The Attentional Resource Allocation Scale (ARAS): Development of a new measure to assess absorption and dissociation

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Introduction

- Several models of posttraumatic symptom development focus on attentional resource allocation during and after exposure (Brewin et al., 1996). Attentional resource allocation has been described using the constructs of *dissociation* and *absorption*.
- *Dissociation* is a "disruption in the usually integrated functions of consciousness, memory, identity, or perception" (APA, 2000) or a state wherein external stimuli, internal stimuli, or both are excluded from consciousness due to a discrepant – rather than unitary – manifestation of cognitive awareness (Erdelyi, 1994; Nemiah, 1991). *Absorption* is a state in which limited stimuli are focused on, to the exclusion of other stimuli due to a unifying – rather than discrepant – manifestation of cognitive awareness.
- These constructs are popularly measured by the Dissociative Experiences Scale (DES; Bernstein & Putman, 1986) and Tellegen Absorption Scale (TAS; Tellegen & Atkinson, 1974); however, their psychometric properties and interrelationship remain unclear.
- The ARAS was developed to (1) clarify the overlapping factor structures of the DES and TAS, and (2) to provide a more parsimonious assessment of dissociation and absorption. Initial exploratory factor analyses suggest the ARAS comprises three factors (i.e., *imaginative involvement*, *dissociative amnesia*, *attentional dissociation*).
- The current study assessed the proposed 3-factor solution of the ARAS using confirmatory factor analyses (CFA) of a mixed community/student sample who reported experiencing a traumatic event. A secondary aim was to assess the potential utility of the ARAS as a predictor of posttraumatic symptoms.

Method

Participants

- Participants were a community sample of individuals who reported a traumatic event (*n*=233; 33 men, *M*age =33.0; *SD*=15.76); 200 women, ages 18-63 (*M*age=28.82; *SD*=15.94).

Measures

- The *Attentional Resource Allocation Scale* (ARAS; Carleton et al., in preparation) is a 15-item measure designed to assess the attention-modifying constructs of absorption and dissociation with items ranging from 0 (*never*) to 4 (*always*) derived from the TAS and DES. Initial analyses suggest three factors (i.e., imaginative involvement, dissociative amnesia, attentional dissociation).
- The *Peritraumatic Dissociative Experiences Questionnaire* (PDEQ; Marmar et al., 1997) is a 10-item measure that assesses dissociative experiences around the time of a traumatic event. Peritraumatic dissociation is well-established as a predictor of posttraumatic symptom development (e.g., Ozer et al., 2003).
- The *PTSD Checklist – Civilian Version* (PCL-C; Weathers et al., 1994) is a 17-item self-report rating scale of diagnostic criteria B, C, and D for PTSD, as delineated in the DSM-IV (APA, 1994). Symptom subscale scores reflect posttraumatic symptom clusters (i.e., reexperiencing, avoidance, numbing, hyperarousal).

Procedure

- To evaluate the potential utility of the ARAS, the three subscales were assessed using confirmatory factor analysis (Hu & Bentler, 1999). Hierarchical multiple regression analyses evaluated ARAS subscales as predictors of posttraumatic symptom clusters. The PDEQ was included in these analyses in an effort to distinguish contributions of trait (ARAS) and state (PDEQ) variables.

Results

- Descriptive statistics and factor loadings are presented in Table 1. Independent *t*-tests confirmed no significant sex differences on any of the measures (*p*>.05)

Fit indices

- The 3-factor structure (i.e., *imaginative involvement*, *dissociative amnesia*, *attentional dissociation*) resulted in acceptable fit indices:
  - Chi square/df ratio (CMIN) = 1.41 (values should be < 2.0)
  - Root Mean Square Error of Approximation (RMSEA) = .04 (should be ~.06 or lower)
  - Comparative Fit Index (CFI)=.97 (should be close to .95 or greater)
  - Standardized Root Mean Square Residual (SRMR) = .04 (should be below .08)
  - Expected Cross Validation Index (ECVI) = .81 (lower generally better; Brown & Cudeck, 1993)

ARAS subscales and posttraumatic symptoms

- Hierarchical multiple regression analyses were conducted with the PDEQ entered on the first step and the three ARAS subscales (i.e., *imaginative involvement* [ARAS-II], *dissociative amnesia* [ARAS-DA], *attentional dissociation* [ARAS-AD]) entered on the second step.
- Predictors were entered in the model in this order to assess whether the trait variables assessed by the ARAS independently predicted scores on PCL-C symptom clusters (i.e., reexperiencing, avoidance, numbing, hyperarousal) over and above the PDEQ.
- Results of multiple regression analyses are presented in Tables 2-5. Scores on the ARAS-DA and (to a lesser degree) the ARAS-II subscales significantly predicted posttraumatic symptom cluster scores over and above the PDEQ. The ARAS-AD was not a significant predictor in any of the analyses.

Discussion

- CFA supported the 3-factor structure of the ARAS (i.e., *imaginative involvement*, *dissociative amnesia*, *attentional dissociation*).
- ARAS subscales differentially predicted posttraumatic symptoms above and beyond the contribution of the PDEQ. This finding is notable in that the ARAS assesses trait tendencies toward dissociation and absorption whereas the PDEQ assesses state variables around the time of traumatic event.
- The ARAS *dissociative amnesia* subscale contributed significantly to all the regression models, suggesting a systematic relationship between the trait tendency toward dissociative amnesia and posttraumatic symptom severity (e.g., Weiss et al., 1995). Whether this relationship is mediated by peritraumatic dissociation or not remains unclear and further research is necessary to disentangle the mechanisms that result in worsened posttraumatic symptoms.
- Consistent with suggestions that absorption may be linked to posttraumatic symptoms (e.g., Liotti, 2004; McNally, 2003), the ARAS *imaginative involvement* subscale was a significant predictor for PCL-C *reexperiencing* and *numbing* symptom clusters.
- The notion that the capacity for imaginative involvement may facilitate reexperiencing makes intuitive sense – a narrow focus on limited stimuli (e.g., trauma memories/images) accurately characterizes reexperiencing symptoms.
- The mechanisms by which imaginative involvement is associated with numbing symptoms are less clear. Accordingly, further research is necessary to describe this relationship.

Table 1. ARAS item descriptive statistics and factor loadings

	M	*SD*	*Loading*	*CITC*	*α**
Factor 1: Imaginative involvement **(scale alpha = .81)**					
TAS 16: It is sometimes possible for me to be completely immersed in nature or in art and to feel as if my whole state of consciousness has somehow been temporarily altered.	.96	1.18	.75	.62	.76
TAS24: When listening to organ music or other powerful music I sometimes feel as if I am being lifted into the air.	.71	1.08	.72	.56	.78
TAS12: When I listen to music I can get so caught up in it that I don't notice anything else.	1.35	1.16	.63	.60	.77
TAS30: The sound of a voice can be so fascinating to me that I can just go on listening to it.	.83	1.06	.62	.59	.77
TAS7: If I wish, I can imagine (or daydream) some things so vividly that they hold my attention as a good movie or story does.	1.39	1.31	.45	.59	.77
Factor 2: Dissociative amnesia **(scale alpha = .82)**					
DES3: The experience of finding myself in a place and having no idea how I got there.	.40	.79	.71	.57	.80
DES25: I find evidence that I have done things that I do not remember doing.	.76	.94	.66	.58	.79
DES16: The experience of being in a familiar place but finding it strange and unfamiliar.	.79	.99	.66	.67	.76
DES7: The experience of feeling as though I am standing next to myself or watching myself do something as if I were looking at another person.	.59	.92	64	.57	.79
DES12: The experience of feeling that other people, objects, and the world around me are not real.	.58	.93	.59	.66	.77
Factor 3: Attentional dissociation **(scale alpha = .77)**					
DES2: Listening to someone talk and suddenly realizing that I did not hear all or part of what was said.	2.08	.97	.78	.56	.72
DES1: The experience of driving a car and suddenly realizing that I don't remember what has happened during all or part of the trip.	1.30	1.13	.74	.54	.72
DES17: I find that when I am watching television or a movie I become so absorbed in the story that I am unaware of other events happening around me.	1.39	1.08	.49	.44	.76
DES20: I sometimes sit staring off into space, thinking of nothing, and am not aware of the passage of time.	1.38	1.16	.45	.56	.72
TAS18: I am able to wander off into my thoughts while doing a routine task and actually forget that I am doing the task, and then find a few minutes later that I have completed it.	1.29	1.12	.44	.60	.70

Note: *M* = item mean scores; *SD* = standard deviation; *CITC* = corrected item-total correlation; α* = scale alpha if item deleted

Table 2. Multiple regression: PCL-C reexperiencing scores dependent variable

Model	Predictor	*β*	R^2	*r*	*part r*	ΔR^2	*F*	ΔF
1			.20				53.61**	
	PDEQ	.44**		.44	.44			
2			.32			.12	25.0**	12.63**
	PDEQ	.28**		.44	.25			
	ARAS-II	**.25****		.46	.16			
	ARAS-DA	**.18***		.47	.12			
	ARAS-AD	-.02		.37	-.02			

Note: **p*<.05, ***p*<.01; PCL-C reexperiencing scale descriptive statistics: *M* = 11.12, *SD* = 5.08

Table 3. Multiple regression: PCL-C avoidance scores dependent variable

Model	Predictor	*β*	R^2	*r*	*part r*	ΔR^2	*F*	ΔF
1			.13				31.42**	
	PDEQ	.35**		.35	.35			
2			.20			.07	13.50**	6.72**
	PDEQ	.21**		.35	.19			
	ARAS-II	.02		.31	.00			
	ARAS-DA	**.22***		.39	.14			
	ARAS-AD	.12		.34	.08			

Note: **p*<.05, ***p*<.01; PCL-C avoidance scale descriptive statistics: *M* = 4.71, *SD* = 2.42

Table 4. Multiple regression: PCL-C numbing scores dependent variable

Model	Predictor	*β*	R^2	*r*	*part r*	ΔR^2	*F*	ΔF
1			.25				72.05**	
	PDEQ	.50**		.50	.50			
2			.33			.09	27.09**	9.36**
	PDEQ	.36**		.50	.32			
	ARAS-II	**.19***		.41	.12			
	ARAS-DA	**.23****		.46	.15			
	ARAS-AD	-.10		.32	-.06			

Note: **p*<.05, ***p*<.01; PCL-C numbing scale descriptive statistics: *M* = 9.95, *SD* = 4.83

Table 5. Multiple regression: PCL-C hyperarousal scores dependent variable

Model	Predictor	*β*	R^2	*r*	*part r*	ΔR^2	*F*	ΔF
1			.19				54.43**	
	PDEQ	.44**		.44	.44			
2			.26			.07	19.10**	6.64**
	PDEQ	.31**		.44	.28			
	ARAS-II	.16		.37	.10			
	ARAS-DA	**.18***		.41	.12			
	ARAS-AD	-.03		.31	-.02			

Note: **p*<.05, ***p*<.01; PCL-C hyperarousal scale descriptive statistics: *M* = 10.88, *SD* = 5.39

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