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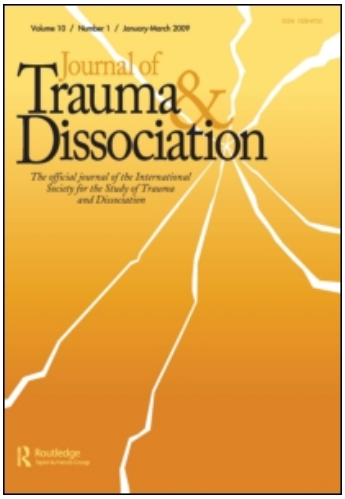

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# Dissociation, Psychiatric Symptoms, and Personality Traits in a Non-Clinical Population

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# Dissociation, Psychiatric Symptoms, and Personality Traits in a Non-Clinical Population

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**ABSTRACT.** This study investigated the relationship between dissociation and psychiatric symptoms as well as between dissociation and personality traits in a student population using the Dissociative Experiences Scale (DES), the Brief Symptom Inventory (BSI), and the Eysenck Personality Questionnaire (EPQ). The results indicate a strong association between dissociation and psychiatric symptoms in general as well as an association between dissociation and neuroticism. Both associations are primarily mediated through more benign forms of dissociation. Additionally, phobic anxiety and paranoid ideation from the BSI were found to account for 52.5% of the variance in DES-scores. Two components of dissociation, psychological and somatoform, as well as the relevance of considering both cognitive and affective factors in the dissociative process are discussed. *[Article copies available for a fee from The Haworth Document Delivery Service: 1-800-HAWORTH. E-mail address: <docdelivery@haworthpress.com> Website: <http://www.HaworthPress.com>* *© 2003 by The Haworth Press, Inc. All rights reserved.]*

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**KEYWORDS.** Dissociation, personality traits, psychiatric symptoms

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The use of the dissociation concept and the interpretation of which phenomena constitute dissociation have recently widened considerably (Cardeña, 1994), so much so that dissociative processes are now inferred and incorporated into the understanding of a wide array of psychological phenomena, as part of numerous psychological disorders, as well as serving a prominent role in more stable personality traits such as neuroticism (de Silva & Ward, 1993). The expanded application of dissociation theories in the explanation of psychological disorders suggests that a clarification of the relationship between dissociation and psychiatric symptoms as well as personality traits is required.

Dissociation as it is presently defined refers to the "lack of normal integration between thoughts, feelings, and experiences in consciousness and consequently in memory" (Bernstein & Putnam, 1986, p. 727), and the category of dissociative phenomena includes a great variety of experiences. Therefore it is generally agreed that dissociative phenomena are distributed on a continuum increasing in severity, complexity, and chronicity (Ross, 1996). The dissociative continuum ranges from mild and benign experiences such as absorption and imaginative involvement across depersonalization and derealization to the severest phenomena such as amnesia and dissociative states (Ross, 1996). Phenomena within the absorption category are often conceptualized as normal or non-pathological dissociation (Irwin, 1999), whereas phenomena further along the continuum are conceptualized as pathological. However, using statistical methods, Waller, Putnam and Carlson (1996) extracted the dissociative taxon, a subscale of the Dissociative Experiences Scale (DES, Bernstein & Putnam, 1986), which measures pathological forms of dissociation and identifies a distinct *type* of dissociation, mainly found in individuals suffering from dissociative psychopathology. The existence of this taxon leaves open the question of whether dissociation is to be understood as a trait phenomenon as has been the case with the continuum-model, or whether the trait interpretation must be reserved for non-pathological forms of dissociation, whereas pathological dissociation constitutes a distinct type and not a trait.

Recognizing the possible contribution of dissociative processes to psychopathology, Allen and Coyne (1995) investigated the relationship between dissociation as measured by the DES (Bernstein & Putnam, 1986) and the various scales of the MMPI-2 focusing on psychotic experiences. Their results indicate that dissociation contributes consider-

ably to high scores for psychotic experiences. More specifically and contrary to their hypothesis, absorption was found to contribute the most despite the fact that absorption is conceptualized as the mildest and most benign form of dissociation, and should not therefore be the main component of dissociation in relation to psychiatric symptoms. A more recent study by Allen, Coyne, and Console (1996) substituting the Brief Symptom Inventory (BSI, Derogatis, 1993) for the MMPI-2 replicated these findings. However, as Allen and Coyne (1995) point out their results could be due to the fact that absorption phenomena in traumatized populations reach extreme levels compared to non-traumatized populations. Subsequently these results may not readily be generalized to other populations.

Studies have mainly focused on the prevalence of dissociation in general populations (i.e., Ross, Joshi, & Currie, 1990) and not the nature or content of these processes. However, Norton, Ross, and Novotny (1990) looked for predictive factors of dissociation and found that the subscales of phobic anxiety, anger-hostility, and somatization on the HSCL-90, irrational thinking as measured by the Barnes-Vulcano Rationality Test (BVRT), and an absorption measure based on the Tellegen Absorption scale accounted for 61% of the variance on the DES. In addition, the contribution of each separate measure or subscale to scores on the DES was below 5%, thus indicating that it was the simultaneous occurrence of these phenomena that was essential for their predictive ability.

Another line of research links personality factors to dissociation (de Silva & Ward, 1993). Eysenck (1982) hypothesized hysterics to be ambivalent neurotics, that is, they score high on emotional instability and vary on extroversion on the Eysenck Personality Questionnaire (EPQ). De Silva and Ward (1993) confirmed the hypothesis of a positive correlation between neuroticism and dissociation, as well as the expected lack of an association between extroversion and dissociation.

However, when looking further into the dissociation-neuroticism relationship, Irwin (1998) incorporated a measure of schizotypy to test its relevance in relation to dissociation. Although a correlation between neuroticism and dissociation was confirmed in the Irwin (1998) study, the results indicated that schizotypy in general had a larger effect on DES-scores than neuroticism. From these results it seems that neuroticism is a less important factor in explaining dissociation compared to measures of cognitive disturbances such as schizotypy (Irwin, 1998), psychotic experiences, and schizophrenia (Allen & Coyne, 1995), or irrational thinking (Norton et al., 1990). It must, however, be stressed that

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in the Norton et al. study (1990) no single measure was singled out as a predictive factor, instead it was the *joint* contribution of both cognitively and affectively based measures that accounted for 61% of the variance in DES-scores, indicating that measures of cognitive disturbances cannot solely explain the phenomena of dissociation. The relevance of affectively based factors is further underlined by the Irwin study on affect balance (1995) in which dissociation scores correlated with the presence of negative affects, such as anger, hostility and depression. Thus in conjunction the two studies by Irwin (1995, 1998) indicate that both cognitive and affective factors may be important when trying to understand dissociative phenomena.

A recent study focusing on sleep-related disturbances and their relation to dissociation, schizotypy and general trait measures (Watson, 2001) concludes that sleep disturbances, dissociation, and schizotypy share a common domain of unusual cognitions and perceptions, and that features of this domain are not represented in general trait measures such as neuroticism.

Conceptualizations of dissociation would indicate that dissociation has a strong cognitive component due to its effect on memory structures; however, strong and overwhelming affect may also serve a prominent role in bringing about dissociation as illustrated in the conceptualization of dissociation as a defense mechanism. It is therefore warranted to assume that affective as well as cognitive factors are involved in dissociative processes.

The BSI incorporates measures of both paranoid ideation and negative affects (depression and hostility) and it would be relevant to use these subscales as well as the neuroticism subscale of the EPQ, in order to clarify whether their joint contribution to dissociation scores exceeds that of the scales or measures individually. Furthermore, Allen et al. (1996) found that the subscales of the BSI pertaining to anxiety disorders were especially prominent in their contribution to dissociation, and consequently these subscales may also be included as indicators of an anxiety component within dissociation.

With these insights in mind, the purposes of the present study were:

a. To clarify the nature of the dissociative processes employed by the general population, and whether the nature of these processes has any relationship to the kind of psychiatric symptoms found in this population.
b. To clarify the relationship between dissociation and more stable personality traits such as neuroticism and extroversion.

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c. To assess whether the level of dissociation can be predicted by cognitively or affectively based factors alone, or whether it is in fact the joint contribution of these factors that is predictive of the level of dissociation found.

## *MATERIALS AND METHODS*

### *Participants*

Participants for this study were 107 Danish undergraduate students of psychology. The total sample included 19 males and 87 females, and ages range from 21-47 (mean = 28.25; SD = 5.97). Data on gender were missing for 1 respondent, and data on age were missing for 2 respondents. The return rate was 90%.

### *Measures*

*Dissociative Experiences Scale*. The scale measures the respondent's "dissociativity," that is, the percentage of the time a person is engaged in dissociative experiences. The scale consists of 28 items covering a wide range of dissociative experiences. Responses are given on a visual analogue scale ranging from 0% to 100%. The individual scores range from 0 to 100, and the overall score is the added individual scores divided by the number of items, i.e., 28. The scale has proven both valid and reliable as a measure of the respondent's level of dissociation (Bernstein & Putnam, 1986; Dubester & Braun, 1995). Factor analyses have indicated the existence of three separate factors: absorption-imaginative involvement, depersonalization-derealization, and amnesia-dissociative states (Ross, 1996). The version used in this study was a Danish version of the original scale (Bernstein & Putnam, 1986). In this study we used the factor structure proposed by Carlson et al. (1991) and replicated by Schwartz and Frischholz (1991) to define subphenomena of dissociation. Although the DES-taxon (Waller et al., 1996) could have been incorporated to define pathological subphenomena of dissociation, the character of this subscale makes it less useful in a non-clinical population and irrelevant to the purpose of this study. Therefore the factor structure rather than the taxon was incorporated to distinguish between different types of dissociative experiences.

*The Brief Symptom Inventory*. This scale is an abbreviation of the Symptom Checklist-90 (Derogatis, Lipman, & Covi, 1973), and mea-

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sures the presence and severity of psychiatric symptoms. It consists of 53 items rated on a 5 point Likert scale (0-5). The subscales are Somatization, Obsessive-Compulsive, Interpersonal Sensitivity, Depression, Anxiety, Hostility, Phobic Anxiety, Paranoid Ideation, and Psychoticism. In addition the scale has a Global Severity Index (GSI), i.e., the overall average, and a Positive Symptom Index indicating the average severity of symptoms reported. As a brief psychiatric rating scale the BSI has been shown to be both reliable and valid (Derogatis & Melisaratos, 1983; Derogatis, 1993). The version used was a Danish translation of the original scale.

*Eysenck Personality Questionnaire*. This questionnaire has three subscales: Neuroticism, Extroversion, and Psychoticism. In addition, the EPQ contains a Lie-scale measuring the extent of social desirability, i.e., whether the person is "faking good." The version used in this study is a Danish translation of the questionnaire containing 101 items of which 11 do not pertain to any of the subscales. The remaining items are distributed almost evenly among the four subscales. The questionnaire in its original version has shown to be both valid and reliable as a measure of the proposed personality dimensions (Eysenck & Eysenck, 1978).

*Posttraumatic Stress Diagnostic Scale*. This questionnaire is a Danish self-report version of Foa's Posttraumatic Stress Diagnostic Scale (PDS; 1995), a measure that indicates the presence of PTSD in the respondent. The PDS has been shown to be both reliable and valid in terms of predicting PTSD (Foa, 1995), and it was used to screen for the possible presence of PTSD in our sample. In the current sample the PDS indicates a possible PTSD-prevalence of 8.4%. Instead of excluding these subjects they were included in the total sample as part of a normal population allowing for factors invoking normal variation. All subjects were therefore included in the statistical analyses.

### *Procedure*

All students following courses in research methods at the Institute of Psychology at Aarhus University at either bachelor or masters level were approached in class and invited to participate in the present study. It was stressed that participation was voluntary and that anonymity would be ensured. If the students wished to participate they were instructed to fill in demographic details (age and gender) and the PDS. Afterwards instructions for the remaining questionnaires were given.

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### *Statistical Analysis*

Reliability analyses in the form of Cronbach's α, and inter-item analyses of the Danish version of the DES were performed to ensure the reliability and discriminative ability of the scale in the translated version. All data were tested using the Kolmogorov-Smirnov to ascertain whether a normal distribution could be assumed.

As univariate statistical methods do not take into account the possible intercorrelation between subscales any correlations found could be due to chance. Therefore analyses of canonical correlation were performed with two sets of variables the DES vs. the BSI and the DES vs. the EPQ, to investigate the relationship between the two sets of variables. Multiple regression or correlation analyses were then used to obtain a measure of the individual contribution from each scale to the variation in another set of scales.

## *RESULTS*

### *Dissociative Experiences Scale*

The mean and standard deviation for the full scale and subscales on the DES are displayed in Table 1. Scores on the Dissociative Experiences Scale (DES) are highly skewed. The interquartile range for scores on the full scale was 2.37-9.96 = 7.59, that is 75% of the sample have scores below 10, and thus only reported having dissociative experiences or being engaged in dissociative activity up till about 10% of the time. This is consistent with what may be expected in a non-clinical population (Ross et al., 1990; Ijzendorn & Schuengel, 1996). None of the scales–DES-total, absorption, depersonalisation/derealisation, and amnesia–were normally distributed as indicated by the Kolmogorov-Smirnoff analysis. The internal consistency for the entire scale as measured by Cronbach's α was 0.91, which indicates very good internal consistency. Furthermore this coefficient is similar to those found in other studies (Frischholz et al., 1990; Ross, Joshi & Currie, 1991; Dubester & Braun, 1995; Ray & Faith, 1995). The subscales of Depersonalization and Absorption also had good α-coefficients equivalent to the total scale, however the Amnesia subscale has a somewhat lower coefficient and therefore less satisfactory internal consistency. The discriminating ability (cf. Briggs & Cheek, 1986) for the total scale was good, which also holds for the subscales.

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TABLE 1. Means ± Standard Deviations, Cronbach's Alphas, Inter-Item Correlations, Z-Scores and Significance Levels for Kolmogorov-Smirnof Test of Non-Normality for Full Scale, Subscales and Indexes on the DES, EPQ, and BSI

| | | Mean ± SD | No. of items | α | Inter-item | *Z* | *p* |
|---|---|---|---|---|---|---|---|
| DES | Total | 6.56 ± 7.64 | 28 | .91 | .27 | 1.71 | < .01 |
| | Amnesia | 2.09 ± 2.93 | 8 | .60 | .23 | 1.71 | < .01 |
| | Depersonalization-Derealization | 2.85 ± 7.31 | 6 | .81 | .44 | 3.57 | < .01 |
| | Absorption-Imaginative Involvement | 11.29 ± 11.76 | 9 | .87 | .48 | 2.7 | < .01 |
| EPQ | Neuroticism | 8.91 ± 5.40 | 23 | .87 | .22 | 0.93 | NS |
| | Extroversion | 14.58 ± 4.59 | 21 | .83 | .19 | 1.77 | < .05 |
| | Psychoticism | 3.63 ± 2.18 | 25 | .45 | .37 | 1.38 | < .05 |
| | Lie-Scale | 5.39 ± 3.13 | 21 | .68 | .08 | 0.57 | NS |
| BSI | Somatization | 0.37 ± 0.50 | 7 | .80 | .38 | 2.39 | < .05 |
| | Obsessive-Compulsive | 0.82 ± 0.62 | 6 | .80 | .39 | 1.52 | < .05 |
| | Interpersonal Sensitivity | 0.90 ± 0.67 | 4 | .73 | .42 | 1.65 | < .05 |
| | Depression | 0.61 ± 0.70 | 6 | .90 | .61 | 2.72 | < .05 |
| | Anxiety | 0.75 ± 0.59 | 6 | .82 | .45 | 1.92 | < .05 |
| | Hostility | 0.44 ± 0.50 | 5 | .73 | .38 | 2.25 | < .05 |
| | Phobic Anxiety | 0.14 ± 0.24 | 5 | .20 | .07 | 3.85 | < .05 |
| | Paranoid Ideation | 0.37 ± 0.47 | 5 | .74 | .36 | 2.27 | < .05 |
| | Psychoticism | 0.42 ± 0.49 | 5 | .71 | .32 | 2.73 | < .05 |
| | Total | 27.54 ± 22.19 | 53 | .95 | .26 | 1.70 | < .01 |
| | Global Severity Index | 0.53 ± 0.41 | 53 | - | - | 1.70 | < .05 |
| | Positive Symptom Total | 18.08 ± 9.88 | - | - | - | 0.30 | NS |
| | Positive Symptom Index | 1.40 ± 0.39 | - | - | - | 1.52 | < .05 |

### *Eysenck Personality Questionnaire*

Table 1 also presents the results from the four scales on the EPQ. Scores on the Neuroticism and Extroversion scales showed the greatest variation, whereas the Lie-scale and especially the Psychoticism scale showed a very small range.

Both the extroversion and the psychoticism scales were found not to be normally distributed. Cronbach's α was highly unsatisfactory for the

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psychoticism scale suggesting lack of internal consistency, which taken together with the very low inter-item correlation for the L-scale suggesting poor discriminating ability could indicate caution when interpreting results involving these measures. For extroversion and neuroticism both internal consistency and discriminating ability were within acceptable limits.

### *Brief Symptom Inventory*

Results from the BSI are presented in Table 1. Means of scores on the subscales were all below 1.0 (SD: 0.26-0.82). This tendency was underlined by the Global Severity Index (GSI), the mean of which was also below 1.0. In addition the Positive Symptom Total suggested that respondents reported between 0 and 50 symptoms with an average of about 20 symptoms per respondent. However the average severity of the symptoms reported as indicated by the Positive Symptom Distress Index was just below two, the score equivalent of "to some extent."

Analyses confirmed that scores on the BSI-scales were not normally distributed. Most scales on the BSI have satisfactory internal consistency as well as discriminating ability; however, two subscales had an increased inter-item correlation, a tendency most prominent for the depression scale indicating restricted discriminating ability. This was also evident with the subscale of phobic anxiety; however, in this case both Cronbach's $\alpha$, as well as the inter-item correlation were well outside of acceptable limits warranting caution in interpreting results stemming from this subscale.

### *Univariate Correlation*

Table 2 presents results from the univariate correlation analyses (Spearman's rho). Most correlations reached a significance level of 0.01, even after allowing for Bonferroni corrections. The DES and BSI were responsible for the greatest number of correlations (and the strongest), whereas the EPQ, except for its Neuroticism scale, showed fewer significant correlations with other measures.

From the analyses there appeared to be a strong relationship between the DES and the BSI, which was most evident in the subscales of Somatization, Interpersonal Sensitivity, Paranoid Ideation, and Psychoticism where all significance levels (full scale and subscales) reached $p < .01$. A strong yet slightly different pattern of correlation was found

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TABLE 2. Non-Parametric Correlations Between Scales and Subscales on the DES, BSI, and the EPQ

| | DES Scales | | | |
|---|---|---|---|---|
| BSI Scales: | Average | Absorption | Depersonalization | Amnesia |
| Global Severity Index | .58** | .51** | .57** | .51** |
| Somatization | .48** | .44** | .36** | .45** |
| Obsessive-Compulsive | .35* | .33* | .35* | .46** |
| Interpersonal Sensitivity | .55** | .48** | .53** | .42** |
| Depression | .34* | .33* | .40** | .24 |
| Anxiety | .31 | .22 | .40** | .34* |
| Hostility | .36** | .33* | .31 | .27 |
| Phobic Anxiety | .31* | .29 | .42** | .29 |
| Paranoid Ideation | .57** | .53** | .51** | .46** |
| Psychoticism | .48** | .42** | .49** | .37** |
| EPQ Scales : | | | | |
| Extroversion | −.02 | .04 | −.09 | −.15 |
| Neuroticism | .30* | .29* | .26* | .23* |
| Psychoticism | .25* | .26* | .19 | .14 |
| Lie-Scale | .01 | −.03 | −.11 | −.04 |

*$p < .05$ Bonferroni corrected; ** $p < .01$ Bonferroni corrected.
(Bonferroni cut-offs for correlations between DES and BSI were set at $\alpha = .0013$ ($p < .05$), and $\alpha = .0003$ ($p < .01$), and for correlations between the DES and EPQ they were set at $\alpha = .003$ ($p < .05$), and $\alpha = .0006$ ($p < .01$), thus accounting for the number of tests done for each set of scales).

for the remaining subscales. As a contrast, the subscales of the EPQ, except for Neuroticism and to some extent Psychoticism, showed very little significant correlation with the DES and its subscales.

As expected there was a substantial number of intercorrelations between the subscales on the DES (rho = .52-.56) and the BSI (rho = .29-.78), whereas the subscales on the EPQ did not correlate except for Extroversion and the Liescale (rho = −.23).

## *Canonical Correlation*

### *DES vs. BSI*

The canonical correlation between the DES subscales and the BSI subscales were significant for two sets of canonical variates ($R_{c1} = .81$, $\chi^2 = 139.20$, $df = 27$, $p < .05$) and ($R_{c2} = .63$, $\chi^2 = 47.31$, $df = 16$, $p < .05$).

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The canonical loading for all variables for the first set of canonical variates range from intermediate to high and are displayed in Table 3. The magnitude of the canonical loadings would suggest that all subscales on the BSI are involved in the substantial correlation between the two sets of variables, and although Paranoid Ideation shows the highest contribution the remaining subscales follow close behind. The first canonical variate extracted from the DES subscales was found to explain 33.9% of the variance in the BSI, and the first canonical variate extracted from the BSI scales was found to explain 43% of the variance in the DES subscales.

In the second set of canonical variates the DES-subscales Depersonalization (−.51) and Amnesia (.49) were the only contributors with canonical loadings above .30.[1] the BSI scales only Depression (−.32),

TABLE 3. Loadings for the Canonical Variates for the DES vs. BSI and the DES vs. EPQ

| | | Canonical Loading |
|---|---|---|
| Canonical variates for DES vs. BSI | | |
| DES scales | Absorption | −.87 |
| | Depersonalization | −.85 |
| | Amnesia | −.70 |
| BSI scales | Paranoid Ideation | −.85 |
| | Somatization | −.78 |
| | Phobic Anxiety | −.76 |
| | Psychoticism | −.75 |
| | Depression | −.74 |
| | Anxiety | −.71 |
| | Interpersonal Sensitivity | −.69 |
| | Hostility | −.59 |
| | Obsessive-Compulsive | −.59 |
| Canonical variates for DES vs. EPQ | | |
| DES scales | Absorption | −.91 |
| | Depersonalization | −.87 |
| | Amnesia | −.66 |
| EPQ scales | Psychoticism | −.57 |
| | Extroversion | .51 |
| | Neuroticism | −.69 |

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Anxiety (−.45), and Psychoticism (−.46) have canonical loadings above .30. Despite the statistical significance of the second set of canonical variates the amount of variance accounted for by these variates in the various sets is only 7% and 2.8%, respectively. The minimal amount of variance accounted for suggests that the second set of canonical variates is a result of statistical rather than practical significance.

*DES vs. EPQ*

The canonical correlation for the DES and EPQ was significant for one set of canonical variates ($R_c = .55$, $\chi^2 = 38.97$, $df = 12$, $p < .001$). The loadings of each variable for the canonical variates are displayed in Table 3. The results indicate that absorption has the strongest influence on EPQ scores closely followed by depersonalization. Furthermore the canonical loadings would suggest that neuroticism had the strongest relationship to the DES-subscales when considering all three EPQ-scales. Interestingly extroversion contrary to all other scales has a positive canonical loading, indicating that the influence of extroversion was complementary to that of both psychoticism and neuroticism. However, when considering the variances, the canonical variate for the DES-subscales accounted for only 8.4% of the variance within the EPQ-scales, whereas the canonical variate for the EPQ-scales accounted for 20.4% of the variance within the DES-subscales.

*Standard Multiple Regression Analysis with Selected Factors*

Multiple regression analysis was performed using the BSI subscale of paranoid ideation as an indicator of cognitive disturbances such as schizotypy, the BSI subscales of anxiety, phobic anxiety, and obsessive-compulsive as indicators of an anxiety component, the BSI subscales of hostility, and depression as indicators of negative affect, and finally the neuroticism scale on the EPQ. The analysis showed the chosen scales in conjunction to account for 49.9% of the variance in DES-scores ($F = 14.79$, $df = 7, 90$, $p < .05$). Only paranoid ideation ($\beta = .56$, $p < .05$) and phobic anxiety ($\beta = .39$, $p < .05$) were found to have a significant individual contribution to the DES-scores. Based on this a second multiple regression analysis was performed using the DES as the dependent variable and the subscales of phobic anxiety and paranoid ideation as predictor variables. The results found the two scales to account for 52.5% of the variance in DES-scores ($F = 55.346$, $df = 2$,

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100. $p < .05$), with $\beta = .42$ for phobic anxiety and $\beta = .47$ for paranoid ideation.

## *DISCUSSION*

The discussion is in three parts, each relating to the main areas of interest: (a) the nature of the relationship between dissociation and personality traits, (b) the nature of the relationship between dissociation and psychiatric symptoms, and (c) the relative role of cognitive, and affective factors in dissociation.

As expected, a significant relationship between neuroticism and dissociation was found, which was reflected in all the subscales of the DES. The absorption factor accounted for the greatest amount of variance in neuroticism; however, only the joint contribution of all three subscales was significant in predicting neuroticism scores using multiple regression analysis. The results therefore indicate a significant relationship between neuroticism and dissociative experiences although a causal link cannot be extracted from these results. However, one might speculate as to whether dissociation serves as a prominent defense mechanism against neurotic anxiety and thereby forms the basis for the correlation found between neuroticism and dissociation. Leonard, Telch, and Harrington (1999) found that high dissociators (as measured by the DES) responded more positively to the inducement of dissociation than low dissociators; however, this result was reduced to a non-significant trend after controlling for symptoms of anxiety and depression. Also, the Irwin study on affect balance (1995) found an association between negative affect, i.e., depression and dissociation. Thus it is possible that high emotional lability as exemplified in neurotic anxiety enhances the probability of a person engaging in dissociative experiences.

Another interesting finding concerns Eysenck's (1982) hypothesis of a non-significant relationship between dissociation and extroversion. In the present study these measures were found to have an inverse relationship although in a previous study they were found not to correlate (de Silva & Ward, 1993). However, the present result is not surprising since the nature of the extroversive trait logically would suggest that it is manifested in ways different to dissociative experiences. Extroversion contrary to dissociation constitutes a solid anchoring in ones physical environment and other people, whereas the dissociative experience seems to disrupt the ability to relate appropriately to external reality.

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The expected strong association between dissociation and psychiatric symptoms was confirmed in this study, since all subscales on the BSI showed significant correlation with dissociation as underlined by the canonical loadings of the BSI subscales ranging from .85 to .59. Therefore we were unable to confirm the previous findings (Allen et al., 1995, 1996) of a unique relationship between specific psychiatric symptoms such as anxiety disorders and psychoticism and dissociation. Instead our results point to an association between dissociation and psychiatric symptoms in general, that is, in a normal population not characterized by specific psychiatric symptoms, dissociation correlates with the level of psychiatric symptoms in general rather than specific symptom clusters.

Although differences in canonical loadings are present for the DES-scales, it is only the amnesia subscale, which has a considerably lower loading than absorption and depersonalization. Perhaps this reflects the fact that in a normal population one would expect a higher level of benign dissociative experiences (Carlson, 1994) and thus greater variation on these scales than in the amnesia subscale (see Table 1). In fact, the use of a non-clinical population altogether suggests less variation in severe psychological impairment and thus less variation in measures of such symptoms.

Whereas Allen et al. (1995) explained their finding of absorption as a main contributor by arguing that their traumatized population experienced absorption in pathological forms, the present results do not fully support the interpretation of absorption gone awry as proposed by Allen et al. (1995) since depersonalization as well as amnesia have a substantial influence on the level of psychiatric impairment too. However, if focusing on the dissociative experiences characteristic of this population, i.e., absorption and depersonalization, these processes may, despite their qualitative differences, be interpreted as varying forms of withdrawal from external reality as proposed by Allen et al. (1995) in relation to absorption alone. Based upon this interpretation the strong correlation between dissociation and psychiatric symptoms may be mediated by the accompanying disruptive influence on reality testing ascribed to these processes. This interpretation relates especially well to the correlation found between dissociation and symptoms of paranoid ideation and psychoticism, since these symptoms are characterized by an impaired ability to relate to reality.

However, disrupted reality testing cannot readily explain the finding of somatization as another prominent symptom associated with dissociation. Instead, one may interpret this finding using the distinction be-

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tween somatoform and psychological dissociation (Nijenhuis, Spinhoven, Van Dyck, van der Hart, & Vanderlinden, 1996). Although dissociation is conceptualized as a mental process, this process affects both mind and body, and as a result dissociative phenomena may also result in somatoform symptoms. Dissociation as well as somatization constitutes prominent reactions to trauma (van der Kolk, Pelcovitz, Roth, Mandel, McFarlane, & Herman, 1996), and dissociated traumatic experiences are often described as dormant and non-verbalised fragments of the bodily memory (van der Kolk, 1996). Furthermore, the association between dissociation and somatization is not a result unique to this study since Norton et al. (1990) in a normal population found somatization in conjunction with other factors to account for a substantial amount of variance in dissociation scores. One could therefore hypothesize that the strong association between dissociation and psychiatric symptoms is based on two components: somatoform and psychological dissociation. Using this interpretation somatoform dissociation would refer to psychiatric symptoms expressed through bodily complaints, whereas psychological dissociation refers to the breach in reality testing described previously.

Based on previous research we expected some psychiatric symptoms and personality traits to be more prominent in dissociation than others, and therefore our last area of interest was concerned with whether any single measure could account for a significant amount of variance or whether it was only the joint contribution of these symptoms or traits that was important in dissociative processes. Our canonical correlation analyses would suggest that no factor on its own would stand out as a significant contributor, although our results also indicate that both paranoid ideation and phobic anxiety each on their own accounted for a significant amount of unique variance. However, when joining all relevant factors–cognitive, affective as well as anxiety indicators–a much larger amount of variance was accounted for. This would indicate that although cognitive factors with a paranoid or schizoid content have a unique contribution to dissociation, one cannot rule out the influence of affective factors on the basis of their smaller effect size, since the joint contribution of these factors accounts for a more substantial amount of variance than the sum of each factor on its own.

Consequently, it seems that the interaction of cognition and affect is essential in mediating dissociation, that is, when a disruption in reality testing, e.g., irrational thinking, is accompanied by a high level of affect or anxiety, the likelihood of dissociation being prompted is considerably higher than when these factors are present independently. This

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may be exemplified by the fact that phobic anxiety, which was found to have the highest loading on dissociation in a traumatized population (Allen et al., 1996), was the only affective factor to account for unique variance in a normal population. Although the BSI describes the phobic anxiety subscale as indicating an affective disorder, the essence of phobic anxiety may be described as an irrational fear of a specific object or situation, in which a disconfirmation of false beliefs is difficult to obtain due to the overwhelming affect. Thus in phobic anxiety per se one could argue that the affective element is accompanied by a cognitive element, which is essential in triggering the overwhelming affect and consequently the activated defenses, e.g., dissociation. However, previous research (Holden, Starzyk, McLeod, & Edwards, 2000) indicates that caution is warranted concerning the reliability of the subscales of the BSI especially in a student population. Therefore the results of this study must be replicated with other instruments as well as using the general population rather than students.

In this study we have tried to outline some of the characteristics of dissociation in a non-clinical population. Even if the findings from this study do not exhaustively answer the questions posed, they do indicate what may characterize dissociation in normal populations. We have shown that what we term dissociation may refer to both psychological and somatoform experiences, but we do not know whether these processes follow the same pathway. Also we have shown that one needs to consider both cognitive and affective factors when discussing dissociation. Watson (2001), when outlining common aspects of sleep-related disturbances, schizotypy, and dissociation, defined unusual cognitions and perceptions as characterizing the dissociative trait and ruled out neuroticism as a relevant trait in understanding dissociative phenomena. However, we do not argue that neuroticism is an inherent part of the dissociative trait, but rather that affective lability enhances the probability of this trait being manifested.

In this study we discussed disturbed cognition as indicating a failure in reality testing. However, it might be interesting to evaluate whether it is disturbed cognition in general that influences dissociation or whether it is specific subtypes of disturbed cognition that serve as the main influence in dissociative processes. In future research it would therefore be worthwhile to address the different aspects of cognition and their relation to dissociation. The same argument holds true for affective factors as well as the interaction between cognition and affect. Developing our understanding of these processes would perhaps cast some light on the

inconsistency between the dissociative profile in a normal and in a traumatized population.

Focusing on the inconsistency between dissociative profiles in different populations may also have some bearing on whether the non-continuum model of pathological dissociation (Waller et al., 1996) would be applicable to explain any differences found between the dissociative profile in a non-clinical vs. a population with dissociative psychopathology, or whether the continuum model which conceptualize dissociation as some form of a personality trait (Kihlstrom et al., 1994) which carried to an extreme becomes maladaptive and pathological, is better fitted to explain these possible differences. The present study, however, was concerned with a non-clinical population and therefore only investigates the nature of what may be termed a normative dissociative trait. Although psychiatric symptoms are incorporated in this study, these were treated as sub-clinical phenomena, which may highlight the nature of the dissociative process rather than the nature of the dissociative psychopathology. However, further insight into what lies at the core of the association between elevated levels of dissociation and specific symptoms in a specific population might serve to widen both the understanding of the clinical disorder, as well as our understanding of psychological processes in general.

## NOTE

1. This cut off point is suggested by Tabachnick and Fidell, 1996, p. 222, since lower loadings account for less than 10% of the total variance.

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