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THE DISSOCIATIVE EXPERIENCES SCALE-II: DESCRIPTIVE STATISTICS, FACTOR ANALYSIS, AND FREQUENCY OF EXPERIENCES*

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ABSTRACT

Psychometric aspects of the Dissociative Experiences Scale-II were studied with 308 American community college students. The overall DES mean was 21.70. Item-corrected correlations ranged from .30 to .62. The scale's Cronbach Alpha was .92. There were no significant correlations between DES scores and sex or religiosity. Age was negatively and significantly correlated to DES scores ($r = –.24$). A factor analysis showed only a single factor. Descriptive statistics of the DES-T were also presented. We obtained a mean of 13.81 and a Cronbach Alpha of .75. The DES-T was significantly correlated to the rest of the scale ($r = .79$), and to the age of the participants ($r = –.22$). The findings show that the DES II has good inner consistency.

In recent years many studies have been published in which the Dissociative Experiences Scale (DES [1]) has been used to measure the frequency of dissociative experiences (for reviews see [2, 3]). This scale has been shown to be both valid and reliable in research designed to test its psychometric properties [4-8]. However, the scoring of the scale is slow and cumbersome because responses must be measured with a ruler along a 100 cm. response continuum. This is especially so

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when administering the scale to large samples. Consequently, an easier-to-score version, the DES II, was developed (for a copy of the scale, see Carlson and Putnam's article [2]). This revised scale uses a sequence of numbers ranging from 0 to 100. Arranged as a continuum in increments of 10, the revised scale allows for a quicker and more efficient scoring procedure. Initial research has shown that the scores of the DES II are similar to those obtained on the original scale [9-11].

In this study, originally designed to relate dissociative experiences to other such experiences such as dreams and out-of-body experiences [12, 13], we present data that further explores the psychometric properties of the DES II.

METHOD

Participants

The study participants were 308 students at McHenry County College, a community college located in Crystal Lake, Illinois. Sixty percent of the participants were female, 79 percent were single, and 93 percent were white. Participant's ages ranged from 17 to 59 years (Mean = 23, *SD* = 8.27). The students were surveyed in courses of: sociology (34 percent), psychology (21 percent), communication (15 percent), film (10 percent), philosophy (8 percent), photography (7 percent), government and criminal justice (4 percent), and women's studies (1 percent).

Questionnaire

In this study we used a questionnaire that we call the Questionnaire of Mental Experiences. It consists of demographic questions and 43 other items using a response scale that ranges along a continuum from 0 to 100 in increments of 10. The additional items included the 28-item DES II [2], questions about dreams [12], selected items from Tellegen's Absorption Scale [14], and several additional questions about ostensible parapsychological phenomena, and one about mystical experience. For the analyses presented here we used only the demographic items and the DES items.

The questionnaire was constructed by randomizing the presentation order of all items used and modifying the response method of the other items to match that of the DES II items. Instructions emphasized that answers should reflect the percentage of time in which a person had the experience in question and that experiences that occurred under the influence of drugs or alcohol should not be included.

Procedure

We obtained the cooperation of a subset of the faculties of Humanities, Communications, and Social Sciences. The nine instructors who took part in this

study allowed us to distribute questionnaires in 17 of their courses. The method of presentation and the method of return was determined by each cooperating instructor who chose from a variety of options that we presented to them.

Some instructors were willing to allow a longer time in class for presentation of the questionnaires and others preferred to limit the time. To conform to each instructor's preference, we offered three methods of questionnaire presentation: in-class, drop off with mass return, and drop off with individual mail return. In the in-class option we arrived in class, were introduced by the instructor, and gave a short description of our research and the questionnaire. A cover letter, the consent forms, and the questionnaire were then distributed. The introductory talk emphasized that participation was entirely voluntary. Students were given the option to refuse the packet, to return the packet without completing the questionnaire, or, if they wanted to fill the questionnaire but were unwilling for us to use their data, to return the completed questionnaire with an unsigned consent form. They were encouraged to keep the cover letter which contained a summary of the study purpose and our names and addresses in case they wished to contact us for any reason. Students were then given time to read the cover letter and consent form, and complete the questionnaire. Usually, this required about 20 to 25 minutes. In the drop off with mass return option, we arrived in class, were introduced by the instructors, and gave our introductory talk, handing out the packet at the end of the talk. The instructor then arranged to collect the packets from the students at a later date and mail them to us. In the drop off with individual mail return option, everything proceeded as in the other two options, but students were given self-addressed, stamped envelopes in which to return their questionnaires to us. Both of the drop off options typically took about five minutes of class time. A final point: some of the instructors decided to offer credit for questionnaire completion independently of our instructions. We conducted analyses to assess the possible effect of credit and the different collection methods on our results.

Our introduction of the study emphasized the idea that the questionnaire was designed to examine such normal phenomena as memory, imagination, and dreams. We avoided identifying the questionnaire as dealing with dissociation, and dissociative processes were not mentioned in either our introduction or in the question and answer period after the questionnaire completion.

Analyses

The data was entered into the StatPac Gold 4.5 program. Each questionnaire was coded for type of questionnaire presentation and return as well as for whether or not credit was offered by the instructor. Our analyses were conducted using Pearson correlations, *t* tests, and a factor analysis with Varimax rotation. Effect sizes for the *t* test analyses were calculated using Cohen's *d.* All *p* values were two-tailed.

RESULTS

Collection Methods and Credit for Questionnaire Completion

To see if the method of collection and the assignment of credit for questionnaire completion affected the DES scores, we compared these variables (see Table 1). There were no significant differences between the DES scores on questionnaires completed and collected in-class and those scores obtained on questionnaires completed outside of class and returned by mail ($t(282) = .28$, $p = .78$, $d = .06$), nor between in-class questionnaires and those completed outside of class but collected by the teacher for return to us ($t(282) = .22$, $p = .83$, $d = .05$). Similarly, no significant differences were obtained when we compared the DES scores of questionnaires collected by teachers to those returned by the students themselves ($t(46) = .04$, $p = .97$, $d = .01$). Those students who obtained academic credit for questionnaire completion did not show significantly different mean DES scores from those who were not offered credit for completion by their instructors ($t(305) = .73$, $p = .47$, $d = .09$). The fact that these subsets of the data did not differ significantly from one another led us to pool the data and proceed with our other analyses using the complete database of 308 questionnaires.

DES Scores

The mean DES score for the entire sample of 308 students was 21.70 (Range: 1-65, Median 19, Mode = 13, $SD = 12.87$). Figure 1 shows the distribution of the scores. The scores were not normally distributed but instead were skewed toward lower mean scores. A Kolmogorov-Smirnov test for normality yielded a value of 1.75 ($p < .01$).

Out of 308 participants, 80 (26 percent) scored 30 or higher on the DES, and 228 (74 percent) scored under 30. Table 2 shows the mean scores and basic percentages of each item. In addition, the table presents the correlations relating each particular item to the rest of the scale. The coefficients ranged from .30 to .68 with a mean of .52 (Median = .54, Mode = .48). The Cronbach Alpha was .92. We also performed a split-half correlation of the even and odd items of the DES, $r(306) = .82$, $p < .001$.

We also calculated descriptive statistics for the DES-T, or those eight items of the DES considered to form a taxon and to discriminate, better than the rest of the scale, those persons who may be suffering from pathological conditions [15]. The mean DES-T score was 13.81 ($N = 308$, Range: 0-58.75, Median = 11.25, Mode = 0, $SD = 12.37$). A Kolmogorov-Smirnov test for normality yielded a value of 2.32 ($p < .01$).

The Cronbach Alpha for the DES-T was .75. The DES-T was significantly correlated to the rest of the scale, $r(306) = .79$, $p < .001$. Other details about the individual DES-T items appear on Table 2 (items 3, 5, 7, 8, 12, 13, 22, and 27).

Table 1. DES Scores in Relation to Form of Data Collection and Academic Credit

Variable	*N*	DES mean score
Collection of questionnaire		
In class completion	260	21.81
Mailed back by student	24	21.04
Teacher collected and mailed back	24	21.21
Academic credit for completion		
Yes	84	20.86
No	223	22.06

Relationships to Demographic Variables

There were no significant relationships with sex (Male Mean DES Score = 21.72, Female Mean DES score = 21.69, $t(306) = .02$, $p = .98$, $d = .003$), or with religiosity as measured on a 5-point scale ranging from "not religious at all" to "extremely religious" ($r(303) = -.01$, $p = .8$). Mean DES scores were negatively related to age ($r(165) = -.24$, $p = .003$).

Table 3 shows correlational analyses between age and the individual items of the DES. We report only those significant at the .01 level or less. All the coefficients were negative.

Regarding ethnic background, we could only compare whites ($N = 286$, DES Mean Score = 21.48) to Hispanics ($N = 16$, DES Mean Score = 23.63), and found no significant difference ($t(300) = .64$, $p = .52$, $d = .17$).

We were interested in the relationship between "artistic temperament" and DES scores. For this reason, we did a post-hoc comparison of the mean DES scores of the students in photography ($N = 19$) and film classes ($N = 29$) to the rest of the students ($N = 240$). The combined mean DES score of photography and film students was 27.42, while the rest of the students obtained a mean of 20.54. This difference was statistically significant ($t(286) = 3.44$, $p = .001$, $d = .55$).

The same analyses were conducted with the eight items of the DES-T. The DES-T was significantly and negatively correlated to age ($r(303) = -.22$, $p = .004$) and nonsignificantly to religiosity ($r(165) = .002$, $p = .97$). Photography and film students (Mean DES-T = 19.44, $N = 48$) obtained higher DES-T scores than students from the other courses (Mean Other Courses = 12.69, $N = 240$), $t(286) = 3.48$, $p = .001$, $d = .57$. There were no significant sex differences on the DES-T (Male DES-T Mean = 14.21, $N = 123$; Female DES-T Mean = 13.55, $N = 185$; $t(306) = .46$, $p = .65$, $d = .05$) nor ethnic differences (White DES-T Mean = 13.50, $N = 286$; Hispanic DES-T Mean = 18.05, $N = 16$; $t(300) = 1.42$, $p = .16$, $d = .36$).

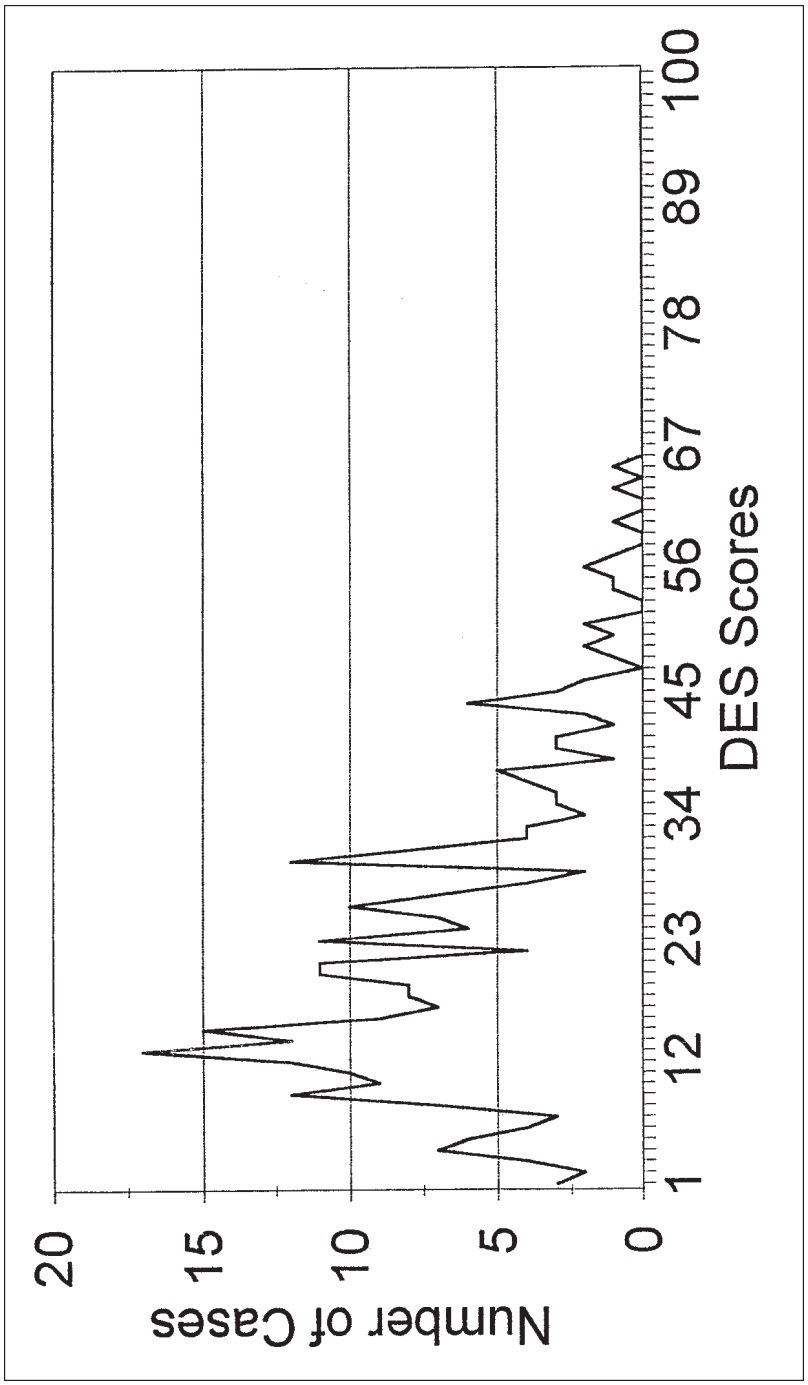

Figure 1. Distribution of DES scores for all participants.

Factor Analysis of the DES

The initial aim of this analysis was to attempt to replicate the three factors extracted by Ross, Joshi, and Currie [16]. In the Ross et al. article, the authors described submitting their data to a factor analysis using Varimax rotation, a technique designed to maximize the difference between high and low loadings of items on factors. Ross's three-factor solution explained approximately 47 percent of the variance in his data set. It was not known whether he relied on an orthogonal loading structure (which attempts to find uncorrelated factors), or an oblique simple structure (which allows for inter-factor correlation).

Using StatPac 4.5, we performed a factor analysis, using the Varimax rotational technique, forcing a 50 percent variance-explained extraction solution for comparison purposes. Because it is known that the items of the DES are highly inter-correlated, we decided to rely on the oblique simple structure of the factors derived. Because the operation was an exploratory one, to determine whether or not Ross' factors could be extracted from our data set, or improved upon, we decided to use a .32 loading cut-off criteria, which represents, according to Tabachnick and Fidell [17, p. 677], a "poor" fit of item loading to factors. Such a liberal criterion was employed to give as much opportunity for replication as possible. When the analysis was run, all 28 items of the DES loaded on one factor, with loadings ranging from a low of .38 for item 10 to a high of .69 for item 5. Thirty-three percent of the variance was explained by this single factor. When rerun, forcing a three-factor solution, an identical result was obtained.

In an effort to understand why the factor analysis of our DES data differed so strikingly from Ross et al.'s [16] three-factor solution, we reexamined the fit of our data to the assumptions underlying factor analysis. Tabachnick and Fidell [17] make the point that the less normally distributed the data to be factor-analyzed is, the more unreliable and unpredictable the results of the factor analysis. They recommend graphing the individual item distributions and examining them visually for skewness and kurtosis, as well as testing statistically whether the skewness and kurtosis found is significantly non-normal. Using their formula for calculating a skewness *z*-score and a kurtosis *z*-score [17, pp. 72-73], it was found that 24 of the 28 items of our data set were significantly positively skewed (that is, with skewness *z* scores at or beyond 2.58, $p = .01$, 2*t*), 18 of which were severely skewed (skewness *z* scores at or beyond 6.00). Overall, skewness *z* scores ranged from 1.09 ($p = .28$, 2*t*) to 34.78 ($p < .0001$) with a mean skewness *z* of 6.31 ($p < .0001$). Twenty of the item distributions also suffered from significant kurtosis, but only one of these was not also significantly skewed, and the overall kurtosis *z* score for the entire data set was not significant (Kurtosis $z = 1.12$, $p = .26$, range = .55 to 10.25).

Because the overall level of kurtosis in the data set as a whole was not significantly non-normal, we decided to focus on the overall positive skewness of the item score distributions. We also decided to apply the transformation

Table 2. Mean Scores, Percentage of Claims of Experiences, and Correlation of Individual Items with Overall DES Scores

Item	*N*	Mean score	*S.D.*	%	Correlation (*r*) with overall DES
Driving a car and realizing one does not remember what happened during the trip	308	31.30	28.13	77	.58
Missing part of a conversation	305	45.77	25.74	97	.64
Finding oneself in a place but unaware how one got there	308	9.25	16.40	41	.64
Finding oneself dressed in clothes one can't remember putting on	308	2.31	7.67	13	.44
Finding unfamiliar things among one's belongings	308	9.74	16.85	41	.55
Being approached by people one doesn't know who call one by a different name	308	17.53	21.97	64	.49
Seeing oneself as if looking at another person	308	12.53	20.18	45	.48
Not recognizing friends or family members	307	9.77	16.18	45	.30
Not remembering important events in one's life	308	10.81	19.60	40	.46
Being accused of lying when one is telling the truth	308	20.65	21.60	71	.48
Not recognizing one's reflection in a mirror	305	5.54	12.40	25	.49
Other people and objects do not seem real	308	8.38	15.71	33	.43
Feeling as though one's body is not one's own	308	9.09	18.68	33	.40
Remembering past so vividly one seems to be reliving it	307	31.95	28.26	81	.61
Not sure if remembered event happened or was a dream	308	33.99	28.82	87	.61
Being in a familiar place but finding it unfamiliar	304	19.08	21.96	67	.57

Table 2. (Cont'd.)

Item	*N*	Mean score	*S.D.*	%	Correlation (*r*) with overall DES
Absorption in television program or movie	308	39.45	29.36	89	.57
So involved in fantasy that it seems real	308	31.01	27.77	80	.66
Able to ignore pain	305	33.34	27.78	84	.40
Staring into space	308	27.95	26.81	78	.68
Talking out loud to oneself when alone	308	41.40	31.35	89	.42
Feeling as though one were two different people	304	29.41	27.94	75	.58
Usually difficult things can be done with ease and spontaneity	257	44.98	23.52	97	.31
Not sure whether one has done something or only thought about it	305	27.18	24.64	84	.66
Finding evidence of having done things one can't remember doing	308	12.99	19.34	54	.60
Finding notes or drawings that one must have done but doesn't remember doing	308	14.16	19.76	53	.60
Hearing voices inside one's head	306	22.17	29.79	55	.53
Looking at the world through a fog	308	8.67	16.12	37	.48

recommended for significantly positively skewed distributions to all individual item score distributions, no matter what the actual characteristics of the individual item distributions, so as to maintain the original mathematical relationship of the item scores to each other in the data set as a whole. Consequently, even the four item score distributions that were not significantly positively skewed were transformed in the same manner as the 24-item score distributions that were significantly positively skewed.

In the case of significant positive skewing in a data set, Tabachnick and Fidell recommend transforming the raw scores before factor analysis by adding a constant to ensure that the minimum score is 1, and by then taking the inverse of the resulting score [17, p. 85]. The formula for the transformation is thus: New Score = 1/(Old Score + 1).

Table 3. Pearson Correlations of Age and Individual DES Items

DES item	*N*	*r*
Being accused of lying when one is telling the truth	167	–.32
Not sure if remembered event happened or was a dream	167	–.28
Absorption in television program or movie	167	–.30
So involved in fantasy that it seems real	167	–.24
Staring into space	167	–.24
Not sure whether one has done something or only thought about it	165	–.22
Finding notes or drawings that one must have done but does not remember doing	167	–.22
Hearing voices inside one's head	165	–.22

Note: The table includes only analyses significant at the .01 level or less.

After transformation, 15 of the 28 item score distributions were either less severely positively skewed or negatively skewed but with an absolute value closer to 0. Thirteen item score distributions were more severely positively skewed. Overall, however, the positive skewness of the data set as a whole decreased (mean skewness $z = 2.31$, $p = .02$, range = –15.89 to 35.24). The kurtosis of the item score distributions overall remained virtually the same (K$z = 1.99$, $p = .05$, range = .68 to 9.02) post-transformation.

The transformed DES item scores were factor-analyzed again using the Varimax rotation, the 50 percent of the variance extraction solution, and the oblique simple structure factor loadings with a loading cut-off of .32. Again only one factor emerged, on which 27 of the 28 items loaded, with a range of loadings from .33 for item 19 to .62 for item 18, and 25 percent of the variance explained. (Only Item 23, with a loading score of .15, did not load on the factor.) When the analysis was run again, forcing a three-factor extraction solution, the result was identical to that obtained with the 50 percent of the variance extraction solution.

It did not seem appropriate to continue to transform the scores of the item distributions in order to obtain an overall data set that was more in keeping with the normal distribution, given the problems of interpretation that such mathematical transformations bring.

DISCUSSION

Our analyses of the DES II indicate reasonably good indices of internal consistency, as seen in the alpha coefficient, the split-half correlation, and in the item-corrected correlations. The same may be said of the DES-T items. For example, our alpha coefficient for the DES was .92 and a recent meta-analysis of the DES found a mean alpha of .93 in 16 studies [3].

The analyses conducted for differences in the way the questionnaires were collected and for academic credit were originally performed to see if the scores were found to be homogeneous so that we could feel assurance in combining the 308 replies in our statistical analyses. However, the lack of significance suggests more than comparable scores. The fact that there were no significant differences in DES scores in relation to the way the questionnaires were collected suggests that motivational factors (student interest in mailing the questionnaires and academic credit for participation in the project) did not have an effect on the reporting of dissociative experiences.

Our overall DES score (21.70) was higher than the scores of studies conducted with presumably normal student and adolescent samples, a mean of 14.40 in 21 studies [3]. However, such a high score with a student sample is not without a precedent, as seen in the mean score of 23.8 reported in a previous study [5].

Like other studies, we did not obtain significant relationships between DES scores and such demographic variables as sex and ethnicity. However, we obtained a negative correlation with age ($r = -.24$), an effect size comparable to Ross et al.'s [18] representative sample ($r = -.23$), and to Bernstein and Putnam's [1] initial sample ($r_s = -.19$). The DES-T was also negatively related to age ($r = -.22$).

We further analyzed the age relationship in terms of the individual DES items and found that eight of the items were negatively related to age at the .01 level of significance. The coefficients obtained a mean of –.26 and a range of –.22 to –.32.

We were encouraged to find that photography and film students had higher DES and DES-T scores than did the rest of the sample. The findings obtained moderate effect sizes for the DES ($d = .55$) and for the DES-T ($d = .57$). The results may be related to the "artistic" or creative styles one sometimes sees in students of the visual arts. But our classification of students certainly is no substitute for a better measure of artistic or creative styles such as measures of divergent thinking.

Our factor analyses of the DES led us to conclude that, in this study, the item score distributions of the DES formed a single, unitary measure of dissociation, and that, in that sense, Ross et al.'s [16] three-factor model was not replicated in this data set. This is consistent with the findings of other studies that have failed to replicate the three-factor structure, reporting instead a single factor [19-23].

One hopes that future studies will continue to use the DES II. Our results, as well as those of others [10] suggest that this instrument has good inner consistency and promises to be as useful to researchers as clinicians as the original DES.

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