

THE FACTOR STRUCTURE OF THE DISSOCIATIVE EXPERIENCES SCALE IN COLLEGE STUDENTS

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ABSTRACT

A factor analysis of the Dissociative Experiences Scale (DES) in college students indicates that the scale contains three distinct, though correlated dimensions: imaginative involvement, depersonalization/derealization, and amnesia. The similarity of the DES factor structure in this non-clinical sample to that found in psychiatric groups and other non-clinical samples offers some assurance that what is reflected in the overall DES score is similar in the different populations. On the other hand, subtle but statistically reliable sex differences were found on the imaginative involvement and amnesia factors, suggesting that combining the data of men and women, as has been done in previous factor analytic studies of the DES, may be inappropriate. If these gender-related differences are confirmed, their possible significance in the etiology and phenomenology of dissociative disorders should be considered.

INTRODUCTION

The Dissociative Experiences Scale (DES) devised by Bernstein and Putnam (1986) is a 28-item self-report measure which yields a quantitative index of dissociation. The scale is internally consistent, has a high test-retest reliability, and effectively discriminates individuals diagnosed with dissociative disorders from other psychiatric groups and from non-clinical samples (Bernstein & Putnam, 1986; Pitblado & Sanders, 1991; Sanders, McRoberts, & Tollefson, 1989). DES scores are positively correlated with tolerance for physical pain (Giolas & Sanders, 1992), providing additional evidence of validity. Since its 1986 publication, the scale has been used in numerous studies with various subject groups.

Bernstein and Putnam (1986) proposed that dissociation is appropriately seen as a continuum extending into the normal population, a view supported by our own previous research (Sanders, et al., 1989; Sanders & Giolas, 1991). The supposition that the DES reflects a single continuum, however, has been challenged by recent factor analytic stud-

ies which indicate that the scale is not uni-dimensional (Carlson et al., 1993; Schwarz, Frischholz, Braun, & Sachs, 1991; Ross, Jossi, & Currie, 1991; Ray, June, Turaj, & Lundy, 1992). Moreover, there is some evidence that the factor structure of the measure in college students may differ from the factor structure in psychiatric groups (Schwarz et al., 1991), a finding which presents an even more serious challenge for the continuum notion. Schwarz et al. (1991) argued for a single factor solution in their study of a relatively small sample of college students (N = 69), whereas three DES factors have been identified in psychiatric groups (Carlson et al., 1991; Schwarz et al., 1991).

The present study was undertaken to further investigate the DES factor structure in college students. DES data for two large samples of college men and women were subjected to factor analysis. We also asked whether there is any sex difference in the DES factor structure. Though MPD is far more frequently diagnosed in women than in men (Putnam, 1989), female college students do not have higher DES scores than male students, indicating that they are not more predisposed to dissociation. The possibility exists, however, that there is a difference in the dimensional structure of the measure related to gender. We addressed this question by statistically comparing the correlation matrices and factor solutions for the men and women in our samples.

METHODS

Two groups of college undergraduate students between the ages of seventeen and twenty-two completed the DES during the academic year 1991/92. The first sample had 359 women and 206 men, and the second had 207 women and 88 men. The students were from introductory psychology classes at the University of Connecticut and were recruited for this study without regard to gender. The DES was administered in small mixed-sex groups of about twenty students each. In the first sample students provided their names; in the second they identified themselves only by the last four digits of their Social Security numbers.

Because there were two cohorts of subjects, it was possible to consider cross-validating the factor analytic results. Cross-validation presented no problems for the women subjects, as the sample sizes were considerable in both cohorts. For the men, however, the small sample size in the second cohort meant that the validation would have very low power. Therefore, only the women's data were compared across samples. The two samples of men were combined, yielding

a sample size of 294, and sex differences in factor structure were evaluated using this combined sample.

RESULTS

The first step in the data analysis was to compare factor solutions for the DES in men and women. This problem was approached by testing for sex differences in the intercorrelations among the twenty-eight items of the DES because an interpretation of differences in factor solutions should be preceded by a demonstration that the correlation matrices are different (see Browne, 1978). The matrix of intercorrelations among the twenty-eight DES items for the women in cohort 1 ($n = 359$) was compared with the same matrix in the combined sample of men ($n = 294$), using the test outlined in Green (1992) and based on Werts, Rock, Linn, and Jöreskog (1976). The results indicated that the

matrices of intercorrelations were different, $X^2(378) = 807.5$, and the Tucker-Lewis index of fit was .90².

Based on these results, it was decided to perform separate factor analyses for the two sexes. The minres technique was used (Harman, 1976), along with an oblique rotation (promax). Three criteria were used to determine the number of factors, namely, the scree plot (Cattrell, 1966), parallel analysis (see Lautenschlager, 1989), and interpretability of the factors. The factor solution for the combined sample of men based on these criteria appeared to be a three-factor solution with 42% of the variance accounted for (see Table 1). The intercorrelations among factors were .61 (1 and 2), .61 (1 and 3), and .48 (2 and 3). Factor loadings suggested that the first factor was imaginative involvement, the second factor was depersonalization/derealization, and the third factor was amnesia.

Using the same criteria for determining number of fac-

TABLE 1
DES Factor Solution for Men: Pattern Coefficients

Factor 1	<i>Imaginative Involvement</i>	Fact 1	Fact 2	Fact 3
14.	Remembering seems real	.60	-.14	.24
16.	Familiar place seems unfamiliar	.51	.11	.18
17.	Absorbed in TV or story	.83	-.15	-.04
18.	Fantasy or daydream seems real	.77	.05	-.10
20.	Sit staring into space	.48	.20	.05
23.	Can do different things easily sometimes	.52	.13	.06
Factor 2	<i>Depersonalization/Derealization</i>			
7.	Standing beside self	.20	.41	.14
11.	Not recognizing self in mirror	-.18	.66	.12
12.	People and things do not seem real	.04	.82	-.11
13.	Body seems not to belong to you	.17	.50	-.06
28.	Seeing the world through a fog	.05	.73	-.11
Factor 3	<i>Amnesia</i>			
5.	Find new things don't remember buying	-.04	.13	.65
6.	Called by another name	.10	-.12	.69
8.	Not recognizing friends or family	-.03	.02	.66
25.	Evidence of doing things don't remember doing	.08	.20	.62

NOTE: Only items which were factorially simple are shown here. These are items which loaded .40 or above on one factor and .25 or lower on each of the other two factors.

tors, the solution for the women in cohort 1 involved three factors. Rather than present that solution, however, we attempted to determine whether this factor solution would replicate in the second cohort. If the solution did replicate, we could combine the samples and present the solution for the combined sample of women.

The intercorrelations among the 28 DES items were therefore compared for the two samples of women. The results indicated that the matrices were not different, $X^2(378) = 653.64$ (X^2 less than twice the number of degrees of freedom), with a Tucker-Lewis coefficient of .93. Indeed, the factor solution for women in the second cohort involved three factors, and the coefficients of congruence (Harman,

1976) between the factors in the two solutions were .92, .90, .71, indicating that the first two factors were virtually identical and that there were minor differences on the third factor.

Essentially, then, the factor solution for the women replicated across cohorts. For ease of presentation, only the factor solution for the combined sample of 566 women, which accounted for 44% of the variance, is presented (see Table 2). The intercorrelations among the factors were .52 (1 and 2), .54 (1 and 3), and .46 (2 and 3).

A comparison of Tables 1 and 2 shows that factor 2, the depersonalization/derealization dimension, is identical in men and women, but that there are sex differences in imag-

TABLE 2
DES Factor Solution for Women: Pattern Coefficients

Factor 1	Imaginative Involvement	Fact 1	Fact 2	Fact 3
6.	Called by another name	.52	-.13	.21
10.	Accused of lying	.54	.10	.07
14.	Remembering seems real	.56	.20	-.06
15.	Unsure if something real or dreamed	.61	.08	.08
16.	Familiar place seems unfamiliar	.49	.24	.14
17.	Absorbed in TV or story	.70	.04	-.09
18.	Fantasy or daydream seems real	.72	.18	-.09
20.	Sit staring into space	.64	.10	.01
21.	Talk aloud to self when alone	.46	.05	.03
23.	Can do difficult things easily sometimes	.66	.08	.06
24.	Unsure if thing done or thought about	.66	-.07	.17
Factor 2	Depersonalization/Derealization			
7.	Standing beside self	-.18	.42	.16
11.	Not recognizing self in mirror	-.12	.74	.22
12.	People and things do not seem real	.08	.76	.01
13.	Body seems not to belong to you	.08	.81	-.05
28.	Seeing the world through a fog	.13	.50	.15
Factor 3	Amnesia			
3.	Find self someplace don't remember going	-.09	.17	.66
4.	Find self in clothes don't remember buying	.00	.09	.70
5.	Find new things don't remember buying	.04	.12	.59

NOTE: Only items which were factorially simple are shown here. These are items which loaded .40 or above on one factor and .25 or lower on each of the other two factors.

inative involvement and amnesia. The imaginative involvement factor for women includes all of the items on the male imaginative involvement factor plus five additional ones, only one of which loaded on a different factor in men (item #6).

A comparison of the amnesia items for men and women reveals a difference in the types of experience indicative of a lapse in memory. The only common experience was finding new things one did not remember buying. For men, being called by another name, not recognizing friends or family, and finding evidence of having done things one does not remember doing also contribute to the amnesia factor. Finding oneself someplace one does not remember going, and finding oneself in clothes one does not remember putting on had high specific loadings for women but not for men.

DISCUSSION

The three DES factors we identified in college students are essentially the same as those identified in psychiatric groups in a large multicenter study (Carlson & Putnam, 1993).³ A similar factor structure was also seen in a large heterogeneous sample drawn from the general community (Ross, Joshi, & Currie, 1992). The demonstration of the similarity of the DES factor structure in these different populations is essential in drawing comparisons among them as we have done in previous research (Sanders et al., 1989; Sanders & Giolas, 1991).

On the other hand, our findings of a statistically reliable difference in the correlation matrices for the two sexes suggests that combining the DES data of men and women, as has been done in previous studies, may not be appropriate. Sex differences were found on the imaginative involvement and amnesia factors. In particular, the imaginative involvement factor for women was broader, containing all of the items representing imaginative involvement in men, as well as five others. This sex difference fits well with sex differences in imagination, particularly with observations suggesting the range of fantasy activities may be broader in women than in men. For example, women are more likely than men to have an imaginary companion, as well as more likely to be highly involved with these companions (Dierker, Davis, & Sanders, unpublished).

The sex difference in the amnesia factor was more complicated. Here, a distinction between subsets of DES "amnesia" items made by Ray et al. (1992) seems relevant. In their factor analysis of the DES in college students, these researchers distinguished between what they termed "segment amnesia," which involves finding evidence of having been amnesic for a period of time (for example, being called by another name), and "in situ amnesia," which involves suddenly awakening to the current situation, for example, by finding oneself dressed in clothes one does not remember putting on, or finding oneself someplace and not remembering how one got there. In their study, these two types of experiences loaded on different factors. Interestingly, in our data the amnesia experiences that were unique to women were of the "in situ" sort, while all of the items on the amnesia factor for men were included in Ray et al.'s (1992), "segment

amnesia" factor. Our findings suggest that there may be a gender-related difference in the means by which people come to realize that they have been functioning in a dissociated state. Women may be more likely to become aware of periods of lapsed time by "coming to" in a different situation, and men more likely to reach an awareness of missing time through more inferential processes.

The sex difference in the amnesia items was particularly interesting because it points to important sex differences in psychological processes. However, we would like to see the solution for men replicated. We are especially confident of women's solution because we were able to cross-validate it in a second cohort of subjects. At this point, then, we consider the sex difference in the factor structure of the DES to be subtle yet potentially interesting and important. If future studies confirm gender-related differences in specific aspects of dissociation, their possible significance in the etiology and phenomenology of dissociative disorders should be considered.

The fact that the DES appears to be multi-dimensional rather than uni-dimensional expands our conceptualization of dissociation. In effect, there appears to be a three-dimensional continuum underlying dissociative experiences. It may be not only the overall amount of dissociation but also the pattern of these three types of experiences which discriminate MPD and other psychiatric disturbances from non-clinical populations. For the present, however, the similarity of the DES factor structure in psychiatric and non-psychiatric samples offers some assurance that what is reflected in the overall DES score is similar in the two groups and supports the parallels we, and others, have drawn between them. ■

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FOOTNOTES

1. The DES data were collected as part of doctoral dissertations at the University of Connecticut by Marina H. Giolas, Ph.D. and Evvie Becker-Laussen, Ph.D. We gratefully acknowledge their careful efforts in obtaining this information, and thank them for making it available to us.
2. There is no universally agreed-upon criterion for assessing the fit of models like those used here. We employed the joint criteria of X^2 less than twice the df and TL greater than .90 for the matrices to be considered equal. Merch et al. (1988) review these, and other, indices of model fit.
3. These findings have not been published, and Carlson and Putnam (1993) express some reservations about the validity of factor analysis for their data.