



## Trauma-related self-defining memories and future goals in Dissociative Identity Disorder



Rafaële J.C. Huntjens<sup>a, \*</sup>, Ineke Wessel<sup>a</sup>, Brian D. Ostafin<sup>a</sup>, Paul A. Boelen<sup>b, c</sup>, Friederike Behrens<sup>a</sup>, Agnes van Minnen<sup>d</sup>

<sup>a</sup> Department of Clinical Psychology and Experimental Psychopathology, University of Groningen, Groningen, The Netherlands

<sup>b</sup> Department of Clinical Psychology, Utrecht University, The Netherlands

<sup>c</sup> Arq Psychotrauma Expert Group, Diemen, The Netherlands

<sup>d</sup> Radboud University Nijmegen, Overwaal Center for Anxiety Disorders, Nijmegen, The Netherlands

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### ABSTRACT

This study examined the content of self-defining autobiographical memories in different identities in patients with Dissociative Identity Disorder (DID) and comparison groups of patients with PTSD, healthy controls, and DID simulators. Consistent with the DID trauma model, analyses of *objective ratings* showed that DID patients in trauma identities retrieved more negative and trauma-related self-defining memories than DID patients in avoidant identities. Inconsistent with the DID trauma model, DID patients' *self-rated* trauma-relatedness of self-defining memories and future life goals did not differ between trauma identities and trauma avoidant identities. That is, the DID patients did not seem to be "shut off" from their trauma while in their avoidant identity. Furthermore, DID patients in both identities reported a higher proportion of avoidance goals compared to PTSD patients, with the latter group scoring comparably to healthy controls. The simulators behaved according to the instructions to respond differently in each identity (i.e., to report memories and goals consistent with the identity tested). The discrepant task behavior by DID patients and simulators indicated that DID patients did not seem to intentionally produce the hypothesized differences in performance between identities. In conclusion, for patients with DID (i.e., in both identities) and patients with PTSD, trauma played a central role in the retrieval of self-defining memories and in the formulation of life goals.

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The capacity to integrate past personal events into a life story is essential for the formation of a coherent identity. Such integration allows for the maintenance of a consistent and predictable view of the self, and contributes to adaptive functioning in the present and setting personal goals for the future (Conway & Pleydell-Pearce, 2000). The ease of integration of past experiences depends on the nature of major events (e.g., how discrepant they are from self-schemas) and how one has dealt with the challenges brought about by these events (Libby & Eibach, 2002).

Traumatic experiences represent events that can be especially difficult to integrate. These experiences may have long-lasting psychological effects on one's self-image and identity, especially

\* Corresponding author. Department of Clinical Psychology and Experimental Psychopathology, University of Groningen, Grote Kruisstraat 2/1, 9712 TS, Groningen, The Netherlands.

E-mail address: [r.j.c.huntjens@rug.nl](mailto:r.j.c.huntjens@rug.nl) (R.J.C. Huntjens).

when the trauma started early in life and lasted for a long period. Such effects of early trauma, specifically chronic, attachment-related abuse or neglect, are proposed to contribute to the development of the controversial disorder Dissociative Identity Disorder (DID), which is associated with persistent problems in forming a coherent and consistent identity (e.g., Lewis, Yeager, Swica, Pincus, & Lewis, 1997; Ross & Ness, 2010; for an overview see; Dalenberg et al., 2014, 2012.; Dorahy et al., 2014; but for a critical perspective on the presumed link between dissociation and trauma see; Giesbrecht, Lynn, Lilienfeld, & Merckelbach, 2008; Lynn, Lilienfeld, Merckelbach, Giesbrecht, & van der Kloet, 2012; Merckelbach & Muris, 2001; Piper & Merskey, 2004).

In DSM-5 (American Psychiatric Association, 2013), DID is considered to be characterized by the presence of two or more distinct identity states, in which patients experience sudden alterations in the sense of self and agency. These perceived identities are also considered to differ in sensory awareness, perceptual bias, emotional tone, emotion regulation, memory processes, thought

processes, and behavioral response patterns (Dell & O’Neil, 2009). A basic tenet of the trauma model of DID is that the disorder is characterized by different identities in which patients report inconsistent access to autobiographical information (Dalenberg et al., 2012; Kluff, 1984; ISTSS, 2011; Putnam, 1997; Hart, Nijenhuis, & Steele, 2006). Two fundamental types of identities can be distinguished based on their function in the patient’s life (e.g., Hart, Nijenhuis, & Steele, 2006). The *avoidant identity type* is assumed to be unaware of traumatic experiences and focuses on dealing with responsibilities in daily life (e.g., work, study, care-taking, social interaction). In this identity, the patient experiences “too little of the past”, compulsively avoids situations or experiences that might evoke traumatic memories, and experiences numbing, detachment and partial or complete amnesia for the traumatic past. In contrast, the *trauma identity type* is “stuck” in past traumatic experiences and focuses on defense against feelings of current threat. In this state, the patient experiences “too much of the past” and not enough of the present. The patient feels and behaves as though the traumatic events are still happening or about to happen again, and experiences overwhelming emotions such as intense fear, helplessness, horror, anger, and/or shame (Boon, Steele, & Hart, 2011; Dell & O’Neil, 2009).

Debated issues in the area of DID include the descriptive psychopathology, diagnosis, etiology and treatment of the disorder (Lilienfeld, Lynn, & Lohr, 2015). In the current study, we evaluate the phenomena of identity fragmentation and amnesia. Several previous studies investigated memory functioning in DID (see Dorahy & Huntjens, 2007 for an overview). Most of these studies focused on inter-identity amnesia, which is the inability to retrieve memories of events experienced in other (types of) identities. The results indicated a failure of objective testing to substantiate the DID patients’ subjective experience of inter-identity amnesia. That is, there is transfer of information between different identities, irrespective of the valence of experimental stimuli (i.e., neutral or negative words) and the nature of the memory test (i.e., implicit or explicit). Note, however, that most of this research used *non-personal* stimuli to assess information transfer.

Studies of *personal*, autobiographical memory functioning in DID have been scarce. Investigating autobiographical memory has value not only by providing a window into the past but also by shedding light on how people define themselves based on such past experiences. Relatedly, such assessment also provides a window on psychological functioning in the present, as the reconstruction of autobiographical events in memory is modulated by current concerns, self-image, and active goals (Conway & Pleydell-Pearce, 2000; Conway, Singer, & Tagini, 2004; Sutin & Stockdale, 2011). In DID specifically, investigating autobiographical memory may provide insight into the complicated interplay between autobiographical memory and the nature and features of various identities characterized by different emotional and behavioral functions in the patient’s life.

In a recent study, Huntjens, Verschuere, and McNally (2012) used a concealed information task to assess recognition of autobiographical details in an amnesic identity. The results indicated transfer of autobiographical information between identities in DID. This study measured autobiographical memory in an indirect fashion. Studies looking at direct retrieval of autobiographical events in different identities used an autobiographical memory cueing procedure, which consists of asking the patient to retrieve specific episodes from the past related to retrieval cues. The results of two case studies (Bryant, 1995; Schacter, Kihlstrom, Kihlstrom, & Berren, 1989) employing this procedure indicated that patients with DID reported different autobiographical memories across identities, with more recent and positive memories reported in an avoidant identity, and early negative memories reported in a

trauma identity. Subsequent to these case studies, we used the Autobiographical Memory Test (AMT; Williams & Broadbent, 1986) in a larger sample of DID patients (Huntjens, Wessel, Hermans, & van Minnen, 2014). During the AMT, participants are asked to retrieve specific events from memory (i.e., an event within a restricted time period), in response to abstract positive and negative cue words. Previously it has been shown that both patients with depression and PTSD but also people who believe they harbor repressed memories of childhood sexual abuse (McNally et al., 2006), retrieve fewer specific memories in response to these cue words (e.g., categoric memories like “Every time I visited my grandparents ...”) (Moore & Zoellner, 2007; Williams et al., 2007). We hypothesized that DID patients would be inclined to retrieve fewer specific memories in their avoidant identity than in their trauma identity. Instead, we found no significant differences in memory specificity between different identities; DID patients were more overgeneral in *both* identities compared to healthy controls and they performed similar to PTSD patients (Huntjens et al., 2014). These results are at odds with previous findings suggesting compartmentalization of autobiographical memories in different DID identities (Bryant, 1995; Schacter et al., 1989). A potential reason for the discrepancy is that the AMT may not be appropriate to target personally *important* autobiographical memories (Jansari & Parkin, 1996; Rybash & Monaghan, 1999; Sutherland & Bryant, 2005),<sup>1</sup> which may be essential when considering the identity defining function of autobiographical memory (Bluck, Alea, & Ali, 2014).

A method applicable to elicit personally *important* memories is the self-defining memory paradigm. By definition, self-defining memories are exemplar autobiographical memories that reflect one’s identity. These personal recollections are affectively intense, repetitive, vivid, and comprise enduring concerns about oneself (Singer & Salovey, 1993). Several studies demonstrate the centrality of such memories to psychopathology. For example, Sutherland and Bryant (2005) investigated self-defining memories in people with PTSD following assault or road accidents. PTSD patients reported more negatively valenced self-defining memories that were related to the trauma than either trauma survivors without PTSD or non-trauma control participants. This study also investigated the relation between self-defining memories and personal goals, with the latter defined as things that were most important for the participant to achieve in the future (i.e., something that the participant was either trying to attain, or something he or she typically was seeking to avoid or prevent; Moffitt & Singer, 1994). In the PTSD group, the retrieval of trauma-related self-defining memories was found to be strongly associated with trauma-related personal goals (e.g., “I want to get over the pain”). In this study, memories of trauma thus seemed to play a central role in how people with PTSD defined themselves in terms of important personal events from the past and the goals set for the future. These findings accord with the notion that traumatic events may become central reference points for identity and for other events in the autobiographical knowledge base for those with PTSD (e.g., Berntsen, 2001).

The aim of the current study was to investigate self-defining memories and personal goals in DID in order to shed light on the

<sup>1</sup> That personal importance is relevant in considering differential identity functioning in DID is suggested by earlier work (Reinders et al., 2006; 2012) in which DID patients were directly exposed to a transcript of their reported personal trauma history. The results indicated differential brain activation in trauma identity states versus avoidant identity states. We did not include this study in the current overview because, as the authors noted, the task did not necessarily involve active memory retrieval in the DID patients, but rather passive exposure to past reported experience. The identity-specific task performance can be interpreted as differential reactivity to an emotional script.

nature and features of different identities in DID and more generally, on the relation between trauma, psychopathology, and self-identity. We compared self-defining memories reported by DID patients while they were in a trauma identity with memories reported during an avoidant identity. The DID patient performance was contrasted with that of a PTSD group with a comparable history of childhood abuse. We chose this group to ensure comparable severity of trauma history. In addition, we included comparison groups of healthy controls and DID simulators. Given the ongoing debate about DID, many previous studies have included a simulator group instructed to mimic task performance in different imagined identities (e.g., Eich, Macaulay, Loewenstein, & Dihle, 1997; Huntjens, Postma, Peters, Woertman, & Hart, 2003; for an overview see Boysen & VanBergen, 2014). We adhered to this practice by including a group of healthy amateur actors instructed to mimic DID. These simulators created two imaginary identities, one identity reporting memories of personally experienced childhood sexual abuse (denoted the trauma identity), and another identity who did not acknowledge experiences of past abuse (denoted the avoidant identity). Comparable to DID patients, the simulators performed the self-defining memory and personal goals task twice, once in each identity.

Given that the trauma model of DID emphasizes discrete, personalized behavioral states in DID (ISTSS, 2011), and given that the reconstruction of autobiographical memories is shaped by one's sense of self and current concerns, differential autobiographical memory retrieval in different DID identities was expected. Given the focus of the trauma identity on traumatic events experienced in the past and vulnerability to future harm, DID patients were expected to selectively retrieve trauma memories of negative valence and trauma-related future goals in their trauma identity. In contrast, given the detached nature of the avoidant identity, the DID patients were expected to retrieve more neutral, non-trauma-related memories in this identity. Moreover, given the avoidant identity's function to avoid (situations or experiences that might evoke) traumatic memories, this identity was expected to generate more avoidant personal goals (i.e., relative to approach goals) than the trauma identity. Avoidant goals are defined as goals related to avoiding undesirable outcomes (e.g., "I do not want to be afraid anymore"). These are contrasted with approach goals, defined as those related to approaching positive outcomes (e.g., "I want to make more friends"; Elliot & Friedman, 2007). Finally, based on the results of Sutherland and Bryant (2005), a positive association was predicted between trauma-related self-defining memories and trauma-related future personal goals for PTSD as well as DID patients, but not healthy controls.

## 1. Method

### 1.1. Participants

Given the high prevalence of DID in women compared to men (Sno & Schalken, 1999), we restricted the inclusion to female participants in all groups. Eleven DID patients participated in the study. One additional DID patient completed the self-report questionnaires but did not complete the present tasks as she found switching on demand to be too strenuous. This patient was not included in the present analyses. The mean number of reported identities was 13 ( $SD = 12$ ; range of 4–39, not including one out of the 11 DID patients who reported 196 identities). Comparison participants were 31 healthy participants, 26 DID simulating participants, and 27 patients with PTSD, who suffered early and chronic interpersonal trauma (sexual and/or physical abuse). We recruited DID and PTSD patients from treatment settings in the Netherlands and Belgium by asking clinicians to invite patients to

participate. DID or PTSD was always the primary diagnosis. Use of medication was allowed.

The DID patients self-selected two identities for participation in the experiment, with one identity reporting awareness of a traumatic past (called the trauma identity) and the other identity reporting no memories of personally experienced trauma (called the apparently normal identity). Furthermore, the selection of identities was based on: (a) the ability to switch between identities on request, (b) the ability to perform the tasks without spontaneous switches to or interference from other identities, (c) the ability to read and write, and (d) sufficient stability to perform tasks.

The healthy control participants were community volunteers who responded to a newspaper advertisement. We excluded potential participants who reported any relevant memory, visual, or attention problems and control participants who reported a history of sexual and/or physical abuse (all self-report). All healthy control participants were screened for current psychiatric disorders using the Mini-International Neuropsychiatric Interview (M.I.N.I.; Sheehan et al., 1998). They did not meet criteria for any psychiatric disorder. Additionally, we included participants instructed to mimic DID. The simulator group consisted of female amateur actors.

The current study was part of a larger study on which we reported elsewhere (Huntjens et al., 2012; Huntjens et al., 2014; van Heugten-van der Kloet, Huntjens, Giesbrecht, & Merckelbach, 2014).<sup>2</sup> The study was approved by the Medical Ethical Committee of the University Medical Center Groningen, the Netherlands.

### 1.2. Questionnaires

Trait dissociation was measured using the Dissociative Experiences Scale (DES (Carlson & Putnam, 1993)). The DES is a 28-item self-report questionnaire. Respondents are required to indicate how often they experience each item when not under the influence of alcohol or drugs. Responses are measured on a scale ranging from 0 (never) to 100 (always). The total score is the averaged score across all items, with scores above 20, or more conservatively above 30, suggest pathological dissociation. The DES has been used in well over 200 published studies and its psychometric properties are well attested (van Ijzendoorn & Schuengel, 1996). In the present sample, the DES demonstrated good internal consistency (Cronbach's  $\alpha = 0.97$ ).

*PTSD Symptom Scale Self-Report version (PSS-SR)*. The PSS-SR is a 17-item measure developed by Foa, Riggs, Dancu, and Rothbaum (1993) that taps PTSD symptoms. Respondents rate the frequency of each symptom on 4-point scales ranging from 0 (not at all) to 3 (five or more times per week/almost always). As the majority of participants reported multiple traumas, questions were anchored to the trauma causing the most distress. Control participants responded to the PSS-SR in relation to the most distressing event. The English (Foa et al., 1993) and Dutch versions (Engelhard, Arntz, & van den Hout, 2007) have good psychometric properties. Cronbach's  $\alpha$  in the current sample was 0.97.

### 1.3. Assessment and procedure

Written informed consent was obtained before participation.

<sup>2</sup> The number of participants in the current paper differs slightly from the Huntjens et al., 2012 paper. For the task described in Huntjens et al., 2012., each participant was matched to a DID patient based on certain task characteristics (i.e., answers on questions about autobiographical information as described in the paper), resulting in smaller control and simulator groups. In the current study, one additional DID patient was included who agreed to participate at a later stage.

The DID and PTSD patients were tested individually by the first author at their treatment center and the test circumstances were as standard as possible (i.e., quiet test room). The other participants were tested by research assistants. They completed the diagnostic screening by telephone and filled in the questionnaires at home in the week before the experiment, which was performed at the university laboratory.

As part of the first session, the DID and PTSD patients completed a written consent form, diagnostic interviews, the self-report version of the Posttraumatic Symptom Scale (PSS-SR; Foa et al., 1993), and the Dissociative Experiences Scale (DES; Carlson & Putnam, 1993). Other participants (i.e., simulators and healthy participants) completed the PSS-SR in relation to the most distressing event in their personal past. In a second session, two weeks later, the participants were asked to write down five self-defining memories. These were described as memories that were at least 1 year old, very familiar, clear, and important memories that had been recalled and thought about many times (Singer & Moffitt, 1991). Following the procedure described in Huntjens et al., 2014, the participants also indicated the valence of the memory on a 7-point Likert scale (ranging from 1 = very negative to 7 = very positive).<sup>3</sup> We then asked the participants to generate and write down 10 personal goals. Following Emmons (1986), these were described as things that they typically attempt to accomplish in their everyday behavior. Examples of personal goals were provided (e.g., “being attractive”, “no longer depend on my boyfriend”).

DID patients completed the self-defining memory and personal goals task twice, once in their avoidant identity and once in their trauma identity, with the order of identity counterbalanced across participants. After this, DID patients rated the extent to which all memories and goals were related to personally experienced trauma on a 7-point Likert scale (ranging from 1 = not at all to 7 = very much) (for a comparable procedure see Huntjens et al., 2014). The DID patients performed this rating task in their host identity (i.e., the identity most often in control of the patient's behavior in daily life) or another identity that was knowledgeable about the patient's trauma history. This was done to ensure that associations between memories/goals and trauma experienced by the patient were reported to the fullest extent possible. That is, even a trauma identity may only report knowledge about a specific (category of) traumatic incidences but may not be aware of *all* traumatic events experienced in the patient's past. Obviously, an avoidant identity reporting amnesia for the traumatic past would be unable to provide trauma-relatedness ratings. Similarly, an independent rater would lack the knowledge about the patients' histories that is required to infer how personal goals are linked to specific traumatic events. Therefore, we only obtained subjective trauma-relatedness ratings from host identities.

We showed the simulator participants a documentary film about a DID patient and gave them additional written information about DID. Subsequently, we asked them to create two imaginary identities. One identity had to have memories of personally experienced childhood sexual abuse (denoted the trauma identity), whereas the other was instructed not to acknowledge the abuse (denoted the apparently normal identity). Following the procedure of previous studies on DID (Huntjens et al., 2003; Silberman, 1985), simulators received a data sheet for the identity on which we asked

them to assign a name, age, gender, physical description, personal history, and personality style of the identities. Finally, we asked them to practice switching their identities during the week preceding their participation in the experiment. The simulator participants completed the screening and questionnaires as themselves (i.e., not simulating), and the self-defining memory and goals tasks in their simulated identities. The task instruction in the avoidant identity was to retrieve memories of events as experienced in this identity, not including memories of trauma, and goals consistent with this identity. In the trauma identity, the instruction was to retrieve memories of the trauma identity (i.e., including past traumatic experiences), and goals consistent with this specific identity.

#### 1.4. Scoring

Following Sutherland and Bryant (2005), an objective trauma rating was determined for the self-defining memories in addition to the self-reported trauma rating by two independent raters classifying each memory as either trauma-related or not (i.e., referring to sexual or physical abuse, neglect or excessive verbal abuse or punishing). The raters were graduate students blind to participant status. The mean interrater-reliability ( $K$ ) was 0.88. Each personal goal was coded as either an approach or avoidance goal by two independent raters according to the coding system described by Elliot and Friedman (2007). Avoidance goals can be recognized by words such as “not”, “stay away from”, and “stop” (e.g., I do not want to depend so much on my boyfriend anymore). The mean interrater agreement was  $K = 0.91$ . After establishing the interrater agreement, disagreements were discussed between raters until consensus was reached.

## 2. Results

We present nonparametric test results when appropriate (i.e., given violations of parametric test assumptions). In ANOVAs, we report Gabriel's post-hoc pairwise comparisons tests as these are powerful in case of unequal cell sizes (Gabriel, 1969).

The participants' demographics and scores on several self-report questionnaires are summarized in Table 1. Kruskal-Wallis tests indicated that the groups did not differ on age,  $\chi^2(3) = 1.45$ ,  $p = 0.69$ . The groups differed significantly on level of education,  $\chi^2(3) = 16.26$ ,  $p = 0.001$  with Mann Whitney U tests showing that PTSD patients scored significantly lower than healthy controls ( $U = 652.50$ ,  $z = 3.94$ ,  $p < 0.001$ ,  $r = 0.52$ ), and simulators ( $U = 490.00$ ,  $z = 2.58$ ,  $p = 0.01$ ,  $r = 0.35$ ). DID patients did not differ significantly from controls ( $U = 227.50$ ,  $z = 2.00$ ,  $p = 0.10$ ,  $r = 0.31$ ) or simulators ( $U = 173.00$ ,  $z = 1.08$ ,  $p = 0.33$ ,  $r = 0.18$ ), nor PTSD patients ( $U = 109.50$ ,  $z = -1.33$ ,  $p = 0.21$ ,  $r = 0.22$ ). On the DES dissociative symptoms, the group difference was significant,  $\chi^2(3) = 54.13$ ,  $p < 0.001$ . The patient groups (DID and PTSD) differed significantly ( $U = 59.00$ ,  $z = -2.88$ ,  $p = 0.003$ ,  $r = 0.47$ ), yet, as expected, the patient groups scored significantly higher than controls and simulators (all  $p$ 's  $< 0.001$ ). The simulator group did not differ significantly from the healthy comparison group ( $U = 487.50$ ,  $z = 1.36$ ,  $p = 0.18$ ,  $r = 0.18$ ). This pattern was also found for PSS-SR posttraumatic stress symptoms,  $\chi^2(3) = 68.15$ ,  $p < 0.001$ .

### 2.1. Self-defining memories in trauma versus avoidant identities

We first compared the characteristics of the self-defining memories in trauma versus avoidant identities in DID patients and simulators. The mean scores for the different identities and groups are presented in Table 2.

A paired samples  $t$ -test revealed that DID patients did not differ

<sup>3</sup> Participants also dated the memory but as the scoring of this measure was ambiguous (i.e., some patients referred to the patient age in answering and some to the identity age whereas this was unclear for the rater), we do not report this measure. Also, patients indicated the perspective of remembering (i.e., field or observer perspective). Due to an experimenter error resulting in missing values, we also do not include this measure.

**Table 1**  
Participants' demographics and median scores (and range) on posttraumatic symptoms and trait dissociation.

|                    | DID (n = 11)        | PTSD (n = 27)       | Controls (n = 31)   | Simulators (n = 26) |
|--------------------|---------------------|---------------------|---------------------|---------------------|
| Age                | 42.00 (26.00–63.00) | 41.00 (22.00–66.00) | 45.00 (25.00–61.00) | 46.00 (22.00–70.00) |
| Level of education | 6.00 (1.00–6.00)    | 5.00 (3.00–7.00)    | 6.00 (4.00–7.00)    | 6.00 (3.00–7.00)    |
| DES                | 42.86 (21.85–66.43) | 20.36 (0.00–58.21)  | 7.14 (1.07–17.50)   | 5.18 (1.07–26.07)   |
| PSS-SR             | 29.00 (20.00–49.00) | 32.00 (23.00–48.00) | 3.00 (0.00–17.00)   | 2.00 (0.00–15.00)   |

Note. Education was assessed on a scale from 1 (low) to high (7) (Verhage, 1964); DES = Dissociative Experiences Scale; PSS-SR = PTSD Symptom Scale Self-Report version.

**Table 2**  
Mean (SD) characteristics of self-defining memories and personal goals in the avoidant identity state and trauma identity state for DID patients and simulators.

|                                | DID (n = 11)      |                 | Simulators (n = 26) |                 |
|--------------------------------|-------------------|-----------------|---------------------|-----------------|
|                                | Avoidant identity | Trauma identity | Avoidant identity   | Trauma identity |
| Self-defining memories         |                   |                 |                     |                 |
| Trauma-relatedness self-report | 4.38 (1.87)       | 5.41 (1.20)     | 3.32 (1.90)         | 6.35 (0.78)     |
| Trauma-relatedness objective   | 0.04 (0.08)       | 0.38 (0.28)     | 0.02 (0.05)         | 0.25 (0.17)     |
| Valence                        | 4.76 (1.07)       | 2.54 (1.50)     | 5.38 (1.13)         | 3.27 (0.83)     |
| Personal goals                 |                   |                 |                     |                 |
| Trauma-relatedness self report | 4.64 (1.80)       | 5.01 (1.16)     | 3.06 (1.67)         | 5.76 (0.81)     |
| Proportion of avoidance goals  | 0.30 (0.16)       | 0.36 (0.16)     | 0.15 (0.13)         | 0.23 (0.14)     |

in self-reported trauma-relatedness of memories when retrieved in their trauma identity as compared to memories when retrieved in their avoidant identity,  $t(10) = 1.72, p = 0.12, \eta^2 = 0.23$ . In contrast, in the simulator group, the participants rated the memories retrieved in the trauma identity as more trauma-related compared to the memories retrieved in the avoidant identity, Wilcoxon Signed Rank test,  $z = -4.26, p < 0.001, r = 0.59$ . The independent raters coded the memories retrieved in the DID trauma identity as significantly more trauma-related (i.e., as evident in a higher proportion of trauma-related memories) compared to the self-defining memories retrieved in the avoidant identity,  $z = -2.38, p = 0.02, r = 0.51$ . A comparable result was found for the simulator group,  $z = -4.14, p < 0.001, r = 0.57$ .

With regard to memory valence, the DID patients rated memories retrieved in their trauma identity significantly more negatively compared to memories retrieved in their avoidant identity,  $z = 2.67, p = 0.008, r = 0.57$ . The simulators again showed the same pattern,  $z = 4.32, p < 0.001, r = 0.60$ .

## 2.2. Personal goals in trauma versus avoidant identities

In the DID group, the identities did not differ from each other in terms of mean self-reported trauma-relatedness of future goals,  $t(10) = 0.86, p = 0.41, \eta^2 = 0.07$ . In contrast, in the simulator group, the participants rated personal goals reported in their trauma identity as significantly more trauma-related compared to those retrieved by their avoidant identity,  $t(24) = 7.21, p < 0.001, \eta^2 = 0.68$ .

In DID, no significant difference was found between identities in the proportion of avoidance goals (i.e., number of avoidance goals divided by the total number of goals),  $t(10) = 1.34, p = 0.21, \eta^2 = 0.15$ . In contrast, in the simulator group, the difference between the identities was significant, with the trauma identities scoring a higher proportion of avoidance goals compared to the avoidant identities, Wilcoxon Signed Rank test,  $z = -2.32, p = 0.02, r = 0.32$ .

## 2.3. Self-defining memories and personal goals for DID patients compared with PTSD patients and healthy controls

The mean scores for both the PTSD and DID (for DID the average scores across identities) patient groups and the healthy controls on

the variables related with self-defining memories and personal goals are presented in Table 3. We present overall group comparisons when DID identities did not differ in task performance. In cases where previous comparisons between identities indicated significant differences, we present separate analyses for the trauma identity and the avoidant identity compared to PTSD patients and healthy controls.

The overall group comparison on trauma-relatedness of self-defining memories as indicated by the participants was significant,  $F(2, 66) = 37.78, p < 0.001, \eta^2 = 0.53$ . Post-hoc testing indicated that DID patients ( $p = 0.001$ ) as well as PTSD patients ( $p < 0.001$ ) rated their self-defining memories as more trauma-related compared to healthy controls, whereas trauma-relatedness did not differ between PTSD and DID ( $p = 0.75$ ).

On trauma-relatedness of memories rated by independent raters, we first compared the scores of DID trauma identities to PTSD patients and healthy controls. The overall group difference was significant,  $\chi^2(2) = 29.59, p < 0.001, \eta^2 = 0.44$ . Trauma identities differed significantly from healthy controls ( $U = 38.50, z = -4.75, p < 0.001, r = 0.73$ ), whereas they scored comparable to PTSD patients ( $U = 115.00, z = -1.11, p = 0.29, r = 0.18$ ). Comparing the DID avoidant identities to the other groups also resulted in a significant overall effect,  $\chi^2(2) = 27.41, p < 0.001, \eta^2 = 0.40$ , with DID avoidant identities scoring significantly lower on rater indicated trauma-relatedness compared to PTSD patients ( $U = 237.00, z = 3.02, p = 0.004, r = 0.49$ ) and comparable to healthy controls ( $U = 156.00, z = -0.74, p = 0.69, r = 0.11$ ).

Comparing the DID trauma identities with the other groups on memory valence revealed a significant overall difference between

**Table 3**  
Mean (SD) Characteristics for Self-Defining Memories and Personal Goals for DID Patients, (averaged over identities), PTSD patients, and Controls.

|   | DID (n = 11) | PTSD (n = 27) | Controls (n = 31) |
|---|--------------|---------------|-------------------|
| Self-defining memories                  |              |               |                   |
| Trauma-relatedness self-report          | 4.89 (1.22)  | 5.24 (1.05)   | 2.80 (1.14)       |
| Proportion Trauma-relatedness objective | 0.21 (0.13)  | 0.27 (0.26)   | 0.02 (0.06)       |
| Valence                                 | 3.65 (0.97)  | 3.21 (1.60)   | 4.97 (1.09)       |
| Personal goals                          |              |               |                   |
| Trauma-relatedness self-report          | 4.82 (1.34)  | 5.67 (0.87)   | 2.21 (0.89)       |
| Proportion of avoidance goals           | 0.33 (0.14)  | 0.17 (0.13)   | 0.23 (0.16)       |

groups,  $\chi^2(2) = 23.77, p < 0.001, \eta^2 = 0.35$ . DID trauma identities did not differ significantly from PTSD patients ( $U = 186.50, z = 1.23, p = 0.23, r = 0.20$ ), whereas they did score significantly more negative compared to healthy controls ( $U = 308.50, z = 3.96, p < 0.001, r = 0.61$ ). Comparing the DID avoidant identities against the other groups showed a significant overall difference between groups,  $F(2, 66) = 14.04, p < 0.001, \eta^2 = 0.30$ . Post-hoc tests indicated that DID avoidant identities indicated significantly less negative memories compared to PTSD patients ( $p = 0.004$ ), but scored comparable to healthy controls ( $p = 0.95$ ).

On personal goals, a significant group difference emerged,  $\chi^2(2) = 47.66, p < 0.001, \eta^2 = 0.69$ . Both DID ( $U = 19.00, z = -4.34, p < 0.001, r = 0.67$ ) as well as PTSD patients ( $U = 6.00, z = -6.43, p < 0.001, r = 0.84$ ) rated their goals as more trauma-related compared to healthy controls. Furthermore, DID patients tended to rate their goals as less trauma-related compared to PTSD patients ( $U = 201.50, z = 1.71, p = 0.088, r = 0.28$ ).

Interestingly, on the proportion of avoidance goals rated by independent raters,  $\chi^2(2) = 9.40, p = 0.009, \eta^2 = 0.14$ , there was a significant difference between the patient groups, with DID patients scoring higher compared to PTSD patients ( $U = 53.00, z = -3.14, p = 0.001, r = 0.51$ ). PTSD patients scored comparable to healthy controls ( $U = 507.00, z = 1.42, p = 0.16, r = 0.19$ ), while the difference between DID patients and healthy controls approached significance ( $U = 104.00, z = -1.92, p = 0.058, r = 0.30$ ).

#### 2.4. Relation between self-defining memories, personal goals, and symptoms

Nonparametric Spearman's *rho* correlations showed that in the combined patient sample ( $n = 38$ ) self-reported and objective trauma-relatedness of self-defining memories were associated ( $\rho = 0.33, p = 0.045$ ). Furthermore, self-reported ( $\rho = 0.66, p < 0.001$ ) but not objectively rated ( $\rho = 0.18, p = 0.28$ ) trauma-relatedness of self-defining memories and trauma-relatedness of personal goals were strongly associated. Finally, for the self-defining memories, the association between self-reported ( $\rho = 0.30, p = 0.068$ ) but not objectively rated ( $\rho = -0.003, p = 0.99$ ) trauma-relatedness and posttraumatic symptoms approached significance and the correlation between trauma-relatedness of personal goals and posttraumatic symptoms was significant ( $\rho = 0.44, p = 0.005$ ). No significant results were found for the association between any of these variables and dissociative symptoms in the patient sample and no significant associations were found in the control sample.

### 3. Discussion

We hypothesized differential task performance in the DID trauma and avoidant identities. DID patients were expected to selectively retrieve trauma memories of negative valence and trauma-related future goals in their trauma identity. In contrast, DID patients were expected to retrieve more neutral, non-trauma-related memories in the avoidant identity. Moreover, this identity was expected to generate more avoidant personal goals than the trauma identity. Finally, a positive association was predicted between trauma-related self-defining memories and trauma-related future personal goals for PTSD as well as DID patients, but not healthy controls. Consistent with this hypothesis, DID patients retrieved more negative and trauma-related (i.e., the latter as determined by independent raters) self-defining memories in their trauma identity compared to their avoidant identity. However, in contrast with the hypothesis of differential identity functioning, the DID patients did not differ significantly between identities in either self-reported trauma-relatedness of self-defining memories or self-

reported trauma-relatedness of future goals. They also did not differ significantly on the proportion of avoidance future goals.

According to the DID trauma model, trauma identities are characterized by their persistent reliving of traumatic events from the past and avoidant identities are characterized by their failure to integrate traumatic memories, instead focusing on responsibilities in daily life in a detached way (e.g., Boon et al., 2011). The results of the current study partly accord with these ideas. DID patients rated the memories retrieved in the trauma identity as more negative compared to those retrieved in the avoidant identity. Also, the scores of objective raters indicated that the memories retrieved in the trauma identity revolved more around reliving of trauma (i.e., explicitly referring to sexual, physical or emotional abuse or neglect) compared to the memories retrieved in the avoidant identity. Interestingly, however, DID patients themselves indicated that the memories retrieved in both identities were trauma-related to the same degree. Similarly, self-reported trauma-relatedness of future goals did not differ between avoidant and trauma identities.

A potential reason for the discrepancy between the patient and independent ratings on trauma-relatedness is that the criteria for the independent raters involved objective trauma-related events (i.e., referring to sexual or physical abuse, neglect or excessive verbal abuse or punishing). It appears that whereas memories retrieved in the trauma identity revolve more around actual traumatic events, the memories retrieved in the avoidant identities may be more strongly related to the broader area of trauma-related consequences (i.e., not finishing high school, entering a self-defense course, starting therapy).<sup>4</sup> Importantly, DID patients scored high in *both* identities on self-reported trauma-relatedness of self-defining memories and future goals. That is, the DID patients did not seem to be “shut off” from their trauma while in their avoidant identity. The trauma of DID patients seems to be strongly related both to their self-defining memories and to their personal goals, even while in the avoidant identity. Inconsistent with the DID trauma model, trauma thus seems to take a central position in the memories and goals of DID patients both in trauma *and* avoidant identities. Instead of an inability to recall negative events from one's past, DID rather seems to involve a reluctance to accept and reflect upon one's trauma history. In considering the theoretical contribution of the current data, it is important to also address alternative viewpoints of DID. The sociocognitive model of DID proposes differential identity functioning as the result of learned sociocognitive responses in high suggestible and fantasy prone individuals (e.g., Giesbrecht et al., 2008; Lilienfeld et al., 1999; Lynn et al., 2012). Given the ongoing debate about this disorder, we added a simulator group in the current study to investigate outcomes based on the instruction to behave like a DID patient. The results indicated that DID simulators' responses were partly comparable to the DID patients, “retrieving” negative, trauma-related self-defining memories (i.e., as determined by self-report and independent raters) in their trauma identity as well as trauma-related personal goals. On several measures, however, the simulators showed differences between identities which were *not* apparent in DID patients. One could say they were too good at faking (Boysen & VanBergen, 2014). They behaved according to the

<sup>4</sup> Explorative post-hoc inspection of the content of the memories that were not rated as trauma-related by the independent raters but reported as trauma-related by the patients in the avoidant state, indicated the following themes: adult partner and family relations, school and work-related performance (e.g., not finishing high school), experiences of auto-mutilation and substance abuse, running away and other experiences related to home or foster care, psychological treatment or hospitalization (e.g., starting a self-defense course), the death/suicide of a significant other, becoming a (grand)mother, the interaction between identities, other childhood experiences, and other emotional experiences.

instructions to respond differently in each identity (i.e., to report memories and goals consistent with the identity tested). Specifically, compared to their avoidant identity, they reported a significantly higher self-report trauma-relatedness in their trauma identity both on self-defining memories and on personal goals. Only the higher proportion of avoidance goals in the simulator trauma identity as compared to the avoidant identity was unexpected.

In line with previous studies (Huntjens et al., 2014), the differences in results between DID patients and simulators indicate that intentional simulation seems an unlikely explanation of the DID patient behavior. Most proponents of the trauma model and the sociocognitive model nowadays agree that DID is not a disorder of intentional simulation. Instead, proponents of both models agree that DID is a disorder of self-understanding. As Dalenberg et al. (2014) phrased it: “Clearly those with DID have the inaccurate idea that they are more than one person. However, this inaccurate belief or perception is not evidence for the inherent invalidity of the patients’ psychopathology, just as delusions of those with psychotic disorders are not indicators that they do not have a psychiatric disorder” (p. 568).

Inferences about the current results for the controversy surrounding DID as either a trauma-related disorder or a disorder mainly resulting from sociocognitive influences must be made with caution. Different identities were to some extent characterized by the retrieval of different memories from the past, but avoidant identities did not seem to focus solely on daily life independent of the traumatic past (e.g., work, study, caretaking, social interaction). Also, avoidant identities were not characterized by the formulation of more avoidant goals compared to the trauma identities. The different identities were to some degree characterized by differential retrieval. Differential retrieval of memories from the past may play a role in the development or maintenance of the different perceived identities in DID, and may hinder the formation of a coherent identity. In addition, the persistent retrieval of trauma memories in the trauma identities may be accompanied by a continuous experience of negative emotional experiences in this identity. Moreover, current trauma-focused concerns may result in the retrieval of avoidance goals completing a perpetuating circle of trauma-related self-definition and negative emotional experience. However, an alternative perspective is that differences in content and quality of self-defining memories do not precede but follow from the DID patients’ divergent construction of self in alternate identities. This possibility is illustrated by the DID simulator scores in the current study, who “retrieved” more negative, trauma-related self-defining memories in their trauma identity compared to their avoidant identity. As the reconstruction of autobiographical memories is shaped by active self-concept and goals, an acquired (i.e., by iatrogenic or other sociocognitive influences) focus on trauma and alleged differences between identities may also lead DID patients to intentionally or more automatically retrieve negative memories directly related to traumatic events in trauma identities and more positive memories in other identities. However, the differences between simulator and DID patients in this study point out that DID patients do not seem to intentionally produce the hypothesized differences in performance between identities, for they would have acted comparably to the simulators.

Previous studies indicated the central role of previous traumatic events on the retrieval of self-defining memories and future goals in PTSD (Sutherland & Bryant, 2005) and complicated grief (Boelen, 2012; Maccallum & Bryant, 2008). The current study extends these findings to PTSD patients reporting a history of severe repeated trauma starting in childhood. Additionally, the most consistent finding in the current study is the similarities in responding between PTSD patients and DID patients.

Comparing the DID patients with PTSD patients and healthy controls revealed that both PTSD patients as well as DID trauma identities retrieved more negative and trauma-related (i.e., as indicated by objective raters) self-defining memories compared to healthy controls and the avoidant identities. Conversely, the PTSD patients as well as the DID patients in both identities rated their memories as well as future goals as more trauma-related compared to healthy controls. Finally, group comparison indicated that DID patients did not resemble PTSD patients on proportion of avoidance goals. DID patients retrieved (i.e., in both identities) a higher proportion of avoidance goals compared to PTSD patients. Moreover, in the combined patient sample, the association between self-reported trauma-relatedness for self-defining memories and current posttraumatic PTSD symptoms approached significance, which is consistent with recent findings indicating that in trauma patients, especially for those suffering from PTSD, traumatic events may have become central reference points for the organization of one’s identity and for the generation of expectations for future events (Berntsen & Rubin, 2006).

The converging results in this study and our previous study of similarities in autobiographical memory functioning in DID and PTSD (Huntjens et al., 2014) may be taken as supportive of including both types of patients in a joint diagnostic category of posttraumatic disorders. The suggestion of a combined diagnostic category for PTSD and the dissociative disorders offers an alternative view to the existing opposing theoretical models of DID. Other evidence supporting the idea of such a joint category comes from studies on comorbidity of PTSD in samples of DID patients, which is very high (e.g., Rodewald, Wilhelm-Göling, Emrich, Reddemann, & Gast, 2011).

One important difference was that compared to PTSD patients, DID patients were characterized by a more avoidant style of personal goal setting (e.g., “I don’t want to be afraid anymore”). PTSD patients did not differ significantly from healthy controls in their proportion of avoidance goals, which is congruent with an earlier study in PTSD comparing veterans with and without PTSD (Kashdan, Breen, & Julian, 2010). One reason for the higher proportion of avoidance goals in DID compared to PTSD may be differences in the length of treatment or the treatment phase in both groups. Previous research indicated that in a general psychiatric sample, patients report more avoidance goals in the start phase of treatment and more approach goals in the recovery phase of treatment (Clarke, Oades, & Crowe, 2012). This would suggest a shorter mean treatment length for DID patients in the current study. However, the mean length of treatment in the current study for DID patients (median = 7.3 years, range 1–17 years) was longer instead of shorter compared to PTSD patients (median = 1.5 years, range 0–12 years). Alternatively, DID therapy may be characterized by less focus on the formulation of approach goals. Most of these DID patients are treated according to a phase-based approach, with the different phases characterized by: 1) stabilization and symptom reduction, 2) treatment of traumatic memories, and 3) integration and rehabilitation (International Society for the Study of Trauma and Dissociation, 2011). The majority of DID patients does not progress into the trauma treatment phase but remain in a first stage stabilization treatment phase even after long periods of time (Groenendijk & Hart, 1995). Possibly, DID patients are not inclined or encouraged to formulate approach goals in this initial phase of treatment. Because previous empirical studies have indicated that avoidance goals can result in negative outcomes such as lower subjective well-being (Elliot, Sheldon, & Church, 1997), special attention may need to be given to formulating more approach-related goals in the treatment of DID patients.

A limitation of the present study is the relatively small DID sample size. We have partly tackled this limitation by the inclusion

of comparison groups of adequate size. The resulting effect sizes as reported indicate medium to large effect sizes. Both significant and nonsignificant results should be qualified by the sample size. Despite the small sample size, we believe it is important to report these results as, to the best of our knowledge, this is the first study of self-defining memories and personal goals in a sample of dissociative patients and in a sample of chronic PTSD. Another limitation is that the experimenter was not blind for the group status. Blind testing of (at least) the DID patients and simulators would have been preferable (Boysen & VanBergen, 2014). Also, independent corroboration of the reported trauma memories would have added to the validity of the results, in view of findings indicating that dissociative experiences are related to commissions in emotional memory (e.g., Candel, Merckelbach, & Kuijpers, 2003). Furthermore, the lower educational level of the PTSD patients in the current sample (although not significantly lower than DID patients) may have confounded the results for the comparison between PTSD and healthy controls. However, as lower education is a known risk factor for developing PTSD (e.g., Brewin, Andrews, & Valentine, 2000), selecting a PTSD group with higher mean education may compromise the external validity to other patients with PTSD. A final limitation is that all participants completed the self-defining memory task before the future goal task. Thinking about (trauma-related) past memories may have influenced the report of goals to include more trauma-related goals. Ideally, one would counterbalance the tasks, or use a long test interval between tasks.

In sum, both DID and PTSD patients showed that trauma played a central role in the retrieval of self-defining memories as well as the formulation of personal goals. This was true for both trauma as well as avoidant identities in DID patients. Also, the self-reported trauma-relatedness of memories and goals was associated with current PTSD symptomatology. Moreover, in thinking about their future goals, the DID patients seemed more focused on the avoidance of current distress as compared to the approach of positive goals. Therapeutic interventions may profit by addressing client self-perceptions as a trauma victim, as such perceptions may play a perpetuating role in retrieving trauma-related self-defining memories that in turn substantiate maladaptive self-definition and current complaints. Instead, developing an alternative self-perception based on the experience of surviving the trauma and the experience of posttraumatic growth may potentially decrease the access to trauma-related memories. Finally, the formulation of future approach goals instead of a focus on avoidance goals in therapy may foster recovery in DID patients.

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