make sexual abuse victims a unique population, and therefore the generalizability of treatments effective with this population to individuals exposed to other types of traumas cannot be assumed. Overall, the differences across interventions make it difficult to draw general conclusions about TF-CBT and also make it impossible to discern what treatment components are responsible for change and which components do not provide any additional benefit.

Attrition is also problematic among trauma-specific therapies among youth, with 48% to 62% no-show rates for initial intake appointments, and 25% to 60% of children and families dropping out of treatment prematurely (Sprang et al., 2012). Additionally, between 16% to 40% of youth diagnosed with PTSD at pretreatment continue to meet the diagnostic criteria for PTSD at posttreatment (e.g., Cohen, Mannarino, & Knudsen, 2005; King et al., 2000). Although the

field has made progress in the treatment of PTS and PTSD among youth, it seems evident that

additional research into this area is warranted.

As indicated in the diagnostic criteria for PTSD, avoidance of trauma reminders, either

internal or external, is central to the diagnosis of PTSD (American Psychiatric Association,

2000). Additionally, experiential avoidance, defined as an unwillingness to experience painful or

aversive internal events combined with attempts to control or inhibit such events, has been

shown to be predictive of PTS and PTSD symptomology among both adults (e.g., Plumb, Orsillo,

& Luterek, 2004) and adolescents (e.g., Shenk, Putnam, & Noll, 2012). Further, some data have

started to emerge supporting the negative relationship between mindfulness and PTSD symptom

severity (Thompson & Waltz, 2010). Given the limitations among existing research, the

centrality of avoidance to PTS and PTSD pathology, and the potential role of mindfulness in PTS

severity, acceptance and mindfulness-based interventions, including acceptance and commitment

therapy (ACT; Hayes, Strosahl, & Wilson, 1999), are worthy of investigation as a treatment for

PTS/PTSD.

ACT is an empirically based psychological intervention that has shown effectiveness in

the treatment of a number of concerns among adults (e.g., Hayes, Luoma, Bond, Masuda, &

Lillis, 2006; Powers, Zum Vörde Sive Vörding, & Emmelkamp, 2009) and may be beneficial in

the treatment of PTS and PTSD among young people. ACT focuses on the utility and function of

psychological experiences such as thoughts, feelings, memories, and physiological sensations,

and pursuing meaningful life activities regardless of their presence. ACT uses various behavioral

and experiential techniques to target six core processes with the aim of creating change that will

allow individuals to function with their traumatic memories in a way that is more personally meaningful and values driven, also known as psychological flexibility.

ACT has been shown to effectively treat a number of concerns among adolescents and adults (Murrell & Scherbarth, 2006; Powers et al., 2009), but no large studies investigating the effectiveness of ACT as a treatment for PTS or PTSD currently exist. Four case studies have shown preliminary support for the use of ACT as a treatment of PTSD in adults (Codd, Twohig, Crosby, & Enno, 2011; Orsillo & Batten, 2005; Twohig, 2009) and late-adolescence/young-adulthood (Batten & Hayes, 2005). Further, research suggests individuals who attempt to avoid or suppress distressing trauma-related thoughts experience both an increase in the frequency of these thoughts (Shipherd & Beck, 2005) and greater PTS symptom severity generally (Cameron, Palm, & Follette, 2010). ACT aims to target such cognitive and emotional avoidance, and thus theoretically makes sense as a potentially effective treatment for PTS.

The purpose of this study was to test whether ACT is an effective treatment for adolescents who experience clinically significant PTS symptomology. Specifically, this study investigated ACT's influence on behavior change, quality of life, and severity of PTS and PTSD related symptoms. The acceptability of ACT as a treatment for youth with PTS as well as ACT's impact on its presumed processes of change were also investigated. It was predicted that 10 weeks of ACT would be related to a decrease in the severity of PTS/PTSD symptomology, a decrease in avoidant behavior/an increase in values-driven behavior, and therefore an increase in reported quality of life. Additionally, it was predicted that treatment would be related to a decrease in experiential avoidance and would be rated as an acceptable treatment.

Method

This study utilized two (community and residential) nonconcurrent multiple baseline across participants designs to examine the effect of ACT on the frequency and severity of PTS symptomology and to control for the effects of the passage of time, testing, and contact.

Participants and Setting

Participants were eligible to enroll if they were 12 to 17 years of age, had experienced a traumatic event as defined by the DSM-IV, and continued to experience significant distress and/or functional interference within their lives, as indicated by a rating of 2 or higher on the global severity rating on the Clinician Administered PTSD Scale for Children and Adolescents (CAPS-CA; i.e., moderate severity; definite distress or functional impairment but functions satisfactorily with effort). Fourteen of the 29 individuals that contacted the study were eligible for an intake to determine eligibility. Of the 10 that met eligibility requirements, three participants dropped out (i.e., time constraints, familial obligations, discomfort discussing trauma), and one was an early responder and chose to end treatment prematurely (still completed post and follow-up measures).

All assessment and treatment procedures were conducted by a trained graduate student therapist. The community participants completed all assessment and treatment procedures in therapy rooms within a university research laboratory. The residential participants completed all assessment and treatment procedures within the residential treatment facility. A summary of participants is provided in Table 1.

Measures

Daily self-monitoring. The primary outcome variable was based on the diagnostic criteria for PTSD and the amount of distress and interference associated with PTS

symptomology. This specific measure was created for this study because daily reporting that was the same for all participants was needed. Participants recorded their daily subjective rating in five areas on a scale from 0 to 10, with 10 indicating higher frequencies, distress, and/or interference. The specific areas were a) daily avoidance, b) reexperiencing, c) arousal symptoms, d) how distressing these symptoms were, and e) how much the symptoms interfered with daily functioning. Example questions include: rate how often you deliberately avoided things associated with your past traumatic experiences or avoided doing things that may remind you of your past trauma(s); rate how frequently you experienced recurring, unwanted and/or upsetting thoughts or memories of your past traumatic experience(s). This includes upsetting dreams/nightmares related to the events and/or feeling as if you were reliving the event. Personalized examples and specific behaviors that would fall into each of the categories were discussed with the examiner at the end of the pretreatment interview and were based on client-specific concerns. Self-monitoring of anxiety symptoms has been used routinely in single-subject research with adolescents (e.g., Armstrong, Morrison, & Twohig, 2013) and is considered to be a valid, reliable, and accurate system of measurement when conducted properly (Jackson, 1999; Korotitsch & Nelson-Gray, 1999). Results were reported to the researcher via the Internet using individual online login IDs or using a paper tracking form that was returned to the experimenter each week. The scores from these five questions were summed (for a total score of 0-50).

Clinician Administered PTSD Scale for Children and Adolescents. The Clinician Administered PTSD Scale for Children and Adolescents (CAPS-CA; Newman et al., 2004) is a 33-item structured interview used to assess PTSD diagnostic status, and symptom frequency and intensity for youth aged 8 to 18 years. The CAPS-CA produces a global severity rating from 0 to

4 (0 = asymptomatic; 1 = mild/minimal distress or functional impairment; 2 = moderate/definite

distress or functional impairment but functions satisfactorily with effort; 3 = severe/considerable

distress or functional impairment, limited functioning even with effort; 4 =

extreme/incapacitating distress or pervasive impairment), and an overall score ranging from 0 to

136 based on the frequency and severity of each of the 17 diagnostic criteria for PTSD. Overall

scores of 20 to 39 fall within the mild PTSD/subthreshold range, while scores of 40 or greater are

clinically significant. The CAPS-CA is a valid and reliable measure of childhood PTSD,

evidenced by strong internal consistency (α = 0.82-0.89), convergent validity indicators, and

inter-rater reliability (*r* = 0.80-1.00; Harrington, 2009).

Child PTSD Symptom Scale. The Child PTSD Symptom Scale (CPSS; Foa, Johnson,

Feeny, & Treadwell, 2001) is a 24-item self-report measure that assesses PTSD related

symptoms and severity in individuals between 8 and 18 years of age. It includes 17 symptom

items and 7 functional impairment items. The CPSS yields a total symptom severity scale score

(ranging from 0-51) and a total severity-of-impairment score (ranging from 0-7). A score greater

or equal to 11 was established as a clinical cutoff score (Foa et al., 2001). The CPSS has

adequate internal consistency (α = .89) and high convergent validity (*r* = .80; Foa et al., 2001).

Comprehensive Quality of Life Scale—Student Version. The Comprehensive Quality

of Life Scale—Student Version (ComQol—S5; Cummins, 1997) is a self-report measure that

assesses subjective and objective quality of life on seven life domains: material well-being,

health, productivity, intimacy, safety, community, and emotional well-being. Objective and

subjective quality of life (Qol) scores are obtained. The objective domains comprise culturally-

relevant measures of objective well-being. The subjective domains comprise domain satisfaction

weighted by their importance to the individual. The objective and subjective scales have been validated independent of one another. The ComQol—S5 has adequate test-retest reliability (r > .73) and good content and construct validity (Cummins, 1997). The ComQol-S5 has been validated with individuals ages 12-18.

Avoidance and Fusion Questionnaire for Youth. The Avoidance and Fusion Questionnaire for Youth (AFQ-Y; Greco, Lambert, & Baer, 2008) is a 17-item self-report measure that assesses experiential avoidance and cognitive fusion in youth. Scores range from 0-68, with higher scores indicating higher levels of experiential avoidance and fusion. Internal consistency of the AFQ-Y is high ($\alpha = .90$), and moderate correlations in expected directions were found between the AFQ-Y and measures acceptance and mindfulness, thought suppression, anxiety, problem behavior, and quality of life (Greco et al., 2008).

Treatment Evaluation Inventory–Short Form. The Treatment Evaluation Inventory–Short Form (TEI-SF; Kelley, Heffer, Gresham, & Elliot, 1989) is a 9-item self-report measure of treatment acceptability. Two items do not apply to the population in question and were omitted. The 7-item modified version has been used previously (e.g., Twohig et al., 2010). The original TEI-SF instrument has high internal consistency ($\alpha = .85$) and a reliable factor structure (Kelly et al., 1989). Participants rate each item on a 5-point likert scale; total scores over 21 indicate greater acceptability than unacceptability of the intervention.

Procedures

Potential participants were recruited using multiple methods throughout the community (i.e., flyers, paid newspaper and radio advertisements, local and campus newspaper stories on the study, contacted local mental and medical health providers, contacted local school counselors

and psychologists). Recruitment was extended to a local residential treatment facility for adolescent girls with eating disorders due to a low response rate from the community recruitment. Thus, the final sample for this study consisted of four participants from the community and three participants with comorbid eating disorders who were residing within a residential treatment facility.

Parents and children were initially screened by phone when they contacted the study. If basic eligibility requirements were met (e.g., age, seeking services for PTS/PTSD), the pretreatment assessment was scheduled. Parents and children attended the 2-hour pretreatment assessment where they signed an informed consent and assent. Confidentiality and reporting obligations outlined within the informed consent/assent forms were also explicitly covered. Participants completed all assessments (see Measures) at the time of intake (pretreatment) including a structured interview with the adolescent using the CAPS-CA to assess for presence of PTS or PTSD eligibility and to gather background information and present difficulties. If the participant was eligible, paper copies of the daily self-monitoring measure and/or online login information were given along with verbal instructions for completion and reporting. Self-monitoring began at the time of the initial intake and lasted throughout the duration of the study. A minimum of five, stable PTS baseline data points and a reduction in the previous participants' PTS symptomology (unless first participant) were required before a participant could enter the treatment phase of this study. Ten individual weekly 1-hour session of ACT (see Treatment) began at the end of the baseline phase, which ranged from 7 to 66 days following pretreatment. The AFQ-Y and CPSS were given at all treatment sessions and self-monitoring continued through all phases of the experiment. One week after the final session (posttreatment), and three

months after the final session (follow-up) all measures were given again. However, the TEI-SF was only administered at posttreatment.

Treatment

The protocol in the present study was a modified protocol created from pre-existing treatment manuals for a different adolescent (Armstrong et al., 2013) and adult anxiety disorder (Twohig et al., 2010), and supplemented from a manual specifically developed for PTSD in adults (Walser & Westrup, 2007). The goals of this treatment protocol were: a) to decrease the use of experiential avoidance strategies, b) to help the client determine effective strategies for responding to trauma related symptoms, c) to practice using these strategies outside of session, d) to gradually decrease distress associated with trauma related symptoms, and e) increase occurrence of identified, meaningful life activities. A more thorough summary of the treatment is provided in Table 2. Additionally, a copy of the treatment manual is available from the corresponding author.

Treatment Adherence

All treatment sessions were either video or audio recorded to monitor treatment integrity. Twenty percent of the tapes were scored for treatment integrity by an independent graduate student researcher who was trained to competence in coding procedures and ACT processes. Treatment adherence was assessed using a standardized treatment integrity scoring system that has been used in previous ACT research (Armstrong et al., 2013; Twohig et al., 2010). The sessions reviewed were selected randomly but systematically so that of the ten total sessions, two sessions from each participant (only one session for C2 because she attended only three sessions) and at least one of each session number were reviewed. Thirteen total sessions were reviewed.

Two recordings of sessions 1, 2, and 3, and one incident of sessions 4 through 10 were reviewed. If two tapes of a session were scored the scores were averaged so that each session is represented only once in these averages. Using a partial interval scoring system (one minute blocks) for the entire recorded sessions, across all intervals coded, processes occurred the following percent of the sessions (with overlap occurring): acceptance/willingness = 39%, defusion = 9%, self-as-context = 2%, present moment awareness = 12%, values = 16%, and committed action = 15%. General assessment was coded in 35% of intervals. ACT-inconsistent elements were not endorsed in any session; however, ACT-consistent exposure activities (occurring within session) occurred in 0.6% of the intervals. Three of 13 (23%) sessions were independently scored by a second rater (MPT) to assess the fidelity of the initial ratings. Across all intervals scored, there was agreement in greater than 98% of intervals, thus showing high validity of the initial rater. Averaged across all coded sessions, "therapist competency" was rated as M = 4.8 and "adherence to the ACT model" was rated as M = 4.7 by the primary rater, on a 0 to 5 point scale with 5 being the highest score. There was 100% agreement for therapist competency and adherence to ACT model between the two raters.

Results

The primary dependent variable for this investigation was the PTS-related symptoms based on self-monitoring. Total daily PTS symptom scores for all participants are presented in Figure 2. Individuals' data across all time periods are displayed in Table 3. Posttreatment means were calculated using the last seven days of self-reported PTS symptomology (generally occurring the week after the last treatment session and week prior to posttreatment assessment).

Community Participants

Community Participant 1. During his 8-day baseline, C1 had a mean total PTS score of 35.8 ($SD = 6.6$), with a range from 26 to 45. C1 showed a high degree of variability throughout the course of treatment. C1 attributed this to days in which he had visitation with his father, as this was a stressful experience for him. At posttreatment, C1 exhibited an 81.3% ($M = 6.7$, $SD = 5.0$) reduction in PTS symptomology, which was maintained to a lesser degree at follow-up (55.3% reduction; $M = 16.0$, $SD = 9.4$). C1 no longer met diagnostic criteria for PTSD at posttreatment or follow-up.

Community Participant 2. Baseline lasted 20 days for C2. During this time, C2's total self-reported PTS symptomology ranged from 29 to 32 ($M = 30.4$, $SD = 1.3$). C2's PTS symptomology declined sharply once treatment began, which was maintained with moderate variability throughout the course of treatment. C2 opted to discontinue treatment after session 3 because she felt like she was doing better, felt as if she was too busy to continue participation, and did not believe there would be continued benefit from additional participation in treatment. C2's mean total PTS ratings represented a 75% decrease in PTS symptomology compared to pretreatment ($M = 7.5$, $SD = 3.4$). At follow-up, C2 exhibited further improvement in PTS symptomology, with an overall reduction of 92.3% in PTS symptomology compared to pretreatment ($M = 2.2$, $SD = 3.0$). C2 continued to meet diagnostic criteria for PTSD at posttreatment but no longer met criteria at follow-up.

Community Participant 3. C3 remained in the baseline phase for 62 days and reported a mean total PTS score of 12.5 ($SD = 5.9$, range = 8 to 26). C3 did not meet diagnostic criteria at pretreatment, as she did not possess enough hyperarousal symptoms. At the time of

posttreatment, C3 exhibited a 99% decrease in total PTS symptomology ($M = 0.1$, $SD = 0.4$). At follow-up he maintained a 92% decrease in this symptomology ($M = 1.0$, $SD = 2.2$).

Community Participant 4. During her 66 days of baseline, C4 had a mean PTS total score of 14.8 ($SD = 8.9$), with ranges from 5 to 29. PTS symptomology decreased dramatically at the time of her fourth self-report, 23 days into baseline. Her reported scores remained lower throughout the rest of the baseline period. C4's total PTS symptomology decreased by 19% at posttreatment ($M = 12.0$, $SD = 4.4$). She exhibited even further improvement at follow-up, with a decrease in PTS symptomology of 32% ($M = 10.0$, $SD = 0.7$). C4 no longer met diagnostic criteria for PTSD at posttreatment or follow-up. At the time of posttreatment, C4 admitted to refusing to complete PTS daily ratings and/or intentionally underreporting daily ratings throughout the baseline and early phases of treatment as a way to instigate her mother. Retrospectively, C4 said she would have rated her overall trauma-related distress at the start of treatment at a 7.5 on a scale from 0 to 10, with 10 indicating higher levels of symptomology. At posttreatment she rated her general level of trauma-related distress at a 4. Given C4's reported manipulation, her self-reported symptomology and functioning should be interpreted cautiously.

Residential Participants

Residential Participant 1. During her seven days of baseline, R1 had a mean PTS total score of 24.1 ($SD = 6.1$), with ranges from 17 to 33. R1 did not meet diagnostic criteria for PTSD at pretreatment, as she did not possess adequate hyperarousal symptoms. R1's total PTS symptomology decreased by 78% at posttreatment ($M = 5.3$, $SD = 4.0$), which was maintained at follow-up (77% reduction compared to baseline; $M = 6.1$, $SD = 3.8$).

Residential Participant 2. Baseline lasted 35 days for R2. R2's total self-reported PTS symptomology ranged from 34 to 46 ($M = 40.9$, $SD = 3.6$). R2's PTS symptomology declined quickly once treatment began, followed by consistent and gradual decline and moderate variability throughout treatment. R2's posttreatment mean total PTS represented a 98% decrease from baseline ($M = 0.7$, $SD = 0.8$), and her follow-up PTS score represented a 91% decrease compared to baseline ($M = 3.5$, $SD = 0.5$). R2 no longer met diagnostic criteria for PTSD at posttreatment or follow-up.

Residential Participant 3. R3 remained in the baseline phase for 43 days, and reported a mean total PTS score of 28.9 ($SD = 7.9$, range from 16 to 50). PTS scores increased slightly during the first part of baseline and then decreased slightly during the second half of baseline, and spiked once more immediately before treatment. During the first half of baseline, R3 was approaching the 1-year anniversary of her mother's death, which was the trauma being targeted in treatment and explains this increase in symptomology. R3 also reported increases in symptomology around the 18th of each month, as this is the day her mother passed away. Thus, the pattern seen during baseline is representative of this cyclical pattern, with a more dramatic increase the days leading up to the 1-year anniversary. At the time of the postassessment, R3 exhibited a 65.4% decrease in total PTS symptomology ($M = 10$, $SD = 0.0$). She no longer met diagnostic criteria for PTSD at posttreatment. Unfortunately, R3's functioning at follow-up could not be attained.

Summary of Outcome Results

Community Sample. As a whole, the overall percent reduction in total self-reported PTS symptomology for the community sample was 69% at posttreatment and 68% at follow-up. The

overall percent reduction in trauma related symptoms according to the CPSS was 63% at posttreatment and 70% at follow-up. Reductions in CAPS-CA scores were observed for all participants from pretreatment to posttreatment (average reduction of 57%), and these results were maintained at follow-up (average reduction of 71%). At posttreatment, three participants exhibited clinically meaningful change, indicated by a reduction of 15 or more points on the CAPS-CA. At the time of follow-up, however, all participants exhibited clinically meaningful change on the CAPS-CA. Additionally, three of the participants were below the clinical range for PTS symptomology at posttreatment, as indicated by an overall CAPS-CA score below 40. One of these three participants, however, fell in the mild/subthreshold range for PTS symptomology, as indicated by an overall CAPS-CA score that fell between 20 and 39. The fourth participant was above the clinical range for PTS symptomology at posttreatment. This participant was the individual who discontinued treatment prematurely. At follow-up, however, no participants fell above the clinical range. The participant who fell in the mild/subthreshold range from PTS symptomology continued to fall in this range at follow-up. All participants rated the treatment as acceptable, indicated by TEI-SF scores greater than 21 for all participants, with an average TEI-SF score of 30.

Residential Sample. As a whole, the overall percent reduction in total self-reported PTS symptomology was 81% at posttreatment ($N = 3$) and 84% at follow-up ($N = 2$). The overall percent reduction in trauma related symptoms according to the CPSS was 59% at posttreatment and 57% at follow-up. Reductions in CAPS-CA scores were observed for all participants from pretreatment to posttreatment (average reduction of 61%), and these results were maintained for participants who were able to be contacted at follow-up (average reduction of 60%). At

posttreatment two participants exhibited clinically meaningful change on the CAPS-CA. The individual who did not exhibit clinically meaningful change at posttreatment did exhibit such change by the time of follow-up. All three participants fell below the clinical range for PTS symptomology at posttreatment according to the CAPS-CA. One participant, however, fell in the mild/subthreshold range for PTS symptomology and continued to fall in this range at follow-up according to the CAPS-CA. All participants rated the treatment as acceptable, indicated by TEI-SF scores greater than 21 for all participants, with an average TEI-SF score of 27.

Psychological Process of Change Results

Changes in experiential avoidance/psychological flexibility were also investigated. Figure 2 shows weekly ratings on the measure of ACT processes (AFQ- Y) alongside changes in PTS symptom totals. Taken together, three of four community participants and all three residential participants showed process changes in expected directions throughout the course of treatment, with an average reduction on the AFQ-Y of 65% for the community sample and 57% for the residential sample from pre- to post-treatment and an average reduction of and 56% for the community sample and 42% for the residential sample from pretreatment to follow-up. These results indicate that engagement in ACT was related to decreases in experiential avoidance and increases in psychological flexibility.

Discussion

This study provides preliminary support for the effectiveness of a 10-session ACT protocol to treat adolescents with PTS. A multiple-baseline across participant design was utilized with two separate adolescent samples: a community sample and a residential sample with comorbid eating disorders. All participants showed large decreases on the main dependent

variable, daily ratings of PTS symptomology, and these results were maintained at follow-up.

Reductions in CAPS-CA scores at posttreatment and follow-up were seen, indicating decreases

in the frequency and severity of PTS symptoms. Slight increases in quality of life were seen. Six

of the seven participants showed positive changes in psychological flexibility between

pretreatment and posttreatment, with all participants who completed the assessments showing

changes by follow-up. Additionally, all participants reported that the intervention was acceptable

via standardized measure.

Results of this study are encouraging and possess both empirical and clinical implications.

The literature base of ACT as a treatment for children and adolescents is in its infancy compared

to the research that has been conducted on ACT for adults. To date only two published

randomized trials on ACT with youth exist: a pilot study for adolescents with depression (Hayes,

Boyd, & Sewell, 2011) and one for adolescents with chronic pain (Wicksell, Melin, Lekander, &

Olsson, 2009), both of which found ACT to be an effective treatment for the selected population.

This study represents the first in the area of ACT for adolescent anxiety generally and PTS

specifically, and the reductions in PTS symptomology were comparable to those found in TF-

CBT (e.g., Cohen et al., 2005; Vandervord Nixon, Sterk, & Pearce, 2012). Further, this study

supports ACT as an effective treatment not only for adolescents with PTS but also for

adolescents with PTS and comorbid conditions, including comorbid eating disorders.

Additionally, in this study, ACT was effective for individuals who experienced different

types of traumatic events (i.e., exposure to violence, sexual abuse, physical abuse, traumatic loss,

and natural disaster) as well as for individuals who experienced a single traumatic incident and

for those who experienced multiple traumas. Much of the existing outcome research conducted

with youth with PTS have focused on individuals exposed to single incidents of trauma and/or on specific types of trauma exposure (e.g., sexual abuse, exposure to domestic violence). Additionally, much of the existing literature has utilized samples that combine children and adolescents. There may be important developmental differences between these two groups that influence the effectiveness of a given treatment approach. Thus, that this study was conducted with adolescents and found ACT to be effective across multiple trauma types is noteworthy.

The high rating of treatment acceptability among participants in this study is also notable. Treatment acceptability is an important issue for all treatment approaches with youth, and perhaps to an even greater degree with PTS. Given that exposure to trauma is related to a number of negative outcomes that can persist into adulthood (Flood, McDevitt-Murphy, Weathers, Eakin, & Benson, 2009), early intervention may be essential in helping to prevent long-term negative outcomes. Treatment refusal and treatment dropout have been problematic among trauma treatments for youth. The exclusion of trauma narratives or repeated retellings of traumatic events may have influenced the positive acceptability ratings of ACT. Trauma narratives, retelling of traumatic events, and other imaginal or in vivo exposure activities are not necessarily inconsistent with an ACT approach. From an ACT perspective, such activities could function as ways to practice mindful acceptance of difficult internal experiences in order to provide new learning opportunities that will allow the individual to incorporate additional, more flexible behavioral responses into his/her repertoire that will assist in values-driven behavior.

Given the centrality of avoidance in PTSD, engagement in any trauma treatment at all is a form of exposure. Thus, elements of exposure were present in this study, as it would be impossible to completely eliminate all forms of exposure from a treatment that directly targets

trauma. Behavioral commitments outside of treatment sometimes placed clients in contact with previously avoided external and internal stimuli, and in-session discussions often elicited internal stimuli previously avoided by the client. Exposure presented from this framework may assist with treatment engagement and aid in treatment acceptability. Future research can help clarify how ACT may be able to be supplemented by other treatment approaches and/or how ACT can be used as an adjunct to other treatments to help with treatment engagement and compliance.

This study combined with the existing literature base of ACT with youth also provides preliminary support for the appropriateness and effectiveness of ACT's processes and procedures for this age group. As pointed out by Coyne, McHugh, and Martinez (2011), it is a common misconception that ACT is too abstract and complex to use with young people. Interestingly, the experiential techniques and metaphors presumed to be too esoteric for youth might actually be the primary treatment components that contribute to the effectiveness and appropriateness of ACT's use with children and adolescents. ACT's primary reliance on experiential learning and metaphors is less instructive than other interventions such as psychoeducation and rational arguments, and is therefore more difficult to defy, argue, or comply with (Coyne et al., 2011; Greco, Blackledge, Coyne, & Ehrnreich, 2005). Further, because ACT emphasizes values, it may be a natural fit for adolescence because of the values exploration and increased ability for abstract thinking central to this developmental period (Greco et al., 2005). Of course, developmental abilities must be taken into consideration and numerous adaptations of commonly used ACT metaphors and exercises have been created (e.g., Greco et al., 2005; Murrell, Coyne, & Wilson, 2005). This study provides further evidence that ACT can be effectively adapted for youth while maintaining fidelity to its model.

In addition to the positive contributions of this study, there are a number of limitations that must be addressed. First, although ACT received favorable acceptability ratings, difficulty recruiting interested participants and treatment dropout in this study were comparable to those among existing treatments. It should be noted that all three community participants considered treatment dropouts experienced chronic, severe sexual abuse histories, and exhibited complex trauma symptomology. This may suggest that modifications are needed to the protocol for adolescents with this history and presentation, or it may be indicative of the need for additional interventions that target treatment interfering behaviors among adolescents with complex trauma.

Additionally, although the two separate samples provide promising support for the utility of ACT across unique groups, there are multiple complications related to conducting research with a residential population. The residential participants were receiving ongoing individual, family, and group therapy simultaneous to their participation in this study. All of these participants were receiving comprehensive residential care for severe and chronic eating disorders, and this was the primary target of treatment throughout their stay. The ACT therapist for this study was a part of the residential treatment team and worked closely with the residential therapists and team. Residential therapists reported that trauma was not being targeted in individual, family, or group sessions; however, data on this was not gathered. Taped sessions or formal assessment of TAU to confirm this report would have strengthened this study.

Consistent daily PTS data collection was also more challenging than initially expected, particularly during the baseline phase and among the community sample. Given that avoidance is a primary component of PTS, simply tracking the frequency and distress of PTS symptoms is a form of exposure and directly challenges the avoidance agenda central to the pathology itself. In

this study, inconsistent daily data collection was conceptualized as a form of avoidance of trauma reminders. Future research utilizing occasional data probes or alternative treatment designs that do not include daily symptom tracking can help isolate effects related to ACT itself versus effects related to regular symptom monitoring. Daily symptom monitoring, particularly during the baseline phase, may have also impacted potential participants' decision whether or not to engage in this study, as potential participants may have been deterred upon discovering that regular symptom tracking would be required. It is possible the initial explanation of the study, including the description of regular symptom tracking as well as the description of the selected intervention could account for acceptance or decline of participation. Future research investigating factors related to treatment seeking behavior and acceptance or refusal of psychological treatment can help us better understand this phenomenon.

Another limitation of this study was that the therapist, instead of another independent researcher, conducted all assessments. Due to time constraints and availability, assessments were conducted by the treating therapist; however, utilization of an independent assessor for the CAPS-CA would have strengthened this study. Further, this study relied on self-report data and a semi-structured interview conducted by the therapist and did not include data provided by the parent/guardian. It is unknown how the findings of this study may have been impacted had additional information been collected from parents. Similarly, best practice recommends parental involvement throughout the course of treatment, and this study utilized some, but minimal involvement with parents. Future research should control for parental involvement and investigate its impact on outcomes.

Finally, inclusion of follow-up data at later time points needed in order to determine the long-term impacts of treatment gains. A logical next step to help confirm the long-term effectiveness of ACT for adolescent PTS/PTSD would be a randomized controlled trial with assessments conducted at pre-, post-treatment, and successive follow-up periods up to a year or longer by independent assessors blind to time and condition. Such a study would help draw stronger conclusions about the effectiveness of ACT as a treatment for PTS and PTSD among youth.

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Table 1

Participants

Participant	Sex	Age	Trauma Type(s) (Age of Trauma)	Comorbid Condition(s)
C1	M	12	Witnessed father's arrest & imprisonment (4)	GAD; Celiac Disease
			Physical Abuse (8)	
C2	F	17	Sexual Abuse (5-8)	MDD
C3	M	13	Natural Disaster (10)	None
C4	F	15	Sexual Abuse (14)	MDD
R1	F	15	Death of a Primary Caregiver (8)	ED NOS; GAD
			Exposure to Violence (8-12)	
R2	F	15	Sexual Abuse (7-9)	Diabetes; Bulimia Nervosa; ADHD
			Physical Abuse (4-9)	
R3	F	15	Death of a Primary Caregiver (14)	Anorexia Nervosa; MDD; GAD

Note. All participants self-identified as Caucasian. M = Male; F = Female; ADHD = Attention Deficit Hyperactivity Disorder; ED NOS = Eating Disorder Not Otherwise Specified; GAD = Generalized Anxiety Disorder; MDD = Major Depressive Disorder

Table 2

Summary of Treatment Sessions

Session	Treatment Components	Exercises/Content
1	Informed Consent	• Warning that therapy may result in emotional discomfort • Commitment to complete all 10 sessions
	Limits to Confidentiality	• Confidentiality exceptions will follow APA ethical guidelines
	General Assessment	• Description & interference of PTS symptoms (PTSS) • Reasons & expectations for treatment
	Psychoeducation	• Discuss fight, flight, or freeze response • Discuss PTS & PTSD & client specific experiences
2	Creative Hopelessness	• Discuss workability of control strategies for PTSS • Identify the negative impact & paradoxical nature of attempts to control PTSS: *Tug of War* metaphor
3	Control as the Problem	• Reinforce the futility of attempts to control PTSS • Identify attempts to control as part of the problem: *Polygraph*, *Chocolate Cake*, & *Falling in Love* exercises
	Defusion	• *Physicalizing* exercise & draw a picture of this object
	Acceptance	• Introduce acceptance as an alternative to control: *Two Scales* metaphor & *Trauma on Paper* exercise
4	Acceptance	• Identify willingness as an alternative to control & the decrease in effort
	Defusion	• Teach the limits of language & its role in suffering: *Kid in a Grocery Store* metaphor, *What are the Numbers* exercise, & Tichener's *Milk, Milk, Milk* exercise
	Committed Action	• Behavioral commitments to practice defusion strategies this week
5	Acceptance & Defusion	• *Passengers on the Bus* metaphor/exercise
	Values	• Introduce values: *Passengers on the Bus* metaphor
	Committed Action	• Behavioral commitment
6-7	Values	• Define & clarify values: *Compass* metaphor, *Heart Shaped Box* exercise & behavioral consistency: *Bull's Eye* exercise
	Acceptance	• Encourage acceptance: *Annoying Party Guest* metaphor
	Committed Action	• Behavioral commitments to engage in value-based activities
8	Contact with Present Moment	• Increase awareness: *Awareness of Inner Experiences, Leaves on a Stream* exercise, *Kindergarten Teacher* metaphor
	Defusion	• *Having a Thought versus Buying a Thought* activity
	Committed Action	• Behavioral commitments to engage in value-based activities
9	Self-as-Context	• Identify the self as the context: *Chessboard* & *TV Set* metaphors
	Contact with Present Moment	• *Watching Thoughts on a Screen*
	Committed Action	• Review relevant processes & increase behavioral commitments
10	Review & Termination	• Summarize treatment: *Passengers on a Bus* metaphor • Discuss end of treatment & apply ACT processes to termination • Suggest *Get Out of Your Mind & Into Your Life* workbook

Table 3.

Pre-, Post-, and Follow-up Scores for All Participants

Participant	Daily Self-Monitoring			CAPS-CA			CPSS			ComQol O			ComQol S			TEI-SF	AFQ-Y		
	Pre	Post	FU	Pre	Post	FU	Pre	Post	FU	Pre	Post	FU	Pre	Post	FU	Post	Pre	Post	FU
C1	35.8	6.7	16	**60**	6	16	**16**	2	4	69.0	69.0	76.1	78.5	74.4	83.4	35	24	11	17
C2	30.4	7.5	2.2	**50**	**46**	18	**13**	**13**	6	58.3	67.8	65.4	68.0	62.0	69.9	27	22	7	4
C3	12.5	0.14	1	**64**	9	12	**17**	0	3	66.6	82.1	78.5	63.9	76.6	78.1	27	21	2	7
C4	14.8	12	10	**68**	38	24	**40**	**14**	13	42.8	61.9	64.2	57.8	62.2	65.7	30	50	27	26
R1	24.1	5.3	5.6	**43**	32	26	**14**	**11**	8	53.5	52.3	55.9	80.8	73.6	80.0	28	16	18	9
R2	40.9	0.7	3.5	**64**	12	12	**34**	8	10	46.4	53.5	52.3	63.5	75.1	74.0	27	37	3	6
R3	28.9	10		**69**	16		**29**	6		41.6	60.7		46.2	73.6		26	44	15	

Note. AFQ-Y = Avoidance and Fusion Questionnaire for Youth; CAPS-CA = Clinician Administered PTSD Scale for Children and Adolescents; ComQol (O and S) = Comprehensive Quality of Life Scale (objective and subjective); CPSS = Children's PTSD Symptom Scale; TEI-SF = Treatment Evaluation Inventory–Short Form; **Bold** = Scores in the clinical range
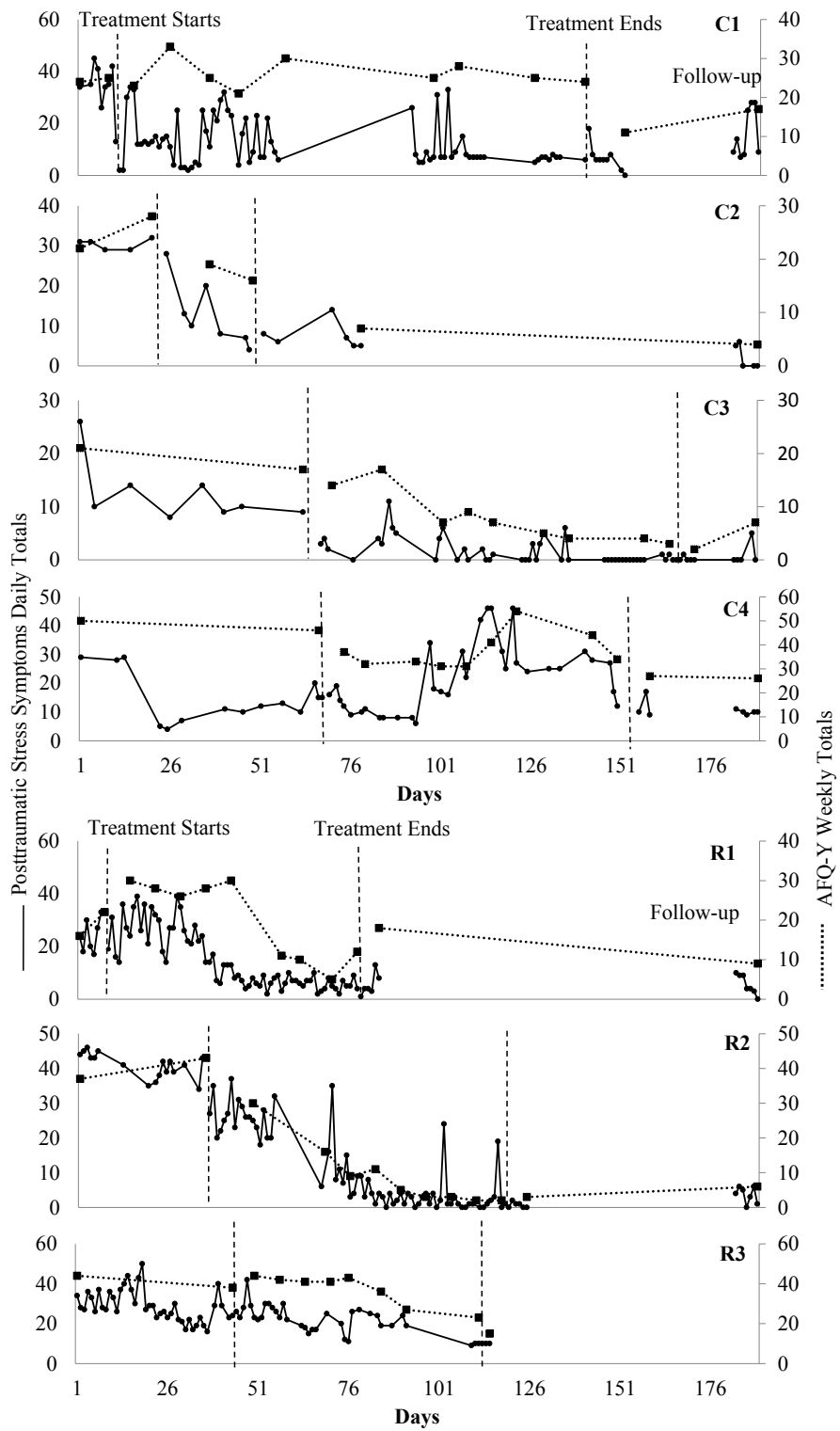
Figure 2. Daily trauma ratings (solid line) and weekly ACT process data (dotted line).

Author note:

Michelle R. Woidneck (michelle.woidneck@boystown.org) is at the Boys Town Center Behavioral Health Clinic, 13460 Walsh Drive, Boys Town, NE, 68010. Kate L. Morrison and Michael P. Twohig (michael.twohig@usu.edu) are in the Department of Psychology at Utah State University, 2810 Old Main Hill, Logan, UT, 84322. This study was completed as Dr. Woidneck's dissertation at USU. A copy of the manual is available from the corresponding author.

Author Bios:

Michelle Woidneck, Ph.D. is a post-doctoral fellow at the Boys Town Center for Behavioral Health. Her research and clinical interests are in acceptance and commitment therapy, posttraumatic stress, and working with adolescents and families with diverse clinical presentations.

Kate L. Morrison, B.A. is a doctoral student in psychology at Utah State University. Her research and clinical interests are in acceptance and commitment therapy, delay discounting, and treatment of anxiety disorders.

Michael Twohig, Ph.D. is an Associate Professor of Psychology at Utah State University. His research focuses on the treatment of anxiety disorders using exposure based therapies and acceptance and commitment therapy.