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Effects of Traumatic Experiences on Obsessive-Compulsive and Internalizing Symptoms: The Role of Avoidance and Mindfulness

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Abstract

Background—Trauma exposure is associated with adverse psychological outcomes including anxiety, depression, and obsessive-compulsive (OC) symptoms. Adolescence is increasingly recognized as a period of vulnerability for the onset of these types of psychological symptoms. The current study explored the mediating roles of experiential avoidance and mindfulness processes in the association between retrospective reports of childhood trauma and current internalizing and OC symptoms in adolescents.

Method—A group of at-risk adolescents ($N=51$) and a group of college students ($N=400$) reported on childhood trauma, experiential avoidance, mindfulness, anxiety, depressive, and OC symptoms. Mediation analyses were performed to examine the mechanistic roles of avoidance and mindfulness in the association between trauma and internalizing and OC-specific symptoms.

Results—In the group of at-risk adolescents, experiential avoidance and mindfulness both significantly mediated the association between childhood trauma and OC symptoms. In the college student sample, experiential avoidance mediated the association between trauma and OC symptoms. Experiential avoidance, as well as the *observe, act with awareness*, and *nonjudgmental* facets of mindfulness all significantly mediated the association between trauma and internalizing symptoms.

Limitations—The group of at-risk adolescents was small, and the college student group was demographically homogeneous. All data was self-report and cross-sectional.

Conclusion—The current study demonstrated that experiential avoidance and mindfulness processes may be the mechanisms through which the association between trauma and obsessive-compulsive and trauma and internalizing symptoms exist in adolescents. These findings provide potential targets for clinical intervention to improve outcomes for adolescents who have experienced trauma.

Keywords

Trauma; Experiential Avoidance; Internalizing; Obsessive-Compulsive; Mindfulness

Exposure to trauma before the age of eighteen is *not* a rare occurrence, and its ramifications can be significant (Elzy et al., 2013). *Trauma exposure* is defined as the experience of an event that involves an actual or perceived threat to the physical integrity of self or others (American Psychiatric Association, 2000). Events that fall into this category most commonly include either interpersonal events (i.e., sexual, emotional, or physical abuse or neglect; interpersonal violence; school or community violence) or non-interpersonal events (life-threatening illness; natural disaster; motor vehicle or other serious accident).

According to the most recent data by the U.S. Department of Health & Human Services, over 700,000 children were maltreated in 2014, with 75% of victims experiencing neglect; 17% physical abuse; and 8% sexual abuse (USDHHS, 2016). During adolescence, witnessing violence or surviving any type of assault appears to be a widespread occurrence. Kilpatrick et al. (2000) examined the prevalence of victimization in a representative sample of over 4,000 adolescents aged 12–17, finding that 8% of adolescents reported experiencing sexual assault; 23%, physical assault; and 41%, witnessing violence. In total, 50% of adolescents endorsed witnessing violence or experiencing at least one trauma, with many reporting multiple traumas (Kilpatrick et al., 2000).

Early life stress or trauma is a major risk factor for the development of psychiatric symptoms later in life (Ford, 2013; Heim and Nemeroff, 2001). Trauma-related disorders, such as posttraumatic stress disorder (PTSD), are the psychiatric conditions most often associated with trauma exposure (Kendall-Tackett et al., 1993). However, there is also a robust association between significant childhood adversities and the development of other adult internalizing disorders, such as depression and anxiety (Chapman et al., 2004; Cogle et al., 2010; Edwards et al., 2003; Fierman et al., 1993; Ford et al., 2010). Further, adolescence is a time of increased vulnerability to develop anxiety or depressive symptoms (Paus et al., 2008), especially after experiencing a childhood interpersonal trauma or witnessing violence as a child (Brown et al., 1999; Russell et al., 2010). In addition to trauma-related disorders, there is emerging research examining a unique relation between trauma exposure and obsessive-compulsive (OC) symptoms (Fontenelle et al., 2012).

Empirical and case studies have demonstrated an association between a history of trauma and increased severity of OC symptoms (for review, see Miller and Brock, 2017). For example, individuals with a diagnosis of obsessive-compulsive disorder (OCD) reported significantly more childhood trauma compared to healthy controls (Lochner et al., 2002). Further, in a large clinical sample of individuals diagnosed with OCD, severity of OC symptoms was significantly associated with a history of traumatic events (Cromer et al., 2007).

Onset of OC symptoms often appears in two developmental periods, with one peak around puberty (10–13 years) and another in early adulthood (21–29 years) (De Luca et al., 2011; Zohar, 1999). OCD has been identified as one of the most common psychiatric conditions affecting youth (Stewart et al., 2004; Valleni-Basile et al., 1994), with early-onset symptoms being particularly detrimental (do Rosario-Campos et al., 2001; Wang et al., 2012). Little is known, however, about how exposure to trauma could affect OC symptoms in adolescents. The few studies that have examined trauma history and OC symptoms in adolescents have

focused on comorbid OCD and PTSD symptoms rather than history of trauma specifically (Essau et al., 2000; Lafleur et al., 2011). In order to provide appropriate and early intervention for children and adolescents experiencing OC symptoms, it is important to better understand OC symptoms, along with internalizing symptoms, in adolescents with a history of trauma.

Although trauma exposure increases risk for developing psychiatric symptoms, not every young adult who has experienced trauma develops symptoms; individual differences lead to differing outcomes (Kessler et al., 1995). One mechanism that may help explain the role that trauma exposure plays in the development or exacerbation of psychiatric symptoms is *experiential avoidance*, which can be characterized as an unwillingness or inability to remain in contact with internal experiences (thoughts, memories, emotions, and/or bodily sensations) or any attempt to alter or escape the experiences (Hayes et al., 1996). Importantly, individuals who have experienced trauma often engage in experiential avoidance (Follette et al., 2006; Orsillo and Batten, 2005).

The employment of avoidant coping strategies in response to trauma is associated with potentially problematic behaviors, such as less social engagement or high-risk sexual behavior, as well as with psychological difficulties, such as PTSD symptoms (Batten et al., 2002; Brockman et al., 2016; Orcutt et al., 2005). Experiential avoidance has been identified as an important mechanism which may partially explain the association between trauma exposure and the manifestation of psychopathology in populations of adolescents (Venta et al., 2012) and young adults (Land, 2010). Briggs and Price (2009) examined the interplay of adverse childhood experiences (including neglect and abuse), anxiety and depressive symptoms, OC symptoms, and experiential avoidance in a community sample of young adults and undergraduates (mean age of 28). Experiential avoidance mediated the relation between adverse childhood experiences and OC symptoms, even when controlling for anxiety and depression. Given this finding, the associations between trauma exposure, experiential avoidance, and psychopathology need to be further elucidated, especially in the particularly vulnerable time period of adolescence.

Mindfulness- and acceptance-based therapies, such as Acceptance and Commitment Therapy (Hayes et al., 1999) and Mindfulness-Based Stress Reduction (Kabat-Zinn, 2003), have increasingly been utilized to target and address experiential avoidance. These therapies aim to decrease avoidance while increasing *acceptance*, the willingness to remain in contact with all current internal and external sensations, even if the internal sensations are aversive, in order to pursue valued living (Cordova, 2001; Kabat-Zinn, 2003). Similarly, these therapies aim to cultivate mindfulness, or a nonjudgmental awareness of the present moment (Kabat-Zinn, 2003). Mindfulness is often characterized in the literature as a multifaceted construct consisting of five distinct yet interrelated facets: 1) *observing* or noticing present moment experience, 2) the ability to *describe* or put present-moment experience into words, 3) *acting with awareness* or concentrating on behavior rather than acting on “automatic pilot” 4) *nonjudgment of experience* such as thoughts or emotions and 5) *nonreactivity* to inner experience, or the ability to be aware of inner experiences without immediately reacting to them (Baer et al., 2006). Acceptance- and mindfulness-based therapies have been shown to be effective in addressing symptoms of trauma-related disorders (Orsillo and

Batten, 2005; Vujanovic et al., 2013), internalizing disorders (Forman et al., 2007; Swain et al., 2013), and OC symptoms (Bluett et al., 2014; Twohig et al., 2010). There is less information on how interventions based on principles of mindfulness and acceptance may mitigate psychiatric symptoms in adolescents. Considering the high rates of trauma exposure, internalizing disorder symptoms, and OC symptoms in adolescents, basic research needs to clarify how acceptance and mindfulness processes could be incorporated into treatment for young adults.

The current study examined the mediating roles of experiential avoidance and the five facets of mindfulness in linking childhood trauma exposure and OC-specific and internalizing symptomology in young adults. Current age ranges utilized to define adolescence vary, but neuroimaging studies have shown that the brain continues to develop well into a person's twenties, prompting discussions surrounding the most appropriate way to characterize this important developmental time period (Curtis, 2015; Johnson et al., 2009). Therefore, two populations of adolescents were utilized: 1) at-risk adolescents attending an alternative high school and 2) undergraduate students at a large Midwestern university. The authors hypothesized that experiential avoidance would mediate the relation between trauma exposure and elevated internalizing and OC symptoms in both at-risk adolescents and undergraduate students. Additionally, because recent work has suggested that mindfulness processes build upon one another and therefore may be targeted individually in clinical work (Strosahl et al., 2015), multiple mediation analyses were conducted with mindfulness facets in examining the association between trauma exposure and internalizing and OC symptoms in an attempt to understand which specific aspects of mindfulness may be important targets for intervention.

Method—Study 1

Participants

Participants were recruited from a Midwestern alternative high school, where students are referred for academic failure, substance abuse, risk for dropout, or psychosocial difficulties. Of the 120 students at the school, 53 chose to participate. Sample characteristics are in Table 1.

Procedure

Institutional Review Board (IRB) approval was obtained. Data were collected using Qualtrics (www.qualtrics.com) in 2014. Participants completed the assessment upon enrollment in the study after providing written informed consent. The data included in the current analyses are cross-sectional baseline data from a longitudinal intervention study.

Measures

Childhood traumatic experiences—Childhood trauma was measured using the Early Trauma Inventory Self-Report Short Form (ETI-SR-SF; Bremner et al., 2007), which measures four domains of trauma, including general trauma and physical, emotional, and sexual abuse. The ETI-SR-SF is a 27-item scale that is based on the endorsement of previous traumatic experiences (*0 = No, 1 = Yes*). The mean for healthy controls from the validation

study was 3.5 ± 3.3 (Bremner et al., 2007). The four domains of trauma display adequate internal consistency (Cronbach's α 's 0.70–0.87; Bremner et al., 2007), and the short-form correlates highly with the long form. Reliability in this sample was good ($\alpha = .87$).

Experiential avoidance—The Avoidance and Fusion Questionnaire-Youth (AFQ-Y) was used to measure experiential avoidance (Greco et al., 2008). The 17-item instrument is designed for youth, and higher scores indicate greater avoidance. An example item is “I try hard to erase hurtful memories from my mind.” Items use a 5-point Likert scale ($0 = \textit{Not at all true}$, $4 = \textit{Very true}$). The AFQ-Y demonstrates good internal consistency and convergent and construct validity. Reliability in this sample was excellent ($\alpha = .97$).

Mindfulness—The Child and Adolescent Mindfulness Measure (CAMM-10) was used to measure mindfulness (Greco et al., 2011). The 10-item measure uses a 5-point Likert scale ($0 = \textit{Never true}$, $4 = \textit{Always true}$), with higher scores indicating greater mindfulness. Example items include: “It’s hard for me to pay attention to only one thing at a time” and “I get upset with myself for having certain thoughts.” Research has indicated good internal consistency and convergent, construct, and incremental validity (Greco et al., 2011). Reliability in this sample was excellent ($\alpha = .96$).

Obsessive-compulsive symptoms—To measure the severity of obsessive-compulsive symptoms, the revised Obsessive-Compulsive Inventory-Revised (OCI-R) was utilized (Foa et al., 2002). Example items include “I frequently get nasty thoughts and have difficulty in getting rid of them” and “I get upset if objects are not arranged properly.” The scale uses a 5-point Likert scale ($0 = \textit{Not at all}$, $4 = \textit{Extremely}$), representing the extent to which a symptom was bothersome or distressing in the past month. Internal consistency was good (Foa et al., 2002). Higher scores represent more severe OC symptomatology. Reliability in this sample was excellent ($\alpha = .95$).

Method—Study 2

Participants

Participants were recruited through an online study portal through a large Midwestern university. Students at the university participate in research studies for partial course credit. 414 responses were gathered, of which 400 responses were usable.

Demographic characteristics of the sample indicate that the sample was young ($M = 19.16$, $SD = 1.33$), primarily Caucasian (68.1%), and heterosexual (88.1%). The sample consisted of more females (64.0%) than males (34.3%). Participant characteristics are displayed in Table 2.

Procedure

The project was approved through the University IRB. Qualtrics was used to collect data.

Measures

Childhood traumatic experiences—See Method-Study 1. Reliability in this sample was good ($\alpha = .85$).

Experiential avoidance—Experiential avoidance was measured with the Acceptance and Action Questionnaire-II (AAQ-II; Bond et al., 2011). The seven-item measure uses a 7-point Likert scale ($0 = \text{Never true}$, $6 = \text{Always true}$) with higher ratings indicating increased experiential avoidance. Example items include “my painful memories prevent me from having a fulfilling life” and “worries get in the way of my success.” Good internal consistency has been demonstrated in other samples (mean alpha coefficient = .84 across various samples). Reliability in this sample was excellent ($\alpha = .91$).

Mindfulness—To measure mindfulness, the Five Facet Mindfulness Questionnaire (Baer et al., 2006) was utilized to measure five mindfulness processes: Observing, Describing, Acting with Awareness, Non-Judging of Experience, and Non-Reacting to Inner Experience. The FFMQ is a 39-item questionnaire that uses a 5-point Likert scale ($1 = \text{Never or very rarely true}$, $5 = \text{Very often or always true}$). Internal consistency of each facet is adequate ($\alpha = .75-.91$). Internal consistency in this sample was adequate for each facet: Observe ($\alpha = .76$), Describe ($\alpha = .84$), Act with Awareness ($\alpha = .87$), Nonjudgment ($\alpha = .88$), and Nonreactivity ($\alpha = .72$).

Obsessive-compulsive symptoms—See Method-Study 1. Reliability in this sample was excellent ($\alpha = .94$).

Internalizing symptoms—The presence and severity of anxiety was measured using the General Anxiety Disorder-7 (GAD-7; Spitzer et al., 2006). The 7-item measure uses a 4-point Likert scale ($0 = \text{Not at all}$, $3 = \text{Nearly every day}$), with higher scores representing more severe anxiety symptoms. Example items include “feeling nervous, anxious or on edge” and “worrying too much about different things.” Internal consistency was adequate in the validation study, and criterion, construct, and procedural validity were established (Spitzer et al., 2006). Reliability in this sample was good ($\alpha = .89$).

In order to measure depression severity, the Patient Health Questionnaire-9 (PHQ-9) (Kroenke et al., 2001) was used to measure depressive symptoms. Using a 4-point Likert scale ($0 = \text{Not at all}$, $3 = \text{Nearly every day}$), the PHQ-9 measures severity of depression symptoms according to the nine diagnostic criteria in the DSM-IV (e.g., feeling down, losing interest), with higher scores representing more severe depressive symptoms. Criterion, construct, and external validity were established in several samples (Kroenke et al., 2001). Reliability in this sample was excellent ($\alpha = .92$).

An internalizing composite factor was created using the Dimension Reduction function of SPSS, version 23, with the items from the PHQ-9 and GAD-7. A Principal Components Analysis (PCA) was conducted with the 16 items from both scales, and no rotation was used. The items loaded onto one factor that accounted for 48.55% of the total variance, and all factor loadings were above .64. Thus, a single factor was used to represent internalizing symptoms.

Statistical Analyses

Mediation analyses for both studies were conducted using the PROCESS macro (Hayes, 2013) in SPSS, version 23. In Study 1, two mediation analyses were conducted to examine the mediating role of 1) avoidance and 2) mindfulness in the relation between traumatic experiences and obsessive-compulsive symptoms. In Study 2, the mediating role of avoidance was examined in the relation between traumatic experiences and 1) obsessive-compulsive symptoms and 2) internalizing symptoms. Second, multiple mediation analyses were conducted with the five facets of mindfulness to examine the mediating role of mindfulness facets in the relation between traumatic experiences and 1) obsessive-compulsive symptoms and 2) internalizing symptoms. Results reflect three analyses: 1) effect of traumatic experiences on the mediator, 2) effect of mediator on the outcome of interest *and* effect of traumatic experiences on the outcome while controlling for the mediator (direct effect), 3) the effect of traumatic experiences on the outcome by way of the mediator—indirect effect. PROCESS uses a bootstrapping method that provides a confidence interval around the indirect effect, and when zero is not included in the confidence interval, this indicates a significant indirect effect. A 95% confidence interval was computed using 10,000 resamplings. All reported coefficients are unstandardized. Percent mediation statistics were calculated to reflect the portion of the total effect accounted for by the indirect effect.

Results—Study 1

Descriptive statistics are reported in Table 1. The sample was slightly more female than male, racially diverse, and about 16 years of age on average. Item-level missing data were handled using mean imputation if less than 10% of the items in a scale were missing. In all cases with this sample, only one item was missing when mean imputation was used. If greater than 10% of the scale's items were missing, the scale was counted as missing, and the PROCESS macro did not include the data. Only 2 participants were not included ($N = 51$).

Avoidance

Previous trauma was not significantly related to avoidance (coefficient: 0.19, CI: [-0.004, 0.38], $p = .055$). Avoidance was significantly related to OC symptoms (coefficient: 1.70, CI: [.78, 2.63]), $p < .001$). A direct effect of previous traumatic experiences on OC symptoms was *not* observed (coefficient: 0.31, CI: [-0.34, .95], $p = .34$). An indirect effect of avoidance was observed (coefficient: 0.32, CI: [.01, .85]), accounting for half of the total effect ($R_M = .51$). See Table 3 and Figure 1a for results.

Mindfulness

Previous trauma was related to mindfulness (coefficient: -0.67, CI: [-1.03, -0.32], $p < .001$). Mindfulness was related to OC symptoms (coefficient: -1.21, CI: [-1.66, -0.76], $p < .001$). A direct effect of previous traumatic experiences on OC symptoms was *not* observed (coefficient: -0.19, CI: [-0.82, -0.44], $p = .55$). An indirect effect of mindfulness was observed (coefficient: 0.81, CI: [.38, 1.45]), accounting for more than the total effect ($R_M = 1.30^1$). See Table 3 and Figure 1b for results.

Results—Study 2

Descriptive statistics are reported in Table 2. Item-level missing data for the AAQ, FFMQ, PHQ-9, GAD-7, and OCI-R were handled using mean imputation if only one item on a relevant scale or subscale was missing. If two or more items from the scale were missing, the scale was counted as missing, and the PROCESS macro did not include the data. For the ETI, zeros were imputed in cases where less than 20% of the items were missing. Additionally, three participants did not report their gender and four reported their gender as “other,” and because imputation is not appropriate, these participants were excluded from analyses. The current mediation analyses included 390 participants, and 24 participants were excluded from analyses.

Obsessive-Compulsive Symptoms

Avoidance—When examining the indirect effect of avoidance on the association between previous traumatic experiences and OC symptoms, the following results were observed. Previous trauma was related to avoidance (coefficient: .76, CI: [.59, .93], $p < .001$). Avoidance was significantly related to OC symptoms (coefficient: .44, CI: [.29, .59], $p < .001$). A direct effect of previous trauma on OC symptoms was observed (coefficient: .66, CI: [.39, .94], $p < .001$). An indirect effect of avoidance was observed (coefficient: .33, CI: [.21, .48]), accounting for a proportion of the total effect ($P_M = .33$). See Table 4 and Figure 2a for results.

Mindfulness—The FFMQ subscales were included in a multiple mediation model to simultaneously examine the indirect effect of mindfulness facets on the association between previous trauma on OC symptoms. The first model examined if trauma was related to each facet, controlling for gender. Trauma was related to the Observe (coefficient: .24, CI: [.13, .35], $p < .001$), Act with Awareness (coefficient: $-.27$, CI: $[-.38, -.16]$, $p < .001$), and Nonjudgment facets ($-.42$, CI: $[-.54, -.30]$, $p < .001$). Trauma was not related to the Describe ($p = .16$) or Nonreactivity facets ($p = .93$).

The second model examined if mindfulness facets and previous trauma related to OC symptoms, while controlling for gender. The Observe (coefficient: .63, CI: [.37, .89], $p < .001$) and Describe (coefficient: $-.46$, CI: $[-.71, -.21]$, $p = .0003$) facets related to OC symptoms. The Act with Awareness ($p = .08$), Nonjudgment ($p = .11$), and Nonreactivity ($p = .87$) facets were not related to OC symptoms. A direct effect of previous trauma was observed (coefficient: .64, CI: [.38, .89], $p < .001$). Gender was a significant covariate (coefficient: .02, CI: [.002, .03], $p = .02$).

Mediation analyses indicated that the Observe facet was the only significant indirect effect (coefficient: .33, CI: [.20, .51]), accounting for a proportion of the total effect ($P_M = .16$). See Table 5 and Figure 2b for results.

¹Percent mediation statistics can be greater than 1 because the indirect effect is a product of two paths.

Internalizing Symptoms

Avoidance—Previous trauma was significantly related to avoidance (coefficient: .73, CI: [.57, .89], $p < .001$). Avoidance was related to internalizing symptoms (coefficient: .06, CI: [.06, .07], $p < .001$). A direct effect of previous trauma was observed (coefficient: .04, CI: [.02, .06], $p < .001$). An indirect effect of avoidance was observed (coefficient: .05, CI: [.03, .06]), accounting for over half of the total effect ($P_M = .54$). See Table 6 and Figure 3a for results.

Mindfulness—Trauma was related to the Observe (coefficient: .25, CI: [.15, .36], $p < .001$), Act with Awareness (coefficient: $-.27$, CI: [$-.38$, $-.16$], $p < .001$), and Nonjudgment facets (coefficient: $-.41$, CI: [$-.52$, $-.29$], $p < .001$). Trauma did not predict the Describe ($p = .15$) or Nonreactivity facets ($p = .98$).

The second model examined if mindfulness facets and previous trauma related to internalizing symptoms, while controlling for gender. The Observe (coefficient: .03, CI: [.01, .04], $p < .01$) Act with Awareness (coefficient: $-.04$, CI: [$-.06$, $-.03$], $p < .001$), Nonjudgment (coefficient: $-.05$, CI: [$-.06$, $-.03$], $p < .001$), and Nonreactivity (coefficient: $-.03$, CI: [$-.05$, $-.004$], $p = .02$) facets were related to internalizing symptoms. The Describe facet did not ($p = .11$). Gender was a significant covariate (coefficient: .21, CI: [.07, .35], $p < .01$). A direct effect of previous trauma on internalizing symptoms was observed (coefficient: .05, CI: [.03, .06], $p < .001$).

The Observe, (coefficient: .01, CI: [.003, .01]), Act with Awareness (coefficient: .01, CI: [.01, .02]) and Nonjudgment (coefficient: .02, CI: [.01, .03]) facets were significant indirect effects in the relation between previous trauma and internalizing symptoms. Percent mediation statistics indicated that the mindfulness facets accounted for portions of the total effect: Observe ($P_M = .08$), Act with Awareness ($P_M = .13$), and Nonjudgment ($P_M = .22$). See Table 7 and Figure 3b for results.

Discussion

These studies illustrate the importance of two important targets for intervention, avoidance and mindfulness, in the relation between traumatic experiences and psychiatric symptoms. The first study examined this association in a sample of at-risk adolescents, where the mean number of previous traumatic events was greater than 1 SD above the normative values in the validation study for the trauma measure (Bremner et al., 2007). In this study, when controlling for the mediators, the direct effect of trauma on obsessive-compulsive symptoms was not significant. Furthermore, the indirect effects of avoidance and mindfulness both accounted for over half of the total effect. These findings indicate that among adolescents who have experienced trauma, avoidance and mindfulness are key determinants in predicting obsessive-compulsive symptoms. Nevertheless, significant limitations of this study (small N , limited power) rendered us unable to explore the impact of trauma and mediating variables on internalizing symptoms. Thus, a second study with a larger sample size allowed for the measurement and examination of internalizing symptoms with gender as a covariate.

In the second study, among a sample of college undergraduates, we examined the mediating role of avoidance and mindfulness in the association between traumatic experiences and obsessive-compulsive symptoms and found that avoidance was a significant mediator. Additionally, through the examination of specific mindfulness processes, findings indicated the Observe facet as a significant indirect effect, associated with higher obsessive-compulsive symptoms. Next, the role of these mediators were examined in the relation between traumatic experiences and internalizing symptoms, and avoidance accounted for over half of this total effect. Further, Observe, Act with Awareness, and Nonjudgment also accounted for a substantial proportion of the total effect, with Nonjudgment accounting for the highest proportion of the total effect.

The differences in findings between the two samples are notable. The inclusion of two samples allowed for comparison of the results between high-risk and normative groups. The younger, high-risk sample reported higher levels of experienced trauma than the older, college student sample. The high-risk sample was also more diverse and were known to be experiencing difficulties academically, socially, or otherwise. Importantly, in Study 1, the direct effect from traumatic experiences to OC symptoms was not significant, though in Study 2, this relation was significant. More recent conceptualizations of mediation (Hayes, 2013) do not require the presence of the $X \rightarrow Y$ relation to conduct mediation analyses, but previous thinking necessitated such a relation (Baron and Kenny, 1986). This difference in results is important, as it may underscore the importance of avoidance and mindfulness in the progression from experiencing trauma to later OC symptoms. Further, if avoidance and mindfulness are in fact implicated as important determinants in the relation between traumatic experiences and later psychological symptoms, early intervention and prevention programs could specifically target these processes with children and adolescents who have experienced trauma. Future longitudinal research is necessary to examine the role of avoidance and mindfulness in this relation, as well as appropriate interventions to address these processes.

The current findings support previous work that has identified avoidance as a mediator of the association between trauma and various psychological outcomes (Marx and Sloan, 2002; Orcutt et al., 2005; Reddy et al., 2006; Rosenthal et al., 2005). Avoidance was a powerful mediator between trauma exposure and psychological functioning for OC symptoms, in both high-risk and nonclinical samples. These findings are also consistent with the previously identified role of experiential avoidance in other trauma-related psychopathology, such as PTSD (Tull and Roemer, 2003). Avoidance of trauma-related memories, thoughts, and emotions may be one of the most common coping strategies among individuals exposed to trauma (Tull et al., 2004). However, chronic avoidance maintains the power of the internal stimuli, resulting in distress, dysregulation, and continued psychopathology (Gross and Levenson, 1997; Hayes et al., 1999; Shipherd and Beck, 1999). The current study contributes additional evidence showcasing how experiential avoidance after trauma exposure can contribute to psychopathology, in the form of increased OC *and* internalizing symptoms in young adult samples. Improved treatment efforts aimed at reducing avoidance are crucial in order to address trauma-related psychiatric difficulties, including depression, anxiety, and OCD.

In relation to specific mindfulness facets and psychopathology, higher Observe skills were predictive of more severe OC symptoms and internalizing symptoms. Anxiety disorders are theorized to arise from continual overestimates of the dangerousness of situations (social anxiety, agoraphobia), one's own physical sensations (panic disorder), or one's own thoughts (OCD; Abramowitz et al., 2003; Clark, 1999). For individuals with OCD, there is a strong belief that unwanted thoughts about an action are equivalent to completing the action or that it makes the action more likely to occur, known as *thought-action fusion* (Shafran et al., 1996). These maladaptive cognitions often lead to behavioral or cognitive rituals in an attempt to eliminate the thought, creating a cycle of obsessive thoughts and subsequent compulsions (Rachman, 1998). Therefore, heightened observation of mental imagery may create more distress and, thus, more severe OC symptoms.

The Act with Awareness and Nonjudgment facets predicted *lower* internalizing symptoms in the college sample. This is in line with previous work by Cash and Whittingham (2010) which found that higher levels of nonjudgment and acting with awareness facets of mindfulness were related to lower levels of depressive symptoms as well as lower levels of anxiety and stress-related symptoms (for the nonjudgment facet only). Further, young adults with a lack of mindfulness skills may be particularly susceptible to depressive and anxiety symptoms. In an undergraduate sample, Soysa and Wilcomb (2015) found that lower levels of acting with mindful awareness and lower levels of nonjudgment of experience predicted depression and stress, while lower levels of mindful nonjudgment also predicted anxiety. Rumination (Aldao et al., 2010), as well as negative judgment of thoughts, internal sensations, and self (Johnson et al., 1992; McNally, 1990; Rimes and Watkins, 2005) have long been characteristic of internalizing disorders—areas for which increased skills in mindful awareness and nonjudgment could be particularly useful.

Clinical Implications

The current studies helped to further elucidate specific targets for clinical interventions. First, individuals who have experienced trauma may be more likely to engage in avoidant coping strategies (Follette et al., 2006), and while these strategies may be effective in providing short-term relief from unpleasant internal experiences, avoidance often leads to an increased salience of the unwanted stimulus in the long-term (Chawla and Ostafin, 2007; Thompson et al., 2011).

Additionally, the identification of specific mindfulness facets as mechanistic processes that help account for the association between trauma and obsessive-compulsive and internalizing symptoms helps to provide a more precise understanding of which individual facets of mindfulness may be particularly important in terms of explaining these associations, and subsequently, which facets may be most important to target clinically in this population. The current study's identification of the observe facet of mindfulness as a predictor of *greater* internalizing and OC symptoms is in line with previous work showing that interventions targeted at improving the observation of experience alone may not be particularly helpful unless coupled with the cultivation of other mindfulness processes (Desrosiers et al., 2014, 2013). Further, the current findings indicate that acting with awareness (acting with attention to behavior rather than running on "auto-pilot") and nonjudgment of inner experience may

be important mindfulness processes to focus on for trauma-exposed individuals. Mindfulness- and acceptance-based interventions, including ACT (Hayes et al., 1999) and MBSR (Kabat-Zinn, 1990), which aim to help individuals to increase acceptance, to relate to internal experiences nonjudgmentally, and to remain aware while engaging in behavior, may improve psychological outcomes for individuals who have experienced childhood trauma.

Limitations

The first study had a small sample size, which limited our ability to control for gender. This led us to conduct a second study among a sample of college undergraduates using a larger sample and greater range of measures. Nevertheless, the sample of undergraduates was demographically homogenous, lacking the diversity represented in the first sample. In addition, both studies examined a sample with restricted age range, which limits the generalizability of these conclusions to adults. In addition, in both studies, data were self-reported, which introduces the potential for bias. Report on traumatic experiences was retrospective, so the findings are not specific with regard to the timing of the trauma. In addition, adults with more psychosocial problems may be prone to recall more childhood traumatic experiences (Widom et al., 2004), indicating the need for prospective research on the longitudinal impact of trauma. Finally, the number of traumatic experiences was examined collectively (a total number of traumas). Thus, results are unable to determine if specific traumatic events play a role in later outcomes.

Conclusions

Despite several limitations, the studies have several notable strengths. First, the examination of these associations in two samples of young adults has significant implications for the prevention literature. In samples of youth, particularly those at high-risk for developing psychopathology, interventions that directly address avoidance and mindfulness may be useful for individuals exposed to trauma. Second, the measurement of childhood trauma in the second sample (aged above 18) allows for some degree of temporal precedence to be established. Despite lacking knowledge of when specific traumatic experiences occurred, it is clear that childhood trauma and current avoidance/mindfulness play a significant role in current symptoms. Finally, this study adds to the literature by examining the mediating role of these processes in the relation between trauma and psychiatric symptoms. Given the well-established incidence rates of trauma among both youth and adults, it is critical that research examine the mechanisms by which trauma leads to later adverse outcomes, and this study introduces two key processes that impact said outcomes – avoidance and mindfulness.

In conclusion, the current findings indicate that among two samples of young adults, the association between childhood trauma and obsessive-compulsive symptoms is mediated by avoidance and mindfulness. Furthermore, the second study examined these processes as mediators of the relation between traumatic experiences and internalizing symptoms, finding once again that avoidance and mindfulness were significant mediators. Using the FFMQ, we were able to pinpoint what facets of mindfulness specifically are accounting for this effect. These findings present potential targets for clinical intervention and for examination in future research. Among traumatized young adults, the provision of these specific skills may lead to more favorable psychological outcomes. Thus, changing the way that young adults

relate to internal experiences may impact trajectories of psychopathology and help traumatized individuals to build meaningful, rich lives, even in the presence of difficult experiences.

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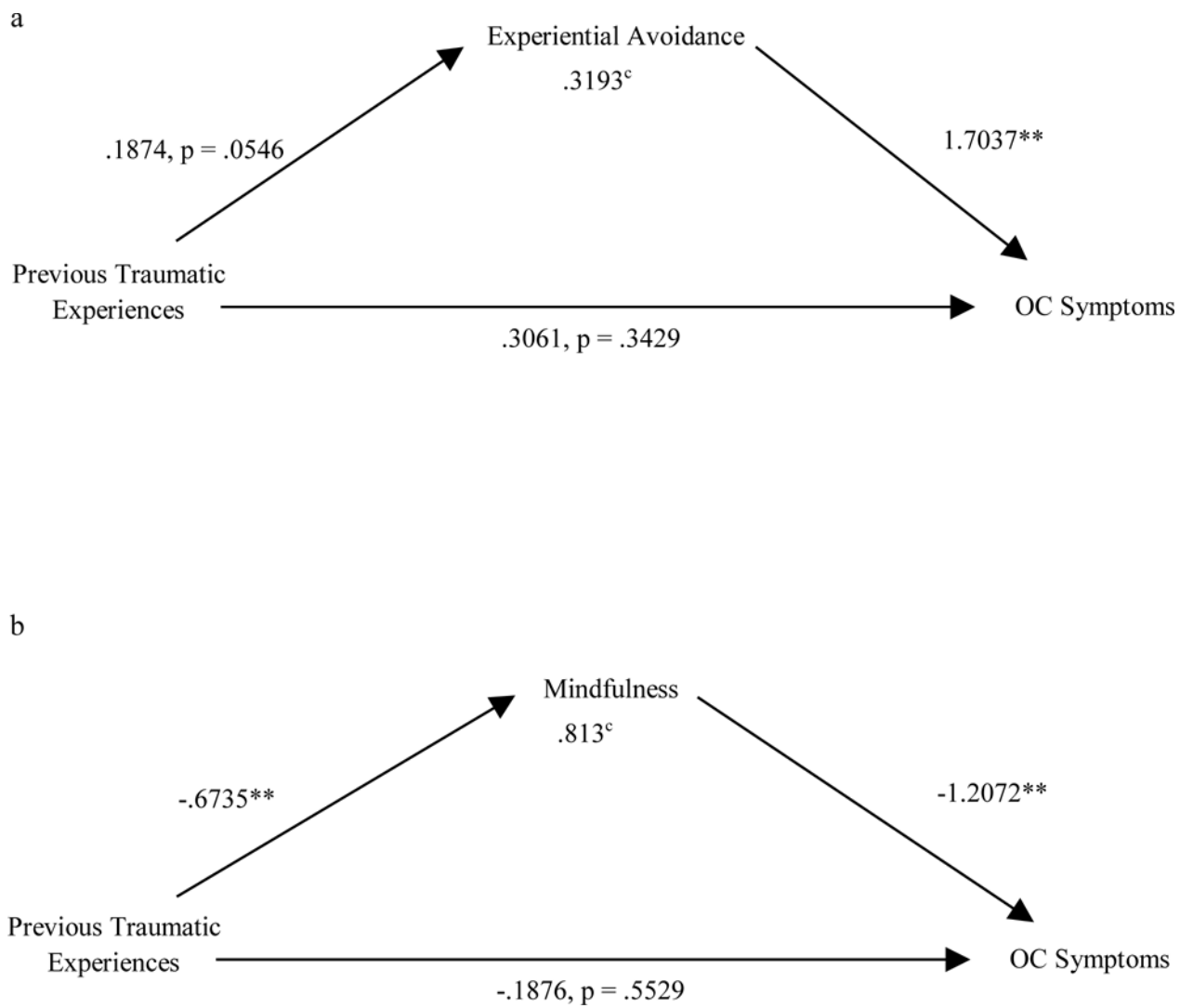


Figure 1.

a: Unstandardized coefficients for association between previous trauma and obsessive-compulsive symptoms, as mediated by experiential avoidance in adolescent sample

b: Unstandardized coefficients for association between previous trauma and obsessive-compulsive symptoms, as mediated by mindfulness in adolescent sample

* = $p < .05$, ** = $p < .01$, c = CI does not include zero

Previous Traumatic Experiences = ETISR-SF Score

Experiential Avoidance = AAQ-II Score

Mindfulness = CAMM-10 Score

OC symptoms = OCIR-R Score

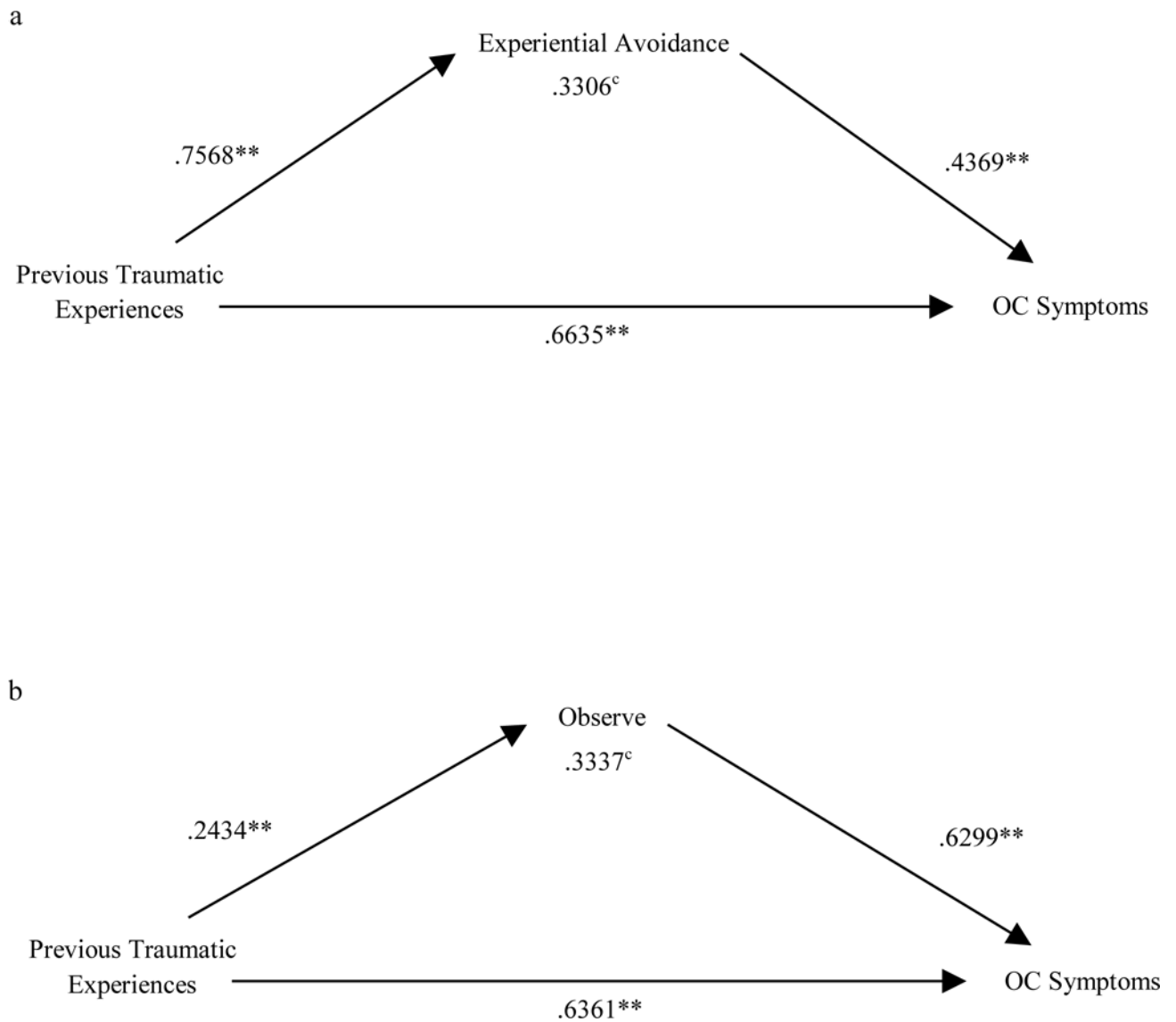


Figure 2.

a: Unstandardized coefficients for association between previous trauma and obsessive-compulsive symptoms, as mediated by experiential avoidance in college student sample

b: Unstandardized coefficients for association between previous trauma and obsessive-compulsive symptoms, as mediated by observe facet of mindfulness in college student sample

* = $p < .05$, ** = $p < .01$, c = CI does not include zero

Previous Traumatic Experiences = ETISR-SF Score

Experiential Avoidance = AAQ-II Score

Observe = FFMQ Observe Score

OC symptoms = OCIR-R Score

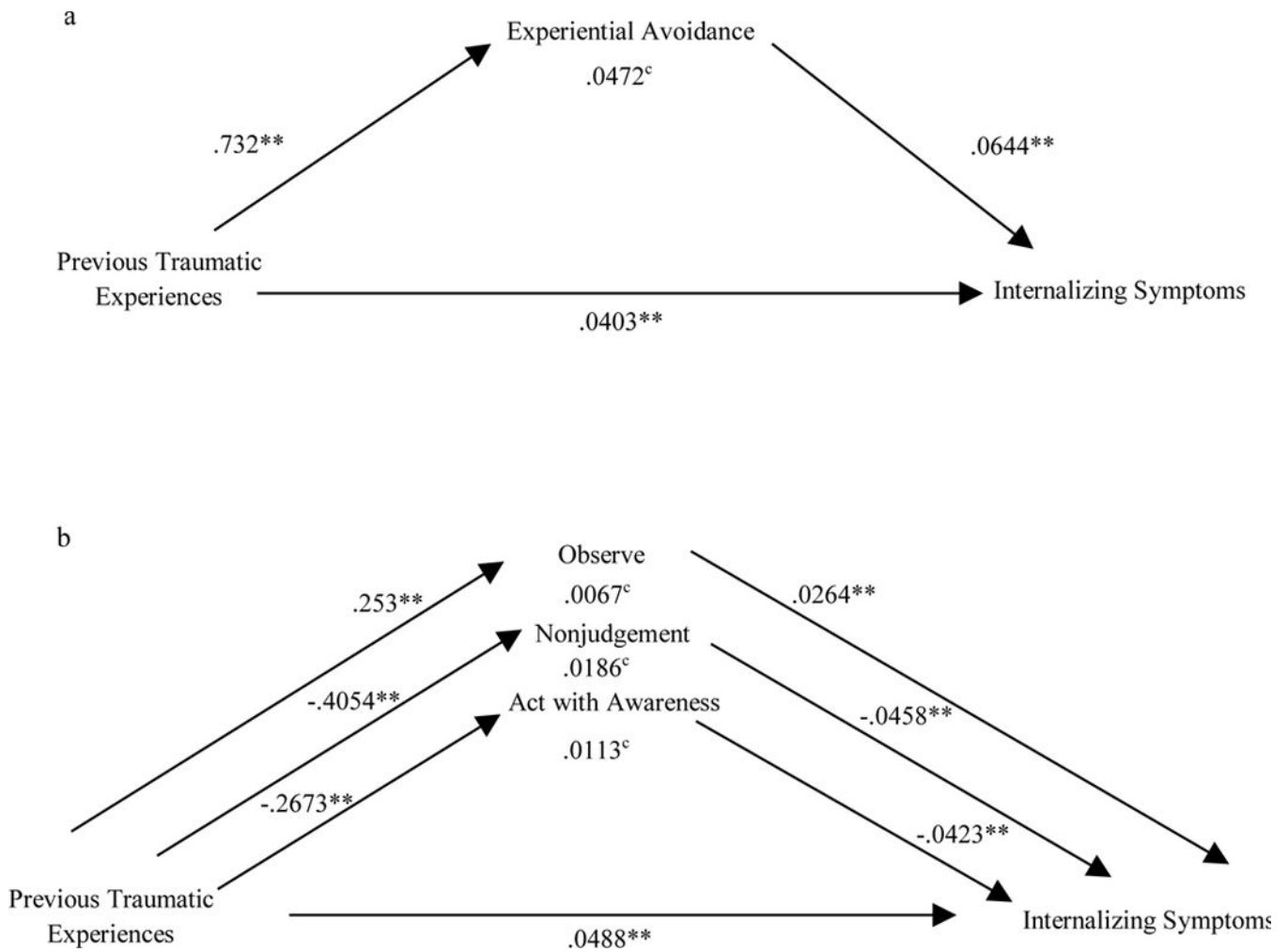


Figure 3.

a: Unstandardized coefficients for association between previous trauma and internalizing symptoms, as mediated by experiential avoidance in college student sample

b: Unstandardized coefficients for association between previous trauma and internalizing symptoms, as mediated by observe, nonjudgment, and act with awareness facets of mindfulness in college student sample

* = $p < .05$, ** = $p < .01$, c = CI does not include zero

Previous Traumatic Experiences = ETISR-SF Score

Experiential Avoidance = AAQ-II Score

Observe = FFMQ Observe Score

Nonjudgment = FFMQ Nonjudgment Score

Act with Awareness = FFMQ Act with Awareness Score

Internalizing Symptoms = GAD-7 and PHH-9 Internalizing Composite Factor Score

Table 1

Descriptive statistics of the adolescent sample, N = 51.

	N (%)
Gender	
Male	21 (39.6%)
Female	32 (60.4%)
Age, M(SD)	16.29 (1.01)
Race	
White, Non-Hispanic	18 (34.0%)
White Hispanic	6 (11.3%)
African American	22 (41.5%)
American Indian or Alaska Native	1 (1.9%)
Native Hawaiian or Pacific Islander	1 (1.9%)
Biracial or Multiracial	5 (9.4%)
Employment Status	
Full-time	3 (5.7%)
Part-time	26 (49.1%)
Unemployed	24 (45.3%)
Grade in School	
9	5 (9.4%)
10	15 (28.3%)
11	24 (45.3%)
12	9 (17.0%)
Sexual Orientation	
Heterosexual	35 (66%)
Homosexual, Bisexual, or Other	15 (28.3%)
Missing	3 (5.7%)
ETI, M(SD)	9.66 (5.66)
AFQ-Y, M(SD)	2.43 (3.86)
CAMM, M(SD)	32.04 (7.82)

Note. ETI = Early Trauma Inventory. AFQ-Y = Avoidance and Fusion Questionnaire – Youth. CAMM = Child and Adolescent Mindfulness Measure.

Table 2

Descriptive statistics of the college student sample, N = 400.

	N (%)
Gender	
Male	142 (34.3%)
Female	265 (64.0%)
Unsure, prefer not to answer, other	4 (0.9%)
Missing	3 (0.7%)
Age, M(SD)	19.16 (1.33)
Race	
White, Non-Hispanic	282 (68.1%)
White Hispanic	56 (13.5)
African American	13 (3.1%)
Asian American	40 (9.7%)
American Indian or Alaska Native	1 (0.2%)
Native Hawaiian or Pacific Islander	1 (0.2%)
Biracial or Multiracial	15 (3.6%)
Missing	6 (1.4%)
Employment Status	
Full-time	12 (2.9%)
Part-time	188 (45.4%)
Unemployed	211 (51%)
Missing	3 (0.7%)
Year in College	
1	218 (52.7%)
2	106 (25.6%)
3	54 (13%)
4	29 (7%)
Sexual Orientation	
Heterosexual	369 (88.1%)
Homosexual, Bisexual, or Other	40 (9.7%)
Missing	5 (1.2%)
ETI, M(SD)	6.28 (4.89)
AAQ-II, M(SD)	21.10 (8.98)
FFMQ	
Observe	24.58 (5.38)
Describe	25.84 (5.46)
Act with Awareness	24.93 (5.46)
Nonjudgment	25.05 (6.11)
Nonreactivity	20.59 (3.9)
OCI-R	14.2 (13.62)
PHQ-9	8.5 (6.83)

	N (%)
GAD-7	6.53 (5.52)

Note. ETI = Early Trauma Inventory. AAQ = Acceptance and Action Questionnaire-II. FFMQ = Five Facet Mindfulness Questionnaire. PHQ-SSS = Patient Health Questionnaire-Somatic Symptom Severity.

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Association between previous trauma and obsessive-compulsive symptoms, as mediated by avoidance and mindfulness in adolescent sample.

Table 3

Outcome Variable	Predictor	Coefficient (SE)	CI	t	p
Avoidance	ETI	.19 (.10)	[-.004, .38]	1.97	.05
OC Symptoms	Avoidance	1.70 (.46)	[.78, 2.63]	3.69	<.001
	ETI	.31 (.32)	[-.34, .95]	.96	.34
	Indirect Effect	Effect (Boot SE)	CI		
OC Symptoms	Avoidance	.32 (.21)	[.01, .85]		

Outcome Variable	Predictor	Coefficient (SE)	CI	t	p
Mindfulness	ETI	-.67 (.18)	[-1.03, -.32]	-3.84	<.001
OC Symptoms	Mindfulness	-1.21 (.22)	[-1.66, -.76]	-5.38	<.001
	ETI	-.19 (.31)	[-.8189, .4436]	-.60	.55
	Indirect Effect	Effect (Boot SE)	CI		
OC Symptoms	Mindfulness	.81 (.27)	[.38, 1.45]		

Note. $N = 51$. ETI = Early Trauma Inventory (total number of previous traumatic experiences). OC Symptoms = Obsessive-Compulsive Symptoms, as measured by OCI-R. Boot SE = Bootstrapped Standard Error. CI = Confidence Interval.

Association between previous trauma and obsessive-compulsive symptoms, as mediated by experiential avoidance in college student sample.

Table 4

Outcome Variable	Predictor	Coefficient (SE)	CI	t	p
AAQ-II	ETI	.76 (.09)	[.59, .93]	8.79	<.001
	Gender	.01 (.005)	[-.001, .02]	1.67	.10
OCI-R	AAQ-II	.44 (.08)	[.29, .59]	5.78	<.001
	ETI	.66 (.14)	[.39, .94]	4.74	<.001
OCI-R	Gender	.01 (.01)	[-.002, .03]	1.78	.08
	Indirect Effect	Effect (Boot SE)	BootCI		
OCI-R	AAQ-II	.33 (.07)	[.21, .48]		

Note. $N = 390$. ETI = Early Trauma Inventory (total number of previous traumatic experiences). AAQ-II = Acceptance and Action Questionnaire, second version. OCI-R = Obsessive Compulsive Inventory – Revised. Boot SE = Bootstrapped Standard Error. CI = Confidence Interval. BootCI = Bootstrapped Confidence Interval.

Table 5

Association between previous trauma and obsessive-compulsive symptoms, as mediated by five facets of mindfulness in college student sample.

Outcome Variable	Predictor	Coefficient (SE)	CI	t	p
FFMQ					
Observe	ETI	.24 (.06)	[.13, .35]	4.38	<.001
	Gender	.00 (.003)	[-.01, .01]	-.02	.99
Describe	ETI	-.08 (.06)	[-.19, .03]	-1.41	.16
	Gender	.002 (.003)	[-.005, .008]	.46	.64
Act with Awareness	ETI	-.27 (.06)	[-.38, -.16]	-4.73	<.001
	Gender	-.003 (.003)	[-.01, .003]	-.99	.32
Nonjudgmental	ETI	-.42 (.06)	[-.54, -.30]	-6.80	<.001
	Gender	-.0002 (.003)	[-.007, .01]	-.07	.94
Nonreactivity	ETI	-.004 (.04)	[-.09, .08]	-.09	.93
	Gender	-.003 (.002)	[-.01, .001]	-1.40	.001
OCI-R					
Observe	FFMQ	.63 (.13)	[.37, .89]	4.74	<.001
	Describe	-.46 (.13)	[-.71, -.21]	-3.66	<.001
Act with Awareness	Nonjudgmental	-.23 (.13)	[-.48, .03]	-1.75	.08
	Nonreactivity	-.20 (.12)	[-.44, .05]	-1.60	.11
ETI	Nonreactivity	-.03 (.17)	[-.37, .31]	-.16	.87
	Gender	.64 (.13)	[.38, .89]	4.85	<.001
Gender	Indirect Effect	.02 (.01)	[.002, .03]	2.29	.02
	Effect (Boot SE)	Effect (Boot SE)	BootCI		
OCI-R					
Observe	FFMQ	.33 (.08)	[.20, .51]		
	Describe	.04 (.03)	[-.01, .10]		
Act with Awareness	Nonjudgmental	.06 (.03)	[-.001, .14]		
	Nonreactivity	.08 (.05)	[-.01, .19]		
Gender	Nonreactivity	.0001 (.01)	[-.01, .20]		

Note. N = 391. FFMQ = Five Facet Mindfulness Questionnaire; ETI = Early Trauma Inventory (total number of previous traumatic experiences); Boot SE = Bootstrapped Standard Error; CI = Confidence Interval; BootCI = Bootstrapped Confidence Interval.

Association between previous trauma and internalizing symptoms, as mediated by experiential avoidance in college student sample.

Table 6

Outcome Variable	Predictor	Coefficient (SE)	CI	t	p
AAQ-II	ETI	.73 (.08)	[-.57, .89]	8.85	<.001
	Gender	2.82 (.74)	[1.36, 3.79]	3.79	<.001
Internalizing Symptoms	AAQ-II	.06 (.005)	[.06, .07]	14.09	<.001
	ETI	.04 (.01)	[.02, .06]	4.92	<.001
	Gender	.08 (.07)	[-.05, .22]	1.21	.23
	Indirect Effect	Effect (Boot SE)	BootCI		
OCLR	AAQ-II	.05 (.01)	[.03, .06]		

Note. $N = 394$. ETI = Early Trauma Inventory (total number of previous traumatic experiences). AAQ-II = Acceptance and Action Questionnaire, second version. OCLR = Obsessive Compulsive Inventory – Revised. Boot SE = Bootstrapped Standard Error. CI = Confidence Interval. BootCI = Bootstrapped Confidence Interval.

Table 7

Association between previous trauma and internalizing symptoms, as mediated by five facets of mindfulness in college student sample.

Outcome Variable	Predictor	Coefficient (SE)	CI	t	p
FFMQ					
Observe	ETI	.25 (.05)	[.15, .36]	4.67	<.001
	Gender	.03 (.49)	[-.93, .99]	.06	.95
Describe	ETI	-.08 (.06)	[-.19, .03]	-1.43	.15
	Gender	-.15 (.51)	[-1.15, .84]	-.30	.76
Act with Awareness	ETI	-.27 (.06)	[-.38, -.16]	-4.86	<.001
	Gender	.60 (.49)	[-.37, 1.57]	1.22	.22
Nonjudgmental	ETI	-.41 (.06)	[-.52, -.29]	-6.76	<.001
	Gender	-.65 (.54)	[-1.71, .41]	-1.21	.23
Nonreactivity	ETI	-.001 (.04)	[-.08, .08]	-.03	.98
	Gender	-1.17 (.36)	[-1.88, -.46]	-3.25	.001
Internalizing Symptoms					
FFMQ					
Observe	Observe	.03 (.008)	[.01, .04]	3.16	.002
	Describe	-.01 (.008)	[-.03, .003]	-1.59	.11
Act with Awareness	Act with Awareness	-.04 (.008)	[-.06, -.03]	-5.20	<.001
	Nonjudgmental	-.05 (.008)	[-.06, -.03]	-5.89	<.001
Nonreactivity	Nonreactivity	-.03 (.01)	[-.05, -.004]	-2.37	.02
	ETI	.05 (.008)	[.03, .06]	6.01	<.001
Gender	Gender	.21 (.07)	[.07, .35]	3.02	.003
	Indirect Effect	Effect (Boot SE)	BootCI		
OCI-R					
FFMQ					
Observe	Observe	.01 (.003)	[.003, .01]		
	Describe	.001 (.001)	[-.0002, .004]		
Act with Awareness	Act with Awareness	.01 (.003)	[.006, .02]		
	Nonjudgmental	.02 (.004)	[.01, .03]		
Nonreactivity	Nonreactivity	.0000 (.001)	[-.002, .002]		

Note. N = 391. FFMQ = Five Facet Mindfulness Questionnaire; ETI = Early Trauma Inventory (total number of previous traumatic experiences); Boot SE = Bootstrapped Standard Error; CI = Confidence Interval; BootCI = Bootstrapped Confidence Interval.