

Traumatic Stress, Affect Dysregulation, and Dysfunctional Avoidance: A Structural Equation Model

John Briere

Keck School of Medicine, University of Southern California, Los Angeles

Monica Hodges

Keck School of Medicine, University of Southern California, Los Angeles and California State University, Long Beach

Natacha Godbout

Keck School of Medicine, University of Southern California, Los Angeles

The multivariate relationship between interpersonal trauma, posttraumatic stress, affect dysregulation, and various avoidance behaviors was examined in a sample of 418 trauma-exposed participants from the general population. Structural equation modeling indicated that (a) suicidality, substance abuse, dissociation, and problematic activities such as self-injury and dysfunctional sexual behaviors were all indicators of a robust latent variable, named dysfunctional avoidance, (b) accumulated exposure to various types of interpersonal trauma was associated with this avoidance factor, and (c) the relationship between trauma and dysfunctional avoidance was independently mediated by both posttraumatic stress and diminished affect regulation capacity.

A substantial body of literature indicates that exposure to traumatic events is associated with a range of psychological outcomes, including anxiety, depression, posttraumatic stress, somatization, and cognitive distortions (Briere, 2004; Friedman, Keane, & Resick, 2007). Studies further suggest a link between exposure to extended interpersonal victimization and symptoms associated with borderline personality traits or disorder (Sansone, Songer, & Miller, 2005), including identity disturbance, affect dysregulation, and problematic interpersonal relationships (Briere & Rickards, 2007; van der Kolk, Pelcovitz, Roth, Mandel, McFarlane, & Herman, 1996), as well as dissociation (Chu & Dill, 1990), suicidality (Zlotnick, Donaldson, Spirito, & Pearlstein, 1997), substance abuse (Ouimette & Brown, 2003), and “tension reduction” behaviors (Briere, 2002a) such as self-mutilation, binge–purge eating, impulsivity, and excessive or dysfunctional sexual activities (e.g., Briere & Rickards, 2007; Green, Krupnick,

Stockton, Goodman, Corcoran, & Petty, 2005). Many of these symptoms appear to be associated with repeated and sustained child abuse and neglect (van der Kolk et al., 1996), although later interpersonal traumas also may be involved (Ford, 1999).

As the potentially trauma-related etiology of these symptoms and problems has become more clear, clinicians and theorists have sought to explain why phenomena as diverse as dissociation, substance abuse, suicidal behavior, and “acting out” behaviors might arise from trauma exposure. Suggested in less trauma-related contexts by Lazarus and Folkman (1984) and Hayes (e.g., Hayes, Strosahl, & Wilson, 2003), a common but not fully tested view is that such behaviors can represent an attempt to cope with triggered or sustained posttraumatic emotional states, perhaps especially when these states overwhelm internal affect regulation capacities and thereby motivate the need for avoidance (Briere, 2002a; van der Kolk et al., 1996). From this perspective, certain correlates of trauma exposure can be considered avoidance responses to the extent that they alter awareness, distract, anesthetize, produce distress-incompatible states, or temporarily forestall negative experiences, thereby redirecting attention away from otherwise overwhelming emotions (Briere & Scott, 2006). For example, substance abuse, suicidality, dissociation, and tension-reduction behavior are often viewed as avoidance activities by clinicians and researchers (e.g., Chapman, Gratz, & Brown, 2006; Hayes et al., 2003; Khantzian, 1997; Schneidman, 1996; Spiegel, 1993). Repeated interpersonal trauma may especially motivate avoidance because it appears to both (a) produce enduring negative emotional states, and (b) disrupt (or inhibit the development of) the

Monica Hodges is now at Department of Psychology, California State University, Long Beach, CA.

John Briere, Department of Psychiatry and the Behavioral Sciences, Keck School of Medicine, University of Southern California, Los Angeles; Monica Hodges, Department of Psychiatry and the Behavioral Sciences, Keck School of Medicine, University of Southern California, Los Angeles, and Department of Psychology, California State University, Long Beach; Natacha Godbout, Department of Psychiatry and the Behavioral Sciences, Keck School of Medicine, University of Southern California, Los Angeles.

Correspondence concerning this article should be addressed to: John Briere, Psychological Trauma Program, 2010 Zonal Ave., 1P51, Los Angeles, CA 90033. E-mail: jrbriere@usc.edu.

© 2010 International Society for Traumatic Stress Studies. View this article online at wileyonlinelibrary.com DOI: 10.1002/jts.20578

biological and psychological components of emotional regulation that otherwise serve to equilibrate or downregulate such states (Pearlman & Courtois, 2005).

In support of this view, various studies report an association between interpersonal trauma and posttraumatic stress, affect regulation difficulties, and avoidance responses, as noted above. Further, two studies indicate that a count of the number of different types of interpersonal (but not noninterpersonal) traumas experienced by a person is especially predictive of more complex symptomatology, including dysfunctional behaviors and dissociation (Briere, Kaltman, & Green, 2008; Cloitre et al., 2009). Despite these findings, however, we know of only one published study that specifically examined the role of trauma-related affect dysregulation and posttraumatic stress in the potential development of an avoidance behavior. In this study (Briere, 2006), logistic regression analysis revealed that posttraumatic stress and affect dysregulation (but not their interaction) predicted participants' elevation on at least one scale (versus no elevation on any scale) of the Multiscale Dissociation Inventory (Briere, 2002b). Although encouraging of the avoidance hypothesis, that analysis (a) did not evaluate the full range of dissociative symptomatology (only presence or absence of one or more scale elevations), (b) was limited to a single form of dysfunctional avoidance (e.g., dissociation, as opposed to additional responses such as dysfunctional behaviors, substance abuse, or suicidality), and (c) did not utilize data analytic strategies that might more formally evaluate causal hypotheses.

Using an existing general population dataset and structural equation modeling (SEM), we sought to test two hypotheses: first, that the construct dysfunctional avoidance is an empirically meaningful latent variable, as evaluated by the measurement model component of SEM; and second, that the cumulative number of different types of interpersonal (as opposed to noninterpersonal) traumas experienced by individuals would be related to dysfunctional avoidance, but that much of this relationship would (a) be mediated by posttraumatic stress and affect dysregulation, and (b) moderated by the interaction between these two variables. Regarding the latter, we predicted that dysfunctional avoidance would especially arise when posttraumatic stress and affect dysregulation were both high, i.e., when the individual was suffering from relatively severe posttraumatic stress in the context of relatively low affect regulation capacity, resulting in a need for avoidant solutions to overwhelming negative emotions.

METHOD

Participants and Procedure

The current study was performed on data from the Detailed Assessment of Posttraumatic Stress (Briere, 2001), Multiscale Dissociation Inventory, and Inventory of Altered Self-Capacities (Briere, 2000) standardization studies, with permission of the test publisher, Psychological Assessment Resources. Subsequent to approval

by the Institutional Review Board of the University of Central Florida, a random sample of registered automobile owners and/or individuals with listed telephone numbers was collected by a national sampling service, stratified to match general population proportions on sex, age, race, and geographic location. Potential participants were mailed a questionnaire containing demographic questions and, among other measures, the three tests described above. Participants received \$5.00 upon mailing back the questionnaire. To provide additional participants in the lower age ranges, 70 university students were recruited from college classes and offered course credit for completing the same protocol as above, but without financial compensation. All questionnaires were anonymous, although financial compensation in the general population sample was tied to names and addresses that were destroyed before data analysis.

According to the test publisher, the first 558 (10%) of 5,485 potential participants to respond to an internet inquiry, along with the 70 university students, were included in the standardization sample. Demographic analysis of the student versus general population subsamples indicated no differences on relevant variables other than age, with the exception that women were overrepresented relative to men (data on the exact gender ratio for the student sample is unavailable from the test publisher). As is common in Web-based standardization studies, data from additional individuals in this participant pool were not collected because their data were not required to fill relevant cells of the stratified sample matrix. As a result, the actual response rate is unknown, but likely to be higher than 10% because the study was terminated before all eligible participants were able to respond. Several published studies have used data from this sample (e.g., Briere, 2006; Briere, Scott, & Weathers, 2005).

Of the 628 participants, 446 (71%) reported a lifetime exposure to one or more traumas that met Criteria A1 and A2 of the *Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition-Text Revision (DSM-IV-TR)*; American Psychiatric Association, 2000). Data missing from 28 participants on key variables resulted in their exclusion from analyses, leaving a final sample of 418 participants. The mean age of trauma-exposed participants in this sample was 45.0 years ($SD = 16.5$). One-hundred eighty (43%) participants were female, 201 (48%) were male, and 37 (9%) did not indicate gender. Ethnicity of participants was as follows: 338 (81%) Anglo American; 23 (5%) African American; 16 (4%) Latino American; 12 (3%) Asian American; 7 (2%) Native American; 6 (1%) "Other," and 16 (4%) who did not indicate ethnicity.

Measures

The Detailed Assessment of Posttraumatic Stress was used to assess trauma exposure, posttraumatic stress, and two potential indicators of dysfunctional avoidance (substance abuse and suicidality). This measure is a 104-item standardized test of trauma and its effects, with scales that evaluate, for example, the respondent's

lifetime number of different types of traumatic events (Relative Trauma Exposure), symptoms of posttraumatic stress (Reexperiencing, Avoidance, Hyperarousal, and Posttraumatic Stress–Total) linked to a specific trauma and experienced over the prior month, and associated features of traumatic stress (e.g., suicidality and substance abuse). This test has been shown to be reliable and valid (Briere, 2001).

To test hypotheses regarding the role of accumulated interpersonal versus noninterpersonal traumas in the development of dysfunctional avoidance, the Relative Trauma Exposure scale was divided into two variables: the total number of different interpersonal traumas (e.g., sexual abuse, physical assault) experienced, and the total number of different noninterpersonal traumas (e.g., disasters, motor vehicle accidents) experienced. Tests of hypotheses regarding the role of posttraumatic stress utilized the 30-item Posttraumatic Stress–Total scale, which had very good internal consistency in the present study ($\alpha = .96$). The two scales of the Detailed Assessment of Posttraumatic Stress used to index dysfunctional avoidance also demonstrated acceptable reliabilities: Suicidality (10 items, $\alpha = .90$) and Substance Abuse (10 items, $\alpha = .72$).

The Multiscale Dissociation Inventory was used to assess the third potential indicator of dysfunctional avoidance: dissociation. This test is a 30-item standardized and normed questionnaire measure of dissociative responses, consisting of six scales: Disengagement, Depersonalization, Derealization, Memory Disturbance, Emotional Constriction, and Identity Dissociation. It is reliable and correlates as expected with victimization history, posttraumatic stress disorder (PTSD), and other measures of dissociation (e.g., Briere, 2002b; Dietrich, 2003). In the current study, the total score (the sum of all items of the six scales) demonstrated very good internal consistency, $\alpha = .93$.

Two scales of the Inventory of Altered Self-Capacities were used as indicators in this model: the Affect Dysregulation scale to assess affect dysregulation, and the Tension Reduction Activities scale as the fourth potential indicator of dysfunctional avoidance. The Inventory of Altered Self-Capacities is a 63-item standardized test that generates scale scores in five additional areas beyond affect dysregulation and tension reduction, including Abandonment Concerns, Identity Impairment, and Interpersonal Conflicts. A factor analysis in the normative sample indicated that each of the scales of this instrument reflects a statistically distinct self-related symptom dimension (Briere, 2000), including separate factors for affect dysregulation and tension reduction.

The Affect Dysregulation scale demonstrated very good internal consistency in the present study ($\alpha = .93$). Items within this 9-item scale tap affect instability (e.g., rapid mood changes) and affect regulation skill deficits (e.g., difficulty calming down when upset). The 9-item Tension Reduction Activities scale had acceptable internal consistency ($\alpha = .76$). Typical items of this scale refer to self-injury, food bingeing, impulsive aggression, and the use of sexual activity as a way to neutralize negative feelings.

Data Analysis

Hypotheses were analyzed in three phases, using Bentler's (2005) structural equation modeling software, EQS (version 6). The first set of analyses examined the measurement model for the latent dysfunctional avoidance variable, as indicated by Tension Reduction Activity, Dissociation, Suicidality, and Substance Abuse scales. Then the proposed mediating effects of affect dysregulation and posttraumatic stress between trauma exposure and dysfunctional avoidance were examined. Direct effects of cumulative noninterpersonal trauma and cumulative interpersonal trauma on dysfunctional avoidance were evaluated first, using the original and classical approaches described by Baron and Kenny (1986) and Holmbeck (1997) for establishing the presence of mediation. SEM models were then constructed to test whether affect dysregulation and posttraumatic stress mediated the effects of trauma on dysfunctional avoidance.

The direct effects model tested cumulative interpersonal and noninterpersonal trauma as they related to dysfunctional avoidance. Evaluation of this structural model, as well as associated Wald's statistics, then determined whether either variable, or both, would be used in the next phases of analysis.

In the second phase, the two measured dependent variables, affect dysregulation and posttraumatic stress, were added to the direct effects model to evaluate the proposed mediating effects of affect dysregulation and posttraumatic stress in the relationship between cumulative trauma exposure and dysfunctional avoidance. The use of multiple mediators in structural equation modeling is increasingly common (see, e.g., MacKinnon, Lockwood, Hoffman, West, & Sheets, 2002), in part because it allows better representation of complex phenomena, as well as evaluation of the unique role of each mediator relative to the other. Given the expected correlation of these variables, disturbance terms for the measured mediator variables (affect dysregulation and posttraumatic stress) were covaried.

The final phase of analyses examined whether the interaction between affect dysregulation and posttraumatic moderated the direct effects of trauma exposure on the use of dysfunctional avoidance. This was tested based on the mediation model described above, along with the addition of an interaction term. Moderation analyses were conducted using the cross-product of affect dysregulation and posttraumatic stress variables, centered at their mean (Baron & Kenny, 1986).

Structural equation modeling estimates relationships among variables, considering all relationships simultaneously and minimizing the effects of measurement error. Because the variables of interest in the current study are naturally nonnormally distributed, the robust estimation method was used. The robust method allows for the calculation of the adapted Satorra–Bentler scaled chi-square value, corrected fit indices, and robust standard error, all of which address nonnormality (see Byrne, 2006). Several indices were employed to determine whether the hypothesized models fit

Table 1. Frequency of Types of Traumatic Events Experienced by Participants

Type	<i>n</i>	%
Motor vehicle accidents	237	57
Natural disaster	116	28
Work/home accident	110	26
Assault	105	25
Threatened assault	132	32
Shooting/stabbing with injury	52	12
Combat	44	10
Robbery/mugging	48	11
Sexual assault	72	17
Childhood sexual abuse	96	23
Witnessed someone else getting injured	211	50
Other	107	26

the observed data. A nonsignificant χ^2 indicates the absence of meaningful unexplained variance. However, because this statistic is sensitive to sample size, the ratio of chi-square to degrees of freedom (χ^2/df) was also considered, with values of 2.0 or less considered satisfactory (Newcomb, 1990). The comparative fit index (CFI), which compares the hypothesized model with the null model, was calculated, with a value of .95 or higher indicating a good fit (Hu & Bentler, 1999). Finally, the root mean square error of approximation (RMSEA) considers the error of approximation in the population and estimates the difference between model-implied and actual variances and covariances, with values less than .06 being preferred (Hu & Bentler, 1999).

RESULTS

Trauma types and frequency of each type are presented in Table 1. Means, standard deviations, and correlations are presented in

Table 2. Participants in the present study had been exposed to a mean of three different types of traumatic events in their lifetime, with an average of slightly more than one exposure type each for noninterpersonal and interpersonal traumas. The Spearman correlation between accumulated types of interpersonal and noninterpersonal trauma was .11, $p < .05$.

Measurement Model

Analysis of the measurement model for dysfunctional avoidance resulted in very good indices of fit, CFI = 1.00; $\chi^2 (2) < 1$; $\chi^2/df = 0.23$; RMSEA = .000. This variable was significantly represented by all of its four indicators (all at $p < .01$), with standardized coefficients of .44 for substance abuse, .56 for suicidality, .75 for dissociation, and .80 for tension reduction activities.

Direct Effects Analyses

Structural equation modeling analysis, examining the direct effects of both cumulative noninterpersonal trauma and cumulative interpersonal trauma on the latent dysfunctional avoidance variable, indicated that the structural model fit the data well, CFI = .99; $\chi^2 (9) = 10.57$, $p = .30$; $\chi^2/df = 1.17$; RMSEA = .02. A review of path coefficients indicated that cumulative interpersonal trauma significantly predicted dysfunctional avoidance ($\beta = .43$, $p < .001$), whereas cumulative noninterpersonal trauma was unrelated to dysfunctional avoidance ($\beta = .02$, *ns*). Wald statistics for improving model fit suggested that the path from cumulative noninterpersonal trauma be eliminated. Removal of this variable from the model resulted in a very good fit, CFI = 1.00; $\chi^2 (5) = 2.76$, *ns*; $\chi^2/df = 0.55$; RMSEA = .00; $R^2 = .19$, and the path from cumulative interpersonal trauma remained moderately strong ($\beta = .43$, $p < .001$). Accordingly, cumulative noninterpersonal trauma was excluded from subsequent analyses.

The direct effects of affect dysregulation and posttraumatic stress on dysfunctional avoidance also were tested prior to

Table 2. Means, Standard Deviations, and Correlations Among Variables Modeled in Structural Equation Modeling

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8
1. RTE-it	1.31	1.39	1							
2. RTE-nonit	1.11	0.91	.17**	1						
3. PTS-T	37.90	14.74	.35**	.08	1					
4. AD	11.59	4.71	.35**	.17**	.59**	1				
5. TRA	10.47	2.72	.38**	.08	.58**	.74**	1			
6. SUB	10.73	2.00	.11*	.01	.24**	.35**	.35**	1		
7. SUI	10.84	2.87	.25**	.03	.41**	.45**	.46**	.23**	1	
8. DIS	34.47	8.15	.30**	.07	.66**	.59**	.60**	.36**	.41**	1

Note: RTE-it = Relative Trauma Exposure–interpersonal trauma; RTE-nonit = Relative Trauma Exposure–noninterpersonal trauma; PTS-T = Posttraumatic Stress–Total; AD = affect dysregulation; TRA = tension reduction activities; SUB = substance abuse; SUI = suicidality; DIS = dissociation.

* $p \leq .05$. ** $p \leq .01$.

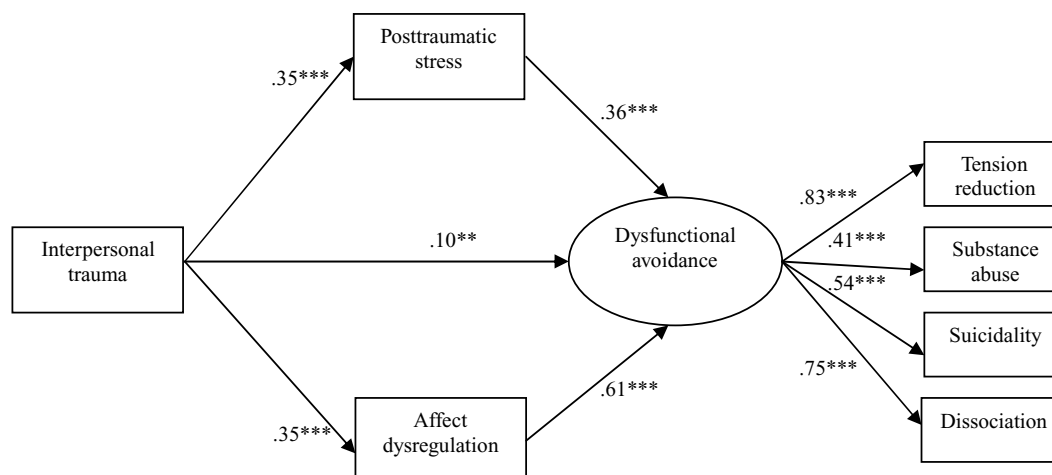


Figure 1. Results of structural equation modeling analysis of mediating effects of posttraumatic stress and affect dysregulation on dysfunctional avoidance associated with relative exposure to interpersonal trauma.

** $p < .01$. *** $p < .001$.

mediation analysis and resulted in a very good fit, $CFI = 1.00$; $\chi^2(8) = 15.57$, $p = .05$; $\chi^2/df = 1.95$; $RMSEA = .05$, and confirmed significant relationships between affect dysregulation and dysfunctional avoidance ($\beta = .62$, $p < .001$) as well as between posttraumatic stress and dysfunctional avoidance ($\beta = .38$, $p < .001$).

Mediation Analyses

A model examining the mediating effects of affect dysregulation and posttraumatic stress on the relationship between cumulative interpersonal trauma and dysfunctional avoidance was tested next. This model provided a good fit to the data, $CFI = .97$; $\chi^2(11) = 19.50$, $p = .06$; $\chi^2/df = 1.77$; $RMSEA = .04$, $R^2 = .83$, with no significant unexplained variance remaining (see Figure 1). As expected, exposure to accumulated interpersonal trauma was significantly associated with dysfunctional avoidance. Affect dysregulation and posttraumatic stress both strongly mediated this relationship, as evidenced by the significant reduction of the standardized regression coefficient in comparison to the direct effects model (i.e., from $\beta = .43$ to $.10$). Affect dysregulation and posttraumatic stress significantly influenced dysfunctional avoidance, consistent with the presence of mediation. As expected, the disturbance terms for affect dysregulation and posttraumatic stress were correlated ($r = .54$, $p < .001$).¹

These results indicate that both affect dysregulation and posttraumatic stress independently mediate the effects of accumulated types of interpersonal trauma on dysfunctional avoidance. However, although cumulative interpersonal trauma predicted affect

dysregulation and posttraumatic stress to an equivalent degree, affect dysregulation was a very strong predictor of dysfunctional avoidance, whereas posttraumatic stress (PTS) provided significant, but less, influence. As defined by MacKinnon et al. (2002), the magnitude of the mediation of the relationship between cumulative interpersonal trauma and dysfunctional avoidance was $.13$ for posttraumatic stress and $.22$ for affect dysregulation.

Moderation Analyses

The final SEM analysis examined the hypothesis that the specific combination of high posttraumatic stress and high affect dysregulation would moderate dysfunctional avoidance in individuals exposed to interpersonal trauma. Accordingly, an Affect Dysregulation \times Posttraumatic Stress interaction term was added to the mediation model. Results indicated adjustment fits similar to those of the mediated model, $CFI = .97$; $\chi^2(15) = 23.13$, $p = .08$; $\chi^2/df = 1.54$; $RMSEA = .04$, but the interaction term was not significantly related to dysfunctional avoidance ($\beta = .14$, *ns*).

Controlling for Posttraumatic Stress-Related Avoidance

Although these results suggest that posttraumatic stress and reduced affect regulation capacity mediate the cumulative interpersonal trauma—dysfunctional avoidance relationship, it was possible that the posttraumatic stress findings were confounded by the fact that posttraumatic stress (as measured by the Posttraumatic Stress-Total scale), itself, includes avoidance symptoms. Specifically, the diagnostic criteria for PTSD include effortful avoidance behaviors and numbing (APA, 2000), both of which might be expected to correlate with other forms of avoidance, such as substance abuse, suicidality, dissociation, or tension reduction behaviors. To

¹ Disturbance term correlations are not included in Figure 1, in the interest of visual clarity.

rule out this possibility, we removed the avoidance symptoms from the PTS variable used in the prior analyses, leaving only the reliving and hyperarousal symptoms as components of posttraumatic stress. This conservative reanalysis resulted in an equivalent robust CFI, without significant modifications in the path coefficients relative to the prior model, $CFI = .97$, $\chi^2(11) = 19.02$, $p = .06$; $\chi^2/df = 1.73$; $RMSEA = .04$.

DISCUSSION

As hypothesized, the results of this study indicate that cumulative exposure to different types of interpersonal trauma is associated with dysfunctional avoidance, and that this relationship is mediated by posttraumatic stress and reduced affect regulation capacities. The relationship between posttraumatic stress and dysfunctional avoidance, although important, has been demonstrated previously (e.g., Hartl, Rosen, Drescher, Lee, & Gusman, 2005). The potentially superordinate role of diminished affect regulation capacity, however, is a newer finding, although theoreticians have suggested that affect dysregulation might underlie various “acting out” behaviors in trauma survivors (Briere, 2002a; Pearlman & Courtois, 2005).

Although a mediational model was supported in this study, the hypothesized moderation was not found. Specifically, posttraumatic stress and affect dysregulation both independently mediate the relationship between accumulated interpersonal traumas and dysfunctional avoidance, but their interaction does not significantly augment or exacerbate dysfunctional avoidance. Importantly, this does not necessarily contradict the notion that dysfunctional avoidance arises from overwhelming emotional states: high levels of posttraumatic stress may exceed even intact affect regulation capacities, and those with substantially impaired affect dysregulation may be overwhelmed by any significant level of posttraumatic stress (Briere & Scott, 2006).

It is significant that the SEM results indicated a relationship between dysfunctional avoidance and accumulated interpersonal traumas, but not noninterpersonal traumas. This finding is in accord with other studies on the relative impacts of interpersonal victimization (e.g., rape) as opposed to noninterpersonal events (e.g., disasters), wherein the former is usually more symptom-producing than the latter (e.g., Briere & Rickards, 2007; Green et al., 2000). Typically, human-caused traumas are viewed by victims as more intentional, intrusive, and malignant, and may involve perceptions of betrayal, each of which are associated with more negative outcomes (Briere & Scott, 2006; Freyd, Klest, & Allard, 2005). In contrast, events like disasters generally do not imply intentional maltreatment. As a result, although noninterpersonal traumas can clearly produce posttraumatic symptomatology in some cases, overall they may be less likely to engender the level of distress that would motivate dysfunctional avoidance.

It should be emphasized that, like other studies of accumulated forms of trauma exposure (e.g., Briere et al., 2008; Cloitre et al.,

2009; Follette, Polusny, Bechtle, & Naugle, 1996), the current study employed a measure of the number of different types of trauma experienced by participants, as opposed to the frequency of events within a given trauma type (e.g., the total number of times the participant had been sexually abused), and/or the sum of all trauma frequencies across different trauma types. Clearly, the latter variable might especially be of interest, and should be examined in future studies. As noted by Cloitre et al. (2009), however, the literature on interpersonal violence suggests that the frequency and duration of specific forms of victimization are surprisingly weak predictors of subsequent symptomatology, whereas as reviewed earlier, a count of types of interpersonal trauma exposures appears to be a robust correlate of outcome. These findings suggest that there is something specifically injurious about experiencing multiple forms of interpersonal victimization across the life span, and that such cumulative experiences may motivate dysfunctional avoidance.

The results of this study generally support the prediction that phenomena such as suicidality, substance abuse, dissociation, and dysfunctional behavior may, among other things, specifically serve the purpose of reducing emotional distress in individuals who have experienced multiple forms of interpersonal trauma. They further suggest that it is not the level of posttraumatic distress alone that triggers and reinforces such behaviors, but more importantly, the effects of reduced affect regulation capacity. However, the relationship between affect regulation and dysfunctional avoidance might partially reflect overlapping variance in the Inventory of Altered Self-Capacities scales used to measure affect dysregulation and one component of dysfunctional avoidance, tension-reduction behaviors. Items of the Tension Reduction Activities scale inquire about the use of externalizing behaviors to reduce distress, thereby potentially increasing the association between this scale and reports of inability to regulate distress. However, as noted earlier, the factor analysis presented in the *Inventory of Altered Self-Capacities Manual* (Briere, 2000) indicates that Affect Dysregulation and Tension Reduction Activities scales load on different factors, and thus do not reflect the same underlying phenomena. As well, the test of the measurement model in this study indicated that dysfunctional avoidance forms a robust, coherent factor (with perfect fit indices and RMSEA values of 1.0 and .00, respectively), composed of dissociation, suicidality, and substance abuse, as well as tension reduction behavior. Especially relevant is the strong univariate correlation between affect dysregulation and dissociation ($r = .59$); a relationship that does not appear to reflect measurement overlap issues.

The finding that posttraumatic stress and affect regulation difficulties predicted unique variance in dysfunctional avoidance suggests multiple pathways to dysfunctional avoidance behaviors in interpersonal trauma survivors. Some individuals may respond to posttraumatic stress with dysfunctional avoidance, others may engage in dysfunctional avoidance primarily due to insufficient affect regulation capacity, and some may invoke dysfunctional avoidance

in response to the additive combination of these variables. Although there are few studies in this area, it is possible that these different pathways are associated with different trauma typologies. For example, early trauma may predominately lead to affect dysregulation, identity, and relational issues (Pearlman & Courtois, 2005), whereas later trauma may be more associated with post-traumatic stress, depression, and anxiety (Briere, 2004). Exposure to both early and later adverse events (i.e., complex trauma) might produce a combination of high posttraumatic stress and substantially reduced affect regulation capacity, thereby motivating high levels of dysfunctional avoidance.

The current results provide additional evidence that some phenomena associated with a diagnosis of borderline personality disorder (e.g., affect dysregulation, tension reduction behaviors, suicidality, substance abuse, and dissociation) may be related to a history of multiple types of interpersonal trauma. These findings have implications for treatment, including the possibility that trauma-relevant interventions may be helpful in resolving some of the symptoms typically associated with borderline traits. Given the current results, such interventions might include therapeutic exposure to reduce posttraumatic stress (e.g., Foa, Hembree, & Rothbaum, 2007) and various cognitive-behavioral and relational treatments shown to increase affect regulation capacity and/or reduce experiential avoidance (Cloitre, Koenen, Cohen, & Han, 2002; Hayes et al., 2003; Linehan, 1993). The relationship between trauma exposure and reduced affect regulation also reinforces concerns that therapeutic exposure, at least when applied to complex trauma survivors, may need to be carefully titrated to match existing affect regulation capacities in case such procedures overwhelm the client with emotional states that cannot be easily downregulated (e.g., Briere & Scott, 2006; Courtois, 2004).

The conclusions of this study should be tempered by consideration of its several limitations. First, the actual response rate of all possible participants of this study is unknown, with a bottom limit of 10% under the unlikely assumption that all later potential participants after the study closed would not have completed protocols. Although the final sample was carefully stratified to match the demographics of the general population, a low participation rate may have resulted in sample bias associated with one or more unmonitored variables. Second, this study was retrospective, and thus participants' reports of trauma exposure may have been influenced by the passage of time. Third, SEM, although an improvement over other possible statistical techniques, does not guarantee that the hypothesized causal relationships are, in fact, causal. Even with good fit indices and explanation of a large proportion of variance in dysfunctional avoidance, the specific order of causation between variables hypothesized in the current study was based on clinical experience and theoretical suppositions. Future studies might best evaluate these variables with longitudinal designs to verify the direction of the observed effects. Finally, because the current study was intentionally limited to trauma-exposed individuals, we could not evaluate the extent to which

some instances of dysfunctional avoidance arise from nontrauma-related etiologies. For example, there are likely other routes to affect dysregulation, including inherited or acquired neurobiological dysfunctions (Krystal & Neumeister, 2009), subtraumatic events such as growing up in an invalidating but not grossly violent family environment (Linehan, 1993), and nontrauma-related disturbance in the child's early attachment to significant caregivers (Cassidy & Shaver, 2008). Because the current study demonstrated a strong pathway from affect regulation difficulties to dysfunctional avoidance, it is quite possible that such nontrauma etiologies will result in dysfunctional behaviors and dissociation by virtue of their impacts on affect regulation capacity alone.

REFERENCES

- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.
- Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, 51, 1173–1182.
- Bentler, P. M. (2005). *EQS 6 structural equations program manual*. Encino, CA: Multivariate Software.
- Briere, J. (2000). *Inventory of Altered Self-Capacities*. Odessa, FL: Psychological Assessment Resources.
- Briere, J. (2001). *Detailed Assessment of Posttraumatic Stress (DAPS)*. Odessa, FL: Psychological Assessment Resources.
- Briere, J. (2002a). Treating adult survivors of severe childhood abuse and neglect: Further development of an integrative model. In J. E. B. Meyers, L. Berliner, J. Briere, C. T. Hendrix, T. Reid, & C. Jenny (Eds.), *The APSAC handbook on child maltreatment* (2nd ed., pp. 175–202). Newbury Park, CA: Sage.
- Briere, J. (2002b). *Multiscale Dissociation Inventory*. Odessa, FL: Psychological Assessment Resources.
- Briere, J. (2004). *Psychological assessment of adult posttraumatic states: Phenomenology, diagnosis, and measurement* (2nd ed.). Washington, DC: American Psychological Association.
- Briere, J. (2006). Dissociative symptoms and trauma exposure: Specificity, affect dysregulation, and posttraumatic stress. *Journal of Nervous and Mental Disease*, 194, 78–82.
- Briere, J., Kaltman, S., & Green, B. L. (2008). Accumulated childhood trauma and symptom complexity. *Journal of Traumatic Stress*, 21, 223–226.
- Briere, J., & Rickards, S. (2007). Self-awareness, affect regulation, and relatedness: Differential sequels of childhood versus adult victimization experiences. *Journal of Nervous and Mental Disease*, 195, 497–503.
- Briere, J., & Scott, C. (2006). *Principles of trauma therapy: A guide to symptoms, evaluation, and treatment*. Thousand Oaks, CA: Sage.
- Briere, J., Scott, C., & Weathers, F. W. (2005). Peritraumatic and persistent dissociation in the presumed etiology of PTSD. *American Journal of Psychiatry*, 162, 2295–2301.
- Byrne, B. M. (2006). *Structural equation modeling with EQS: Basic concepts, applications, and programming* (2nd ed.). Mahwah NJ: Erlbaum.
- Cassidy, J., & Shaver, P. R. (2008). *Handbook of attachment: Theory, research, and clinical implications*. New York: Guilford Press.
- Chapman, A. L., Gratz, K. L., & Brown, M. Z. (2006). Solving the puzzle of deliberate self harm: The experiential avoidance model. *Behaviour Research and Therapy*, 44, 371–394.

- Chu, A., & Dill, D. L. (1990). Dissociative symptoms in relation to childhood physical and sexual abuse. *American Journal of Psychiatry*, 149, 887–893.
- Cloitre, M., Koenen, K. C., Cohen, L. R., & Han, H. (2002). Skills training in affective and interpersonal regulation followed by exposure: A phase-based treatment for PTSD related to childhood abuse. *Journal of Consulting and Clinical Psychology*, 70, 1067–1074.
- Cloitre, M., Stolbach, B. C., Herman, J. L., van der Kolk, B., Pynoos, R., Wang, J., et al. (2009). Developmental approach to complex PTSD: Childhood and adult cumulative trauma as predictors of symptom complexity. *Journal of Traumatic Stress*, 22, 399–408.
- Courtois, C. A. (2004). Complex trauma, complex reactions: Assessment and treatment. *Psychotherapy: Theory, Research, Practice Training*, 41, 412–425.
- Dietrich, A. (2003). Characteristics of child maltreatment, psychological dissociation and somatoform dissociation of Canadian inmates. *Journal of Trauma and Dissociation*, 4, 81–100.
- Foa, E. B., Hembree, E. A., & Rothbaum, B. O. (2007). *Prolonged exposure therapy for PTSD: Emotional processing of traumatic experiences: Therapist guide*. New York: Oxford University Press.
- Follette, V. M., Polusny, M. A., Bechtel, A. E., & Naugle, A. E. (1996). Cumulative trauma: The impact of child sexual abuse, adult sexual abuse and spouse abuse. *Journal of Traumatic Stress*, 9, 25–35.
- Ford, J. (1999). Disorders of extreme stress following war-zone military trauma: Associated features of posttraumatic stress disorder or comorbid but distinct syndromes? *Journal of Consulting and Clinical Psychology*, 67, 3–12.
- Freyd, J. J., Klest, B., & Allard, C. B. (2005). Betrayal trauma: Relationship to physical health, psychological distress, and a written disclosure intervention. *Journal of Trauma and Dissociation*, 6, 83–104.
- Friedman, M. J., Keane, T. M., & Resick, P. A. (Eds.). (2007). *Handbook of PTSD: Science and practice*. New York: Guilford Press.
- Green, B. L., Goodman, L. A., Krupnick, J. L., Corcoran, C. B., Petty, R. M., Stockton, P., et al. (2000). Outcomes of single versus multiple trauma exposure in a screening sample. *Journal of Traumatic Stress*, 13, 271–286.
- Green, B. L., Krupnick, J. L., Stockton, P., Goodman, L., Corcoran, C. & Petty, R. (2005). Effects of adolescent trauma exposure on risky behavior in college women. *Psychiatry*, 68, 363–376.
- Hartl, T. L., Rosen, C. S., Drescher, K. D., Lee, T. L., & Gusman, F. D. (2005). Predicting high-risk behaviors in veterans with posttraumatic stress disorder. *Journal of Nervous and Mental Disease*, 103, 464–472.
- Hayes, S. C., Strosahl, K. D., & Wilson, K. G. (2003). *Acceptance and commitment therapy: An experiential approach to behavior change*. New York: Guilford Press.
- Holmbeck, G. N. (1997). Toward terminological, conceptual, and statistical clarity in the study of mediators and moderators: Examples from the child-clinical and pediatric psychology literatures. *Journal of Clinical and Consulting Psychology*, 65, 599–610.
- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1–55.
- Khantzian, E. J. (1997). The self-medication hypothesis of substance use disorders: A reconsideration and recent applications. *Harvard Review of Psychiatry*, 4, 231–244.
- Krystal, J. H., & Neumeister, A. (2009). Noradrenergic and serotonergic mechanisms in the neurobiology of posttraumatic stress disorder and resilience. *Brain Research*, 1293, 13–23.
- Lazarus, R. S., & Folkman, S. (1984). *Stress, appraisal, and coping*. New York: Springer.
- Linehan, M. M. (1993). *Cognitive-behavioral treatment of borderline personality disorder*. New York: Guilford Press.
- MacKinnon, D. P., Lockwood, C. M., Hoffman, J. M., West, S. G., & Sheets, V. (2002). A comparison of methods to test mediation and other intervening variable effects. *Psychological Methods*, 7, 83–104.
- Newcomb, M. D. (1990). What structural modeling techniques can tell us about social support. In I. G. Sarason, B. R. Sarason, & G. R. Pierce (Eds.), *Social support: An interactional view* (pp. 26–63). New York: Wiley.
- Ouimette, P., & Brown, P. J. (2003). *Trauma and substance abuse: Causes, consequences, and treatment of comorbid disorders*. Washington, DC: American Psychological Association.
- Pearlman, L. A., & Courtois, C. A. (2005). Clinical applications of the attachment framework: Relational treatment of complex trauma. *Journal of Traumatic Stress*, 18, 449–459.
- Sansone, R. A., Songer, D. A., & Miller, K. A. (2005). Childhood abuse, mental healthcare utilization, self-harm behavior, and multiple psychiatric diagnoses among inpatients with and without a borderline diagnosis. *Comprehensive Psychiatry*, 46, 117–120.
- Schneidman, E. (1996). *The suicidal mind*. New York: Oxford University Press.
- Spiegel, D. (1993). Dissociation and trauma. In D. Spiegel (Ed.), *Dissociative disorders: A clinical review* (pp. 117–131). Lutherville, MD: Sidran Press.
- van der Kolk, B. A., Pelcovitz, D., Roth, S., Mandel, F. S., McFarlane, A., & Herman, J. (1996). Dissociation, affect dysregulation and somatization: The complexity of adaptation to trauma. *American Journal of Psychiatry*, 153, 83–93.
- Zlotnick, C., Donaldson, D., Spirito, A., & Pearlstein, T. (1997). Affect regulation and suicide attempts in adolescent inpatients. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36, 793–798.