

Supplementary material for the manuscript

**Is it Trauma or Fantasy-based?  
Comparing Dissociative Identity Disorder,  
Posttraumatic Stress Disorder,  
Simulators, and Controls**

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## **S1. Definition of dissociation**

Many divergent experiences have been described as dissociative, ranging from normal failures in attention to the breakdown of memory processes as seen in dissociative disorders. There is no unanimous agreement on the meaning of the term dissociation and therefore an attempt to provide some clarity has been made as follows. The term dissociation is, in psychopathology, essentially used to define three different yet related concepts[1]: 1) a diagnostic category, dissociative disorders (DD) of the ICD-10 and DSM-V; 2) a group of symptoms, dissociative in nature such as amnesia or derealisation; 3) some pathogenic processes caused by traumatic experiences interfering with the integration of mental functions.

Dissociation can be broadly defined as a structured separation of mental processes that are ordinarily integrated[2]. Dissociation as in dissociative identity disorder (DID) appears to serve as an automatic defence mechanism which reduces the impact of highly aversive or traumatic events[3]. Boon and Draijer[4] noted that the assumption of a dissociative continuum, ranging from 'normal' forms of dissociation to pathological dissociation such as found in DID, is not supported on phenomenological grounds, and pathological dissociation seems either present or absent. Furthermore, the dissociative continuum model is in contrast with Janet's original ideas[5] in which dissociative states are regarded as discrete pathological states and dissociation is defined as a lack of integration among two or more different "systems of ideas and functions that constitute personality" (p332)[6].

Whereas DID concerns a pathological form of dissociation, studies by proponents of the Fantasy Model mainly studied dissociative symptoms as measured by the Dissociative Experiences Questionnaire (DES)[7-10] in samples of college students. Given the above described distinction between 'normal' and pathological forms of dissociation, findings related to the first cannot be generalized to the latter. It is therefore of importance to study various Trauma and Fantasy measures in a pathological dissociation group in comparison to several control groups.

## **S2. Characteristics of DID-G and DID-S personality states**

In our study, individuals with DID reported an average of 17 personality states (SD= 11.43). Coons[11] described an average of 13 altered personality states in DID. Therapy duration is usually lengthy for individuals with DID,

with an average of 8.13 years (SD 5.24) in therapy for our sample, and comorbidity is generally high[12-17]. The diagnosis of DID was assessed using the Structural Clinical Interview for DSM-IV Dissociative Disorders[18] (SCID-D; Dutch translation[19]) during which PTSD comorbidity was assessed as well. The evaluation revealed that all individuals with DID met criteria for either current comorbid PTSD (82.35%) or PTSD in remission (17.65%). The personal therapists of participants with DID reported the following co-morbid disorders, based on clinical DSM-IV classification[20]: chronic PTSD (n = 3), PTSD (n = 3), somatoform disorder (n = 2), recurrent major depression (n = 4), dysthymic disorder (n = 1), trauma-related specific phobias (n = 2), personality disorder- not otherwise specified (n = 2), mixed personality disorders (n = 2), borderline personality disorder symptoms (n = 3), dependent personality disorder symptoms (n = 1), histrionic personality disorder symptoms (n = 1) eating disorder (n = 2), sleeping disorder (n = 2) and catalepsy (n = 1). Comorbidity has been described in other work by our as well[21,22].

Reinders et al.[23,24] noted that in DID research, types of dissociative personality states of those participating in empirical studies are usually not assessed. Therefore, it was recommended that in future DID research the types of dissociative personality states were verified and reported. This is in line with suggestions of Dorahy et al.[25,26]. Therefore, we provide descriptions of the dissociative personality states of patients and simulating controls who participated in our study. These reported differences coincide with theoretical differences[27]. Descriptions of neutral personality states (NPS) and trauma-related personality states (TPS) are given in Table S1. Table S1 provides the subjectively reported personality state characteristics from the genuine dissociative identity disorder (DID-G) participants and DID simulating healthy controls (DID-S). For reasons of privacy, many characteristics have been categorized.

For subjective age, the two factors group (DID-G (1) and DID-S (2)) and personality state (NPS and TPS) were tested in a repeated measures ANOVA design. A significant main effect of personality state was found ( $p < 0.001$ ), with higher scores for NPS. A trend ( $p < 0.05$ ) was found for main effect of group, with higher reported subjective age in the DID-S group.

In both the DID-G and DID-S groups, 4 TPS reported to be a girl. In the DID-G group 1 NPS described gender as neutral and 1 as male/female, so a bit of both. In the DID-S group 1 TPS reported to be male. All others referred to themselves as female. With regard to ethnicity, all individuals with DID-G reported to be Caucasian, except for 3 TPS, who stated to be unaware of their ethnicity. In the DID-S group Caucasian was predominantly reported as well. Two participants from the DID-S group reported to be unaware of ethnicity, both

in their NPS and TPS. One TPS of DID-S described herself as Moluccan. Reported personal length was different for NPS and TPS in 9 individuals with DID-G and in 10 DID-S participants. Reported weight seemed to be related to perceived length in the DID-G group, since the same individuals with DID-G that reported length differences between NPS and TPS did report differences for weight. In the DID-S group a comparable pattern was found with 1 additional DID-S participant reporting weight differences between NPS and TPS with length recorded equal between both personality states. Hair colour was reported to be different between NPS and TPS in 9 individuals with DID-G and 13 individuals in the DID-S group. Eye colour varied to a lesser extent in the DID-G group, where 4 participants reported personality-state differences for this characteristic and 10 individuals from the DID-S group reported differences. Individuals with DID-G were mostly right handed in both personality states (n = 11), 2 individuals with DID-G reported to be left handed in both NPS and TPS, and 1 DID-G participant reported that NPS was right handed and TPS was left handed. All individuals in the DID-S group described themselves as being right handed. Occupation was reported to be none or unknown in 8 TPS of the DID-G group and 6 NPS. 1 NPS and 4 TPS of the DID-G group reported to be student. In the DID-S group all the participants reported to be employed with 2 NPS and 1 TPS reported occupation to be unknown. 3 NPS and 7 TPS of the DID-S group reported to be a student. Place of residency differed between NPS and TPS in 9 individuals with DID-G and in 9 individuals from the DID-S group as well. Marital status was different for NPS and TPS in 7 DID-G participants and in 13 DID-S participants. Reported number of children differed between personality states in 8 individuals with DID-G and in 6 DID-S participants. Hobbies differed between NPS and TPS for all individuals within the DID-G group (except 1 who reported unknown in both states). 5 TPS of individuals with DID-G reported to have no hobbies. In the DID-S group personality-state differences in hobbies were reported for 13 participants. With regard to usual mood in individuals with DID-G, NPS reported the category happy more often (n = 6) than TPS (n = 1). TPS more often reported sad (n = 7) compared with NPS (n = 1). Anxiety was reported in 3 NPS and 4 TPS of the DID-G group. 7 NPS of the DID-G group reported neutral, but no TPS of the DID-G group reported this mood category. 1 NPS of the DID-G group reported anger. For the DID-S group, 8 NPS reported happy, whereas no TPS reported this category. Anxiety was reported in 4 NPS and 5 TPS of DID-S participants. In the DID-S group the mood sad was reported only in 1 TPS. 2 NPS of the DID-S group reported the category neutral, whereas no TPS did. 1 NPS and 6 TPS of the DID-S group reported feelings of anger.

In sum, global patterns of subjectively reported personality-state characteristics seem to be comparable

between the DID-G and DID-S groups. However, a few remarkable differences can be seen for subjective age (lower in TPS of the DID-G group), eye colour differences (less in the DID-G group), occupation (more often 'none' in TPS of the DID-G group) and usual mood, mainly for the categories sad, angry and neutral.

### **S3. Simulation paradigm**

The controversy surrounding dissociative identity disorder (DID) centres around the disagreement of the aetiology and the validity of the associated symptom profile. This has led to two opposing views: the Trauma Model and the Fantasy Model[24,28]. The trauma-related explanation posits that DID is due to severe, early and chronic traumatization[29]. This model states that dissociation serves a defence mechanism to create distance from the traumatizing events. Proponents of the Fantasy Model state that the etiopsychopathology of DID has a sociocognitive origin rather than being trauma-related[30,31] and can be easily simulated. Several studies of DID[24,32-34], but not all, have included DID simulating controls to control for sociocognitive factors. Differences between the simulated and diagnosed individuals with DID indicate that DID is not fully explained by sociocognitive factors. On the other hand, similarities between the simulated and diagnosed individuals with DID would show that some characteristics of DID can be simulated. These characteristics are not suitable to distinguish simulated from clinical DID. However, if similarities occur in the symptom profiles of individuals with simulated and diagnosed DID, firm conclusions cannot be drawn about the underlying cognitive and behavioural mechanisms driving the similarities, nor about the aetiology of DID as the same behaviour or symptom can have multiple and/or different causations.

As recommended by Boysen and VanBergen[35], we provided several key methodological controls that are important for a DID simulation protocol: 1) we provided strong motivation during simulation preparation so that simulators were motivated to effectively simulate DID; 2) we checked that simulators: 2a) followed instructions during the training phase, 2b) adequately performed their tasks during and after the simulation; 3) we carefully matched groups on demographic characteristics; 4) we used adequate sample sizes to ensure the validity of statistical conclusions. Unfortunately, due to reasons of feasibility we were unable to 5) use blinding procedures so that the experimenters were unaware of participants' diagnostic group.

#### **1. Motivation of enactment**

Candidate simulators were informed about the study and the importance to investigate dissociative identity disorder in further detail. All were voluntarily participating and motivated to take part in the study. After successful participation, they received a compensation of €100.

#### 2a) Instructions for simulators during the training phase

DID simulating controls (DID-S) were instructed to simulate genuine DID (DID-G) in Part 2 measures according to a strict protocol. During the first phase of the training, we provided information about DID to the DID-S subjects. All DID-S subjects received written instructions (see S3a), and watched the Dutch documentary about DID[36] and the movie Sybil[37]. In the second phase, the simulators were instructed by the investigators to create two dissociative personality states that they would enact and asked to complete a form (see S3b) to specify the characteristics of the two personalities they would enact. This form was carefully reviewed by the investigators (E.V. or M.G) and in case of doubt about the suitability clinical experts (N.D. or E.N) were consulted, to assure that the actors fully understood the symptom profile of DID that they needed to simulate. The form consisted of general personal information of the created dissociative personality state and additional person specific information like history and characteristics. A check was done on the capability to simulate the two different dissociative personality states based on whether the description of their neutral and painful experiences met the instructions on how to enact a DID patient.

The third phase of the training phase concerned the actual practice and training phase in which simulators were asked to enact their personality states in preparation for the actual participation in the study. In accordance with Reinders et al.[24], simulators were trained to create and simulate a neutral personality state (NPS) that mentally avoids painful memories, and a trauma-related personality state (TPS) that is fixated on, and tends to re-experience painful memories[27]. DID simulating controls were then questioned via telephone (E.V. or M.G) about how they constructed the two personality states, whether they encountered difficulties and if so, they were given support during the call to improve their role-performance as NPS and TPS. In the hour prior to the actual participation, one of the investigators checked if the candidates experienced and judged that they were able to simulate the roles of NPS and TPS.

2b: During the assessment of Part 2 measures, the investigator checked if simulators engaged in the requested simulations by monitoring their responses and immediately after each task, the investigator checked if the

simulators generally felt they had simulated the roles of NPS and TPS effectively. All controls passed these various checks. In addition, the presence of the personality state under investigation and the interference among personality states were also debriefed after each task that was performed. Using the study protocol, the investigators could structurally evaluate after each questionnaire session if the intended NPS or TPS had been present during the experimental condition.

3. Diagnosed and simulating DID are likely to come from different backgrounds. When creating a non-pathological simulation control group it is impossible to match for these sociodemographic differences. However, care can be taken to match the simulating DID group on common demographics, such as age, education and ethnicity. In the current study, DID simulating controls were recruited from acting schools, through advertisements on the website [www.theaternetwerk.nl](http://www.theaternetwerk.nl), magazines and newspapers. One of the inclusion criteria was that all the actors had at least 2 years of experience with acting, to ensure sufficient experience with acting. Actors were carefully matched on age (DID-G: M 43.88, SD 9.86; DID-S: M 40.51, SD 12.94) and education (DID-G: M 14.88, SD 0.99; DID-S: M 14.94, SD 1.53). All individuals with genuine DID were female, hence so were all simulating controls.

4. Adequate sample sizes: the aim was to include 20 participants in each group. Eventually 17 (DID-G) and 16 (Control groups) was included.

5. Blinding procedures: unfortunately, due to limited financial budget we were not able to enrol independent personnel, so for reasons of feasibility we were unable to use blinding procedures. Therefore, the experimenters were aware of participants' diagnostic group.

### **S3a. Instructions with DID documentary[36] - (unofficial translation from Dutch)**

#### *Instruction 1*

The idea is that during the investigation you pretend to be a patient with DID. To help you prepare for your role, we have added a DVD. This will show a documentary about individuals with DID. The documentary is somewhat

dramatized, but still gives a reasonable picture of what the disorder looks like. On the DVD you can see Barb, Gretchen, and John. It is not the goal that you behave exactly like these three people behave, the DVD is intended to be a general introduction. Hopefully after seeing this DVD you can imagine how a patient with DID behaves and feels. After seeing the DVD we will explain to you what to do.

>> First check the DVD.

### *Instruction II*

As you have seen on the DVD a DID patient has two or more personality states. Dissociative personality states each have their own way of perceiving, relating to and thinking about others and thinking and experiencing the environment and themselves. Sometimes the dissociative personality states do not (fully) know what happens when another personality state takes control over the behaviour. Sometimes there is no memory for events that other personality states have experienced. It is also possible that they do know about the behaviour and experiences of other personality states but they don't experience this behaviour as if they are personal actions.

In this study, neutral and trauma-related personality states will be studied. The neutral personality state is a personality state that does not know about the traumatic memories or at least does not experience the memories as personal.

The trauma-related personality state is aware of traumatic memories. Based on instruction III, we ask you to think of both a neutral and a trauma-related personality state and try to feel and experience the emotions that are typical for the personality states. Just before the experiment, you will get a few minutes to switch to the role of the chosen personality.

In the weeks before the experiment we will ask you to practice the simulation of the personality states. In the last week before the experiment we ask you to practice at least three times and to take a few minutes to feel the related moods. If you have practiced a few times it is less "weird" and easier to successfully enact the dissociative personality states. This all may seem a little strange but remember that this behaviour is very real for these patients. Therefore, make a real effort to behave and feel like a patient with DID.

In the video you have seen Gretchen gets panic attacks. You do not need to simulate these attacks.



### **S3b. Inventory for personality-state characteristics**

#### *Instruction III*

We now ask you to think of a neutral and a trauma-related personality state who will participate in the study.

Keep in mind here that both personality states should have a subjective age older than 10 years. In addition, both personality states must have sufficient reading skills.

Try to specify the characteristics of these personality states below.

#### **Neutral personality state**

1 Name of the personality state:

2 Gender:

3 Age (> 10 years):

4 Race:

5 Height:

6 Weight:

7 Hair colour:

8 Eye colour:

9 Occupation:

10 Income:

11 Place of residency:

12 Marital Status:

13 Children.:

14 Hobbies:

15 Usual mood of this personality state:

16 Important characteristics:

17 Other key features:

**Trauma-related personality state**

1 Name of the personality state:

2 Gender:

3 Age (> 10 years):

4 Race:

5 Height:

6 Weight:

7 Hair colour:

8 Eye colour:

9 Occupation:

10 Income:

11 Place of residency:

12 Marital Status:

13 Children.:

14 Hobbies:

15 Usual mood of this personality state:

16 Important characteristics:

17 Other key features:

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Thank you for completing this questionnaire. Please bring the completed questionnaire to the investigation.

Remember to practice with the personality states.

## **S4. Questionnaires**

Table S2 shows an overview of the different categories of measures and the participating dissociative personality states and groups.

### ***Trauma symptom measures***

#### *Part 1 of the study*

##### *Dissociative Experiences Scale (DES)*

The Dissociative Experiences Scale[38] (DES) is a 28 item measure of the frequency of dissociative experiences including depersonalization, derealisation and psychogenic amnesia. Sample item such as “Some people have the experience of looking in a mirror and not recognizing themselves” are endorsed according to the percentage of time the respondent experiences that symptom (0%= never; 100%= always). Values above 25 or 30 are thought to indicate potential dissociative psychopathology[39]. The DES show high internal consistency, and test-retest reliability range from 0.79 to 0.96[38,40,41].

##### *Somatoform Dissociation Questionnaire (SDQ-20)*

The 20-item Somatoform Dissociation Questionnaire[42] (SDQ) provides a self-evaluation of the severity of somatoform dissociation. Items assess symptoms of analgesia, anaesthesia, motor disturbances, alternating preferences for tastes and smells, pain, and loss of consciousness. Participants respond to the stem “It sometimes happens that” with items including “I am paralyzed for a while”; “it is as if my body or a part of it has disappeared”; and “I dislike tastes that I usually like”. Participants respond a 5-point Likert scale ranging from 1 (this applies to me not at all) to 5 (this applies to me extremely). Previous studies have supported the convergent validity of the SDQ-20 with other measures of dissociation including the DES[43,44]. Additionally Nijenhuis et al.[42] found a high internal consistency of the questionnaire.

##### *State-Trait Anxiety Inventory-Trait (STAI-T)*

The trait version of Spielbergers state-trait anxiety inventory[45] (STAI-T) is a well-validated, 20-item questionnaire addressing the emotional aspects of anxiety targeted to the individual's general and longstanding anxiety level. Participants are instructed to rate their feelings on a 4-point Likert intensity scale, ranging from 1

(almost never) to 4 (almost always). Examples of items are “I am a steady person”, “I am feeling nervous”, and “I lack self-confidence”.

#### *Cambridge Depersonalization Scale (CDS)*

Participants reported the frequency and duration of depersonalisation symptoms over the 'last 6 months' on the Cambridge Depersonalisation Scale[46] (CDS). This questionnaire consists of a 29-item scale, including items as “Parts of my body feel as if they didn't belong to me” and “Previously familiar places look unfamiliar, as if I had never seen them before”. The frequency of the symptoms are reported using a Likert scale ranging from 0 (never) to 4 (all the time). The duration of the symptoms are rated from 1 (few seconds) to 6 (more than a week). Sierra and Berrios[46] showed a high internal consistency (Cronbach's alpha=0.89) and good reliability (split-half reliability=0.92) on this questionnaire.

#### *Part 2 of the study*

##### *Beck Depression Inventory (BDI)*

To measure the current level of depression the self-report questionnaire Beck Depression Inventory[47] (BDI) is used in this study. The questionnaire contains 21 items that are rated from 0 to 3 in terms of intensity. Items are related to symptoms and attitudes of depression, for example sense of failure, depression, mood, sleep disturbances and somatic preoccupation. Research strongly supports the BDI as a reliable and valid measure of the severity of current depression. A meta-analysis of the BDI's internal consistency estimates yielded a mean coefficient alpha of 0.86 for psychiatric patients and 0.81 for non-psychiatric subjects[48].

#### ***Retrospective trauma exposure and attachment***

##### *Part 1 of the study*

##### *Traumatic Experiences Checklist (TEC)*

The Traumatic Experience Checklist[49] (TEC) is a self-report questionnaire that assesses 25 types of trauma including the age of occurrence (so both adult and childhood) and duration. Items such as “sexual abuse (unwanted sexual acts involving physical contact) by your parents, brothers, or sisters”, or “taking care of your parents and/or other children in the family when you were a child” are answered with “yes” or “no”. When a participant responds affirmatively to questions, he or she is asked how old the participant was when the event

happened and rates the degree of traumatic stress on a Likert scale from 1 (not) to 5 (very strong). Participants also indicate the number of perpetrators of emotional, physical, and sexual abuse. Higher scores indicate more severe trauma exposure. The internal consistency, test–retest reliability and criterion-related validity were adequate[49].

#### *Parental Bonding Instrument (PBI)*

To assess fundamental parental styles as perceived by the child, this 25-item self-report questionnaire[50] (PBI) is included. Adults (over 16 years) complete the PBI for how they remember their parents during their first 16 years of life. The same items have to be completed for each parent separately. The items are divided in 'care' items (12) and 'overprotection' items (13), for example statements like “Spoke to me in a warm and friendly voice”, “invaded my privacy”, and “made me feel I wasn't wanted”. All items are scored on a 4-point Likert scale (very like to very unlike). The questionnaire shows high test-retest reliability and concurrent and predictive validity[51,52].

#### *Part 2 of the study*

##### *Childhood Trauma Questionnaire (CTQ)*

The Dutch version of the Childhood Trauma Questionnaire-Short Form[53-55] (CTQ-SF), the Jeugd Trauma Vragenlijst (JTV)[56] is structured to reflect the frequency of maltreatment experiences during childhood. The questionnaire contains 25-item to assess five types of childhood maltreatment; physical, emotional and sexual abuse, and physical and emotional neglect. Each item is rated on a 5-point Likert scale (1=never true, 2=rarely true, 3=sometimes true, 4=often true and 5=very often true). Consistent with previous findings of the English CTQ[57], the JTV showed adequate internal consistency reliability and the questionnaire is able to effectively discriminate between clinical and non-clinical samples. Additionally, the JTV has proven to be valid and reliable. Thombs et al.[58] examined the validation of the Dutch Childhood Trauma Questionnaire-Short Form.

#### ***Fantasy symptom measures***

##### *Part 1 of the study*

##### *Iowa Sleep Experience Survey (ISES)*

Using 18 questions, the Iowa Sleep Experience Survey[59] (ISES) measures sleeping and dreaming

experiences. The ISES asks participants to rate the frequency of various sleep- and dream related experiences. Questions like “When I am in bed, I feel the presence of someone who is not there” and “ I experience 29 nightmares” are scored on a 7-point scale (1=never, 2=less than once a year, 3=once or twice a year, 4=several times a year, 5=once or twice a month, 6=several times a month, 7=several times a week). The ISES is the only reliable and valid measure of the wide range of nocturnal altered-consciousness experiences.

#### *Creative Experience Questionnaire (CEQ)*

The Creative Experiences Questionnaire[60] measures developmental antecedents of fantasy proneness, profound involvement in fantasy and daydreaming, and consequences of daydreaming. The CEQ uses statements like “As a child, I had my own make believe friend or animal” and “When I think of something cold, I actually get cold.” to measure fantasy proneness. The questionnaire is a Dutch 25-item self-report questionnaire in which the participant has to state with “yes” or “no” whether he or she agrees with statements like above. Findings indicate that the CEQ possesses adequate test-retest stability and internal consistency[60]. Furthermore, this questionnaire is strongly correlated with a concurrent measure of fantasy proneness.

#### *Structured Inventory of Malingering Symptoms (SIMS)*

To screen for malingering of psychiatric symptoms (e.g., depression and psychosis) and/or cognitive impairments (e.g., low intelligence and memory complaints), the self-report instrument 'Structured Inventory of Malingered Symptomatology[61,62] (SIMS) is used. In this questionnaire five subscales are scored including: affective disorders, psychosis, amnesic disorders, neurological impairment and low intelligence. In total 75 true-false items like “At times, I am so depressed I welcome going to bed early to 'sleep it off’”, and “Sometimes my muscles go limp for no apparent reason so that my arms and legs feel as though they weigh a ton”. For the Dutch translation of the scale Merckelbach and Smith[63] reported that the SIMS shows good test-retest reliability and internal consistency.

#### *Part 2 of the study*

##### *Gudjonsson Suggestibility Scale (GSS)*

This questionnaire (GSS)[64] intends to measure individual differences in interrogatory suggestibility. The GSS detects two types of error naming the 'Yield' score and the 'Shift' score. The latter one related to how much

subjects could be made to change their answers under the pressure of negative feedback and the first one related to how much the subjects respond to suggestive questions. The following procedure is performed; participants are instructed to remember as much as possible while they are presented with a story in the form of a narrative paragraph. Afterwards, they answer questions about the story, some of which are (mis)leading. Examples of some leading questions are “Did the woman's handbag get damaged in the struggle?” or “Did the woman hit one of the assailants with her fist or handbag?”, while no such events were mentioned in the story. After completing the questions, participants are told that he or she has made a number of errors and are asked to answer the questions for a second time. Studies on the GSS have reported very high inter-rater reliability[65].

### *Deese-Roediger-McDermott*

The Deese-Roediger-McDermott[66,67] (DRM) is a robust and powerful method for examining the creation of false memories[68,69]. The procedure involves presenting a set of associated words (e.g., bed, rest, awake, tired, and dream) and then asking the participant to recall these words. Participants often falsely recall a word that is highly associated with the words presented (the critical lure, e.g., 'sleep').

The ten neutral word lists that will be used are derived from lists previously employed by Peters et al.[70]. Extensive pilot work has shown that these word lists produce rates of false recall and recognition which are comparable to those reported by Roediger and McDermott[67]. The use of only neutral word lists, instead of combining them with trauma-related word lists, is justified because earlier research has shown that trauma-related word lists produced similar results regarding the creation of false memories compared to neutral word lists[71]. Participants are instructed to study each word list after which they will be given two and a half minute to recall as many words as possible from the study phase. While writing down every word they could remember, participants will be asked to start with the words which were presented at the end, continuing with the remaining words in random order. The ten neutral word lists will be counterbalanced across participants.

Finally, a recognition task will be administered to judge the old-new existence of the words. Moreover, they will be asked to indicate how confident they are regarding their old/new judgment on a 4-point scale (1= not certain at all to 4 = very certain).

### ***Other***

#### *Part 2*



### *Vragenlijst voor Kenmerken van de Persoonlijkheid (VKP)*

Since personality disorder comorbidity has been described in DID[72], the Questionnaire on Personality Traits, or Vragenlijst voor Kenmerken van de Persoonlijkheid[73] (VKP) is a useful questionnaire to assess personality disorders. It is a self-report instrument in which 174 questions based on the criteria of both the DSM-IV personality disorders (PD) and the International Statistical Classification of Diseases and Related Health Problems (ICD-10)-PD are presented. Questions concerning about for example work, self-image, interpersonal relationships, and impulse control are included. Sample items are “I hardly ever enjoy myself” (schizoid) and “I often fail to recognize how others feel” (impulsive). Questions can be scored with 0 (not true), 1 (?), or 2 (true). Some questions have a fourth answer possibility: NA (not applicable). Twelve personality disorders according to the DSM-IV and nine personality disorders according the ICD-10 criteria are assessed. The scores for each personality disorder are given in a categorical diagnoses (negative, probable, and positive) and a dimensional score. The VKP has a good reliability and validity [73].

### *Positive and Negative Syndrome Scale (PANSS)*

The PANSS[74] measures symptom severity related to schizophrenia and is included since overlap between psychotic and dissociative disorders has been described[75,76]. The PANSS consists of 7 positive-items, 7 negative-items and 16 general psychopathology items that are scored on a 7-point Likert scale, which represent increasing levels of psychopathology: 1 = absent, 2 = minimal, 3 = mild, 4 = moderate, 5 = moderate-severe, 6 = severe, and 7 = extreme. An example of a positive item is ‘Delusions’: Beliefs which are unfounded, unrealistic, and idiosyncratic. Basis for rating: thought content expressed in the interview and its influence on behaviour. An example of a negative item is ‘Blunted affect’: Diminished emotional responsiveness as characterized by a reduction in facial expression, modulation of feelings, and communicative gestures. Basis for rating: observation of physical manifestations of affective tone and emotional responsiveness during the course of interview. An example of a general psychopathology item is ‘Anxiety’: Subjective experience of nervousness, worry, apprehension or restlessness, ranging from excessive concern about the present or future to feelings of panic. Basis for rating - Verbal report during the course of interview and corresponding physical manifestations. The 30-item positive and negative syndrome scale is a standardized scale based on a semi-structured clinical interview that refers to a specific time period, for example the previous week.

## **S5. Overlap in trauma- and fantasy measures**

In the main manuscript, it is described that dissociative phenomena related to traumatization and dissociative phenomena related to fantasy are not discrete categories and traumatized individuals may use fantasy to cope with traumatizing events and the aftermath of trauma. In order to investigate to what degree fantasy and trauma measures overlap in terms of variance explained in the data we performed a set of principal component analyses (PCA) with the oblique rotation (promax) method using a threshold of one for the eigenvalues (SPSS 20) [similar to [22]]. The PCA was performed on patient groups only (DID and PTSD) to avoid spurious effects [similar to [22]]. A two-step procedure was followed: The first step concerned a validation analyses that informs on how correlated measures are. To be allowed to proceed with the second step, that is the PCA, the requirement that the determinant in the PCA is  $>0.0001$  had to be met. First we analyzed the trauma- and fantasy measures separately and then in a combined manner.

For both the trauma- and fantasy analyses the validation analyses showed that the determinant was  $>0.0001$ . The PCA of the trauma measures led to the generation of three principal components, resulting in a cumulative explained variance of 72.65%. These three principal components, which are intrinsically orthogonal, were associated with a trauma component (explaining 52.49% of the variance, including PBI, TEC and CTQ), a dissociation- and depression component (explaining 10.33% of the variance and including DES, SDQ-20, CDS and BDI), and a separate anxiety component (explaining 9.84% of the variance and including STAI-T). For the fantasy measures, the PCA led to the generation of two principal components, resulting in a cumulative explained variance of 70.00%. These two principal components were associated with a component including SIMS, CEQ and the General Sleep scale of the ISES (explaining 44.67% of the variance), and a component including GSS and the Lucid Dreams scale of the ISES (explaining 25.33% of the variance).

The validation analyses on the trauma- and fantasy measures combined revealed that the STAI-T and GSS showed low correlations (hence, are unrelated) with the other measures. While CDS was strongly correlated with the trauma and dissociation measures, it also showed high correlations with the General Sleep scale of ISES and with SIMS. The SIMS was highly correlated with the General Sleep scale of ISES and it also showed high correlations with DES, SDQ, TEC and BDI. Symptoms of depersonalization (as measured by CDS) thus seem to be related to sleep disturbances, which could both be related to traumatization. Although SIMS was included as a fantasy measure, it is multi-interpretable, as was already described on page 15 of the main

manuscript. Since many items on the SIMS seem to be related to pathological symptoms in DID, it is understandable that a correlation is found between SIMS and sleep disturbances, as well as with trauma- and dissociation measures. For example, amnesia is a subscale of SIMS, which is pathognomic for DID and arguably related to trauma-related phenomena. To be allowed to proceed with the PCA and satisfy the requirement that the determinant in the PCA is  $>0.0001$  we excluded the STAI-T, and GSS (due to low correlations) and the CDS and SIMS (due to overall high correlations) from the consecutive PCA.

The final PCA led to the generation of three principal components, resulting in a cumulative explained variance of 70.87%. These three principal components were associated with a trauma component (explaining 44.78% of the variance, including PBI, TEC and CTQ), a dissociation- and depression component (explaining 16.96% of the variance and including DES, SDQ-20 and BDI), and a fantasy component (explaining 9.13% of the variance and included both scales of the ISES and CEQ).

Overall, these additional analyses reveal that trauma- and fantasy measures in our study show limited overlap and can be fairly well distinguished in different components.

In addition, intercorrelation values for suggestibility, fantasy proneness and daydreaming were calculated, for which Pearson bivariate (two-tailed) correlation analysis (SPSS 20) was used. The correlation between GSS total suggestibility scores and CEQ scores was 0.07 ( $p=0.72$ ). Based on these values, suggestibility (as measured with GSS) and fantasy proneness and daydreaming scores (as measured with CEQ) are not significantly related.

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