ORIGINAL ARTICLES

Absorption, Dissociation, and Posttraumatic Stress: Differential Associations Among Constructs and Symptom Clusters

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Exposure to trauma can result in attentional changes consistent with increasingly intense rumination and re-experiencing. Patient reports of these attentional changes parallel descriptions of the constructs of dissociation and absorption, each of which have been independently associated with aspects of posttraumatic stress symptoms. Additional research is needed to understand the nature of the relationship of each of dissociation and absorption with posttraumatic stress symptoms. The current study assessed the relationships between dissociation and absorption, using a psychometrically-supported measure designed specifically for researching dissociative and absorbed states of attentional allocation (Attentional Resource Allocation Scale; ARAS) and posttraumatic stress symptom clusters. A clinical sample of people with posttraumatic stress disorder (n=30; 67% women) and an analogue community sample of people reporting traumatic exposure (n=222; 86% women) participated in this study. Trait dissociation, state dissociation, and absorption were expected to differentially predict posttraumatic stress symptom clusters. In addition to supporting the factorial validity of the ARAS, results indicated that absorption and state, but not trait, dissociation were the primary predictors of re-experiencing, avoidance, numbing, and hyperarousal. These results suggest that trait absorption in combination with state dissociation during trauma may be involved in the maintenance of posttraumatic stress symptoms. Comprehensive results, implications, limitations, and directions for future research are discussed. (Sleep and Hypnosis 2012;14(1-2):1-12)

Key words: Absorption, dissociation, attention, posttraumatic stress, PTSD

INTRODUCTION

Changes in patterns of attention allocation following traumatic exposure have been implicated in the development and maintenance

Accepted May 21, 2012

of posttraumatic stress symptoms (1–4). Attentional allocation is defined, in part, by absorption and dissociation, constructs which require further empirical investigation vis–à–vis posttraumatic stress (5). Dissociation is characterized as a process involving "disruption in the usually integrated functions of consciousness, memory, identity, or perception" (6), p. 519), with prominent presentations in trauma–related disorders such as posttraumatic stress disorder (PTSD). As a construct,

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M. P. Abrams is supported by a Canadian Institutes of Health Research Canada Graduate Scholarship Doctoral Award (FRN: 87912).

dissociation is conceptualized as both a trait and a state variable. Trait dissociation is the relatively stable dispositional tendency to experience dissociative states (7). In contrast, state dissociation occurs when external or internal stimuli are excluded from consciousness due to disintegrative manifestations of cognitive awareness (8–10). In other words, state dissociation involves increasingly divided attentional resources such that no one stimulus (or group of stimuli) receives more attentional focus than any other, resulting in an absence of conscious attention directed toward any stimulus (as illustrated in Figure 1).

Trait and state dissociation have both been posited as key cognitive responses associated with posttraumatic stress (11-13) that may function as avoidance coping mechanisms. Alternatively, dissociation may function as an indicator of trauma severity (14). Among a sample of veterans, anger and dissociation predicted PTSD, hyperarousal, and avoidance/ numbing severity, while dissociation predicted intrusive severity (15). In the context of trauma, a specific type of state dissociation, called peritraumatic dissociation (16), refers to dissociation that can occur during or immediately after a traumatic event. Symptoms can include numbing, emotional derealization, depersonalization, 'out-of-body' and experiences (6). Several investigations implicate peritraumatic dissociation as an important

predictor of PTSD (17–21) that may account, in part, for the disintegrated and disjointed nature of cognitive representations of trauma (22–24); however, previous mental health status better predicts PTSD symptoms than peritraumatic dissociation (25,26).

Absorption is phenomenologically similar to dissociation, but experientially distinct (27,28) in that it involves deep conscious engagement in an experience (29,30). Posited to function on a continuum (31), absorption is conceived as both trait and state (32). As a trait, absorption reflects individual differences in the capacity and tendency to become absorbed (33). As a state, absorption occurs when a single stimuli, or integrated group of stimuli, are focused on to the exclusion of other external or internal stimuli (Figure 1). In this manner, absorption facilitates experiential avoidance in a fashion similar to dissociation; however, the focus of attention results from an aggregative, rather than disintegrative, manifestation of awareness. Absorption reflects increasing commitment of attentional resources to one stimulus (or group of stimuli), resulting in the absence of conscious attention directed at any other stimuli.

Despite receiving relatively less empirical attention with respect to PTSD than dissociation, absorption has been related to negative emotionality (34), nightmares (35,36), phobias (34), unexpected panic attacks (37–39), and posttraumatic stress (40–43). In particular,



Figure 1. Theoretical Comparison of Dissociation and Absorption

people who report a childhood history of sexual (43) or physical (44) abuse typically report significantly higher levels of absorption than those with no such history. Among those reporting abuse, people reporting recovered rather than continuous memories (45), or those with unresolved traumatic memories related to attachment (46,47), score high on measures of absorption (e.g., daydreaming, self–hypnotic states of consciousness).

Differential relationships have already been identified between each of the PTSD symptom clusters (i.e., re-experiencing, avoidance, numbing, hyperarousal; (48) and several state and trait variables (48,49). Despite the aforementioned theoretical and experimental associations between dissociation, absorption, and posttraumatic stress symptoms, researchers have not examined relationships among these constructs and each of the PTSD symptom clusters. Instead, researchers have typically measured dissociation and absorption independently using the Dissociative Experiences Scale (DES; (50) and Tellegen Absorption Scale (TAS; (29)). Psychometric limitations with both scales led to the development of a single, parsimonious measure for assessing dissociation and absorption – the Attentional Resource Allocation Scale (ARAS; (5)). The initial psychometric properties of the ARAS were promising, indicating good content validity, excellent internal consistency, and a robust 15-item 3-factor solution representing the hallmark components of absorption (i.e., imaginative involvement; (29) and dissociation (i.e., dissociative amnesia, attentional dissociation; (50)). Revised specifically to facilitate research into putative differential relationships among absorption and dissociation and symptoms of Axis I disorders (11,42,51), the psychometric properties of the ARAS have yet to be replicated.

The current investigation had two main purposes. The first purpose was to replicate prior psychometric evidence suggesting the ARAS has a three–factor structure. The second purpose was to assess differential associations between dissociation, absorption, and symptom posttraumatic stress clusters. Understanding the interrelationships among these constructs may provide valuable insights into some of the discrepant symptom patterns associated with PTSD (6, 52). Although the current study is exploratory, hypotheses can be formed based on extant research and theory. First, the posited three-factor structure of the ARAS was expected to be supported. Second, the ARAS subscales - representing trait constructs of imaginative involvement, attentional dissociation, and dissociative amnesia - were expected to account for a significant and substantial portion of variance in the state construct of peritraumatic dissociation. Third, recognizing the inconsistent results in the literature to date (14,25,26), the ARAS subscales and peritraumatic dissociation were expected to account for a significant and substantial portion of variance in posttraumatic stress symptom clusters. The results of this investigation will help clarify relationships among shifts in attentional resource allocation, peritraumatic dissociation, and symptoms of posttraumatic stress. Such clarifications should inform assessment and treatment for clinicians working with individuals who have PTSD by elucidating mechanisms that may be facilitating symptoms, particularly re-experiencing.

METHOD

Participants

Participant data were drawn from two investigations of trauma. The first sample (n= 30) included participants who reported having experienced a significant motor vehicle accident and were subsequently assessed to ensure they met diagnostic criteria for PTSD using the Structured Clinical Interview for DSM–IV–Axis I Disorders (SCID–I; (53)) PTSD module (10 men, ages 18–56, Mage= 30.50, SD= 13.23; 20 women, ages 18–60, Mage= 32.15, SD= 11.56). The second sample (n= 222) included community members who reported experiencing a traumatic event but were not diagnostically assessed (32 men, ages 20–65, Mage= 33.38, SD= 12.66; 190 women, ages 18–63, Mage= 30.12, SD= 10.86). Events reported as the "worst traumatic event" experienced included unexpected death of a loved one (31%), sexual assault (11%), the breakup of a significant relationship (11%), motor vehicle accidents (9%), having a serious illness (8%), being publically ridiculed/ bullied/ humiliated worse than others (8%), physical assault (6%), seeing someone injured or killed (4%), military combat (2%), armed robbery (1%), fire (1%), other (8%). Participation was voluntary and all participants provided informed consent.

Measures

The Attentional Resource Allocation Scale (ARAS; (5)) is a 15-item measure designed to assess the attention-modifying trait constructs of absorption and dissociation with items ranging from 0 (never) to 4 (always) derived from the DES (50) and TAS (29). Initial analyses suggest three factors (i.e., imaginative involvement, dissociative amnesia, attentional dissociation). In the present sample, the internal consistency ranged from acceptable to low for each sample (i.e., community/clinical), each subscale (i.e., imaginative involvement, α = .76 $/ \alpha = .62$; dissociative amnesia, $\alpha = .79 / \alpha = .62$; attentional dissociation, $\alpha = .73 / \alpha = .63$), and the total score (α = .91 / α = .86). The average inter-item correlations were .40 and .27 for the clinical and community samples respectively.

The Peritraumatic Dissociative Experiences Questionnaire (PDEQ; (54)) is a 10–item measure that assesses dissociative experiences around the time of a traumatic event. The PDEQ inquires about experiences during a traumatic event. These experiences include altered time perception, depersonalisation, and derealisation. Participants rate each experience on a 5–point severity scale ranging from 1 (not at all) to 5 (extreme). The total score of the 10–item PDEQ ranges from 10 to 50 (55). The PDEQ was validated in a number of studies, indicating that it was internally consistent, associated with measures of traumatic stress response and general dissociative tendencies (54). In the present sample, the internal consistency was acceptable for each sample (i.e., community/clinical) for the total score (α = .91 / α = .89). The average inter–item correlation for the community sample was .51 and for the clinical sample was .45.

The PTSD Checklist - Civilian Version (PCL-C; (56)) is a 17-item measures used to assess symptoms that correspond to the symptoms associated with the DSM-IV diagnostic criteria for PTSD. On a scale anchored from 1 (not at all) to 5 (extremely) participants rank the degree to which they have been bothered by particular symptoms stemming from potentially stressful life experiences occurring over the past month. Test-retest reliability for the PCL-C has been reported at 0.96 (57) and the overall diagnostic efficiency has been found to be high at 0.90 (58). In the present sample, the internal consistency ranged from acceptable to low for each sample (i.e., community/clinical), each subscale (i.e., re–experiencing, $\alpha = .88 / \alpha = .87$; avoidance, α = .66 / α = .66; numbing, α = .82 / α = .89; hyperarousal, α = .87 / α = .83), and the total score (α = .94 / α = .94). The average interitem correlation for the community sample was .47 and for the clinical sample was .46.

Analyses

First, descriptive statistics, including internal consistency, were calculated for each measure from each sample. A series of independent t-tests were conducted to check for any substantial sex differences within the subscales of the ARAS, the PDEQ, and the PCL–C. Pearson correlational analyses were performed on subscale scores from each measure. Results of these correlational analyses provided direction for the subsequent regression analyses.

Second, two confirmatory factor analyses (CFA) were conducted with the community data set in an attempt to replicate prior evidence suggesting that ARAS has a 3–factor rather than

a unitary structure. CFAs provide goodness-offit indices that can be used for comparing the fit of predefined model factor structures to an available data set (59). The community sample was used to test the model because of the relatively larger variance in responses (60); moreover, the clinical sample size was likely insufficient to produce reliable CFA indices (59). The CFAs were performed using SPSS 19.0 with the raw data as input and the maximum likelihood estimation procedure.

Third, a series of multiple regression analyses were conducted to examine relationships between subscales of the ARAS, the PDEQ, and the PCL-C. Persons with higher scores on the ARAS have been as posited more likely to experience peritraumatic dissociation (5); accordingly, the initial regressions assessed the relationship between the ARAS subscales as independent variables, and the PDEQ as the dependent variable. The entry order was consistent with recommended practice for hierarchical regression that predictors be entered into the model in temporal order (61); specifically, the ARAS subscales, described as dispositional variables (5), followed by peritraumatic dissociation believed to be a trauma-specific shift in attention related to extreme fear (62). The subsequent hierarchical multiple regression analyses were conducted with the three ARAS subscales (i.e., imaginative involvement, dissociative amnesia, attentional dissociation) entered as independent variables

on the first step, the PDEQ entered on the second step as a second independent variable, and the PCL–C symptom cluster scores as dependent variables. Given anticipated changes in the DSM – 5 (63), avoidance and numbing were separated, resulting in four symptom clusters (48,64), each of which was assessed independently.

The analyses were conducted in the community sample and then again in the clinical sample. All assumptions for regression were evaluated and met (i.e., outliers, normality, linearity, homoscedasticity, independence of residuals). The regression analyses enabled evaluation of the unique contributions to each PTSD symptom cluster, from each of absorption, dissociation, and peritraumatic dissociation in analogue and clinical samples.

RESULTS

Descriptive Statistics

The descriptive statistics for the community and clinical samples are presented in Table 1. There were no statistically significant Bonferroni–corrected differences between men and women on any of the subscales in either sample. None of the indices of univariate skewness and kurtosis in the clinical sample were sufficiently out of range to preclude the planned analyses (i.e., had positive standardized skewness values that exceeded 2 or positive

Table 1. Descriptive Statistics, Community (n=222) / Diagnostic (n=30), and Pearson Correlations

	Min-Max	M (SD)	Skew	Kurtosis										
			(SE=.16 /	(SE=.33 /										
			SE=.43)	SE=.83)	1	2	3	4	5	6	7	8	9	10
1. ARAS-II														
Imaginative														
Involvement	0-20/2-14	5.60 (3.84)/8.50 (3.25)	1.01/35	.98/40	-	.68**	.66**	.89**	.37*	.03	.14	17	.20	.03
2. ARAS-DA	0-20/2-14	5.06 (4.04)/7.60 (3.20)	.94/.03	.68/89	.81**	-	.64**	.88**	.07	20	.02	24	.05	17
3. ARAS-AD	0-20/0-12	5.21 (3.58)/6.40 (3.10)	1.07/32	1.60/80	.76**	.76**	-	.87**	.32	01	.10	06	.09	.02
4. ARAS Total	0-60/8-36	15.87 (10.58)/22.50 (8.41)	1.12/20	1.67/94	.93**	.93**	.91**	-	.29	07	.10	18	.13	04
5. PDEQ Total	10-50/15-47	25.32 (10.99)/30.20 (8.91)	.47/.07	82/86	.43**	.40**	.37**	.43**	-	.29	.26	.25	.32	.39*
6. Re experiencing	5-25/6-25	11.11 (5.08)/14.47 (4.55)	.82/.23	02/39	.49**	.45**	.40**	.49**	.44**	-	.60**	.32	.32	.77**
7. Avoidance	2-10/2-10	4.71 (2.42)/6.37 (2.21)	.61/42	67/38	.36**	.37**	.34**	.39**	.35**	.71**	-	.39*	.22	.69**
8. Numbing	5-25/5-25	9.95 (4.84) / 15.43 (5.27)	.93/.00	05/52	.46**	.42**	.35**	.44**	.50**	.68**	.59**	-	.22	.74**
9. Hyperarousal	5-25/9-24	10.88 (5.39)/16.30 (3.95)	.69/05	52/66	.42**	.40**	.30**	.41**	.44**	.74**	.59**	.71**	-	.62**
10. PCL-C Total	17-82/25-78	36.64 (15.55)/52.57 (11.39)	.67/06	38 /.16	.51**	.48**	.40**	.50**	.51**	.90**	.78**	.87**	.90**	-

Notes: ARAS – Attentional Resource Allocation Scale; ARAS-II – Imaginative Involvement Subscale; ARAS-DA – Dissociative Amnesia; ARAS-AD – Attentional Dissociation; PDEQ – Peritraumatic Dissociative Experiences Questionnaire; PCL-C – PTSD Checklist; *p<.05; **p<.01; Community correlations are presented below the diagonal; Diagnostic correlations are presented above the diagonal

standardized kurtosis values that exceeded 7; see (60, 65). Multivariate normality was assessed using Mardia's coefficient of multivariate kurtosis (66) and the results suggested nonnormal data; however, parameter estimates and most CFA model fit indices are robust to nonmaximum-likelihood normality given estimation and a sample size of 100 or more participants (67). Nonetheless, the Bollen–Stine bootstrap chi-square was used and bootstrapped parameter estimates were compared with maximum-likelihood estimates from а procedure (66,68). In all cases, the statistical significance value for the Bollen–Stine bootstrap chi-square produced results comparable with those from the maximum-likelihood procedure for the CFA. The results of Pearson correlation analyses indicated statistically significant relationships between most variables in both samples and are presented in Table 1.

Confirmatory Factor Analyses

For both CFAs (i.e., 3-factor and unitary) raw data from the community sample were used as input in a maximum likelihood estimation procedure. Each model was evaluated using the following fit indices and 90 percent confidence intervals, where applicable: (1) chisquare (values should not be significant); (2) chi-square/df ratio (values should be < 2.0); (3) Comparative Fit Index (CFI; values should approach or exceed .95); (4) the Standardized

Root Mean Square Residual (SRMR; values should approach or fall below .08); (5) Root Mean Square Error of Approximation (RMSEA; values should approach or fall below .06); and (6) Expected Cross-Validation Index (ECVI; lower values indicate a closer fit; (69,70). Goodness of fit evaluations should emphasize the latter four fit indices because of potential chi-square inflation (59). The posited 3-factor structure (i.e., imaginative involvement, dissociative amnesia, attentional dissociation) resulted in acceptable fit indices (Table 1); however, as with the original ARAS psychometric results (5), the fit indices for a unitary model were comparable to those of the 3-factor model (Table 2).

Regression Analyses

There were no significant multicollinearity issues with any of the variables (60). The initial regression analyses indicated imaginative involvement – the ARAS subscale representing trait absorption – was positively associated with peritraumatic dissociation in the community sample but not the clinical sample (Table 3), suggesting that trait absorption is related to peritraumatic dissociation, but not in a rangerestricted (i.e., clinical) sample. Perhaps most intriguing is the absence of a statistically significant relationship between the trait dissociation subscales (i.e., dissociative amnesia, attentional dissociation) and peritraumatic

Table 2. C	onfirmatory F	actor Anal	ysis Fit indice	S					
Factors	χ ²	df	χ²/df	CFI	SRMR	RMSEA	RMSEA 90% Cl	ECVI	ECVI 90% CI
1	175.586	90	1.951	.934	.049	.063	.048; .077	1.033	.885; 1.216
3	165.554	87	1.903	.937	.049	.064	.049; .079	1.048	.901; 1.230

Notes: CFI - Comparative Fit Index; SRMR - Standardized Root Mean Square Residual; RMSEA - Root Mean Square Error of Approximation; ECVI - Expected Cross-Validation Index: CI – Confidence Interval

Dependent Variable: PDEQ Total Score		ß	t	part r	$\Delta \mathbf{R^2}$	$\Delta \mathbf{F}$	
Model Step 1	(Constant) Imaginative Involvement Dissociative Amnesia Attentional Dissociation	.280 (.484) .124 (439) .064 (.279)	14.669** (5.183) 2.475* (1.895) 1.104 (-1.762) .631 (1.141)	.151 (.324) .067 (302) .038 (.195)	.194 (.238)	17.444** (2.706)	

Notes: *p<.05; **p<.01; PDEQ – Peritraumatic Dissociative Experiences Questionnaire

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Dependent Variable: PCL-C Re-experiencing		ß	t	part r	$\Delta \mathbf{R^2}$	$\Delta \mathbf{F}$
Model Step	(Constant)		6.842** (3.466**)			
1	Imaginative Involvement	.294 (.126)	2.777** (.427)	.156 (.079)	.242 (.090)	24.536** (.860)
	Dissociative Amnesia	.123 (320)	1.182 (-1.123)	.066 (208)		
	Attentional Dissociation	024 (.033)	257 (.124)	014 (.023)		
2	PDEQ Total	.276 (.257)	4.409** (1.209)	.248 (.224)	.061 (.050)	19.442** (1.463)
Dependent V	ariable: PCL-C Avoidance	ß	t	part r	$\Delta \mathbf{R^2}$	$\Delta \mathbf{F}$
Model Step	(Constant)		6.336** (2.512*)			
1	Imaginative Involvement	.069 (.094)	.602 (.306)	.037 (.059)	.150 (.032)	12.782** (.289)
	Dissociative Amnesia	.175 (067)	1.546 (228)	.094 (044)		
	Attentional Dissociation	.064 (.007)	.623 (.024)	.038 (.005)		
2	PDEQ Total	.230 (.229)	3.390** (1.037)	.207 (.200)	.043 (.040)	11.489** (1.076)
Dependent V	ariable: PCL-C Numbing	ß	t	part r	$\Delta \mathbf{R^2}$	$\Delta \mathbf{F}$
Model Step	(Constant)		5.485** (6.341**)			
1	Imaginative Involvement	.254 (243)	2.420* (831)	.135 (164)	.216 (.078)	20.022** (.738)
	Dissociative Amnesia	.125 (172)	1.205 (.606)	.067 (120)		
	Attentional Dissociation	075 (.116)	799 (.433)	045 (.080)		
2	PDEQ Total	.365 (.314)	5.876** (1.491)	.328 (.274)	.108 (.075)	34.532** (2.223)
Dependent Variable: PCL-C Hyperarousal		ß	t	part r	$\Delta \mathbf{R^2}$	$\Delta \mathbf{F}$
Model Step	(Constant)		6.082** (3.793**)			
1	Imaginative Involvement	.248 (.189)	2.275* (.634)	.132 (.119)	.194 (.057)	17.543** (.528)
	Dissociative Amnesia	.186 (042)	1.736 (144)	.101 (027)		
	Attentional Dissociation	145 (096)	-1.494 (351)	086 (066)		
2	PDEQ Total	.311 (.286)	4.831** (1.330)	.280 (.250)	.078 (.062)	20.341** (1.769)

Table 4. Regression	Results for Posttraumation	: Stress Symptom (Clusters, Community	Sample (Clinical	sample)
5					

Notes: *p<.05; **p<.01; PDEQ – Peritraumatic Dissociative Experiences Questionnaire; PCL-C – PTSD Checklist

dissociation.

In line with some (14), but not all (25,26), previous research, the subsequent regression analyses suggest peritraumatic dissociation is significantly and substantially associated with each of the PCL-C symptom subscales in the community (i.e., analogue) sample, even after accounting for absorption and dissociation trait variables; conversely, in line with some (25,26), but not all (14), previous research, there was no relationship found between absorption, dissociation, or peritraumatic dissociation in the range-restricted (i.e., clinical) sample. The non-significant relationship in the clinical sample may be the result of insufficient sample size or the range restriction (60) because, relative to the community sample, the clinical sample reported high scores with little variance on both the PCL-C and ARAS.

In the community sample, a relationship was found between imaginative involvement and each of the PCL–C re–experiencing, numbing, and hyperarousal subscales in the community sample (Table 4). The other two ARAS subscales (i.e., dissociative amnesia and attentional dissociation) representing trait dissociation–posited as highly related to PTSD symptoms (5,11–13)–did not demonstrate a significant relationship with any subscale (Table 4). In addition, and somewhat contrary to prior research and theory (11–13), imaginative involvement predicted PDEQ scores in the community sample, whereas both imaginative involvement and attentional dissociation predicted PDEQ scores in the clinical sample.

DISCUSSION

Attentional resource allocation during and subsequent to trauma exposure has been implicated in models of posttraumatic symptom development (6,16). The constructs of dissociation and absorption – established indices of attentional resource allocation – have typically been measured by the DES (50) and the TAS (29) respectively; however, the psychometric properties and interrelationship of the DES and TAS have been unclear. In addition, the relationships between dissociation, absorption, and PTSD symptom clusters are highly debated (11–13, 40–43), but relatively unresolved. Such inconsistencies prompted the construction of the ARAS as a parsimonious measure of dissociation and absorption (5).

Consistent with results of the initial ARAS study (5), the current results supported the proposed 3–factor structure (i.e., imaginative involvement, dissociative amnesia, attentional dissociation). Similar to the initial study results, the CFA fit indices were also adequate for a unitary structure. Such a pattern of results is generally consistent with research suggesting the interrelatedness of absorption and dissociation (28,71); nevertheless, the constructs remain posited as distinct in form and function (5,27,28). In addition, the current data provide the first study to replicate the proposed factor structure and the previous psychometrics for the ARAS.

The ARAS subscales, presumably representing the constructs of absorption and dissociation, theorized as traits by previous research (7,29,30), were expected to account for a significant and substantial portion of variance in the state construct of peritraumatic dissociation. Partially in line with expectations, imaginative involvement was a significant predictor of peritraumatic dissociation in the community sample; however, none of the other trait variables demonstrated statistically significant relationships with peritraumatic dissociation. A relationship between trait and state dissociation constructs makes intuitive sense, but based on precedent research (72), the relationship may be inconsistent. Conversely, state and trait aspects of absorption are typically distinguished empirically (73). The absence of a relationship in the clinical sample may be the result of insufficient sample size or the range restriction (60), though it may also represent evidence that despite the dimensional nature of PTSD (74,75), absorption, dissociation, and peritraumatic dissociation, could potentially have latent taxonic structures (62). In any case, there appears to be an important but

insufficiently understood relationship between trait and state shifts in attention–contextualized as absorption or dissociation–that may be polarized during trauma. The current results support the ARAS utility in elucidating the nature of such relationships.

The ARAS subscales were also expected to account for a significant and substantial portion of variance in posttraumatic stress symptom clusters; however, despite the inconsistent results in the literature to date (14,25,26), peritraumatic dissociation was still expected to make a statistically significant and substantial contribution to predicting posttraumatic stress symptom clusters. Partially in line with expectations, the ARAS subscales differentially predicted posttraumatic stress symptom clusters in the community sample but not in the clinical sample. Furthermore, accounting for absorption and dissociation did not mediate the relationship between peritraumatic dissociation and posttraumatic stress symptom clusters.

In the community sample, the imaginative involvement subscale of the ARAS was a significant predictor of re-experiencing, numbing, and hyperarousal symptom clusters. The results were consistent with precedent research suggesting that absorption is associated with posttraumatic stress symptom clusters (42,76,77)and supports a systematic relationship between the trait tendency toward imaginative involvement and severity of posttraumatic stress symptom clusters (78). Cumulative results of these investigations suggest that the capacity for imaginative involvement, for some, may actually facilitate the re-experiencing of traumatic events (via rumination), which would be associated with increases in numbing and hyperarousal. In contrast, in the clinical sample imaginative involvement was not significantly related to any of the posttraumatic stress symptom clusters. Given that the scores on the PCL-C were necessarily high in the clinical sample, the associated range restriction may explain the absence of a significant linear relationship between trauma, absorption, and dissociation. Such speculation, despite being in line with dimensional conceptualizations of PTSD (74,75), suggests the latent structure of absorption and dissociation should be empirically assessed.

Consistent with expectations, peritraumatic dissociation accounted for a significant portion of variance beyond the ARAS subscales within the community sample. Such results add to evidence that the relationship between peritraumatic dissociation and trauma are likely exceedingly complex (14,25,26). Again, the comparatively minimal relationship in the relatively range-restricted clinical sample indicates that the latent structure of peritraumatic dissociation warrants investigation (62). Peritraumatic dissociation may be a proxy for trauma severity (25,26). Alternatively, it may represent a distinct evolutionarily-supported protective shift in attention that occurs alongside sufficiently significant traumata (14,62). If there had been higher correlations between the PDEQ and each of the ARAS subscales, or problems with multicollinearity, it would have been reasonable to suggest the PDEQ was suppressing the relationship between trait dissociation and PCL-C scores; however, there were no such indications.

The current results further support the notion that both absorption and dissociation may play a role in the experience of traumatic stress. Similarly, there appears to be a relationship between trauma and peritraumatic dissociation independent of absorption and dissociation. Those relationships may serve to facilitate the highest levels of posttraumatic symptom reporting, but plateau, resulting in the relationship being apparent in analogue but not discrete samples. Furthermore, the current regression results with the clinical and community samples suggests that when assessed together, absorption - not dissociation - is the attentional construct of interest for posttraumatic stress symptom clusters. Indeed, the processes of dissociation and absorption may function in parallel. For example, as absorption increases, dissociation with regard to all other stimuli may

occur (i.e., one stimulus receives maximal attention and all other stimuli receive comparable ancillary levels of attention). This is consistent with anecdotal clinical observations wherein patients report dissociative phenomena while also being able to focus on specific elements during the course of a traumatic event. Similar clinical observations may, in part, account for the paradoxical overlap between these two seemingly divergent phenomena.

There are limitations with regard to this study that warrant consideration when interpreting the results and provide directions for future research. First, the clinical sample was relatively small in the context of the analyses conducted. Future research should include larger clinical samples to evaluate the robust nature of the relationships between absorption, dissociation, and posttraumatic stress symptom clusters. Second, the available clinical sample was homogeneous with respect to the PTSD trauma event (i.e., motor vehicle accidents). Accordingly, the current results may have limited generalizability for other types of traumatic events (e.g., sexual assault, combat). Third, the homogeneity of the traumas experienced by the clinical sample relative to the heterogeneity of the traumas experienced community sample may have facilitated differences in relationships for absorption, dissociation, and posttraumatic stress symptom clusters. Subsequent research should compare homogeneous samples meeting diagnostic criteria with analogue samples. Fourth, the events and constructs explored in the current paper are presumed to occur sequentially; however, in the absence of longitudinal data, causal relationships and risk factors cannot be determined. Future research should attempt longitudinal assessments of trait and state dissociation and absorption as they relate to traumatic experience. Fifth, dissociation, absorption, and peritraumatic dissociation were treated as continuous variables. In contrast, shifts in allocation of attention may be reflected by differences between common shifts and clinically significant shifts. Therefore, future research should clarify the nature of attention allocation through taxometric analyses. Similarly, future investigations should use neurocognitive assessments to explore the relationship between objectively assessed and self–reported flexibility in attention.

Overall, the current study adds to our understanding of the overlap between dissociation, absorption, and trauma by describing the interrelationships and demonstrating the relative predictive power of absorption. The results suggest a complicated

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series of interrelationships that warrant theoretical, and possibly treatment–focused attention. Future research should seek to further elucidate these relationships and determine whether the association between PTSD and attention shifts reflects symptom or common underlying mechanisms. Advancement in this area of research is dependent, however, on the evolving definitions of dissociation and absorption. Improving the scope of the definition will continue to be important in efforts to differentiate between pathological and normative phenomena.

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