Is it Trauma or Fantasy-based?

Comparing Dissociative Identity Disorder,

Posttraumatic Stress Disorder,

Simulators, and Controls

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ABSTRACT

Objective: The Trauma Model of dissociative identity disorder (DID) posits that DID is aetiologically related to chronic neglect and physical and/or sexual abuse in childhood. In contrast, the Fantasy Model posits that DID can be simulated and is mediated by high suggestibility, fantasy proneness, and sociocultural influences. To date these two models have not been jointly tested in individuals with DID in an empirical manner.

Method: The present study included matched groups (patients (n=33) and controls (n=32)) that were compared on psychological Trauma and Fantasy measures: diagnosed genuine DID (DID-G, n=17), DID simulating healthy controls (DID-S, n=16), individuals with posttraumatic stress disorder (PTSD, n=16), and healthy controls (HC, n=16). Additionally, personality state dependent measures were obtained for DID-G and DID-S; both neutral personality states (NPS) and trauma-related personality states (TPS) were tested.

Conclusion: For Trauma measures, the DID-G group had the highest scores, with TPS higher than NPS, followed by the PTSD, DID-S and HC groups. The DID-G group was not more fantasy prone or suggestible and did not generate more false memories. Malingering measures were inconclusive. Evidence consistently supported the Trauma Model of DID and challenges the core hypothesis of the Fantasy Model.

Keywords: dissociative identity disorder, posttraumatic stress disorders, patient simulation, etiology

Significant Outcomes. Patients with diagnosed genuine dissociative identity disorder (DID) were not more fantasy prone or suggestible and did not generate more false memories compared to the other groups. Furthermore, a continuum of trauma-related symptom severity was found across the groups. This continuum supports the hypothesis that there is an association between the severity, intensity, as well as the age at onset of traumatization, and the severity of trauma-related psychopathology. Evidence consistently supports the Trauma Model of DID and challenges the core hypothesis of the Fantasy Model.

Limitations. A limitation of our study is the modest sample sizes. The lack of parallel data in the group comparisons and the dissociative-personality-state comparisons is another limitation. Finally, only female DID participants and controls were studied.

INTRODUCTION

The dissociative disorders (DD) are placed in the Diagnostic and Statistical Manual of Mental Disorders (DSM-5)[1] next to the trauma and stressor related disorders (TSRD) section to indicate links between these categories[2]. This placement is based on the discovery of a dissociative subtype of posttraumatic stress disorder (PTSD)[3-6]. PTSD and dissociative identity disorder (DID) are included in sections of TSRD and DD respectively, which suggests a close relationship between them. Despite the inclusion of DID in the DSM since 1980 and studies on reliability and validity of the diagnosis[7-9], DID is viewed as a controversial diagnosis by sceptics who debate its diagnostic validity and aetiology[10,11].

The *Trauma Model*[12] posits that DID is a severe trauma-related disorder, typically with comorbid PTSD[8], and is related to early childhood traumatization including factors such as disorganized attachment, chronic neglect, and abuse. Empirical research in individuals with DID has been relatively scarce[12-15], but accumulated findings support a *Trauma Mode*l[12] of dissociation and DID, which is sustained by recent neurobiological studies[16-21].

In contrast, the *Fantasy Model*[12], also referred to as the sociocognitive[22] or non-trauma-related model[23], posits that dissociation and DID are related to enactment, sleep disturbances, suggestive psychotherapy and/or sociocultural influences and are mediated by high suggestibility and fantasy proneness. The Fantasy Model states that DID can easily be simulated, but several studies comparing DID simulators to individuals with genuine DID have found that groups can be distinguished, contradicting the Fantasy Model[19,20,23-27]. On the other hand, some studies examining differences on psychological measures found that DID simulating healthy controls can imitate some of the most obvious and well-known symptoms associated with DID such as psychoform dissociation, including phenomena such as amnesia, loss of control and identity confusion, yet simulators fail to adequately present the subtle and less well known symptoms and associated features of DID[24,26,27]. For example, a measure of symptom over-reporting was best able to discriminate simulated DID[27]. Thus far these studies have provided support for the validity of DID as a diagnosis that cannot be easily imitated on psychological testing.

While a dichotomization between the Trauma Model and Fantasy Model is often made, and in the literature there is a precedent for this dichotomy[12,28,29], it is over simplifying constructs that have some overlap. Dissociative phenomena related to traumatization and dissociative phenomena related to fantasy are not discrete categories; for example, traumatized individuals may use fantasy to cope with traumatizing events and the aftermath of trauma[12,30,31]. Generating and maintaining dissociative personality states includes a degree of imagination that, since human existence is sociocultural in nature, will be inescapably affected by social and cultural factors[21]. This does not mean that such influences are the primary causes of core features of dissociative personality states[21]. Dalenberg et al.[12] (p. 562) also recognized this and cited research showing that traumatized children often rely on fantasy and imagination to pretend they are not being abused.

Reinders et al.[23] previously described that proponents of the Trauma Model recognize that some features of dissociative identity states can be influenced by sociocultural factors, that false positive cases of DID have evolved in treatment settings, and that some psychiatric patients imitate DID[32].However, the level of fantasy proneness in individuals with DID is comparable to healthy controls[23] (supplementary material) and lower than patients with borderline personality disorder, a disorder that Fantasy Model proponents do not argue is related to fantasy proneness[33].

Dalenberg et al.[12] reviewed the evidence for both the Trauma- and Fantasy Model in controlled studies with children and adults, and in community and clinical samples. They concluded that when fantasy proneness is controlled for, pathological dissociation is still predictive of a trauma history. They found little support for the assertion that the dissociation–trauma relationship is due to suggestibility or confabulated memories of trauma. Proponents of the Fantasy Model countered that Dalenberg et al. leapt too quickly from correlational data to causal conclusions and that they did not adequately consider the lack of corroboration of abuse in many studies[28]. Despite the descriptive nature of literature reviews, they are of pivotal importance for the Trauma versus Fantasy debate[10,12] because empirical research testing the Trauma versus Fantasy Model in one comprehensive design, for example comparing individuals with genuine DID to a matched trauma group, such as PTSD, on one hand and a DID simulating healthy control group on the other hand, is currently lacking. The current study therefore aims to compare these groups on a variety of questionnaires and explore which theoretical model receives the most support.

Our study compares individuals with diagnosed genuine DID (DID-G) to a ‘Trauma’ and a ‘Fantasy’ control group and includes a non-simulating study-blind group of healthy controls (HC) as well. Including individuals with PTSD allows us to compare the impact of relatively ‘simple’ traumatization with the assumed early and chronic traumatization in DID-G, while including healthy DID simulating controls (DID-S) without trauma exposure allows us to disentangle the possible role of simulation in DID. Incorporation of such control groups enables us to broadly test the Trauma versus Fantasy Model on a wide range of symptom and trauma measures. A variety of measures, using self-report questionnaires, were obtained as part of the Dutch Neuroimaging DID project (www.neuroimaging-DID.com[16,18,34]) in these four groups. In the first part (Part 1) of the study the DID-S group participated as their normal non-simulating selves and participants in the DID-G group were asked to complete questionnaires in the dissociative personality state that primarily fulfils tasks in daily life, hence as a neutral personality state . In DID, following the terminology of the DSM-5[1] and Reinders et al.[35], and the conceptualization of Van der Hart et al.[36], at least two prototypical dissociative personality states can be distinguished: a neutral personality state (NPS) in which trauma memories are experienced with some degree of dissociative amnesia and/or without concurrent emotional and somatic responses due to the perception that these traumatic events were not personally experienced, and a trauma-related personality state (TPS) in which traumatic memories are experienced as personal memories with emotional

and somatic responses to trauma cues. Investigating dissociative-personality-state differences on trauma- and fantasy related measures allows us, for the first time, to assess core diagnostic features of DID and provide a more detailed clinical profile of DID in comparison to PTSD, DID-S and HC. In the second part (Part 2) of the study, the DID-G group participated in both an NPS and TPS, and the DID-S group simulated both an NPS and TPS.

Hypotheses Part 1: If the Trauma Model is correct the *between group* comparisons (DID-G versus PTSD, DID-S, and HC) will show that individuals with DID-G will score higher on trauma-related variables, including somatoform and psychoform dissociation, anxiety and depersonalization, than any other group; the PTSD group will have scores in between those of the DID-G, DID-S, and HC groups on variables related to trauma; and the DID-S and HC will have the lowest scores on all the measures. If the Fantasy Model is correct, individuals with DID-G will score higher than the comparison groups on variables related to fantasy and suggestion, such as fantasy proneness, suggestibility, "creative experiences", and malingering.

Hypotheses Part 2: To test the Trauma- and Fantasy Model with respect to DID-G's *dissociative-personality-state differences* the DID-S group participated in both a simulated NPS as well as a simulated TPS to provide a comparison for the NPS and TPS of the DID-G group. A control group was created by including HC to provide a comparison for the NPS of the DID-G group and including individuals with PTSD to provide a comparison for the TPS of the DID-G group. This created a 3-by-2 factorial design (that is 3 groups, 2 dissociative personality states). For the *dissociative-personality-state differences* comparisons we hypothesized that if the Trauma Model is correct then dissociative-personality-state-dependent differences between the DID-G, DID-S and control groups will be found. If the Fantasy Model is correct, the DID-S' simulated personality states will not be distinguishable from the DID-G's dissociative personality states.

Aims of the Study: The study aims to compare psychological test data from two patient groups and two control groups to examine if the Trauma or Fantasy Model fits the findings best. If the Trauma Model is correct, dissociative identity disorder patients should have higher scores for trauma-related measures (such as dissociative symptoms and reported adverse events) than patients with posttraumatic stress disorder, healthy controls, and individuals simulating dissociative identity disorder. If the Fantasy Model is correct, dissociative identity disorder patients should have higher scores for suggestibility and false memories.

METHODS

Participants

Participants were females between 18 and 65 years, as only female individuals with dissociative identity disorder (DID) volunteered to participate, and native Dutch speakers. Four groups of participants were recruited: women with diagnosed genuine DID (DID-G; n=17), DID simulating healthy controls who simulated DID in Part 2 of the study (DID-S; n=16), women with posttraumatic stress disorder (PTSD; n=16), and healthy controls (HC; n=16).

Dissociative Identity Disorder

Individuals with DID-G were recruited from mental health care institutions across the Netherlands and via advertisements and appeals on internet fora. The diagnosis of DID was assessed by DID experts (E.N. or N.D.) using the Structural Clinical Interview for DSM-IV Dissociative Disorders[37] (SCID-D; Dutch translation[38]).

In consultation with their therapists, individuals with DID-G decided which neutral personality state (NPS) and trauma-related personality state (TPS)[39] would participate for measures obtained in Part 2 of the study. Therapist and patient provided descriptions of these dissociative personality states and researchers E.V. and M.G. confirmed that the selected personality states met the inclusion criteria of the study, meaning that TPS had access to trauma-related memories, whereas NPS mentally avoided these memories[23,35,39]. Fourteen individuals with DID-G participated in both NPS and TPS; three individuals with DID were only able to participate as NPS because they were unable to alternate voluntarily between NPS and TPS on request in a research setting. For definitions of dissociation see supplementary material S1 online and for comorbidity and a description of the dissociative personality states see supplementary material S2 and Table S1.

Control subjects

Participants in the 3 control groups (DID-S, PTSD, and HC) were matched with DID-G on age, education level, gender and ethnicity. Exclusion criteria for DID-S and HC were: the presence of dissociative symptoms, as determined with the Dissociative Experiences Scale (DES cut-off >25)[40] and Somatoform Dissociation Questionnaire (SDQ-20 cut-off >28; SDQ-5 cut-off >7)[41,42], a high score on the Traumatic Experience Checklist (TEC impact >2)[43], high levels of general anxiety on the State-Trait Anxiety Inventory-Trait scale (STAI-T)[44], alcohol or drug abuse, or neurological or mental illness in the past or at present. Exclusion criteria for PTSD were alcohol or drug abuse, or neurological or mental illness in the past or at present.

DID simulating controls were recruited from acting schools, through advertisements on the website

www.theaternetwerk.nl, magazines and newspapers. All actors had at least 2 years experience with acting. After completing an online questionnaire to screen for inclusion criteria, the actors received additional information required for simulation of DID-G in the study. The simulation protocol was based on an established and successful protocol[45], which has been recognized as being rigorous[46] (see supplementary material S3 online). The actors simulating DID were asked to simulate two dissociative personality states consistent with an NPS and TPS as seen in individuals with DID[19-21,23,36]. To prepare them for their participation, DID-S participants received written instructions, a documentary about DID[47], and the movie Sybil[48] that tells a story about a woman who suffers from DID. To make sure they were able to accurately portray DID, DID-S participants were asked to fill in a form with information about the two dissociative personality states they created, which allowed investigators (E.V. or M.G.) to check if the phenomena related to DID were fully understood. For a description of these states, see supplementary material S2 and Table S1 online for an overview.

PTSD was diagnosed by the researchers E.V. and M.G. using the Clinician-Administered PTSD Scale[49,50] (CAPS; Dutch translation, KIP[51]; mean CAPS score of 61.25 (±14.07)). All included individuals with PTSD had experienced interpersonal trauma, which was required in order to represent a mild version of the interpersonal trauma common in DID. Eleven of the PTSD patients reported multiple types of interpersonal traumatizing events during childhood (n=6) or starting from childhood and continuing into adult life (n=5). The remaining 5 PTSD patients reported traumatizing events only during adulthood.

Healthy controls were informed that they would participate as a control group in a study investigating autobiographical memory processing in the brain. They were not informed about the characteristics of the other groups.

Protocol

After reading a description of the study all participants gave written informed consent according to procedures approved by the Medical Ethical Committee (METc) of the University Medical Centre Groningen (UMCG) and the Amsterdam Medical Centre (AMC). The study is part of the larger Dutch Neuroimaging DID study and was approved by the Ethical Committee of both centres.

Part 1 of the study allowed us to test *group differences*. Online questionnaires were administered to individuals in the DID-G (as an NPS), DID-S, PTSD, and HC groups. Participants in the DID-S and HC groups responded truthfully as themselves in order to fit the timeline of the larger neuroimaging study protocol and to assess that they were truly mentally healthy controls. Although it can be argued that the DID-S participating in Part 1 of the study as their normal non-simulating selves is a specific subsample of HC, we did not merge the two groups as the inclusion process was different. The HC were included from the general population, whereas the DID-S were recruited from the smaller population of actresses.

Part 2 of the study allowed us to test additional *dissociative-personality-state differences* within and between the DID-G and DID-S (in their simulated roles) groups, who completed the battery of questionnaires twice, both as NPS and TPS. The order in which dissociative personality states participated was counterbalanced. Individuals with PTSD and HC completed the questionnaires once.

Questionnaires

The main questionnaires were divided into two categories: Trauma and Fantasy. In addition, two other questionnaires of interest were included. Within the Trauma category a division was made between symptom measures and retrospective measures. Symptom measures of trauma assess current trauma-related symptomatology. These measures are considered to have higher reliability than retrospective trauma measures and therefore a division is made. For a detailed description and motivation of all questionnaires see supplementary material S4 and Table S2 online. All instruments had good reliability and validity as is also described in supplementary material S4 online. We investigated and report the overlap in trauma- and fantasy measures in supplementary material S5 online.

Trauma Model

Symptom measures: In Part 1 of the study the following Trauma Model measures were obtained: the frequency of dissociative experiences was assessed with the Dissociative Experiences Scale[40](DES), the severity of somatoform dissociation was measured with the Somatoform Dissociation Questionnaire[41] (SDQ-20), emotional aspects of anxiety targeted to the individual's general and longstanding anxiety level was assessed with the State-Trait Anxiety Inventory-Trait scale[44] (STAI-T), and the frequency and duration of depersonalisation symptoms was measured with the Cambridge Depersonalization Scale[52] (CDS). In Part 2 of the study the current level of depression was measured with the Beck Depression Inventory[53] (BDI).

Retrospective trauma exposure and attachment: In Part 1 of the study the following retrospective trauma measures were obtained: the types of trauma together with the age of occurrence and duration were measured with the Traumatic Experience Checklist[43] (TEC) and care and protection from father and mother were measured with the Parental Bonding Instrument[54] (PBI). In Part 2 of the study the frequency of maltreatment experiences during childhood was assessed using the Childhood Trauma Questionnaire[52,55] (CTQ).

Fantasy Model

Symptom measures: In Part 1 of the study the following Fantasy Model measures were obtained: sleeping and dreaming

experiences or disturbances were measured with the Iowa Sleep Experiences Scale[56] (ISES), fantasy proneness was measured with the Creative Experiences Questionnaire[57] (CEQ), and malingering of psychiatric symptoms and/or cognitive impairments were measured with the Structured Inventory of Malingering Symptoms[58,59] (SIMS). In Part 2 of the study the fantasy instruments included: interrogatory suggestibility as measured with the Gudjonsson Suggestibility Scale[60] (GSS) and the tendency to create false memories as measured with the Deese Roedinger McDermott[61,62] (DRM).

Other Measures

In Part 2 of the study the Vragenlijst Kenmerken Persoonlijkheid[63] (VKP; Questionnaire Personality Characteristics) was included to assess personality disorders characteristics because DID has high comorbidity levels with Axis II disorders[64]. The Positive And Negative Syndrome Scale[65] (PANSS) measures symptom severity related to schizophrenia and was included since overlap between psychotic and dissociative disorders has been described[66-68] and differentiating between diagnoses can be challenging.

Statistical analyses

Data was analysed using SPSS 20 (IBM Statistics). Time between Part 1 and Part 2 of the study was on average 6.5 weeks (SD 7.6) and therefore measures can be considered to be independent and separate multiple comparison corrections were conducted for Part 1 and Part 2 of the study. For the analyses of the questionnaires obtained in Part 1 of the study one way ANOVAs were used. We applied nonparametric Kruskal-Wallis tests and (post-hoc) Mann-Whitney tests when the data did not meet the assumptions of normal distribution or heterogeneity of variance (assessed with Levene's test). For Part 1, Bonferroni multiple comparisons correction was applied: *p*-value 0.05/# of questionnaires (9) = *p*-value ≤0.0056. *P*-value <0.01 is reported as a trend. Post-hoc correction was applied: *p*-value 0.05/# of comparisons (4) = *p*-value ≤0.0125. *P*-value <0.05 is reported as a trend. Statistical tests were two-tailed.

For the analyses of the questionnaires obtained in Part 2 of the study the factors Group (DID-G (1), DID-S (2) and controls (3)) and Personality State (PS: (simulated) NPS and TPS) were tested in a repeated measures ANOVA design. Post-hoc t-tests assessed within and between group personality-state differences, only when a significant main or interaction effect was found. Main effects of Group and PS were assessed as well as interaction effects for Group x PS. For Part 2, Bonferroni multiple comparisons correction was applied: *p*-value 0.05/# of questionnaires (6) = *p*-value ≤0.0083. *P*-value <0.01 is reported as a trend. Post-hoc correction was applied: *p*-value 0.05/# of comparisons (2) = *p*-value ≤0.025. *P*-value <0.05 is reported as a trend. Statistical tests were two-tailed.

RESULTS

Table 1 provides on overview of the main findings from the trauma, fantasy and other measures in this study.

Part 1: Group comparisons

Table 2 shows the results (mean and standard deviation (SD)) of statistical analyses on the questionnaires obtained in Part 1 of the study. DID-G, DID-S, PTSD, and HC groups did not significantly differ with respect to age and education (see top part of Table 2).

Trauma Model

Does DID-G differ from PTSD and healthy controls on trauma symptom measures?

For the dissociation (Dissociative Experiences Scale (DES) and Somatoform Dissociation Questionnaire (SDQ-20)), anxiety (State-Trait Anxiety Inventory – Trait (STAI-T)) and depersonalization (Cambridge Depersonalisation Scale (CDS)) measures significant differences ($p<0.001$) between the groups were found. Post-hoc tests revealed that the DID-G group showed higher scores compared with DID-S, PTSD, and HC groups ($p<0.001$) with the exception of the anxiety measure in which DID-G and PTSD groups did not differ significantly from each other. Individuals with PTSD reported significantly higher ($p<0.001$) symptom scores when compared with HC.

Does DID-G differ from PTSD and healthy controls on retrospective trauma exposure and attachment difficulties?

For the traumatic experiences measure (Traumatic Experience Checklist (TEC)) and the parental bonding measure (Parental Bonding Instrument (PBI)) significant differences ($p<0.001$) between groups were found for DID-G, DID-S, PTSD, and HC on Total and subscales. Post-hoc tests showed that the DID-G group scored significantly higher compared with the DID-S, PTSD, and HC groups ($p<0.01$) with the exception of the lack of maternal care subscale on the PBI, in which the DID-G and PTSD group did not differ significantly. Individuals with PTSD and HC did not differ on the PBI scores.

Fantasy Model

Does DID-G differ from PTSD and controls on fantasy symptom measures?

For the sleep disturbances measure (Iowa Sleep Experience Survey (ISES)) significant group differences ($p<0.001$) were found for the General sleep scale, with significantly higher scores for the DID-G group as compared with the DID-S and HC groups ($p<0.001$). Post-hoc testing revealed no differences for this scale between the DID-G and PTSD groups. Individuals with PTSD reported significantly higher scores compared with HC ($p<0.001$). No significant group differences were found for the Lucid dreams scale.

A trend was found for group differences for the fantasy proneness measure (Creative Experiences Questionnaire (CEQ)). Post-hoc tests showed that the DID-G group scored significantly higher compared with HC ($p<0.01$), but no differences were found comparing the DID-G group to the DID-S or PTSD groups. The PTSD group scored higher significantly than HC ($p<0.01$).

For the malingering measure (Structured Inventory of Malingered Symptomatology (SIMS)) significant differences ($p<0.001$) were found for Total SIMS score and all subscales except for the Low intelligence subscale. Further post-hoc testing showed that for the Total score, and the Neurologic, Affective, Psychosis, and Amnesia subscales, significant differences ($p<0.001$) existed for the DID-G group compared with the DID-S or HC group, with higher scores for the DID-G group. In comparison to the PTSD group, individuals with DID-G scored significantly higher ($p<0.01$) on the Total score and the Neurologic, Psychosis, and Amnesia subscales, but the two groups did not differ on the Affective scale. Individuals with PTSD showed significant higher scores ($p<0.01$) on the Total score and Affective subscale only, when compared with HC.

Part 2: Dissociative-personality-state-dependent group comparisons

Table 3 shows the results (mean and SD) of statistical analyses on the questionnaires obtained in Part 2 of the study.

Trauma Model

Do dissociative personality states in DID differ on trauma symptom measures compared with simulated DID and controls?

On the depression measure (Beck Depression Inventory (BDI)), the DID-G group showed significantly higher scores compared with the DID-S and control groups ($p<0.001$), as reflected in both a significant main effect of group as in significant post-hoc comparisons. In all groups (simulated) trauma-related states showed significantly higher levels of depression compared with (simulated) neutral states ($p<0.001$).

Do dissociative personality states in DID differ on retrospective trauma exposure measures compared with simulated DID and controls?

For the childhood trauma measure (Childhood Trauma Questionnaire (CTQ total)), main effects of group and post-hoc tests showed significantly higher scores ($p\leq0.001$) for the DID-G groups as compared with the DID-S and control groups, indicating greater trauma exposure in individuals with DID-G. For all subscales, that is Emotional Abuse, Emotional Neglect, Physical Abuse, Physical Neglect, and Sexual Abuse, significant main effects of Personality State and Group were found ($p<0.001$), as well as post-hoc differences, with higher scores in DID-G as a group and TPS as the personality state.

Fantasy Model

Do dissociative personality states in DID differ on fantasy symptom measures compared with simulated DID and controls?

For the suggestibility measure (Gudjonsson Suggestibility Scale (GSS)) significant main effects were found for the Recall scores and an interaction effect was found for Recall part 2 ($p<0.01$). Post-hoc tests showed that the DID-S and control groups scored significantly higher on Recall compared with the DID-G group ($p<0.01$) in both dissociative personality states. On Yield 1 and 2, Shift and Total Suggestibility, no significant effects were found. Individuals with DID-G were not more suggestible than individuals with PTSD, simulators, or HC. In all groups, NPS performed better compared with TPS, with the exception that for Recall 2 in the Control group TPS (that is PTSD) scored better than NPS (that is HC), as was reflected in a group x personality state interaction effect.

For the measure of false memories (Deese-Roediger-McDermott (DRM)), no significant main or interaction effects were found with the exception of a main effect of group on correct Recall ($p<0.001$). Post-hoc tests revealed that the DID-G group did not produce more false memories than the DID-S, PTSD or HC groups. Individuals with DID-G showed significantly fewer correct responses compared with the DID-S group ($p<0.001$), but did not differ from the control group with HC and PTSD.

Other

Do dissociative personality states in DID differ from simulated personality states and/or controls on the other 2 measures of interest?

Regarding personality characteristics measures (in Dutch Vragenlijst Kenmerken Persoonlijkheid (VKP)) a main effect of dissociative personality state ($p<0.005$) was found for the subscales Paranoid, Schizoid, Schizotypical, Narcissistic, Avoidant, Dependent, Obsessive-Compulsive, Passive-Aggressive, Depressive and Borderline. Trauma states exhibited higher, more pathological scores than neutral states. No significant main effect of dissociative personality state was present for the subscales Antisocial and Theatrical. A significant main effect of group ($p<0.005$) was found for all subscales except Paranoid. Post-hoc tests showed that the DID-G and DID-S group differed on subscales Dependent and Borderline ($p<0.025$) and a trend was found for subscales Avoidant and Depressive, all with generally higher scores for individuals with DID-G. Significant differences were found for the DID-G group when compared with controls on all subscales, with higher scores for individuals with DID-G ($p<0.05$).

For the measures of positive and negative syndromes of schizophrenia (Positive and Negative Syndrome Scale (PANSS)) main effects of dissociative personality state and group were found for total PANSS score as well as for all subscales, that is positive, negative and global ($p<0.005$). For PANSS total and the positive subscale, the DID-G group

showed significantly higher scores in post-hoc testing compared with the DID-S and control groups ($p<0.025$). Regarding the subscales negative and global, individuals with DID-G scored significantly higher compared with controls ($p\leq0.001$), but not as compared with the DID-S group. On all scales, for all groups, the trauma states showed significantly higher scores compared with neutral states ($p\leq0.001$).

DISCUSSION

The purpose of the current study was to test two aetiological models of DID: the Trauma Model versus the Fantasy Model. To this end a wide range of psychological measures were obtained from individuals with diagnosed genuine dissociative identity disorder (DID-G), DID simulating healthy controls (DID-S), individuals with posttraumatic stress disorder (PTSD), and study-blind healthy controls (HC). All subjects participated in two parts of the study. In Part 1, group comparisons were made between the 4 groups with DID-G and DID-S participating as their normal self, whereas in Part 2 DID-G and DID-S participated in two dissociative personality states, with DID-S simulating the trauma-related personality state (TPS) and neutral personality state (NPS). Our study provides new psychological data supporting the Trauma Model and contradicting the Fantasy Model.

For the fantasy measures inconsistent results were found. Both individuals with DID-G and PTSD reported higher levels of fantasy and daydreaming when compared with HC, while no differences were found comparing the neutral personality state of the DID-G group to the normal self of the DID-S group, or to individuals with PTSD. This indicates that both individuals with DID-G and PTSD were similar in fantasy proneness and did not differ from healthy actresses. This finding contradicts the Fantasy Model's hypotheses. Results are in line with a recent study by Van Heugten-van der Kloet et al.[69], which reported differences in fantasy and daydreaming between DID and HC, and PTSD and HC respectively, but that study also did not find differences between DID and PTSD.

On the other hand, the DID-G group scored higher on the SIMS questionnaire, which was included to test malingering, as compared with the other groups. Malingering of psychiatric symptoms fits the Fantasy Model. The SIMS includes subscales assessing amnesia as well as affective, psychotic, and neurological symptoms. Although affective, psychotic and neurological symptoms may be rare in some patient groups, they are well-documented as common symptoms among individuals with DID[7,8,27]. For example, individuals with DID have many intrusion symptoms that Schneider would have described as classic symptoms of schizophrenia and several studies have documented that the first rank symptoms for schizophrenia are as common in DID[70-72]. Furthermore, even though the SIMS shows good test-retest reliability and internal consistency, it can be argued that the SIMS examines a wide range of symptoms that co-occur with pathological dissociative symptoms. Indeed, dissociative amnesia is a required diagnostic symptom of DID[1]. It is even pathognomic for the disorder. Therefore, it can be argued that the elevated scores on this scale in the DID-G group in comparison with the other groups provides validation for their diagnosis, which can in fact be interpreted as support for the Trauma Model. With these paradoxical interpretations of the malingering data we propose that future studies include larger samples of DID and PTSD to determine if this measure is valid for highly traumatized samples, or include different tests for malingering in DID to confirm or challenge our findings.

With regard to sleep- and dream related experiences, both individuals with DID-G and PTSD reported higher levels of sleep disturbances, which fits the Fantasy Model. This model posits that sleep disturbances may be a mediating factor in dissociative pathology. While this could be the case, sleep disturbances can also be related to the nightmares, hyperarousal, and sleep avoidance that is well documented among traumatized individuals including those with DID and PTSD[56,73,74]. Thus, this result may in fact not be supportive for a Fantasy Model, but more so for a Trauma Model. Results are comparable to the only other study on sleep in individuals with DID, which found that both individuals with DID and PTSD[69] showed more unusual sleep experiences than controls and a higher level of unusual sleep experiences predicted participants belonging to the DID group. Unusual sleep phenomena that are difficult to control, including nightmares and waking dreams, are related to dissociative symptoms[56,75]. However, the more controllable, lucid dreams, are only weakly related to dissociative symptoms[56]. This is in line with our study's finding that the groups did not differ on lucid dreams supporting the Trauma Model.

When we examined dissociative-personality-state-dependent differences, significant effects were found only for the recall tests of the fantasy measures (GSS and DRM) with a general better performance in the DID-S and control groups. Thus, individuals with DID-G showed more difficulty with memory than either the simulators or controls, which is consistent with the Trauma Model. Interestingly, no group differences were found on measures of suggestibility or false memory creation. This contradicts the Fantasy Model's primary thesis that individuals with DID are highly suggestible and overly vulnerable to sociocultural influences, and consequently develop their symptoms of dissociation and their alleged false recollections of having been abused in childhood. Our findings that individuals with DID-G are not more suggestible than individuals with PTSD or other controls and that they did not generate more false memories challenges the core of the Fantasy Model. Researchers have found that dissociation is associated with increased commission memory errors (that is false positives) but not omission memory errors (that is false negatives)[11,76]. The latter are presumably associated with dissociative amnesia. Studies have shown a rather consistent small-to-moderate link between dissociation (generally measured with DES) and commission errors across a variety of paradigms, but studies using the DRM paradigm tend to be an exception[10]. The lack of commission errors in DRM studies may be due to the DRM's false recognition task being fundamentally related to encoding errors[77]. Indeed we did not find group differences on commission errors yet differences in recall were present. Poor recall within the DID group is more consistent with the Trauma Model given that amnesia is a core diagnostic criteria for DID related to exposure to early trauma.

For trauma measures, results from both between group and dissociative personality-state-dependent symptom lists are consistent with the Trauma Model's predictions. As expected, on all these measures the DID-G group showed higher scores than the PTSD group, and the PTSD group showed higher scores than the DID-S group as their normal self, and than

the HC group. Hence, we found a continuum across the groups that is consistent with the idea that more severe and chronic trauma exposure, particularly in childhood, is associated with elevated dissociative symptoms[78] and is supportive of a continuum of trauma related disorders[78-80]. When examining dissociative-personality-state differences a similar pattern emerged for depressive symptoms. Higher scores for depression in the DID-G group compared with the DID-S, PTSD or HC groups support the Trauma Model.

In addition to results obtained from symptom measures that support the Trauma Model, the results on childhood trauma history support the Trauma Model as well. Both childhood trauma and emotional neglect were retrospectively assessed and could thus be distorted by the patients' amnesia as well as the general fallibility of memory for all of us. It is possible that any of the groups' recollections of childhood trauma were under- or over-estimates of these experiences. This caveat applies to all retrospective studies that include reports of childhood trauma (see for example[81]). On our measures of emotional neglect and attachment, the DID-G group showed higher scores than the PTSD group for maternal and paternal overprotection, whereas the PTSD group reported higher scores for paternal care. Overprotection has been associated with disorganized attachment, which is common in DID[82], and is consistent with ideas from the Trauma Model . Furthermore, psychoform and somatoform dissociation has been related to neglect as well as childhood trauma[21,82]. The DID-G and PTSD groups scored similarly high for lack of maternal affection. This similarity of DID and PTSD supports the Trauma Model. When examining dissociative-personality-state differences in individuals with DID-G we found more severe trauma reports in TPS compared with NPS and the DID-G group scored higher on trauma measures compared with all other groups. Since the TPS of the DID-G group is more consciously aware of their traumatic experiences[78], it is important to investigate dissociative-personality-state-dependent retrospective reports of childhood trauma[17,39]. These findings are predicted by the Trauma Model and they are consistent with the clinical profile of DID[36].

With regard to the other measures, the higher scores in the DID-G group for the PANSS total and the positive syndrome subscale are in line with the notion that Schneiderian first-rank symptoms and voices conversing appear to be more common in DID than in schizophrenia[83]. Past research has found that childhood trauma is positively associated with dissociation, hallucinations and delusions[68,83-85]. . Results are consistent with dissociative accounts of the trauma-hallucination link and are in line with the Trauma Model. In general, TPS scored higher across all PANSS scales than NPS, fitting the apparent normality of NPS. Considering the assessment of personality characteristics, it is the question if the generally higher scores for the DID-G group could be interpreted as supporting the Trauma Model since high comorbidity of personality disorders is common in individuals with DID[64,86]. TPS exhibited even higher scores than NPS, which is consistent with research showing that personality disorders are common in highly traumatized samples[87,88], as severe interpersonal traumatization afflicts the capacity to trust others, the capacity for intimacy, as well as the identity organization

itself.

Of note, finally, proponents of the Trauma Model acknowledge that some features of dissociative personality states can be influenced by sociocultural factors[36] and that there are psychiatric patients who imitate DID, often truly believing they have the disorder when in fact they do not[32]. Even if DID symptoms can be simulated and reinforced iatrogenically[22] in some cases, this phenomenon evidently does not prove that genuine trauma-related DID does not exist[89].

Some strengths and limitations of the present study should be noted. A strength is that the DID diagnoses were established by one of two independent experts in the DID field, limiting the chance of including false positive cases[32]. Another strength is that our study is the first to include matched groups in one comprehensive design to test the Trauma Model and Fantasy Model using validated self-report measures.

A limitation is our modest sample sizes. Only a limited number of participants could be included in each group since the current data were developed during a larger neuroimaging study that required control over dissociative personality state switches. However, our sample size of individuals with DID is not unusual in the literature due to the difficulties of recruiting patients who are often afraid of people and quite symptomatic. The lack of parallel data in the group comparisons and the dissociative-personality-state comparisons is another limitation. Apart from the SCID-D and CAPS we did not conduct other standardized interviews to assess presence of axis-I disorders in our sample. Comorbidity in DID is generally high[90,91], therefore future studies need to use other comparison groups to determine if these patterns of findings are due to other disorders or are specific to DID.

Only female DID participants and controls were studied. Studies focusing on a single gender can be seen as advantageous for eliminating gender differences as an explanatory variable. Furthermore, no major differences in the clinical phenomenology of female and male DID patients were reported in previous studies[92,93].

In conclusion, a clear pattern emerged in this study for a trauma-related aetiology of DID. We found a continuum of trauma-related symptom severity across the various groups. This continuum supports the hypothesis that there is an association between the severity, intensity, as well as the age at onset of traumatization, and the severity of trauma-related psychopathology. On the other hand, the fact the women with genuine DID were not more suggestible and not more prone to generate false memories than the other groups challenges the Fantasy Model's core hypothesis. Overall, the present study provides considerable validation for DID as a trauma-related disorder. Apart from its contribution to the discussion on the aetiology and nature of DID, the study's combined findings inform clinicians and forensic experts in need of empirical guidance regarding differences between simulated and genuine DID.

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CONFLICT OF INTEREST

None.

REFERENCES

[1] AMERICAN PSYCHIATRIC ASSOCIATION. Diagnostic and statistical manual of mental disorders: DSM 5. 2013;.

[2] SPIEGEL D, LOEWENSTEIN RJ, LEWIS-FERNANDEZ R et al. Dissociative disorders in DSM-5. Depress Anxiety 2011;**28**:E17-45.

[3] LANIUS RA, VERMETTEN E, LOEWENSTEIN RJ et al. Emotion modulation in PTSD: Clinical and neurobiological evidence for a dissociative subtype. Am J Psychiatry 2010;**167**:640-647.

[4] LANIUS RA, BRAND B, VERMETTEN E, FREWEN PA, SPIEGEL D. The dissociative subtype of posttraumatic stress disorder: rationale, clinical and neurobiological evidence, and implications. Depress Anxiety 2012;**29**:701-708.

[5] WOLF EJ, MILLER MW, REARDON AF, RYABCHENKO KA, CASTILLO D, FREUND R. A latent class analysis of dissociation and posttraumatic stress disorder: evidence for a dissociative subtype. Arch Gen Psychiatry 2012;**69**:698-705.

[6] WOLF EJ, LUNNEY CA, MILLER MW, RESICK PA, FRIEDMAN MJ, SCHNURR PP. The dissociative subtype of PTSD: a replication and extension. Depress Anxiety 2012;**29**:679-688.

[7] BOON S, DRAIJER N. Multiple personality disorder in The Netherlands: a clinical investigation of 71 patients. Am J Psychiatry 1993;**150**:489-494.

[8] PUTNAM FW, GUROFF JJ, SILBERMAN EK, BARBAN L, POST RM. The clinical phenomenology of multiple personality disorder: review of 100 recent cases. J Clin Psychiatry 1986;**47**:285-293.

[9] ROSS CA, NORTON GR, WOZNEY K. Multiple personality disorder: an analysis of 236 cases. Can J Psychiatry 1989;**34**:413-418.

[10] GIESBRECHT T, LYNN SJ, LILIENFELD SO, MERCKELBACH H. Cognitive processes in dissociation: an analysis of core theoretical assumptions. Psychol Bull 2008;**134**:617-647.

[11] LYNN SJ, LILIENFELD SO, MERCKELBACH H, GIESBRECHT T, KLOET DVD. Dissociation and Dissociative Disorders: Challenging Conventional Wisdom. 2012;**21**:48.

[12] DALENBERG CJ, BRAND BL, GLEAVES DH et al. Evaluation of the evidence for the trauma and fantasy models of dissociation. Psychol Bull 2012;**138**:550-588.

[13] REINDERS AATS. Cross-examining dissociative identity disorder: neuroimaging and etiology on trial. Neurocase 2008;**14**:44-53.

[14] BOYSEN GA, VANBERGEN A. A review of published research on adult dissociative identity disorder: 2000-2010. J Nerv Ment Dis 2013;**201**:5-11.

[15] DORAHY MJ, BRAND BL, SAR V et al. Dissociative identity disorder: An empirical overview. Aust N Z J Psychiatry 2014;**48**:402-417.

[16] CHALAVI S, VISSIA EM, GIESEN ME et al. Abnormal hippocampal morphology in dissociative identity disorder and post-traumatic stress disorder correlates with childhood trauma and dissociative symptoms. Hum Brain Mapp 2014;.

[17] REINDERS AATS, WILLEMSEN AT, DEN BOER JA, VOS HP, VELTMAN DJ, LOEWENSTEIN RJ. Opposite brain emotion-regulation patterns in identity states of dissociative identity disorder: a PET study and neurobiological model. Psychiatry Res 2014;**223**:236-243.

[18] CHALAVI S, VISSIA EM, GIESEN ME et al. Similar cortical but not subcortical gray matter abnormalities in women with posttraumatic stress disorder with versus without dissociative identity disorder. Psychiatry Res 2015;**231**:308-319.

[19] SCHLUMPF YR, NIJENHUIS ERS, CHALAVI S et al. Dissociative part-dependent biopsychosocial reactions to backward masked angry and neutral faces: An fMRI study of dissociative identity disorder. Neuroimage Clin 2013;**3**:54-64.

[20] SCHLUMPF YR, REINDERS AATS, NIJENHUIS ERS, LUECHINGER R, VAN OSCH MJ, JANCKE L. Dissociative part-dependent resting-state activity in dissociative identity disorder: a controlled FMRI perfusion study. PLoS One 2014;**9**:e98795.

[21] NIJENHUIS ERS. The Trinity of Trauma: Ignorance, Fragility, and Control The Evolving Concept of Trauma / The Concept and Facts of Dissociation in Trauma . 1st ed., Vandenhoeck & Ruprecht, Goettingen; 2015.

[22] SPANOS NP. Multiple identity enactments and multiple personality disorder: a sociocognitive perspective. Psychol Bull 1994;**116**:143-165.

[23] REINDERS AATS, WILLEMSEN AT, VOS HP, DEN BOER JA, NIJENHUIS ERS. Fact or factitious? A psychobiological study of authentic and simulated dissociative identity states. PLoS One 2012;**7**:e39279.

[24] BRAND BL, MCNARY SW, LOEWENSTEIN RJ, KOLOS AC, BARR SR. Assessment of genuine and simulated dissociative identity disorder on the structured interview of reported symptoms. J Trauma Dissociation 2006;**7**:63-85.

[25] HUNTJENS RJ, VERSCHUERE B, MCNALLY RJ. Inter-identity autobiographical amnesia in patients with dissociative identity disorder. PLoS One 2012;**7**:e40580.

[26] BRAND BL, TURSICH M, TZALL D, LOEWENSTEIN RJ. Utility of the SIRS-2 in Distinguishing Genuine From Simulated Dissociative Identity Disorder. 2014;.

[27] BRAND BL, CHASSON GS. Distinguishing simulated from genuine dissociative identity disorder on the MMPI-2. Psychol Trauma 2015;**7**:93-101.

[28] LYNN SJ, LILIENFELD SO, MERCKELBACH H et al. The trauma model of dissociation: inconvenient truths and stubborn fictions. Comment on Dalenberg et al. (2012). Psychol Bull 2014;**140**:896-910.

[29] DALENBERG CJ, BRAND BL, LOEWENSTEIN RJ et al. Reality versus fantasy: reply to Lynn et al. (2014). Psychol Bull 2014;**140**:911-920.

[30] JANET P. L'amnesie et la dissociation des souvenirs par l' émotion. 1904;**I**:417-453.

[31] HILGARD ER. Divided Consciousness: Multiple Controls in Human Thought and Action. , Wiley, New York; 1977.

[32] DRAIJER N, BOON S. Imitation of Dissociative Identity Disorder: Patients at Risk, Therapists at Risk. 1999;**27**:423-458.

[33] MERCKELBACH H, À CAMPO J, HARDY S, GIESBRECHT T. Dissociation and fantasy proneness in psychiatric patients: a preliminary study. 2005;**46**:181-185.

[34] CHALAVI S, SIMMONS A, DIJKSTRA H, BARKER GJ, REINDERS AATS. Quantitative and qualitative assessment of structural magnetic resonance imaging data in a two-center study. BMC Med Imaging 2012;**12**.

[35] REINDERS AATS, NIJENHUIS ERS, QUAK J et al. Psychobiological characteristics of dissociative identity disorder: a symptom provocation study. Biol Psychiatry 2006;**60**:730-740.

[36] VAN DER HART O, NIJENHUIS ERS, STEELE K. The Haunted Self: Structural Dissociation and the Treatment of Chronic Traumatization. 2006;.

[37] STEINBERG M. Structured Clinical Interview for DSM-IV Dissociative Disorders (SCID-D). 1993;.

[38] BOON S, DRAIJER N. Gestructureerd klinisch interview voor de vaststelling van DSM-IV Dissociatieve stoornissen (SCID-D). 1994;.

[39] REINDERS AATS, NIJENHUIS ERS, PAANS AM, KORF J, WILLEMSEN AT, DEN BOER JA. One brain, two selves. Neuroimage 2003;**20**:2119-2125.

[40] BERNSTEIN EM, PUTNAM FW. Development, reliability and validity of a dissociation scale. 1986;**174**:727–735.

[41] NIJENHUIS ER, SPINHOVEN P, VAN DYCK R, VAN DER HART O, VANDERLINDEN J. The development and psychometric characteristics of the Somatoform Dissociation Questionnaire (SDQ-20). J Nerv Ment Dis 1996;**184**:688-694.

[42] NIJENHUIS ER, SPINHOVEN P, VAN DYCK R, VAN DER HART O, VANDERLINDEN J. The development of the somatoform dissociation questionnaire (SDQ-5) as a screening instrument for dissociative disorders. Acta Psychiatr Scand 1997;**96**:311-318.

[43] NIJENHUIS ERS, VAN DER HART O, KRUGER K. The psychometric characteristics of the Traumatic Experiences Questionnaire (TEC): first findings among psychiatric outpatients. 2002;**9**:200-210.

[44] SPIELBERGER CD, GORSUCH RL, LUSHENE R, VAGG PR, JACOBS GA. Manual for the Stait-Trait Anxiety Inventory. 1983;.

[45] HUNTJENS RJ, PETERS ML, WOERTMAN L, BOVENSCHEN LM, MARTIN RC, POSTMA A. Inter-identity amnesia in dissociative identity disorder: a simulated memory impairment? Psychol Med 2006;**36**:857-863.

[46] BOYSEN GA, VANBERGEN A. Simulation of multiple personalities: a review of research comparing diagnosed and simulated dissociative identity disorder. Clin Psychol Rev 2014;**34**:14-28.

[47] MIERENDORF M. Surviving With A Split Personality. 1993;.

[48] PETRIE D. Sybil. 1976;.

[49] BLAKE DD, WEATHERS FW, NAGY LM et al. A clinician rating scale for assessing current and lifetime PTSD: the CAPS-1. 1990;**13**:187-188.

[50] BLAKE DD, WEATHERS FW, NAGY LM et al. The development of a Clinician-Administered PTSD Scale. J Trauma Stress 1995;**8**:75-90.

[51] HOVENS JE, LUINGE B, VAN MINNEN A. Het klinisch interview voor PTSS (KIP). 2005;.

[52] BERNSTEIN DP, FINK L. Childhood Trauma Questionnaire. A retrospective self-report. 1998;.

[53] BECK AT, WARD CH, MENDELSON M, MOCK J, ERBAUGH J. An inventory for measuring depression. Arch Gen Psychiatry 1961;**4**:561-571.

[54] PARKER G, TUPLING H, BROWN LB. A Parental Bonding Instrument. 1979;**52**:1-10.

[55] BERNSTEIN DP, FINK L, HANDELSMAN L et al. Initial reliability and validity of a new retrospective measure of child abuse and neglect. 1994;**151**:1132-1136.

[56] WATSON D. Dissociations of the night: individual differences in sleep-related experiences and their relation to dissociation and schizotypy. J Abnorm Psychol 2001;**110**:526-535.

[57] MERCKELBACH H, HORSELENBERG R, MURIS P. The Creative Experiences Questionnaire (CEQ): a brief self-report measure of fantasy proneness. 2001;**31**:987-995.

[58] SMITH GP. Assessment of malingering with self-report instruments. In Rogers R, ed. Clinical assessment of malingering and deception, Guilford, New York, 1997.

[59] SMITH GP, BRUGER GK. Detection of malingering: Validation of the Structured Inventory of Malingered Symptomatology (SIMS). 1997;**25**:180-183.

[60] GUDJONSSON GH. A new scale of interrogative suggestibility. 1984;**5**:303-314.

[61] DEESE J. On the prediction of occurrence of particular verbal intrusions in immediate recall. 1959;**58**:17-22.

[62] ROEDIGER HL, MCDERMOTT KB. Creating false memories: Remembering words not presented in lists. 1995;**24**:803-814.

[63] DUIJSENS IJ, EURELINGS-BONTEKOE EHM, DIEKSTRA RFW. The VKP, a self-report instrument for DSM-III-R and CD-10 personality disorders: construction and psychometric properties. 1996;**20**:171-182.

[64] DELL PF. Axis II pathology in outpatients with dissociative identity disorder. J Nerv Ment Dis 1998;**186**:352-356.

[65] KAY SR, FISZBEIN A, OPLER LA. The positive and negative syndrome scale (PANSS) for schizophrenia. Schizophr Bull 1987;**13**:261-276.

[66] MOSKOWITZ A, SCHAFER I, DORAHY MJ. Psychosis, Trauma and Dissociation: Emerging Perspectives on Severe Psychopathology. , John Wiley and Sons Ltd, West Sussex, 2008.

[67] PERONA-GARCELAN S, CARRASCOSO-LOPEZ F, GARCIA-MONTES JM et al. Dissociative experiences as mediators between childhood trauma and auditory hallucinations. J Trauma Stress 2012;**25**:323-329.

[68] VARESE F, BARKUS E, BENTALL RP. Dissociation mediates the relationship between childhood trauma and hallucination-proneness. Psychol Med 2012;**42**:1025-1036.

[69] VAN HEUGTEN-VAN DER KLOET D, HUNTJENS R, GIESBRECHT T, MERCKELBACH H. Self-reported sleep disturbances in patients with dissociative identity disorder and post-traumatic stress disorder and how they relate to cognitive failures and fantasy proneness. Front Psychiatry 2014;**5**:19.

[70] KLUFT RP. First-rank symptoms as a diagnostic clue to multiple personality disorder. Am J Psychiatry 1987;**144**:293-298.

[71] ROSS CA, MILLER SD, REAGOR P, BJORNSON L, FRASER GA, ANDERSON G. Schneiderian symptoms in multiple personality disorder and schizophrenia. Compr Psychiatry 1990;**31**:111-118.

[72] ELLASON JW, ROSS CA. Positive and negative symptoms in dissociative identity disorder and schizophrenia: a comparative analysis. J Nerv Ment Dis 1995;**183**:236-241.

[73] OHAYON MM, SHAPIRO CM. Sleep disturbances and psychiatric disorders associated with posttraumatic stress disorder in the general population. Compr Psychiatry 2000;**41**:469-478.

[74] AGARGUN MY, KARA H, OZER OA, SELVI Y, KIRAN U, KIRAN S. Nightmares and dissociative experiences: the key role of childhood traumatic events. Psychiatry Clin Neurosci 2003;**57**:139-145.

[75] KOFFEL E, WATSON D. Unusual sleep experiences, dissociation, and schizotypy: Evidence for a common domain. Clin Psychol Rev 2009;**29**:548-559.

[76] HOLMES EA, BROWN RJ, MANSELL W et al. Are there two qualitatively distinct forms of dissociation? A review and some clinical implications. Clin Psychol Rev 2005;**25**:1-23.

[77] ROEDIGER HL, MCDERMOTT KB, ROBINSON KJ. The role of associative processes in creating false memories. In Conway MA, Gathercole SE, Cornoldi C, eds. Theories of memory: Volume II, Psychological Press, Hove, Sussex, England, 1998.

[78] VAN DER HART O, NIJENHUIS ER, STEELE K. Dissociation: An insufficiently recognized major feature of complex posttraumatic stress disorder. J Trauma Stress 2005;**18**:413-423.

[79] S. BOON and N. DRAIJER. Multiple Personality Disorder in the Netherlands.1993.

[80] SPIEGEL D. Multiple personality as a post-traumatic stress disorder. Psychiatr Clin North Am 1984;**7**:101-110.

[81] SAR V, AKYUZ G, KUNDAKCI T, KIZILTAN E, DOGAN O. Childhood trauma, dissociation, and psychiatric comorbidity in patients with conversion disorder. Am J Psychiatry 2004;**161**:2271-2276.

[82] DRAIJER N, LANGELAND W. Childhood trauma and perceived parental dysfunction in the etiology of dissociative symptoms in psychiatric inpatients. Am J Psychiatry 1999;**156**:379-385.

[83] DORAHY MJ, SHANNON C, SEAGAR L et al. Auditory hallucinations in dissociative identity disorder and schizophrenia with and without a childhood trauma history: similarities and differences. J Nerv Ment Dis 2009;**197**:892-898.

[84] READ J, VAN OS J, MORRISON AP, ROSS CA. Childhood trauma, psychosis and schizophrenia: a literature review with theoretical and clinical implications. Acta Psychiatr Scand 2005;**112**:330-350.

[85] DAALMAN K, DIEDEREN KM, DERKS EM, VAN LUTTERVELD R, KAHN RS, SOMMER IE. Childhood trauma and auditory verbal hallucinations. Psychol Med 2012;**42**:2475-2484.

[86] ELLASON JW, ROSS CA, FUCHS DL. Lifetime axis I and II comorbidity and childhood trauma history in dissociative identity disorder. Psychiatry 1996;**59**:255-266.

[87] ALLEN JG, HUNTOON J, EVANS RB. Complexities in complex posttraumatic stress disorder in inpatient women: evidence from cluster analysis of MCMI-III Personality Disorder Scales. J Pers Assess 1999;**73**:449-471.

[88] HERMAN JL, PERRY JC, VAN DER KOLK BA. Childhood trauma in borderline personality disorder. Am J Psychiatry 1989;**146**:490-495.

[89] ELZINGA BM, VAN DYCK R, SPINHOVEN P. Three controversies about dissociative identity disorder. 1998;**5**:13-23.

[90] GALBRAITH PM, NEUBAUER PJ. Underwriting considerations for dissociative disorders. J Insur Med 2000;**32**:71-78.

[91] BOZKURT H, DUZMAN MUTLUER T, KOSE C, ZOROGLU S. High psychiatric comorbidity in adolescents with dissociative disorders. Psychiatry Clin Neurosci 2014;.

[92] ROSS CA, NORTON GR. Differences between men and women with multiple personality disorder. Hosp Community Psychiatry 1989;**40**:186-188.

[93] LOEWENSTEIN RJ, PUTNAM FW. The clinical phenomenology of males with MPD: A report of 21 cases. 1990;**3**:135-143.