

DIMENSIONALITY OF DISSOCIATION IN SUBJECTS WITH PTSD

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ABSTRACT

Dissociative symptoms are common in patients with Post-traumatic stress disorder (PTSD). The Dissociative Experiences Scale (DES) is a self-report measure that is often used to assess these symptoms quantitatively. The present study examined the factor structure of the DES in a sample of 129 male combat veterans with PTSD. Quantitative and conceptual criteria were used to select a four-factor solution. One of the subscales (labeled Depersonalization/Derealization) was consistent with a scale found in an earlier factor analysis using a non-clinical subject sample. Three other factors included Memory Disturbance, Absorption, and Distractibility. While these scales are intercorrelated, they may measure conceptually distinct types of dissociative symptoms.

Dissociative symptoms are prominent in patients with post-traumatic stress disorder (PTSD; Bernstein & Putnam, 1986; Bremner et al., 1992; Ross, Norton, & Anderson, 1988). Several symptoms that define the diagnosis of PTSD in *DSM-IV* (American Psychiatric Association, 1995) are primarily dissociative in nature. These include flashbacks, emotional numbing, and psychogenic amnesia for the trauma. In addition, states of psychological or physiological distress triggered by reminders of the trauma may be flashback-like experiences in which one does not lose contact with one's surroundings but re-experiences the feelings and body sensations that occurred during the trauma. Concentration difficulties may be reported when a patient experiences frequent trance states.

In our clinical experience it is not uncommon for PTSD

patients to enter a trance-like state briefly during a treatment session when trauma-relevant affect states or memories begin to enter consciousness. In these patients, this particular dissociative phenomenon may reduce the subjective distress associated with reminders of the trauma. Such dissociative behaviors may be conditioned responses triggered by trauma-related cues, and reinforced by the reduction in distress that they bring about. However, by limiting access to traumatic feelings, visual images or body sensations, they prevent "processing" of traumatic material. According to Horowitz (1986), this leaves traumatic memories in an activated state, in which they are not integrated with long-term memory structures. "Processing" involves integrating these experiences with long-term memory, using mechanisms of assimilation and accommodation (Piaget, 1954). Thus, in patients with PTSD, dissociation may produce short-term relief, warding off intense distress. However, reliance on these mechanisms might prevent integration of traumatic experiences and thus make chronic PTSD a more likely outcome. Recent data suggest that peritraumatic dissociation predicts later development of PTSD (Shalev, 1996).

In general, anxiety disorders like PTSD are maintained by various forms of avoidance, and their successful treatment often requires identifying and gradually removing these avoidance behaviors. For example, simple phobias are treated with in vivo exposure, eliminating behavioral avoidance (Barlow, 1989). Panic disorder is treated with exposure to anxiety sensations, situational anxiety cues, and panic-related thoughts, reducing interoceptive, behavioral, and cognitive avoidance (eg., Barlow & Cerny, 1990). Dissociation may be seen as playing a role in PTSD that is analogous to that played by other forms of avoidance in other anxiety disorders. Dissociation may be a form of "cognitive avoidance" of trauma experiences. Thus, whether one believes PTSD psychopathology is reduced by accessing and integrating traumatic memories, or by habituation of trauma-related distress, consciously experiencing traumatic memories and trauma-relevant affects and sensations is a necessary part of successful treatment. Dissociation might prevent such experiencing; thus, effective PTSD treatment may require identification and modification of dissociative states.

Given the central role of dissociation in the psychopathology of many patients with PTSD, it is important to

be able to assess the presence and severity of dissociative symptoms for an individual patient. The Dissociative Experiences Survey (DES) is a 28-item self-report scale designed to quantify the frequency of occurrence of a wide variety of dissociative symptoms. As might be expected, patients with Dissociative Identity Disorder are the diagnostic group with the highest DES scores (Bernstein & Putnam, 1986). PTSD patients also obtain high scores (Bremner et al., 1992; Carlson et al., 1993; Ross, Norton, & Anderson, 1988). The DES seems to be a reliable and valid global measure of frequency of dissociative symptoms (Carlson & Putnam, 1993). Frequency and severity of dissociative symptoms vary widely, ranging from common experiences (e.g., being absorbed in a book one is reading) to very unusual ones (e.g., finding oneself dressed in clothes one can not remember putting on). This raises the question of whether all the dissociative symptoms are part of a single construct. Recent research using both clinical and normal subject populations has begun to address the question of whether there are distinct subtypes of dissociative experiences. Studies of the factor structure of the DES in non-patient populations have produced varying results. Ross, Joshi, and Currie (1991) chose a three-factor solution in their random sample of the general population. Their factors were labeled Absorption-imaginative involvement, Activities of dissociated states, and Depersonalization-derealization. Carlson and Putnam (1993) also found three factors in their non-clinical sample, labeled Absorption/Changeability, Derealization/Depersonalization, and Amnesic Experiences. These results seem to indicate that normal subjects engage in three distinct types of dissociative behavior: they experience themselves or the world around them as unreal; they become absorbed and "filter out" events that are peripheral to their focus of attention; and they find that they have engaged in activities without being fully aware of what they were doing. However, Fischer and Elnitsky (1990), using a college-student sample, argued for a single-factor solution. A factor analysis on a large sample consisting of non-patients as well as patients with a range of psychiatric diagnoses also produced a three-factor solution (Carlson & Putnam, 1993). The factors were labeled Amnesic Dissociation, Absorption/Imaginative Involvement, and Depersonalization/Derealization.

Earlier factor analytic studies have not adequately addressed the problem of skewed frequency distributions of DES items, caused by the rarity of many dissociative symptoms in the general population (Waller, 1995). We examined the factor structure of the DES in a sample of 129 subjects with PTSD to learn more about subtypes of dissociative symptoms within a single clinical population. This population is expected to have less skewed and more normally-distributed scores on this measure than normals, thus reducing the statistical problems of earlier factor analytic studies.

METHODS

Research Setting

The study was conducted at a VA Medical Center that draws patients from rural and urban areas. Data were gathered as part of an outpatient clinical evaluation in the PTSD clinic. Patients were asked to fill out paper-and-pencil measures before they began clinical interviews.

Subjects

Data for this study came from 129 male patients diagnosed with PTSD using *DSM-III-R* criteria. The diagnosis was agreed upon by two experienced clinicians, using a structured clinical interview developed in our clinic, followed by a discussion with other clinic staff and review of test data. Patients with active psychosis, acute intoxication or dementia were not included in the sample. Patients were mostly Vietnam combat veterans, and were demographically representative of that population (Table 1). For all but one subject, the trauma involved combat experiences. For one subject, the trauma involved a rape in which his life was being threatened.

Measures

In addition to the DES, data from the following scales were collected: the Mississippi scale (Keane, Caddell, & Taylor, 1988), the MMPI-2 PTSD subscale (Keane, Malloy, & Fairbank, 1984), the Impact of Event scale (Horowitz, Wilner, & Alvarez, 1979), and the Combat Exposure scale (Gallop, Laufer, & Yager, 1981). Subjects tended to score in the moderate to high ranges on each of these scales, consistent with earlier findings for patients with combat-related PTSD (Table 2).

Factor Analytic Procedure

DES items were scored on a 100-point scale. Principal components analysis was used with varimax rotation. In choosing a factor solution, Eigenvalues, the scree method, rotated factor loadings, and conceptual clarity of scales were considered. Items were assigned to factors if a) factor loading was over .40, b) loadings on other factors were at least .10 (and preferably .20) below the factor loading, and c) the item fit conceptually with other items in the factor.

RESULTS

The mean DES score in this sample was 30.43 (sd = 17.94). This is similar to levels of dissociation for PTSD patients in earlier studies (Bernstein & Putnam, 1986; Bremner et al., 1992; Ross et al., 1988), and represents a moderately high level of dissociation. The items most commonly endorsed were vivid memories of past events as if reliving it (mean = 63, sd = 32) and missing parts of conversations (mean = 61, sd = 25). The least frequently endorsed items were looking

TABLE 1
Demographics of Subjects

	Mean	SD
Age	45.17	7.15
Age at trauma	20.54	3.30
Time since Trauma	24.65	7.50
	N	% of sample
Race/Ethnicity		
White	110	85.3
African-American	14	10.9
Hispanic	2	1.6
Native American	2	1.6
Asian-American	1	0.8
Comorbid Diagnoses		
Substance abuse/dependence	51	39.5
Substance abuse/ dependence in remission	41	31.8
Panic disorder	18	14.0
Major depressive disorder	12	9.3
Bipolar affective disorder	7	5.4
Agoraphobia without panic	4	3.1
Schizo-affective disorder	3	2.3

in a mirror and not recognizing one's self (mean = 12, sd = 22), and finding one is dressed in clothes one can not remember putting on (mean = 12, sd = 21). Skewness (a measure of the extent to which the frequency distribution is symmetrical along the x-axis) for the 28 DES items ranged from a high of 2.39 to a low of -0.71, with an average of 0.82 (sd = 0.72). Median skewness was 0.73. Kurtosis (a measure of the flatness versus peakedness of the frequency distribution)

for these items ranged from a high of 6.01 to a low of -1.41, with an average of 0.03 (sd = 1.70). Median kurtosis was -0.625. Thus, the frequency distributions are slightly positively skewed, and slightly flatter than a normal distribution (Table 3).

Eigenvalues for the first ten principal components were 11.61, 1.79, 1.50, 1.22, 1.15, 1.09, 0.98, 0.87, 0.83, 0.80. These values suggest a solution between one and six factors. Rotated factor loading matrices were examined for the two-through seven-factor solutions. When conceptual consistency was considered, the four-factor solution appeared best. This accounted for 58% of the variance.

The scales were labeled: Depersonalization/Derealization (alpha = .89, mean = 22, sd = 22), Memory Disturbance (alpha = .81, mean = 31, sd = 19), Absorption (alpha = .69, mean = 41, sd = 23), and Distractibility (alpha = .80, mean = 33, sd = 19). Seven items did not cleanly fit into any factor (Table 4). The Depersonalization/Derealization factor included experiences of feeling disconnected or distant from other people, oneself, one's body, and one's own thoughts. The Memory Disturbance factor included experiences of gaps in declarative memory, and confusions about memories, dreams, and current events. The Distractibility factor included experiences of missing part of the flow of events during normal daily activities like traveling, dressing, or having a conversation. The Absorption factor included experiences of being absorbed in an activity and being unaware of one's surroundings, being able to ignore pain, finding things one can not remember creating, and feeling like two different people.

DES subscale intercorrelations averaged .60 (Table 5). None of the DES scales correlated with Combat Exposure. The Memory Disturbance scale had a small positive correlation with the Intrusive symptoms from the Impact of Event scale. Subjects with more intrusive PTSD symptoms reported higher levels of memory disturbance on the DES. All the DES subscales had positive correlations with the Mississippi scale and smaller positive correlations with the MMPI PTSD scale (see Table 5). Thus, subjects with more intense PTSD symptoms report-

ed higher levels of all types of dissociative symptoms.

DISCUSSION

PTSD subjects in this study reported levels of dissociation similar to those in other studies of PTSD, and much higher than normals (Bernstein & Putnam, 1986; Bremner et al., 1992). Several items in particular (eg., two missing part of a conversation & 14 vivid memories) are reported to occur more than 60% of the time. Other dissociative symptoms (eg., 11 not recognizing oneself in a mirror and four finding oneself dressed in clothes one does not remember putting on) occur about 12% of the time. While it is not surprising to find this pattern of responses in a population with combat-related PTSD, we can not expect this to be consistent across patient populations. For example, DID patients might report relatively more frequent occurrence for items like 4 and 11.

The least frequently endorsed items (eg., 4 & 11.) had the most positively-skewed frequency distributions. The most frequently endorsed items (ie., 2, & 14.) had frequency distributions that were slightly negatively skewed. This supports our contention that factor analysis of this measure is most appropriately used in a homogeneous clinical population, and that factor analytic results obtained using non-clinical subjects (in which items would tend to be very skewed) may not generalize to clinical populations. The skewness of DES items raises questions about the legitimacy of using parametric statistics to examine the factor structure of the measure in the non-clinical population (Waller, 1995). The only previous study using a clinical population (Carlson & Putnam, 1993) used a sample with mixed diagnoses, including normals. While this strategy may increase mean scores and reduce the skewness of item distributions, it also makes it likely that there will be bimodal frequency distributions, in which there is one mean for the non-clinical subjects, and a higher mean for the clinical subjects. The use of traditional factor analysis may not be appropriate in this situation. Use of a mixed sample may also obscure differences that exist in the dimensional structure of dissociative experiences in different populations.

Our findings suggest that the DES can be separated into subscales that are conceptually meaningful, internally consistent, and distinct from each other. Of the factor solutions we examined, the four-factor solution appeared to maximize conceptual clarity and statistical fit. The Depersonalization/Derealization scale focuses on experiences of oneself and others as unreal or distant. While the items in this scale do not cover the full range of potential derealization experiences that might be possible, the items all seem to tap this dimension. The Depersonalization/Derealization scale is very similar to a scale found in an earlier study in the general population (Ross et al., 1991), except that the earlier study included item 11 instead of item 7 and did not include item 18. This may be a subset of highly intercorrelated and

TABLE 2
Scores on Related Scales

	Mean	SD
Mississippi PTSD scale	132.94	18.70
MMPI-2 PTSD subscale	36.91	13.14
Impact of Event scale		
Intrusive	26.52	7.01
Avoidant	27.18	8.08
Combat Exposure	9.85	3.44

conceptually similar items that is stable across populations.

The Memory Disturbance subscale seems to be more conceptually broad. Several of the items suggest uncertainty about the reality of one's memories (e.g., not being sure if an event really happened or was a dream, vivid memories of events as if reliving them). These two items indicate difficulty distinguishing between memories of real events, dreams, and perceptions of current events. Other items on this subscale (finding things you cannot remember buying, finding you did something that you do not remember doing) indicate a disturbance in memory for previous actions. The remaining items in this scale (e.g., being called by another name by people you do not know, being able to do difficult things easily, not recognizing friends and family) may indicate failure to activate appropriate memory mechanisms. While this factor is defined by our statistical procedure, it does seem that some of these items are more difficult to reconcile conceptually.

The Distractibility subscale contains items indicative of gaps in concentration. These items seem to fit well together conceptually. Three of these items were endorsed with high frequency in this population, but the fourth (dressed in clothes one cannot remember putting on) was the least frequently endorsed item.

The Absorption factor focuses on experiences of intense concentration in which one is not aware of one's surroundings, bodily experiences, or the passage of time. The inclusion of the item "feel as if two different people" on this scale suggests that in this population, this item refers to the distinct states of being absorbed versus being aware of one's surroundings, rather than referring to fragmentation of self

TABLE 3
Normality of DES Item Distributions

Item	Skewness	Kurtosis
1	.45	-.82
2	-.59	-.61
3	1.07	.21
4	2.39	6.01
5	1.54	1.49
6	1.24	.55
7	1.36	.62
8	1.31	.59
9	.61	-1.07
10	1.06	-.14
11	2.21	4.23
12	1.30	.59
13	1.82	2.32
14	-.71	-.74
15	.67	-.88
16	.76	-.64
17	.36	-1.39
18	.70	-.87
19	.06	-1.30
20	.26	-1.26
21	.45	-1.25
22	.35	-1.32
23	.66	-.79
24	-.16	-1.37
25	.34	-1.41
26	1.05	-.07
27	1.20	.20
28	1.08	.08

as might be seen in DID.

Seven items did not fit into any of the subscales. Generally, these items loaded on more than one scale, or were dropped because they were the weakest member (statistically and conceptually) of the scale on which they loaded (Table 4).

Alternatively, one might argue for a unidimensional solution based on our data. The Eigenvalues and high inter-scale

correlations could be interpreted as arguments for a unidimensional scale. In addition, the four DES scales had similar correlations with other variables (i.e., PTSD scales and Combat Exposure). The inter-scale correlations and reliabilities of the subscales indicate that approximately 36% of scale variances are due to unreliability (mean alpha is .80; $1 - .80^2 = .36$), while 36% is shared with the other subscales (mean interscale $r = .60$; $.60^2 = .36$). This means that approximately 28% of the variance of each subscale is attributable to distinct concepts, not tapped by the other subscales ($1 - .36 - .36 = .28$). On the other hand, the internal consistency reliability of the entire 28-item scale (alpha = .94) is not much higher than the reliability of the best of the scales (Depersonalization/Derealization alpha = .89) even though this subscale has only six items. Thus, there is little to be gained by using only a single factor.

However, in addition to the statistical evidence of multidimensionality, there are clinical reasons for using the DES as a multidimensional scale. It would be important to know whether a patient's dissociative symptoms are primarily depersonalization, are attributable to distractibility, are a function of absorption, or are the result of memory disturbances. We do not know what effects these different kinds of dissociative symptoms might have on the course of PTSD or on the treatment process. If each of these symptom subtypes can be measured, research can begin to address this question.

Further research will be needed to provide validation of this factor structure. It may prove possible to assess predictive validity by examining the patterns of scale scores across diagnostic groups. Certain forms of dissociation might be more common during various developmental stages, or might be seen as expectable reactions to various types of trauma. Other types of dissociative symptoms might be seen less frequently, and might be more highly associated with the presence of psychopathology. This kind of information would help clinicians differentiate between the expectable kinds of dissociative symptoms for a given patient population, and more problematic dissociative symptoms that should be assessed further. It also might be useful to compare groups of subjects who experienced different types of trauma. Future studies should examine correlations with variables more closely tied to distinct dissociative phenomena. For example, subjects who reports high levels of intrusive PTSD symptoms on other tests or during structured clinical interviews would be expected to produce high scores on the DES Memory Disturbance scale. Subjects reporting high levels of emotional numbing should score higher on the DES Depersonalization scale.

Better understanding of dissociative mechanisms may allow us to develop treatments that address specific dissociative symptoms, making treatment of PTSD more effective. We believe that the present study is a step toward such an understanding of the construct of dissociation. ■

TABLE 4
Varimax Factor Loadings: Four-Factor Solution

ITEM	ITEM CONTENT	MEAN	SD	FACTOR			
				1	2	3	4
Factor 1: Depersonalization/Derealization ($\partial = .89$)							
18	Fantasy/daydream feels real	31	32	.55	.30	.35	.20
28	Looking through fog/things are far away/unclear	24	28	.78	.16	.28	.15
27	Hearing voices inside your head	23	30	.67	.37	.04	.16
12	Other people/objects not real	21	27	.79	.22	.16	.21
7	Stand next to self watching as if another person	19	26	.70	.17	.27	.10
13	Body doesn't belong to them	16	26	.74	.38	.01	.17
Factor 2: Memory Disturbance ($\partial = .81$)							
14	Vivid memory of past events as if reliving it	63	32	.26	.45	.09	.21
25	Find evidence you did something; don't remember	37	31	.19	.70	.46	.10
23	Sometimes able to do difficult things easily	32	30	.10	.46	.19	.10
15	Not sure if it really happened or dream	31	30	.29	.60	.28	.28
6	People they don't know call them by another name	23	26	.10	.60	.15	.00
8	Being told they don't recognize friends & family	19	25	.34	.56	.02	.26
5	Finding new things one can't remember buying	16	22	.33	.64	.08	.12
Factor 3: Absorption ($\partial = .69$)							
19	Able to ignore pain	47	32	.07	.13	.51	.30
20	Sit staring off into space, unaware of time	44	31	.36	.37	.52	.21
22	Feel as if 2 different people	39	33	.29	.25	.56	.29
17	Absorption in movie/TV; unaware of surroundings	36	32	.10	.13	.52	.20
Factor 4: Distractibility ($\partial = .80$)							
2	Miss part of conversation	61	25	.27	-.13	.38	.54
1	Driving, forgetting part of trip	37	26	.04	.15	.21	.80
3	No idea how they got there	24	24	.24	.30	.37	.67
4	Dressed in clothes one can't remember putting on	12	21	.18	.32	.05	.73
Other Items							
24	Not knowing if you did something or just thought...	49	32	.10	.65	.53	.17
21	Talk out loud when alone	37	33	.52	.12	.48	.31
9	No memory of important events	33	31	.32	.42	.54	.00
16	Find a familiar place strange and unfamiliar	30	30	.41	.30	.56	.26
10	Being accused of lying when not lying	26	29	.50	.25	.32	.08
26	Find writing/drawings you can't remember doing	25	29	.40	.35	.54	-.02
11	Look in mirror & not recognize self	12	22	.66	.06	.52	-.07

Note. $N = 129$

TABLE 5
DES Scale Correlations

	Depers	Memory	Absorp	Distract
Memory	.67**			
Absorp	.61**	.63**		
Distract	.50**	.55**	.63**	
Mississippi	.42**	.44**	.36**	.44**
MMPI PTSD scale	.23*	.27*	.22*	.26*
IE-Intrusive	.11	.25*	.20	.20
IE-Avoidant	.07	.16	.18	.18
Combat	-.07	-.10	.01	.01

* $p < .05$ ** $p < .01$

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