

**Out of Mind – Out of Sight
Studies on Clinical and Psychophysiological
Characteristics of Dissociative Identity Disorder.**

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Abstract

Dissociative identity disorder (DID; APA, 1994), previously labeled Multiple personality (APA, 1980) and Multiple Personality Disorder (APA, 1987), has good diagnostic validity (Gleaves, May, & Cardena, 2001) and is supported by taxometric research, whereby two types of dissociation have been identified: Pathological dissociation, whose features are consistent with DID, and non-pathological dissociation (Waller, Putnam, & Carlson, 1996). On these grounds, we aimed to contribute to a further validation of the construct of DID by (1) testing to which extent DID may be separated from other dissociative disorders on a series of clinical and psychophysiological measures, and (2) exploring the characteristics of DID within the framework of Personal construct theory.

14 persons with DID were compared with persons with other dissociative disorders, and non-clinical comparison participants with regard to severity of PTSD related features, dissociative functioning, hypnotizability (Paper I), and prepulse inhibition (PPI) of the acoustic startle eye-blink reflex (Paper II). Persons with DID had reduced habituation of startle reflexes and increased PPI, compared to non-DID participants. These data suggest the operation of an aberrant voluntary attentional processes in the face of unpleasant and threatening stimuli, and this may be a defining characteristic in DID. This finding supports the notion that DID is a separate clinical and nosological entity (Gleaves et al., 2001; Waller et al., 1996). Results also showed that persons with DID differed significantly from persons with other dissociative disorders with regard to the complexity and magnitude of dissociative symptomatology, and with regard to hypnotizability. These results are also indicative of DID being a separate clinical entity, qualitatively

different from other dissociative disorders (Gleaves et al., 2001; Waller et al., 1996).

As expected, histories of childhood sexual and physical assault were reported among persons with DID and persons with other dissociative disorders and both these groups attained high PTSD scores. Although the clinical groups did not differ significantly with regard to scores of current and lifetime PTSD, some differences were observable with regard to the type and occurrence of abuse, with, e.g., a higher percentage of the DID group having experienced sexual assault by a close relative during childhood compared to the group with other dissociative disorders. This is consistent with findings that DID is linked to the nature of the assault and to the relationship between the victim and the perpetrator (Boon & Drajer, 1993).

In a design involving test technology developed within the framework of Personal construct theory (Kelly, 1955), 13 persons with DID were compared to persons with other clinical conditions and non-diagnosed comparison participants with regard to cognitive complexity (Paper III). Contrary to expectations, results showed that displaying alternate personalities does not imply a more multidimensional level of thinking. However, persons with DID seemed to have a more advanced social skill in role thinking and role conceptualization, in comparison with non-dissociative persons.

The results have important implications for the identification, treatment, and understanding of DID.

List of papers

The present dissertation consists of this introduction and the following three papers, which will be referred to in the text by their Roman numerals:

Paper I

Dale, K. Y., Berg, R., Elden, Å., Ødegård, A., and Holte, A. Testing the diagnosis of dissociative identity disorder through measures of dissociation, absorption, hypnotizability and PTSD: A Norwegian pilot study. *Journal of Trauma and Dissociation*. (in press; accepted for publication 16. April 2008)

Paper II

Dale, K. Y., Flaten, M. A., Elden, Å., and Holte, A. Dissociative identity disorder and prepulse inhibition of the acoustic startle reflex. *Neuropsychiatric Disease and Treatment*. (in press; accepted for publication 2. April 2008)

Paper III

Dale, K. Y., Ødegård, A., Tschudi, F., Cromwell, R., Saunders, R., Elden, Å., and Holte, A. Exploring Personal construct theory and dissociative identity disorder. (submitted to *Journal of Constructivist Psychology*.)

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My mother, sister and brother, have been patient and supportive in this long process. My father, who passed away just a few years ago, had a huge influence on me, and I know he would be glad and relieved now. The energy to do the last rounds, I owe to Linda, my darling, who came into my life just over a year ago. Without her, this would have been a bridge too far.

I wish to dedicate this work to all the participants. My dearest thoughts go to those who have struggled most to find a way to survive with their selves.

Karl Yngvar Dale

Molde, June 2008

INTRODUCTION

Background

Dissociative identity disorder (DID; APA, 1994), previously labeled Multiple personality (APA, 1980) and Multiple Personality Disorder (APA, 1987), has good diagnostic validity (Gleaves, May, & Cardeña, 2001) and is supported by taxometric research, whereby two types of dissociation have been identified: Pathological dissociation, whose features are consistent with DID, and non-pathological dissociation (Waller, Putnam, & Carlson, 1996). On these grounds, we aimed to contribute to a further validation of the construct of DID by (1) testing to which extent DID may be separated from other dissociative disorders on a series of clinical and psychophysiological measures, and (2) exploring the characteristics of DID within the framework of Personal construct theory.

DID is defined according to the following criteria of inclusion (APA, 1994):

- the presence of two or more distinct identities, or personality states, each with its own relatively enduring pattern of perceiving, relating to, and thinking about the environment and self
- at least two of these personality states recurrently take control of the person's behavior
- inability to recall important personal information that is too extensive to be explained by ordinary forgetfulness
- the disturbance is not due to the direct physiological effects of a substance

DID is assumed to reflect a failure to integrate various aspects of identity, memory and consciousness. Each personality state may be exper-

perienced as if it has a distinct personal history, self-image, and identity, including a separate name. Individuals with this disorder experience frequent gaps in memory for personal history, both remote and recent. In addition they endure severe adjustment problems towards family, work and friends. Moreover, they experience emotional lability, impeded impulse control, eating disturbances, self mutilation and derealization (APA, 1994).

Approximately 5 % of the general population (Loewenstein, 1994) and around one-quarter of patients with psychiatric illness (Putnam et al., 1996; Saxe et al., 1993) have been reported to have a substantial level of dissociation. Dissociative phenomena are believed to occur as defenses, both during and after traumatic experiences (Spiegel, Hunt, & Dondershine, 1988). Severe and persistent sexual and physical abuse is considered to be the main etiological factor in the development of pathological dissociative survival responses and symptomatology (Boon & Draijer, 1993; Kirby, Chu, & Dill, 1993). The earlier the onset of the abuse, the more serious the symptoms (Kirby et al., 1993). Boon and Draijer (1993) found that, among seventy-one patients with DID, a history of childhood physical and/or sexual abuse was reported by 94.4% of the subjects, and 80.6% met criteria for posttraumatic stress disorder (PTSD; APA, 1994). Additional factors to be taken into consideration include the timing of the trauma and the nature of the family environment (Kirby et al., 1993).

A variety of self report instruments have been validated for the assessment of dissociative disorders. Most frequently used is the 28 item Dissociative Experience Scale (DES; Bernstein & Putnam, 1986). The DES provides a general measure of the level of dissociative experiences in everyday life. Participants are required to circle the percentage of time (given in

increments of 10% ranging from 0% to 100%) that they have had the kind of experience described within each item. A total score is computed as the mean of the responses to the 28 items. From normative data high dissociators are usually identified at a mean score above 30.

The DES is not a diagnostic tool but can serve as a screening device. More precise clinical judgments can be made on basis of the Structured Clinical Interview for DSM-IV (SCID-D; Steinberg, 1995). The SCID-D is a 276 item structured clinical interview designed to make DSM-IV dissociative disorder diagnosis. The SCID-D has an overall interrater reliability of 0.68 (Kappa), a sensitivity of 90%, and a specificity of 100% for diagnosing DID and assesses dissociative symptomatology within four dissociative subcategories, ranging from Amnesia, Depersonalization, Identity confusion, and Identity change.

DID has been categorized as a nosologic entity in our largest systems of mental disorders for nearly three decades (APA, 1980, 1987, 1994; WHO, 1992). At the same time there has been considerable debate whether DID exists as a separate clinical entity, or whether it is merely a fad (Piper & Merskey, 2004a; Piper & Merskey, 2004b) or a variant of schizophrenia, PTSD, hysteria, or borderline personality disorder (Gleaves et al., 2001). The controversy also relates to the etiology of the disorder, with opponents claiming that the disorder is iatrogenetically developed (McHugh, 1993; Merskey, 1992), and to the validity of the dynamics of the disorder, with opponents claiming that persons with DID only act out different roles (Spanos, 1994).

In view of these controversies, Gleaves et al. (2001) reviewed the empirical evidence for the diagnostic validity of DID on grounds of research conducted during the past ten years. They concluded that DID appears to

meet all of the guidelines for inclusion and none of the exclusion criteria. DID is also one of the few disorders currently supported by taxometric research. A critical finding in this respect was made by Waller et al. (1996) who identified two types of dissociation, pathological and non-pathological dissociation, by using taxometric analyses. Furthermore, the taxometric studies seem to support the validity of a pathological dissociative disorder whose features are consistent with that of DID (Gleaves et al., 2001).

The taxonic model of pathological dissociation was corroborated by Waller and Ross (1997) in a study involving taxometric analyses on DES data from 1,055 adult residents of Winnipeg. Results indicated that approximately 3.3% of the general population belongs to a taxon of pathological dissociation.

Pathological dissociation can be identified by an eight-item subscale from the DES (item 3, 5, 7, 8, 12, 13, 22 and 27) labeled the DES-T (Waller et al. 1996). Two primary content areas are represented by the DES-T items: (1) Amnesia of dissociative states and (2) Derealization or depersonalization. None of these tap normal dissociative experiences such as absorption and imaginative involvement. A total score is computed as the mean of the responses to the 8 items.

The DES-T consists of the following items:

- Some people have the experience of finding themselves in a place and having no idea how they got there.
- Some people have the experience of finding new things among their belongings that they do not remember buying.
- Some people sometimes have the experience of feeling as though they are standing next to themselves or watching themselves do something and they actually see them-selves as if they were looking at another person.

- Some people are told that they sometimes do not recognize friends or family members.
- Some people have the experience of feeling that other people, objects, and the world around them are not real.
- Some people have the experience of feeling that their body does not seem to belong to them.
- Some people find that in one situation they may act so differently compared with another situation that they feel almost as if they were two different people.
- Some people sometimes find that they hear voices inside their head that tell them to do things or comment on things that they are doing.

Dissociation, hypnotizability and trauma

Butler, Duran, Jasiukaitis, Koopman, and Spiegel (1996) hypothesized that hypnosis and pathological dissociation share an underlying process: It was observed that hypnosis could produce a variety of dissociations and that the features of absorption, dissociation, and suggestibility/automaticity could be discerned in dissociative pathology. Concordantly, in the neodissociation perspective hypnosis and dissociation are regarded as inseparable phenomena, both characterized by an ability to divide awareness (Hilgard, 1994). Moreover, involuntary hypnotic responding, or “autohypnosis”, is hypothesized to be instrumental for how mental subsystems are dissociated/disconnected by amnesic barriers, as the case might be in DID (Butler et al., 1996; Ross, 1999).

Persons with dissociative disorders have been shown to be significantly more hypnotizable than persons with other mental disorders and non-diagnosed persons (Frischholz et al., 1992). In addition, assessment instru-

ments for dissociation, such as the DES (Bernstein & Putnam, 1986) and its subscale for pathological dissociation, the DES-T (Waller et al, 1996), show high correlations with standardized hypnotizability measures (Butler & Bryant, 1997; Carlson & Putnam, 1989).

Although trauma mediates dissociation (Boon & Draijer, 1993; Kirby et al., 1993), and there is evidently a close relationship between dissociation and hypnotizability, a history of trauma does not alter hypnotizability in most individuals (Putnam & Carlson, 1998). Putnam, Helmers, Horowitz, and Trickett (1995) found that hypnotizability was not more predominant among abuse victims compared to non-abuse controls. However, highly hypnotizable subjects in the abuse group were significantly more dissociative than low hypnotizable subjects. Hence, a subgroup of “double dissociative” subjects, high in both hypnotizability and dissociativity, was identified. Furthermore, “double dissociation” was associated with multiple perpetrators and earlier onset of sexual abuse.

DID and startle

Severe dissociation is linked to sexual and physical trauma during childhood and patients with dissociative problems usually suffer the full spectrum of symptoms related to the diagnosis of PTSD (Nijenhuis, Vanderlinden, & Spinhoven, 1998; Kirby et al., 1993). There are three main types of PTSD symptoms: re-experiencing the traumatic event, avoiding reminders of the trauma and symptoms of hyperarousal or heightened anxiety (APA, 1994). The most disruptive symptoms of PTSD involve intrusive memories of the traumatic event, bad dreams about the traumatic event, flashbacks or a sense of reliving the event, feelings of intense distress when reminded of the trauma,

and physiological stress response to reminders of the event (pounding heart, rapid breathing, nausea, muscle tension, sweating) (APA, 1994).

PTSD patients have been reported to differ from normal survivors by poor habituation of skin conductance to a repetition of loud startling noises (Shalev et al., 1992). Davidson et al. (2004) suggested that this tendency to continue to identify and classify the loud tones as threatening may represent a primary defect among persons with PTSD. Due to this defect, PTSD patients are likely to continue to react to noises rather than rejecting them as redundant information (Davidson et al., 2004). It has also been suggested that individuals with PTSD have an increased tendency for vigilance, i.e., they monitor the environment for potentially threatening stimuli (Orr et al., 2002).

The startle response is a reflex that occurs among most humans and animals in reaction to an abrupt, strong sensory stimulus, for instance a loud noise. The magnitude of this response exhibits several forms of plasticity, e.g., prepulse inhibition (PPI) of the startle response. PPI refers to attenuation in response to a strong stimulus (pulse) if this is preceded shortly by a weak non-startling stimulus (prepulse). It provides an operational measure of sensorimotor gating that serves to prevent the interruption of ongoing perceptual and early sensory analysis. Prepulse inhibition is hypothesized to reflect an automatic pre-attentive inhibitory process that functions to protect the initial processing of the prepulse by dampening the effects of other concurrent or immediately following events such as a startle stimulus (Graham, 1975). In an experiment involving a series of repetitions of a startle eliciting stimulus, Ladwig et al. (2002) found that high-level dissociative patients with PTSD, compared to high-level dissociative patients without PTSD, showed increased startle reflexes and delayed habituation, indicative of

increased arousal in these patients. These data suggest that dissociative disorders are not associated with increased physiological reactivity. In fact, dissociative disorders seem to be associated with reduced physiological reactivity. Griffin, Resick, and Mechanic (1997), using heart rate and skin conductance as measures, found that there was significantly more suppression of autonomic physiological responses among high dissociators compared to low dissociators when interviewed about previous rape episodes. Ebner-Premier et al. (2005) found smaller startle reflexes in borderline disorder patients with high dissociation compared to borderline patients with low dissociation.

One possible mechanism that could explain reduced physiological reactivity in dissociative disorders is reduced attention to external stimuli. Kirino (2006) examined the pathophysiology of dissociative phenomena using the P300 component of event-related potentials, an index of controlled attentional processing, and found that patients with dissociative diagnoses exhibited attenuation of P300 amplitudes during dissociative episodes when compared with controls, indicative of reduced attention to external stimuli, but exhibited recovery to control levels in remission. The data from Kirino (2006) suggest impaired attention in DID, but only during dissociative episodes. However, that study did not use stimuli that could be classified as threatening. Taken together, these studies are consistent with the hypothesis that dissociative disorders are characterized by defensive processes in the form of reduced sensory intake or impaired attention to external stimuli.

Personal construct theory and DID

Dissociation, as a construct in psychology, sprang primarily from the work of Pierre Janet (1923). It referred to the splitting up of thought processes into compartments and sometimes the loss of conscious awareness of certain of these compartments. To describe these compartmentalized sectors of thought, sometimes lost to recall, Janet used the term subconscious. Morton Prince (1906), on the other hand, introduced the term coconscious to subsume dissociative events. Hence, it was emphasized that these various compartments could maintain an equal status of awareness with normal levels of awareness. One important theoretical implication from this work emphasized that psychogenic amnesia was secondary, i.e., subsumed by, the dissociative processes rather than being a separate phenomenon.

Since these beginnings the construct of dissociation has become more objectified in two major ways. One way concerns the formal typology (APA, 1994) with operational criteria for DID. The other has been as a collective group of personality features: (a) imaginative absorption, such as daydreaming, reading, or other activity that reduces awareness of current time, space, and self; (b) depersonalization, i.e., the loss of personal identity, and derealization, which refers to the loss of sense of self in time and place; and (c) psychogenic amnesia, i.e., a failure in memory of some aspects of experience (Bernstein & Putnam, 1986).

One benefit of this empirical shift in recent years has been that the features of imaginative absorption are found to bear no empirical link to the other features of dissociation (Waller et al., 1996). On the other hand, depersonalization and derealization not only bear an empirical link to each other but also to psychogenic amnesia as an expression of ascending severity

(Langelle, 1996). This latter research lent an aspect of construct validity to the earlier work of Janet and Prince for the superordinate construct of dissociation. Furthermore, dissociation is a part of the criteria that characterize the latter day concept of PTSD (APA, 1994). This construct of event-referenced trauma involves dissociation, anxiety, and depression.

Personal construct theory and rep grid technology (Kelly, 1955) would appear to be an appropriate framework to investigate the purported features of dissociation. For example, the DSM (APA, 1994), like all typologies, affords hypotheses that would link dissociation constructs to the total person as an observational unit (i.e., element of classification). According to Kelly (1955), personal constructs are ways of perceiving or interpreting events. An individual may be described in terms of the constructs used and in terms of the structural aspects of the construct system (for example, complex vs. simple construct system). For example, "good-bad" is a construct frequently used by people as they consider events. Under favorable circumstances, the developing individual responds to new elements (e.g., persons) in the environment with the development of new constructs, more abstract constructs, and a more hierarchical construct system. Pathological developments occur when anxiety leads to rigid construct system functioning or to chaotic system functioning in the face of repeated invalidations (Bannister & Fransella, 1966).

Both Langelle (1996) and Cromwell, Sewell, and Langelle (1996) administered the rep grid (Kelly, 1955) to high dissociators including DID patients. In both studies it was suggested that high dissociators differ from both normal controls and other mentally disordered populations in terms of how they construe the world, relationships, and life events. In Cromwell et al.'s study (1996) two DID patients, hospitalized and in treatment, completed

the rep grid. Following the stepwise procedure indicated by a computer, the participants generated their own constructs from grouping triads of elements. The elements were real people, including persons by whom the participants had been sexually offended (perpetrators), and also each individual's alternate personalities. A total number of 22 elements were used. Elements were presented, three at a time, and each patient was asked to indicate ways in which any two elements were alike and different of the third.

The authors suggest that persons with DID, when confronted with certain contradictory constructs, do not use the typical resolution by revising their existing constructs. They seem not to reconstrue themselves by developing new constructs, or a more hierarchical construct system. Instead, it is believed that the dissonance, and sense of intra-psychic conflict, is resolved by creating personified constructs ("person icons"), or "alternate" personalities.

AIMS OF THE PROJECT

We aimed to contribute to a further validation of the construct of DID. This was accomplished (1) by testing to which extent DID may be separated from other dissociative disorders on a series of clinical and psychophysiological measures, and (2) by exploring the characteristics of DID within the framework of Personal construct theory.

SUMMARY PAPERS

Paper I: Testing the Diagnosis of Dissociative Identity Disorder through Measures of Dissociation, Absorption, Hypnotizability and PTSD: A Norwegian Pilot Study.

In Paper I we expected that persons with DID and other dissociative disorders, compared to non-diagnosed comparison participants, had higher scores on a series of measures related to both dissociation and PTSD. Furthermore we expected that higher levels of dissociation were related to higher levels of hypnotizability. Lastly, we expected that persons with DID, to some extent, would be separable from persons with other dissociative disorders, with regard to measures of dissociativity, hypnotic susceptibility and PTSD.

14 persons with DID were compared with 10 persons with other dissociative disorders, and 14 non-diagnosed comparison participants with regard to the variety and magnitude of serious dissociative symptomatology, general dissociative level, pathological dissociation, absorption, current and lifetime traumatic stress, current and lifetime subjective distress, and exposure to traumatic events.

Descriptive and psychometric statistics for all groups were calculated (mean scores, CIs and SDs) and the distribution of the data was examined by Levene's test for equality of variance. Because the clinical variables failed to meet the normal distribution of the scores, we chose to use the Mann-Whitney test, a non-parametric analysis of variance, in combination with a post test Bonferroni adjustment of significance level (in order to control for type 1 error). Differences across groups with regard to age, educational level, and trauma categories were analyzed with independent samples t-tests. To ascertain if educational level could explain the variance in any of the other variables t-tests were performed on these variables with educational level, serving as the independent variable, broken into two: (1) low education participants, 9 – 12 years, and (2) high-education participants, 12 - 16 years. Significance level was adjusted post test for these analyses through the Bonferroni procedure. Power analyses on data concerning dissociative level (DES) and pathological dissociation (DES-T) data were performed to determine how much larger the samples would need to be in order to reach an alpha value of $p = .050$.

Both of the clinical groups reported histories of childhood trauma and attained high PTSD scores. The DID group differed significantly from the group with persons with other dissociative diagnoses and the non-diagnosed comparison group with regard to hypnotizability and the variety and magnitude of serious dissociative symptomatology. However, no significant differences between the two clinical groups were detected with regard to absorption, general dissociative level or symptoms related to traumatic stress.

Paper II: Dissociative Identity Disorder and Prepulse Inhibition of the Acoustic Startle Reflex.

In Paper II we assumed that attentional processing of a stimulus first engages preattentive mechanisms, i.e., automatic, reflex-like orienting, detection, and analysis, that allows the assessment of whether the stimulus is important and in need of further processing. We further assumed that if the stimulus is considered important or relevant, attention is directed to the stimulus by controlled or voluntary processes. Nijenhuis et al. (1998) claimed that dissociative defensive reactions are elicited almost instantaneously, implying that preattentive processing is sufficient for the expression of the defensive reactions and that the reactions occur without conscious control. In this study, prepulse inhibition (PPI) of the startle reflex, which may index both automatic and controlled processing, was investigated in individuals with dissociative disorders and dissociative identity disorder (DID). The ability to protect oneself from stressors, hypothesized to be accentuated in high dissociators, should be related to prepulse inhibition. The present study investigated whether this protection occurred at a preattentive automatic level, or whether it could best be understood as a controlled voluntary process. The following predictions were made: 1) If patients with dissociative disorder have reduced sensory intake or impaired attention to external stimuli (Kirino, 2006), they should show impaired PPI. If the deficits in attentional processing occurred at a preattentive level, reduced PPI should be seen in both the task and no-task conditions, at the 30 to 120 ms stimulus onset asynchronies (SOAs). At the 150 and 420 ms SOAs, reduced PPI would be indicative of impaired controlled attention directed to the prepulse. 2) Based on findings by Ebner-Priemer et al. (2006), it was also predicted that high dissociators should show smaller startle

reflexes to the startle-eliciting stimulus presented alone. This would be consistent with the defensive reaction of reduced attention to external stimuli.

8 persons with DID were compared with a group of 8 persons with other dissociative disorders (the DD group), and a group of 13 non-diagnosed comparison participants (the CONTROL group) with regard to prepulse inhibition (PPI) of the acoustic startle reflex. In the present study PPI was tested at stimulus onset asynchronies (SOAs) between the prepulse and the startle-eliciting stimulus of 30 to 420 milliseconds. Preattentive processes were tested in a condition where PPI was tested without any requirements (no-task), whereas controlled processes were introduced in a separate condition by instructing the participants to judge the duration of the stimuli presented (task). The design was a 3-Group (DID, DD, and CONTROL) \times 2 Task (Task, No-task) \times 6 SOA (30, 60, 90, 120, 150, 420 ms) mixed design with the first factor treated as a between-participants factor and the two last factors treated as within-participants factors. Subjective arousal and mood were analyzed as a 3 Group by 3 Test (before, between the conditions, after) mixed design. The data were analyzed by analysis of variance and significant effects were followed-up with contrast analyses. An alpha level of .01 was used when the presence of PPI was tested and multiple contrasts were computed. Effect sizes were computed as η^2 . To ascertain that PPI was observed, t-tests of differences from 0 (no PPI) were performed for each Group at each SOA.

The findings suggest maladaptive attentional processes at a controlled level, but not at a preattentive automatic level, in persons with DID. The prepulse occupied more controlled attentional resources in the DID group compared to the other two groups. Preattentive automatic processing, on the other hand, was normal in the DID group. Moreover, startle reflexes did not

habituate in the DID group. In conclusion, increased PPI and delayed habituation is consistent with increased vigilance in individuals with DID.

Paper III: Exploring Personal Construct Theory and Dissociative Identity Disorder.

Cognitive complexity reflects a capacity to construe social behavior in a multi-dimensional way. "A more cognitively complex person has available a more differentiated system of dimensions for perceiving others' behavior than does a less cognitively complex individual" (Bieri et al., 1966, p. 185). In Paper III it was assumed that displaying alternate personalities implies a more multidimensional level of thinking. Hence a greater complexity among DID patients was expected.

13 persons with DID, 13 persons with other mental disorders, and 10 non-diagnosed comparison participants were given Kelly rep grids and compared on the dimension of cognitive complexity. In addition, clinical observations were made in the test situation by the test leader (first author). The grids were analyzed with regard to intensity with Flexigrid, a software program developed by the third author. Intensity is a classical measure of cognitive complexity and refers to the average correlation in the grid, arrived at by squaring all the correlations, adding them together and then taking the square root. A lower amount of correlations in the grid, i.e., lower intensity, is indicative of higher levels of cognitive complexity. One-way ANOVA was used to compare intensity in the groups, followed up by independent sample t-tests with prior hypotheses. Levene's test for equality of variances was used. None were found to be significant. The distributions were thus considered not to deviate from normal. A statistical power analysis was performed post hoc

on the intensity differences between the DID and the non-diagnosed comparison group.

Displaying alternate personalities does not imply a more multi-dimensional level of thinking. Instead, the group of non-diagnosed participants had the greater degree of complexity in comparison to both clinical groups. A notable observation in the test situation was that DID patients, compared to non-DID participants, displayed a greater ease and speed of completion of the rep grid task and had less difficulty understanding the rep grid instructions, required less assistance and were faster and more autonomous in completing the test.

ETHICAL ASPECTS

The research was approved by the Regional Committee for Medical Research Ethics in Health Region V in Norway, and was conducted according to the Declaration of Helsinki. Written informed consent was obtained from all participants. No monetary reward was given.

Although trauma related research is not inevitably upsetting for participants, research on such issues must not be carried out without a thorough evaluation of the procedures involved, or without a thorough moral evaluation of the whole project (Carlson, 1996). This implies that any personal or scientific goals must be weighed against the potential for causing distress among participants. Also, special attention should be given to securing the highest degree of confidentiality.

The potential was large in this project for reviving strong feelings of inferiority, shame, and anxiety among those who had been traumatized. The worst case scenario would be that some of these participants were re-traumatized due to procedures or due to lack of sufficient support. There was also a possibility for participants who had not experienced invading circumstances to perceive the procedures as invading and threatening. Hence, it was regarded paramount that all participants should be treated with the outmost sensitivity and respect in order to reduce emotional distress. Furthermore, every bit of interaction that would take place between the test leader and assistants and the participants was given special attention on beforehand in order to prepare a psychologically secure environment for all involved. Optimally, one would be able to obtain the clinical data, without having participants feeling that they had been used, or even worse, abused.

During the clinical interviews and the rep grid sessions, there were inquiries concerning incidents of physical and sexual abuse. Participants who had histories of such events were advised to take breaks, or abort the session, if they experienced negative affect. There was also a possibility for the test leader to abort or suspend sessions due to observed negative emotional development on behalf of the participants. Prior to the procedures, participants were briefed on the contents of the inquiries and they were informed of their possibility to take brakes or abort the session. Fragile and especially sensitive participants were assisted by a friend, spouse or professional helper. There was also prepared a procedure for getting professional assistance for those who might need it due to a crisis reaction, during or after the test program.

DISCUSSION

A broader understanding of DID

As expected, histories of childhood sexual and physical assault were reported among persons with DID and persons with other dissociative disorders (Paper I) and both these groups attained high PTSD scores. I.e., all participants in the DID group met the criteria for PTSD diagnosis, both current and lifetime, a finding which is consistent with earlier research (Boon & Drajer, 1993). Although the clinical groups did not differ significantly with regard to scores of current and lifetime PTSD, some differences were observable with regard to the type and occurrence of abuse, with, e.g., a higher percentage of the DID group having experienced sexual assault by a close relative during childhood compared to the group with other dissociative disorders. This is consistent with findings that DID is linked to the nature of the assault and to the relationship between the victim and the perpetrator (Boon & Drajer, 1993).

In Paper II it was reported that inhibition of startle reflexes at 420 ms among persons with DID indicated that attention was not shifted away from the prepulse in this group, and that the prepulse still occupied resources. This finding is highly unusual and indicates extended processing of prepulses in the DID group. One possible explanation is that significant PPI at the 420 ms SOA reflects an inhibitory process that protects the individual from an intrusive stressor, i.e., the startle-eliciting stimulus. This has been described as a defining characteristic of dissociation (Nijenhuis et al., 1998; Perry & Pollard, 1998; van der Kolk et al., 1996; Williams, Haines, & Sale, 2003).

The DID group also showed a lack of habituation, which might be indicative of heightened vigilance as these participants did not inhibit the

response to the intense noise bursts as was observed in the other two groups. Reduced habituation of the startle reflex has been related to hypervigilance (Orr et al., 2002). It might also be explained in accordance with Davidson et al. (2004) as a disability to classify loud noises as redundant information and hence stop reacting to them.

Spanos (1994) argued that DID can be understood as a type of complex role play. According to Ross (1999) this would imply that there should be no discrete psychophysiological states in DID. However, the findings reported in Paper II of reduced habituation of startle reflexes and increased PPI in persons with DID, compared to non-DID participants, point in a different direction: The data suggest that persons with DID are separable from non-DID persons due to the operation of an aberrant voluntary attentional process in the face of unpleasant and threatening stimuli. In line with Ross's (1999) reasoning, this finding supports the notion that DID is a separate clinical and nosological entity (Gleaves et al., 2001; Waller et al., 1996).

Nijenhuis et al. (1998) claimed that dissociative defensive reactions are elicited almost instantaneously, implying that preattentive processing is sufficient for the expression of the defensive reactions and that the reactions occur without conscious control. This might be true, but in the circumstances created in the PPI experiment (Paper II), we obtained data that supported the conclusion that there is a controlled voluntary process involved in the protective process hypothesized to inhibit the effect of intrusive stressors in high dissociators. In other words, the data do not support the hypothesis that the protective process occurs at an automatic level. Hence, it is possible that persons with DID, at least under non-life-threatening circumstances, are able to consciously redefine their perceptions of the environment when this

environment starts to become unpleasant and intrusive. In this process it is quite possible that they reroute the perception of the stimuli observed and alter their experience of the situation.

As shown in Paper I persons with DID differed significantly from persons with other dissociative diagnoses with regard to the complexity and magnitude of dissociative symptomatology, and with regard to hypnotizability. Although one could expect that the DID group also differed from the non-DID groups with regard to DES and DES-T scores, results are consistent with earlier findings on the relationship between dissociativity and hypnotizability: Higher degrees of dissociativity are related to higher degrees of hypnotizability (Butler & Bryant, 1997; Carlson & Putnam, 1989; Putnam et al., 1995).

The results reported in Paper I expand our knowledge on the role of hypnotizability in DID in that there is now reason to believe that hypnotizability is one of the most central clinical features in DID. These results also support the notion that DID is a separate clinical entity, qualitatively different from other dissociative disorders (Gleaves et al., 2001; Waller et al., 1996).

The purpose of the study reported in Paper III was to continue a query of the utility of dissociation and the construct of DID within the theoretical framework of Kelly's Personal construct theory. Contrary to expectations, results showed that displaying alternate personalities does not imply a more multidimensional level of thinking. I.e., the DID group did not have available a more differentiated system of dimensions for perceiving others' behavior compared to non-dissociative participants. However, DID group members, compared to non-dissociative comparisons, might have a more advanced

social skill in role thinking and role conceptualization. As suggested by Cromwell et al. (1996), they appear to think in terms of "person icon" configurations rather than in construct-contrast configurations. There is also a possibility that the speed differences between DID and non-DID persons may be viewed in terms of the dimension of reflectivity vs. impulsivity. In this case the non-DID person, with or without other mental disorder, may do more self-monitoring and second guessing of their response with each step in completing the rep grid. The DID persons would be viewed as acting more immediately without these contemplations.

Perspectives on trauma and dissociation

As a species, humans have developed a wide variety of biopsychological survival mechanism (adaptive responses) in face of life-threatening and invading circumstances (Kolb, 1993; van der Kolk & Fislser, 1994; van der Kolk, 1997). Each individual has a repertoire of stress responses in relation to different stressors depending on the severity of the stressor and how prepared each individual is, mentally and emotionally, for the exposure. When exposed to threat or pain in the most extreme circumstances, there might be involved defensive responses without conscious processing. These range from "fight or flight"- responses, or hyperarousal - which involves extraordinary bodily activation and arousal (Cannon, 1929; Kardiner, 1941), to "surrender"- responses (Perry & Pollard, 1998) which are characterized by altered perceptions of the environment, and a seemingly normalized level of bodily activation. High dissociators are believed to react mostly within the surrender-spectrum in life-threatening circumstances (Nijenhuis et al., 1998; Perry & Pollard, 1998). The surrender-reaction may, to some extent, be linked to what

Holmes et al. (2005) have labeled "compartmentalization," which is a type of dissociative reaction characterized by an inability to control one's actions and by dysregulation in meta-cognitive processes. Within the surrender-spectrum there might also occur the type of involuntary hypnotic responding, or autohypnosis, which is believed to be essential for the development of DID (Butler et al., 1996, Ross, 1999). Tentatively, it is conceivable that those who develop DID, to a greater extent than those who develop other dissociative disorders, enter into a state of autohypnosis during overwhelming and life-threatening experiences. Autohypnosis is believed to facilitate, by amnesic barriers, the dissociation and disconnection of mental subsystems. In other words, while the child is protected against the full impact of the assaults through compartmentalization/autohypnosis, the process of autohypnosis also induces a parallel system of dissociated personality structures. These dissociated structures are, in turn, strengthened and become more complex as a result of repeated abuse.

During more normal day activities and under exposure to moderate degrees of stress, it is likely that persons with DID are characterized with what Holmes et al. (2005) depict as "detachment," which is defined as an altered state of consciousness characterized by a sense of separation from self or the world. Our finding in Paper II of the operation of a voluntary process that directs attention away from unpleasant or threatening stimuli among persons with DID, might reflect such a *modus operandi*.

In sum, one might presume that persons with DID, depending on the situation and the stressor, either have dissociative experiences that are beyond conscious control, or they are able to detach themselves voluntarily from the situation. These different cognitive patterns reflect different aspects of an

organism reaching for, within its own parameters, the most optimal solutions, or as Sel (1997) argues, this is a “Complex Adaptive System” (CAS). A typical CAS will involve a variety of dissociative capabilities that serve to protect the organism during and after overwhelming stress. These capabilities are believed to reduce the risk of severe disruptions in the developmental process. Hence, dissociation can, paradoxically, be regarded as a very effective means of self-preservation.

Clinical and therapeutic implications

Our results verify that dissociative disorders are associated with histories of childhood physical and sexual abuse, and that most high dissociators display the full spectrum of symptoms related to PTSD. Hence, it is reasonable to believe that persons who show clinical levels of dissociative symptoms would benefit from treatment methods that deal with trauma and are recommended in the field of PTSD.

Our results may indicate that DID can be identified more precisely if patients are assessed for hypnotic susceptibility. In accordance with Frischholz et al. (1992), it would be advisable for practitioners to use a standardized hypnosis test in combination with a standardized clinical instrument as a differential diagnostic procedure. Our results also give reason to believe that clinical hypnosis may play a central role in the treatment of DID (Dale, 1996; Kluft, 1992; Ross, 1999).

Participants with DID seemed to have an unrestrained and near intuitive comprehension of the test instructions in the rep grid procedure. To which extent the rep grid might prove to be useful for individuals with DID in a therapeutic setting must be established through further clinical research.

Strengths and limitations

A major strength in the project is that DID has been triangulated from a wide variety of angles, reflecting the fact that DID is a multifaceted and complex disorder. Through a combination of experimental procedures, personality testing, self-report questionnaires, a series of clinical interviews, and lastly, a hypnosis test, we have attained an extensive set of data. In turn, this has provided a broad basis for comparing our findings with previous observations. In addition, measures that are novel in the field of dissociation, such as PPI, the CAPS, and the rep grid, add valuable nuances to our model of DID and also provide new insight into the underlying mechanisms of the condition.

The main limitations in the project are that the samples were small and groups were to various extents uneven with regard to educational level and age. Furthermore, the non-dissociative comparison group in the PPI experiment (Paper II) was not optimally matched to the clinical groups in terms of medication.

Participants with dissociative disorders and DID came from all over Norway and were recruited through a nationwide search including 46 psychiatric institutions and via an advertisement campaign run in the local newspapers of Tromsø and Stavanger. These strategies were used within a time period of 8 months. A larger number of participants with DID and other dissociative disorders would be advantageous in terms of statistical power, but in order to obtain larger samples, a significantly longer recruitment period would have been necessary.

Participants in all the clinical groups joined the studies through self-selection or on basis of encouragement from their therapist. Even though there

are no obvious reasons why this should make a difference for the results, such strategies should be reconsidered in future studies. Ideally, clinical samples should be drawn through screening procedures within the general population in order to avoid selection bias.

There may have been underreported levels of anxiety and distress in the non-clinical comparison groups (Paper I and II). The CAPS, basically mirroring the structure of the PTSD diagnosis as defined in the DSM-IV, is not a very "fine-masked" instrument for measuring traumatic exposure. Scores are only attained when subjects report having experienced one or more traumatic event (reflecting Criterion A in the DSM-IV diagnosis), which none of the non-clinical participants did. Optimally, we could have supplemented the CAPS with an assessment tool that captured stress-related symptoms irrespective of traumatic incidents.

The most critical limitation in the rep grid procedure (Paper III) is the lack of a comparison group consisting of persons with other dissociative disorders. The inclusion of such a group would have allowed us to specify to which degree our findings are applicable to persons with dissociative disorders in general or only to persons with DID.

Future research

Personal construct psychology and rep grid methodology provides opportunities to elaborate on the perspectives wherein DID is understood to reflect a resourceful, albeit rigid, survival system. Further research within this theoretical realm is also called for in order to capture the essence of DID, which is the presence of two or more distinct personality states. Such research might be done in line with an approach used by Golinkyna and Ryle (1999)

among patients with borderline personality disorder, where each person was tested in different personality states.

There should be available a series of other options regarding future research on DID. As indicated in Paper II, it may be relevant to use threatening stimuli as prepulses or to use fear conditioning procedures as in Davis, Schlesinger, and Sorenson (1989) or Sasaki and Hanamoto (2007). One might expect that any tendencies detected in the current experiment (Paper II) with regard to PPI might be more pronounced in response to threatening stimuli. On the other hand, and in view of the autohypnosis perspective, one might also expect that persons with DID have yet another, unique, pattern of responsiveness under circumstances where (a certain degree of) anxiety is experimentally induced.

Functional neuroimaging has opened a wide range of possibilities in decomposing the psychophysiological mechanisms of DID. It has, e.g., been hypothesized that different types of dissociative parts are mediated by different parts of the nervous system (van der Hart, Nijenhuis, Steele, & Brown, 2004). These parts are believed to represent two types of action systems: (1) action systems dedicated to defense against bodily threat from others and against attachment loss (“emotional parts of the personality,” or EPs) and (2) action systems related to functioning in daily life (“apparently normal parts of the personality,” or ANPs). EPs are presumed to have different psychological, physiologic and neural reactivity to conditioned threat cues: EPs would be fixed in emotional reactivity, whereas ANPs would engage in inhibition of emotivity. These assumptions have to some extent been supported by Reinders et al. (2003). Reinders et al. used functional neuroimaging within a group of 11 persons with DID in order to investigate the

anatomical localization of self-awareness and the brain mechanisms involved in consciousness. It was demonstrated specific changes in brain activity consistent with the ability among participants to generate at least two distinct mental states of self-awareness. The findings revealed the existence of different regional cerebral blood flow patterns for different senses of self.

Generalizability theory (G-theory) is a framework for studying psychometric properties of instruments such as tests, observational measures, and clinical ratings (Hagtvet, 1997). It was originally introduced by Cronbach, Nageswari, and Gleser (1963) in response to limitations of the still popular true-score-model of classical reliability theory (Spearman, 1904). In classical test theory, we have true scores and a single error. The use of G-theory is advantageous compared to classical theory because it allows us to assess multiple sources of error in a specific measurement situation. G-theory assumes that for every construct, there exists a universe of admissible observations. This universe consists of observations which the decision maker considers interchangeable. A person's universe, or true, score is considered his/her score on all admissible observations. In order to obtain a generalizability estimation, generalization studies (G-studies) and decision studies (D-studies) are carried out. The G-study addresses questions of how well measures taken in one context generalize to another and these estimates can be used to design efficient measurement procedures.

Dissociation is closely linked to hypnotizability and PTSD. In terms of G-theory, this implies that a universe of admissible observations concerning dissociation also contains observations concerning hypnotizability and PTSD. Performing a G-study and a series of D-studies on items drawn from assessment instruments that tap these measures (i.e., the HGSHS, the SCID-D,

and the DES) would allow us to estimate how many items would be needed to suggest an optimal measure of dissociation. Furthermore, a series of D-studies, where the independent variables are manipulated in different designs (fixed/random and so on), will generate different generalization components. Through this procedure, we might identify a set of items that re-composes the original material, i.e., we might construct a new “test” for dissociation. A critical analysis will be needed in order to ascertain to which degree each item really represents the construct dissociation, and to which degree the test itself, as a whole, also represents dissociation. Furthermore, the test’s qualities as a differential diagnostic tool could be examined, i.e., to which degree the test differentiated between different types and degrees of dissociation. Does it, e.g., clearly differentiate persons with DID from persons with other dissociative diagnoses? If so, the test could prove to be very useful, both as a screening device in prevalence studies and as a first-step assessment tool in clinical practice. Optimally, it would prove to be as precise as a full scale SCID-D interview, but significantly less time consuming. This type of test might also be sensitive towards a set of subcategories of dissociative conditions that have hitherto not been detected through existing instruments. Such a discovery would both shed new light on the phenomenon of dissociation and it would have serious clinical implications. For instance, it might be established, through further clinical research, that different subcategories of dissociative disorders need different treatment approaches.

Undoubtedly, persons with DID have unique cognitive capabilities and a unique sense of the world. In order to expand our understanding and knowledge of this complex condition, we will need to combine a wide range of experimental and clinical research approaches. Ultimately, a more precise

knowledge of DID with regard to clinical, cognitive and psychophysiological features will ensure a more precise diagnostic and therapeutic practice.

CONCLUSIONS

The three Papers in the present dissertation are consistent with the following conclusions:

DID can be regarded as a clinical entity which is separable from other dissociative disorders (Paper I and Paper II).

DID is associated with histories of childhood sexual and physical assault and high PTSD scores. I.e., all participants in the DID group met the criteria for PTSD diagnosis, both current and lifetime (Paper I).

DID, compared to other dissociative disorders, is associated with more dissociative symptoms and a significantly wider range of serious dissociative symptomatology, as measured by the SCID-D (Paper I).

There is reason to believe that hypnotizability is one of the most central clinical features in DID (Paper I).

Increased PPI and delayed habituation is consistent with increased vigilance in individuals with DID (Paper II).

Persons with DID are characterized by maladaptive attentional processes at a controlled level, but not at a preattentive automatic level (Paper II).

Persons with DID, at least under non-life-threatening circumstances, are able to consciously redefine their perceptions of the environment when this environment starts to become unpleasant and intrusive. In this process it is quite possible that they reroute the perception of the stimuli observed and alter their experience of the situation (Paper II).

Displaying alternate personalities does not imply a more multidimensional level of thinking (Paper III).

Persons with DID display a greater ease and speed of completion of the rep grid task; compared to non-DID participants they have less difficulty understanding the rep grid instructions, require less assistance and are faster and more autonomous in completing the test (Paper III).

DID group members, compared to non-dissociative comparisons, might have a more advanced social skill in role thinking and role conceptualization (Paper III).

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I

**Testing the Diagnosis of Dissociative Identity Disorder through Measures of
Dissociation, Absorption, Hypnotizability and PTSD: A Norwegian Pilot
Study.**

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Abstract

14 women with dissociative identity disorder (DID) were compared with 10 women with other dissociative disorder, and 14 non-diagnosed comparison participants with regard to dissociativity, absorption, trauma related symptoms and hypnotizability. Both of the clinical groups reported histories of childhood trauma and attained high PTSD scores. The DID group differed significantly from the group with persons with other dissociative diagnoses and the non-diagnosed comparison group with regard to hypnotizability and the variety and magnitude of serious dissociative symptomatology. However, no significant differences between the two clinical groups were detected with regard to absorption, general dissociative level or symptoms related to traumatic stress. Results support the notion that DID can be regarded as a clinical entity which is separable from other dissociative disorders. Results also indicated that hypnotizability is the most important clinical feature of DID.

Keywords: DID, trauma, hypnotizability, absorption

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Introduction

Dissociative identity disorder (DID; APA, 1994) has good diagnostic validity (Gleaves, May, & Cardeña, 2001) and is supported by taxometric research, whereby two types of dissociation have been identified: Pathological dissociation, whose features are consistent with DID, and non-pathological dissociation (Waller, Putnam, & Carlson, 1996). On these grounds, and within the framework of a pilot study, we aimed to investigate if DID is a separable clinical entity in relation to other dissociative disorders.

Dissociative disorders are characterized by disruptions in the usually integrated functions of consciousness, memory, sense of identity, and perception of the environment (APA, 1994). Such disruptions must not be related to a neurological condition or processes such as overlearning or distraction (Cardeña, 1994). DID is characterized by the presence of two or more distinct identities, each with its own relatively enduring pattern of perceiving, relating to, and thinking about the environment and self (APA, 1994).

Dissociative phenomena are believed to occur as defences, both during and after traumatic experiences (Spiegel, Hunt, & Dondershine, 1988). Pathological dissociation is linked to severe traumatic stress during childhood (Kirby, Chu, & Dill, 1993). Boon and Drajer (1993) found that a history of childhood physical and/or sexual abuse was reported by 94.4% of 71 patients with DID. 80.6% met the criteria for posttraumatic stress disorder (PTSD; APA, 1994).

Persons with dissociative disorders have been proven to be significantly more hypnotizable than persons with other mental disorders and non-diagnosed persons

(Frischholz et al., 1992). In addition, assessment instruments for dissociation, such as the Dissociative Experience Scale (DES; Bernstein & Putnam, 1986) and its subscale for pathological dissociation, the DES-T (Waller et al, 1996), show high correlations with standardized hypnotizability measures (Butler & Bryant, 1997; Carlson & Putnam, 1989).

Although trauma may induce pathological dissociation, trauma is not associated with increased hypnotizability (Putnam & Carlson, 1998). Putnam et al. (1995) found that abuse victims were not more hypnotizable than non-abuse controls. However, in the abuse group, highly hypnotizable subjects were significantly more dissociated than low hypnotizable.

Based on earlier findings we should expect that persons with DID and other dissociative disorders, compared to normal controls, had higher scores on a series of measures related to both dissociation and PTSD. Furthermore we should expect that higher levels of dissociation were related to higher levels of hypnotizability. Lastly, we should expect that persons with DID, to some extent, would be separable from persons with other dissociative disorders, with regard to measures of dissociativity, hypnotic susceptibility and PTSD.

Method

Participants

Participants were assigned to three groups depending on their diagnostic status: Persons with DID (the DID group, n = 14), persons with other DSM-IV dissociative disorders (the DD group, n = 10), and non-diagnosed persons (the NODD group, n =

14). Participants in the DID group were recruited via a nationwide search among 46 psychiatric institutions, and came from all over Norway. Participants in the DD and the NODD group were recruited by contacting nearby psychiatric institutions, through newspaper advertisement, and through an e-mail based recruitment campaign at the University of Tromsø. Prior to this investigation, participants in the two clinical groups had only been tentatively diagnosed, mainly by their therapists, with regard to dissociative disorders.

Participants in the DID group (mean age 38; mean educational level 13.6) had all been hospitalized due to their mental disorder, but only three were currently in treatment. Seven were chronically disabled and seven were either working or studying at college/university level.

In the DD group (mean age 33.7; mean educational level 11.8) seven participants met the criteria for dissociative amnesia and three met the criteria for depersonalization disorder. Three participants were chronically disabled, two were in rehabilitation programs, three worked either full-time or part-time, and two were university students. All participants had been hospitalized due to their mental disorder, one was currently receiving treatment at a ward, and the rest received treatment from outpatient clinics.

None of the participants in the NODD group (mean age 29.3; mean educational level 13.7) were currently in treatment for mental health problems or had histories of such treatment. Eleven were university students, one participant worked full-time, and three worked part-time, of which two participated in work related rehabilitation programs.

The research was approved by the Regional Committee for Medical Research Ethics in Health Region V in Norway, and was conducted according to the Declaration of Helsinki. Written informed consent was obtained from all participants. No monetary reward was given.

Measures

Dissociative diagnosis was determined through the SCID-D (Steinberg, 1995), a 276 item structured clinical interview designed to make DSM -IV dissociative disorder diagnosis. SCID-D has an overall interrater reliability of 0.68 (Kappa), a sensitivity of 90%, and a specificity of 100% for diagnosing DID.

The variety of serious dissociative symptomatology was measured by adding the number of dissociative subcategories from the SCID-D suffered from to a serious degree. The sub-categories include Amnesia, Depersonalization, Identity confusion, and Identity change (rated from non-existent, through mild, moderate, to serious).

The magnitude of dissociative symptomatology (i.e., how many dissociative symptoms are experienced) was measured by adding the number of SCID-D items that had a positive registration (items 1 – 276).

Dissociative level (i.e., to which degree are symptoms present) was measured with The DES, a 28-item self-report questionnaire reported to be reliable, internally consistent, and temporally stable (Dubester & Braun, 1995). Subjects indicate in increments of

10% (0 - 100) the percentage of time they have the experience described within each item. A total score is computed as the mean of the responses to the 28 items.

Pathological dissociation was measured by the DES-T which consists of item 3, 5, 7, 8, 12, 13, 22 and 27 from the DES. A total score is computed as the mean of the responses to the 8 items.

Absorption was measured with The Tellegen Absorption Scale (TAS; Tellegen & Atkinson, 1974); a 34 item (true-false) self-report questionnaire designed to measure experiences of “hypnotic-like” occurrences where one is either absorbed by external phenomena (e.g. movies) or internal events (e.g. fantasies). A total score is computed as the summation of all items that are responded to as “true.”

Hypnotizability was measured with the Harvard Group Scale of Hypnotic Susceptibility (HGSHS; Shor & Orne, 1962), which is a 12-item scale that has a reliability measure of .83. The HGSHS usually lasts 45 – 60 minutes.

Current and lifetime traumatic stress was measured with The CAPS (Clinician-Administered PTSD Scale; Blake, et al. 1997), a structured interview designed to register current and lifetime prevalence of the 17 DSM-IV based PTSD core symptoms. Each symptom is assessed along a five point scale (0 – 4) with regard to frequency and intensity. A total score is computed by adding the frequency and intensity scores for each of the symptoms.

Current and lifetime subjective distress was measured with the CAPS. Scores are registered along a five point scale (0 - 4), from “none” to “extreme.”

Exposure to traumatic events was measured with the CAPS, wherein traumatic events are defined according to Criterion A in the DSM-IV diagnosis of PTSD and include 16 life-threatening situations, such as natural disaster, physical/sexual assault, and combat exposure. Scores for each individual were computed by adding the number of traumatic events experienced. In order to evaluate the data in line with the relatively strong theoretical basis that dissociative disorders develop as a result of sexual and physical abuse during childhood, we also organized reports of traumatic events into the following 7 categories: (1) Sexual assault during lifetime, (2) Sexual assault during childhood, (3) Sexual assault by a close relative during childhood, (4) Physical assault during lifetime, (5) Physical assault during childhood, (6) Physical assault by a close relative during childhood, and (7) Accidents, serious illness, sudden death, and natural disaster during lifetime.

Procedure

Participants completed the two self-report questionnaires. Afterwards, they underwent clinical assessment with the two clinical interviews, the CAPS and the SCID-D (administered by the second author) and the HGSHS (administered by the first author).

Data analyses

Descriptive and psychometric statistics for all groups were calculated (mean scores,

CI and SDs) and the distribution of the data was examined by Levene's test for equality of variance. Because the clinical variables failed to meet the normal distribution of the scores, we chose to use the Mann-Whitney test, a non-parametric analysis of variance, in combination with a post test Bonferroni adjustment of significance level (in order to control for type 1 error).

Differences across groups with regard to age, educational level, and trauma categories were analyzed with independent samples t-tests. To ascertain if educational level could explain the variance in any of the other variables t-tests were performed on these variables with educational level, serving as the independent variable, broken into two: (1) low education participants, 9 – 12 years, and (2) high-education participants, 12 - 16 years. Significance level was adjusted post test for these analyses through the Bonferroni procedure.

Power analyses on the DES and the DES-T data were performed to determine how much larger the samples would need to be in order to reach an alpha value of $p = .050$.

Results

Age and educational level

Mean age varied across groups but there were no significant differences between groups. There were significant differences in educational level between the DID and the DD group ($t = 2.517, df = 22, p = .02$) and between the DD and the NODD group ($t = -2.126, df = 22, p = .045$), but educational level, when broken into a high and a low education group, did not influence significantly any of the clinical variables.

Absorption and hypnotizability

There were no significant group differences with regard to absorption as measured by the TAS (Table 1.). The DID group scored significantly higher on the HGSHS than both the DD group ($p = .003$) and the NODD group ($p = .xxx$). The difference between the DD and the NODD group was non-significant (Table 1.).

Dissociative level and pathological dissociation

The DID and the DD group differed significantly from the NODD group with regard to DES scores (Table 1.), but the difference between the two clinical groups was non-significant ($p = .508$). Power analyses showed that samples of $n = 220$ would be needed in order to reach an alpha level of $p = .050$ (two tailed). DES-T scores varied slightly, but not significantly, across the clinical groups. The NODD group scored significantly lower than both the DID group and the DD group (Table 1.). Power analyses showed that samples of $n = 90$ would be needed in order to reach an alpha level of $p = .050$ (two tailed).

Variety and magnitude of serious dissociative symptomatology

The DID group had a significantly higher number of SCID-D subcategories, from which they suffered to a serious degree, than the DD group ($p = .xxx$) and the NODD group ($p = .xxx$). There was also a significant difference between the DD and the NODD group in this respect ($p = .xxx$) (Table 1.). Furthermore, the DID group scored significantly higher than the DD ($p = .xxx$) and the NODD group ($p = .xxx$) with regard to SCID-D items, and there was a significant difference between the DD and

the NODD group here ($p = .xxx$).

Insert Table 1 about here

Exposure to traumatic events

All participants in the DID and DD groups reported histories of traumatic events, but only one participant in the NODD group had had such an experience (Table 1.). The DID group did not differ significantly from the DD group in this respect.

When groups were compared with regard to our 7 categories of traumatic events, there are more reports in the DID group, compared to the DD group, of both sexual and physical abuse during lifetime, sexual and physical abuse during childhood, and sexual assault by a close relative during childhood (Table 2). T-tests showed that there were no significant differences across the clinical groups across these 7 subcategories.

Insert Table 2 about here

Current and lifetime PTSD and subjective distress

Only the clinical groups attained PTSD scores (Table 1.). All participants in the DID group met the criteria for PTSD diagnosis, both current and lifetime. In the DD group, 8 (80%) met the criteria for current PTSD and 7 (70%) met the criteria for lifetime

PTSD. As shown in Table 1. there was not a significant difference between the clinical groups with regard to scores of current and lifetime PTSD and current and lifetime subjective distress.

Discussion

The DID group differed significantly from the group of participants with other dissociative disorders with regard to the magnitude and variety of dissociative symptomatology, and especially, with regard to hypnotic abilities. Hence, our study gives support to the notion that DID can be regarded as a clinical entity which is separable from other dissociative disorders (Waller et al., 1996).

As expected, histories of childhood sexual and physical assault were reported in both clinical groups and both these groups attained high PTSD scores. Although the clinical groups did not differ significantly with regard to scores of current and lifetime PTSD, some differences were observable with regard to the type and occurrence of abuse, with, e.g., a higher percentage of the DID group having experienced sexual assault by a close relative during childhood compared to the DD group. This is consistent with findings that imply that DID is linked to the nature of the assault and to the relationship between the victim and the perpetrator (Boon & Drajer, 1993).

The DID group had significantly more dissociative symptoms and a significantly wider range of serious dissociative symptomatology, as measured by the SCID-D, than the DD group. However, the DID group did not score significantly higher than the DD group on the DES or the DES-T. Hence, neither the DES nor the DES-T differentiated between DID and other dissociative diagnoses in this sample.

With larger groups, significant differences between the clinical groups might be attainable, at least on the DES-T.

Absorption did not significantly differentiate between the groups, implying that this measure has low predictive value with regard to DID.

Based on our findings we might assume that hypnotizability is one of the most important clinical features in DID. However, it is important to interpret the results within the limitations set by a small sample pilot study. Furthermore, groups were uneven with regards to age and educational level and there was a serious limitation in the design in that the person administering the hypnosis test was not masked to diagnosis. These issues must be addressed in future studies.

Hypnosis and dissociation are complex phenomena and there need not be a straightforward explanation of how they interact (Putnam & Carlson, 1998). In the neodissociation perspective (Hilgard, 1994), hypnosis and dissociation are regarded as inseparable phenomena, both characterized by an ability to divide awareness. Moreover, involuntary hypnotic responding, or “autohypnosis”, is hypothesized to be instrumental for how mental subsystems are dissociated/disconnected by amnesic barriers, as the case might be in DID. Butler et al. (1996) hypothesized that hypnosis and pathological dissociation share an underlying process: It was observed that hypnosis could produce a variety of dissociations and that the features of absorption, dissociation, and suggestibility/automaticity could be discerned in dissociative pathology.

Persons who develop DID have endured repeated exposure to extreme physical and sexual abuse (Boon & Drajer, 1993) and these persons are also highly hypno-

tizable, as our results show. Hence, we might imagine that those who develop DID, compared to those who develop other dissociative diagnoses, are more prone to use trance states to protect themselves against overwhelming life-threatening experiences. Such a reaction pattern can be depicted as both dissociative and “autohypnotic” (Butler et al., 1996).

Our results indicate that DID can be identified more precisely if patients are screened for hypnotic susceptibility. In accordance with Frischholz et al. (1992), it would be advisable for practitioners to use a standardized hypnosis test in combination with a standardized clinical instrument as a differential diagnostic procedure. Our results also give support to the notion that clinical hypnosis may play a central role in the treatment of DID and other dissociative disorders (Kluft, 1992).

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Table 1 Descriptive and psychometric statistics and group comparisons using the Mann-Whitney Test for all groups on measures of absorption, hypnotizability, dissociation and PTSD.

Measures	Groups	N	Mean scores	95% CI of mean	SD	Mann-Whitney test		
						Groups compared	U	Exact sign.
Absorption	DID	14	21.93	18.29 – 25.57	6.30	DID v.s DD	66.00	.841
	DD	10	23.00	20.30 – 25.70	3.77	DID v.s NODD	63.00	.114
	NODD	14	18.21	14.51 – 21.92	6.41	DD v.s NODD	38.50	.064
Hypnotizability	DID	13	9.15	0 – 12	3.05	DID v.s DD	19.00	.003
	DD	10	6.30	3 – 9	2.11	DID v.s NODD	21.00	.xxx
	NODD	14	4.28	0 – 10	2.99	DD v.s NODD	43.50	.122
Dissociative level	DID	14	41.07	26.94 – 55.20	24.48	DID v.s DD	58.00	.508
	DD	10	35.17	21.27 – 49.06	19.42	DID v.s NODD	9.00	.xxx
	NODD	14	8.43	5.81 – 11.06	4.54	DD v.s NODD	11.00	.xxx
Pathological dissociation	DID	14	40.5	25.15 – 55.88	26.61	DID v.s DD	54.50	.371
	DD	10	29.3	12.96 – 45.76	22.93	DID v.s NODD	7.00	.xxx
	NODD	14	5.4	2.76 – 8.07	4.60	DD v.s NODD	19.50	.002
#Variety of serious dis. symptomat.	DID	14	4.57	4 – 5	.51	DID v.s DD	13.00	.xxx
	DD	10	2.60	1 – 5	1.34	DID v.s NODD	.00	.xxx
	NODD	14	.00	0 – 0	.00	DD v.s NODD	11.00	.xxx
*Magnitude of dis. symptomat.	DID	14	50.71	28 – 66	9.46	DID v.s DD	2.00	.xxx
	DD	10	20.30	6 – 39	9.59	DID v.s NODD	.00	.xxx
	NODD	14	.00	0 – 0	.00	DD v.s NODD	.00	.xxx
Traumatic events	DID	14	7.57	3 – 13	2.60	DID v.s DD	39.50	.074
	DD	10	5.60	3 – 11	2.70	DID v.s NODD	.00	.xxx
	NODD	14	.07	0 – 1	.26	DD v.s NODD	.00	.xxx
Current PTSD	DID	14	75.15	45 – 96	15.10	DID v.s DD	32.50	.042
	DD	10	43.50	0 – 113	39.26	DID v.s NODD	.00	.xxx
	NODD	14	.00	0 – 0	.00	DD v.s NODD	7.00	.xxx
Lifetime PTSD	DID	14	102.30	81 – 128	13.84	DID v.s DD	31.00	.036
	DD	10	70.40	4 – 113	35.83	DID v.s NODD	.00	.xxx
	NODD	14	.00	0 – 0	.00	DD v.s NODD	.00	.xxx
Current subjective distress	DID	14	2.61	2 – 4	.76	DID v.s DD	28.50	.021
	DD	10	1.30	0 – 3	1.25	DID v.s NODD	.00	.xxx
	NODD	14	.00	0 – 0	.00	DD v.s NODD	28.00	.013
Lifetime subjective distress	DID	14	3.53	2 – 4	.66	DID v.s DD	31.50	.036
	DD	10	2.60	0 – 4	1.17	DID v.s NODD	.00	.xxx
	NODD	14	.00	0 – 0	.00	DD v.s NODD	7.00	.xxx

#Variety of serious dissociative symptomatology, *Magnitude of dissociative symptomatology

Table 2 Proportion of persons, as indicated in percentages and fractions, in each group who reported experiences within 7 trauma event categories.

Categories	Groups		
	DID	DD	NODD
(1) Sexual assault during lifetime.	100% (14/14)	90% (9/10)	0
(2) Sexual assault during childhood.	85% (12/14)	60% (6/10)	0
(3) Sexual assault by a close relative during childhood.	64% (9/14)	40% (4/10)	0
(4) Physical assault during lifetime.	92% (13/14)	80% (8/10)	0
(5) Physical assault during childhood.	57% (8/14)	50% (5/10)	0
(6) Physical assault by a close relative during childhood.	42% (6/14)	50% (5/10)	0
(7) Accidents, serious illness, sudden death, and natural disaster during lifetime.	100% (14/14)	100% (10/10)	0.07% (1/14)

III

Dissociative Identity Disorder and Prepulse Inhibition of the Acoustic Startle Reflex

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Abstract

A group of persons with dissociative identity disorder (DID) was compared with a group of persons with other dissociative disorders, and a group of non-diagnosed controls with regard to prepulse inhibition (PPI) of the acoustic startle reflex. The findings suggest maladaptive attentional processes at a controlled level, but not at a preattentive automatic level, in persons with DID. The prepulse occupied more controlled attentional resources in the DID group compared to the other two groups. Preattentive automatic processing, on the other hand, was normal in the DID group. Moreover, startle reflexes did not habituate in the DID group. In conclusion, increased PPI and delayed habituation is consistent with increased vigilance in individuals with DID. The present findings of reduced habituation of startle reflexes and increased PPI in persons with DID suggest the operation of a voluntary process that directs attention away from unpleasant or threatening stimuli. Aberrant voluntary attentional processes may thus be a defining characteristic in DID.

Keywords: Dissociation, DID, PPI, startle, habituation

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Introduction

Dissociation is regarded to reflect an ability to protect oneself from intrusive stressors by perceptual detachment (Perry and Pollard 1998; Nijenhuis, Vanderlinden, and Spinhoven 1998; van der Kolk, van der Hart, and Marmar 1996). In this study, prepulse inhibition (PPI) of the startle reflex, which may index both automatic and controlled processing, was investigated in individuals with dissociative disorders and dissociative identity disorder (DID). The ability to protect oneself from stressors, hypothesized to be accentuated in high dissociators, should be related to prepulse inhibition. The present study investigated whether this protection occurred at a preattentive automatic level, or whether it could best be understood as a controlled voluntary process.

Dissociation involves alterations in consciousness, depersonalization and fragmentation of memory and sense of self. DID is characterized by the presence of two or more distinct identities or personality states, each with its own relatively enduring pattern of perceiving, relating to, and thinking about the environment and self. The disturbance is not due to the direct physiological effects of a substance (American Psychiatric Association, 1994).

Waller, Putnam, and Carlson (1996) identified two types of dissociation, pathological and non-pathological dissociation, by using taxometric analyses. These two types of dissociation do not exist along a continuum; rather they constitute two distinguishable latent classes (Meehl 1982). The taxometric studies seem to strongly support the validity of a pathological dissociative disorder whose features are consistent with that of DID (Gleaves, May and Cardena 2001).

Severe, chronic childhood trauma is considered to be the main etiological factor in the development of pathological dissociative conditions (Boon and Draijer 1993; Gleaves, May, and Cardena 2001; Kirby, Chu, and Dill 1993; Nijenhuis et al, 1998). Patients with dissociative problems usually suffer the full spectrum of symptoms related to the diagnosis of post-traumatic stress disorder (PTSD, APA 1994) (Nijenhuis et al 1998; Kirby et al 1993).

Only a few psychophysiological studies have been conducted on dissociative phenomena. In an experiment involving a series of repetitions of a startle eliciting stimulus, Ladwig et al (2002) found that high-level dissociative patients with PTSD , compared to high-level dissociative patients without PTSD, showed increased startle reflexes and delayed habituation, indicative of increased arousal in these patients. These data suggest that dissociative disorders are not associated with increased physiological reactivity. In fact, dissociative disorders seem to be associated with reduced physiological reactivity. Griffin et al. (1997), using heart rate and skin conductance as measures, found that there was significantly more suppression of autonomic physiological responses among high dissociators compared to low dissociators when interviewed about previous rape episodes. Ebner-Premier et al (2005) found smaller startle reflexes in borderline disorder patients with high dissociation compared to borderline patients with low dissociation. One possible mechanism that could explain reduced physiological reactivity in dissociative disorders is reduced attention to external stimuli. Kirino (2006) examined the pathophysiology of dissociative phenomena using the P300 component of event-related potentials, an index of controlled attentional processing, and found that patients

with dissociative diagnoses exhibited attenuation of P300 amplitudes during dissociative episodes when compared with controls, indicative of reduced attention to external stimuli, but exhibited recovery to control levels in remission. The data from Kirino (2006) suggest impaired attention in DID, but only during dissociative episodes. However, that study did not use stimuli that could be classified as threatening. Taken together, these studies are consistent with the hypothesis that dissociative disorders are characterized by defensive processes in the form of reduced sensory intake or impaired attention to external stimuli.

Attentional processing of a stimulus first engages preattentive mechanisms, ie, automatic, reflex-like orienting, detection, and analysis, that allows the assessment of whether the stimulus is important and in need of further processing. If the stimulus is considered important or relevant, attention is directed to the stimulus by controlled or voluntary processes. Nijenhuis et al (1998) claimed that dissociative defensive reactions are elicited almost instantaneously, implying that preattentive processing is sufficient for the expression of the defensive reactions and that the reactions occur without conscious control. In the present study, this hypothesis was investigated by the method of prepulse inhibition (PPI) of the acoustic startle reflex.

The startle response is a reflex that occurs among most humans and animals in reaction to an abrupt, strong sensory stimulus, for instance a loud noise. The magnitude of this response exhibits several forms of plasticity, eg, PPI. PPI refers to attenuation in response to a strong stimulus (pulse) if this is preceded shortly by a weak non-startling stimulus (prepulse). It provides an operational measure of sensorimotor gating that serves to prevent the interruption of ongoing perceptual and

early sensory analysis. Prepulse inhibition is hypothesized to reflect an automatic preattentive inhibitory process that functions to protect the initial processing of the prepulse by dampening the effects of other concurrent or immediately following events such as a startle stimulus (Graham 1975). Prepulse inhibition deficits have mainly been studied by presenting weak acoustic stimuli prior to intense startle-eliciting noise. As the participant orients to the prepulse to process it at a preattentive level, processing of other competing input is inhibited and the amplitude of the startle reflex is consequently reduced (Graham 1975). When the interval between the weak stimulus (the prepulse) and the reflex-eliciting stimulus is approximately 30 to about 300 ms there is reliable reduction of the startle reflex amplitude compared to when the reflex is elicited in the absence of the prepulse (Elden and Flaten 2002, 2003).

PPI has been shown to be amplified by controlled attentional processes, since directing attention towards the prepulse inhibits startle even further (Blumenthal and Flaten 1994). When participants are instructed to monitor the prepulse for an extended time period, increased PPI is often seen at approximately 400 ms compared to a control condition where participants are not monitoring the prepulse (Elden and Flaten 2002, 2003). Thus, voluntarily directing attention to the prepulse inhibits startle reflexes for an extended period of time after prepulse onset.

In the present study PPI was tested at stimulus onset asynchronies (SOAs) between the prepulse and the startle-eliciting stimulus of 30 to 420 milliseconds. Three groups were employed; a group diagnosed with DID, a group with other dissociative disorders, and a group of normal controls. Preattentive processes were tested in a condition where PPI was tested without any requirements (no-task), whereas

controlled processes were introduced in a separate condition by instructing the participants to judge the duration of the stimuli presented (task). If patients with dissociative disorder have reduced sensory intake or impaired attention to external stimuli (Kirino et al 2006), they should show impaired PPI. If the deficits in attentional processing occurred at a preattentive level, reduced PPI should be seen in both the task and no-task conditions, at the 30 to 120 ms stimulus onset asynchronies (SOAs). At the 150 and 420 ms SOAs, reduced PPI would be indicative of impaired controlled attention directed to the prepulse.

Based on findings by Ebner-Priemer et al (2006), it was also predicted that high dissociators should show smaller startle reflexes to the startle-eliciting stimulus presented alone. This would be consistent with the defensive reaction of reduced attention to external stimuli.

Method

Participants

Three groups of participants were recruited in order to represent three populations including persons with DID, persons with other dissociative disorders, and non-diagnosed persons. A total of 29 persons participated in the study. Participants in the DID sample (the DID group) consisted of 8 women, with a mean age of 34.1 and an age range from 21 to 46. All of these participants had been hospitalized at least once due to their mental disorder. Only two were currently in treatment at a psychiatric ward and six attended outpatient clinics. Two participants were chronically disabled and received welfare, three participants were in a rehabilitation program including

work training, two were on medical leave of absence from their daytime jobs, and one participant was working 80 percent. Participants in the DID group came from all over Norway and were recruited via a nationwide search including 46 psychiatric institutions, both outpatient clinics and wards. The institutions were contacted directly by telephone and letter stating the intentions of the study. The institutions were encouraged to pass on our quest to any patient they might be in contact with who had been diagnosed with DID. If any of these persons were interested to participate in the study, they were encouraged by their therapists to verify this to the first author (KYD) by telephone, e-mail or a written letter.

Participants in the dissociative disorders sample (the DD group) consisted of 7 women and one man with a mean age of 33.7 and an age range from 19 to 45. Two participants in this sample were diagnosed with depersonalization disorder only and the remaining six participants were diagnosed with both depersonalization disorder and dissociative amnesia. Three participants in this group were chronically disabled, two were in a rehabilitation program, one was a college student, and two participants worked full-time. All participants in this group had been hospitalized due to their mental disorder. One was currently receiving treatment at a ward and seven received treatment at outpatient facilities. Most of the participants in the DD group were recruited by contacting nearby mental care institutions using the same procedure as that was used to recruit persons with DID. Some participants were also recruited via a newspaper advertisement. In the advertisement, which was run in the local newspapers of Tromsø and Stavanger, it was stated that we were interested in recruiting persons who either had a diagnosis of DID or who had some of the following experiences: 1)

Finding themselves in a place and having no idea how they got there, 2) Not being able to remember important life events, 3) Acting so differently in different situations that they feel as if they were different persons, and 4) Hearing voices inside their head that tell them what to do.

The non-diagnosed sample (the CONTROL group) consisted of 7 women and 6 men with a mean age of 29.1 and an age range from 20 to 41. None of these had dissociative disorders and none were currently in treatment for mental health problems or substance abuse or had histories of such treatment. Eleven persons were university students and two worked part-time within the framework of a work related rehabilitation program. Participants in the CONTROL group were mostly recruited through an e-mail recruitment campaign at the University of Tromsø. Some of the participants were also recruited via a newspaper advertisement in the local newspaper in Tromsø in which it was stated that people were needed to participate in clinical and psychophysiological tests.

All participants had auditory thresholds of 20 dB or less in both ears at 1000Hz. Seven of the participants in the DID group, three of the participants in the DD group and one participant in the CONTROL group used a prescription drug on a regular basis. The medication in the DID group consisted of centralstimulants (two participants), antidepressants (two participants), anxiolytics (two participants), a thyroid hormone drug (one participant), a hypnotic agent (one participant), and an antipsychotic drug (one participant). In the DD group anxiolytics were used by three participants and one participant used an antidepressant. None of the participants in the CONTROL group used any drug.

The research was approved by the Regional Committee for Medical Research Ethics in Health Region V in Norway, and was conducted according to the Helsinki declaration. Written informed consent was obtained from all participants. No monetary reward was given to the participants.

Clinical measures

Assessment of dissociative diagnosis. Clinical assessment with regards to dissociative diagnosis was obtained through the administration of the SCID-D (Steinberg 1995). The SCID-D is a 276 item structured clinical interview used to diagnose DSM -IV dissociative disorder. The SCID-D also includes registration of demographic data, work history, treatment history, somatic disease, substance abuse and family history. The schedule has an overall interrater reliability of 0.68 (Kappa), a sensitivity of 90%, and a specificity of 100% for the diagnosis of DID (Steinberg 1995). A SCID-D interview usually takes approximately 90 minutes.

Assessment of current and lifetime traumatic stress. Current and lifetime traumatic stress was measured with the CAPS (Clinician-Administered PTSD Scale; Blake et al 1997) that is a structured interview designed to assess 17 symptoms of PTSD outlined in the DSM-IV. Scores are only attained when subjects report having experienced one or more traumatic event (Criterion A in the DSM-IV diagnosis). The CAPS can be used to assess the severity and frequency of each symptom. It provides a comprehensive assessment of both lifetime and current PTSD. Frequency and intensity

ratings are made on five-point scales. A CAPS interview usually lasts from 40 to 90 minutes depending on the extensiveness of the traumatic experiences.

Assessment of dissociative level. Dissociative level was measured with the Dissociative Experience Scale (DES, Bernstein and Putnam 1986), The DES is a 28-item self-report questionnaire that has been reported to be reliable, internally consistent, and temporally stable (Dubester and Braun 1995). It is not a diagnostic tool but serves as a screening device for dissociative disorders. Participants are required to circle the percentage of time (given in increments of 10% ranging from 0 - 100) that they have the kind of experience described in each item. A total score is computed as the mean of the responses to the 28 items. High dissociators will usually be identified among those with mean scores of 30 or above (Bernstein and Putnam 1986).

Assessment of subjective states. The mood rating scale of Bond and Lader (1974) was used to assess alertness, calmness, and contentness.

Apparatus and stimuli

The experiment was conducted in an electrically and sound shielded chamber (Tegnér) where temperature was maintained at 20 ± 1.5 C. Control of the experiment and data acquisition was performed via a Keithley 575 interface. All programs for experimental control and data scoring were written in ASYST 3.1 by the second author (MAF). The auditory equipment used for the hearing test was a Grason-Stadler, Inc. GSI 17 Audiometer (accuracy $\pm 3\%$) and Telephonix TDH39 earphones with MX41AR

cushions. Background noise levels were ambient at about 28 dB (Flaten, Nordmark, and Elden 2005).

The startle-eliciting noise had an intensity of 95 dB SPL with instantaneous rise time and duration of 50 ms, and was produced by a Coulbourn S81-02 noise generator. The associated comparison stimulus had an intensity of 85 dB SPL with instantaneous rise-time and a duration of 40 or 60 ms. The output was passed to a Coulbourn S77-06 multiplier/divider and then to a Coulbourn S78-03 linear summing amplifier. The output was sent to a NAD Electronics 3225PE stereo amplifier and then to a pair of Telephonix TDH 39 earphones. The tone prepulse stimuli and the associated comparison stimuli had intensities of 60 dB SPL with rise times of 20 ms, a frequency of 1000 Hz, and were generated by a Coulbourn S81-06 signal generator, the output of which was sent to a Coulbourn S84-04 rise/fall gate. The signal then entered a Coulbourn linear summing amplifier, then the NAD amplifier, and finally the earphones.

Eye blink EMG reflexes were recorded from the left orbicularis oculi with Ag/AgCl Beckman miniature electrodes filled with TECA conducting paste. The EMG signal was amplified with a factor of 60,000 and filtered (passing 90 - 250 Hz) by a Coulbourn S75-01 Bioamplifier. The signal was rectified and integrated by a Coulbourn S76-01 contour-following integrator with a 10 ms time constant, and the output was sent to the computer via the Keithley interface. Sampling on each trial began 200 ms prior to onset of the first stimulus and continued for 200 ms after onset of the startle stimulus. The sampling rate was 10 Hz prior to onset of the first stimulus and 1000 Hz after stimulus onset.

Comparison stimuli were presented 4000 ms prior to the prepulse and startle-eliciting stimuli. Half of the comparison stimuli were 10-20 ms shorter than the prepulse and startle stimulus, and the other half of the comparison stimuli were 10-20 ms longer than the prepulse and startle stimulus. The duration of the prepulse was 30, 60, 90, 120, 150, or 420 ms, while the duration of the associated comparison stimulus was 20 or 40, 40 or 80, 70 or 110, 100 or 140, 130 or 170, and 400 or 440 ms, respectively. The duration of the startle stimulus was 50 ms and the associated comparison stimulus was +/-10-20 ms. Prior to electrode placement the skin was cleaned with pads containing alcohol and pumice. The EMG electrodes were attached about 10 - 15 mm below the pupil and about 15 - 20 mm below the outer canthus of the left eye. A ground electrode was placed on the forehead.

Procedure

The whole test program lasted a day including intermissions during which the participants filled in the DES form, underwent clinical assessment with the two clinical interviews, the SCID-D and CAPS (performed successively in that order), and lastly, were tested in the psychophysiological laboratory. The clinical interviews were administered by a research assistant who had been trained specifically for this occasion. The laboratory procedures were administered by the first author (KYD).

All participants were examined under identical laboratory conditions. The duration of the experiment was approximately 66 min. Participants were tested under two experimental conditions involving both a passive (No-task) and an active (Task)

attention protocol. Subjective arousal and mood was measured before, between and after the protocols.

At the beginning of each experimental session the participants were placed in an armchair and told that the purpose of the experiment was to investigate effects of attention on physiological and psychological reflexes. Electrodes for measurement of EMG and earphones were then placed on the participants. Lastly, participants were instructed to stay awake, sit with their eyes open, and move as little as possible during the experiment.

Each experiment involved presentations, in a pair-wise fashion, of continuous pure-tone prepulses followed by a white noise startle-eliciting stimulus. The stimulus onset asynchronies (SOAs) between the prepulse and the startle stimulus were 30, 60, 90, 120, 150, and 420 ms. Each of the six SOAs was presented 12 times in semi-random order. The startle stimulus was also presented alone 12 times. Thus 84 trials were presented in each of the Task and No-task conditions. The intertrial interval varied between 13-24 s with a mean of 18 s. The seven conditions were presented in nine blocks of eight trials, one trial for each condition. This ensured random presentation of the SOAs and the control condition. In the Task condition, participants were asked to compare the duration of the tone and noise in each stimulus pair. The following information was provided to the participants before the test; “You will hear some tones and some scratch noises. First a tone is presented and shortly afterwards a scratch is presented. Four seconds later, the same pair of stimuli will be presented a second time. Your task is to judge whether the duration of the second tone is shorter or longer than the duration of the first tone, and if the second scratch is longer or shorter

than the first scratch.” A similar procedure was used by Heekeren et al (2004) where participants were instructed to direct their attention both to the prepulse and the pulse. In the No-Task condition the participants did not receive any instructions besides to sit down, relax, and keep their eyes open; the condition was otherwise identical with the Task condition. The order of presentation of the Task and No-task conditions were counterbalanced across subjects. After completion of the experimental procedure the electrodes were removed.

Reflex scoring and data treatment

The reflex was scored 20 - 120 ms after onset of the startle stimulus. To count as a startle reflex, the integrated EMG voltage had to increase at least 30 A/D units relative to baseline, which was computed as the mean EMG in the 200 ms prior to stimulus onset. Reflex amplitude was the maximum difference between baseline EMG level and peak, in arbitrary analog-to-digital units. Prepulse inhibition was calculated as the ratio of reflex amplitudes on prepulse trials to startle stimulus alone trials. The proportion measure recommended by Blumenthal, Elden, and Flaten (2004) is less dependent on control startle amplitude.

The subjective indexes of arousal and mood were expressed as posttest minus pretest scores.

Design and analysis

The design was a 3-Group (DID, DD, and CONTROL) x 2 Task (Task, No-task) x 6 SOA (30, 60, 90, 120, 150, 420 ms) mixed design with the first factor treated as a

between-participants factor and the two last factors treated as within-participants factors. Subjective arousal and mood were analyzed as a 3 Group by 3 Test (before, between the conditions, after) mixed design. The data were analyzed by analysis of variance and significant effects were followed-up with contrast analyses. An alpha level of .01 was used when the presence of PPI was tested and multiple contrasts were computed. Effect sizes were computed as η^2 . To ascertain that PPI was observed, t-tests of differences from 0 (no PPI) were performed for each Group at each SOA.

Results

Subjective arousal and mood

There was a main effect of Test for alertness ($F(2, 90) = 31.08, p < .0001, \eta^2 = .40$) due to decreased alertness across Tests for all Groups. No main effects or interactions were significant for the contentedness and calmness dimensions of the Bond and Lader (1974) scale.

Insert Table 1 about here

Current and life time PTSD

There were several reports among the participants in the DID and DD groups of both sexual and physical abuse during adulthood and childhood and sexual and physical assault by a close relative during childhood. Participants in these groups had also experienced a wide range of other traumatic incidents, such as serious illness, natural

disaster and dramatic accidents. There were no reports in the CONTROL group of experiences related to non-intrusive, non-abusive incidents, or to experiences related to sexual abuse or physical assault. All participants in the DID group met the criteria for PTSD diagnosis, both current and life time. In the DD group, six met the criteria for current PTSD and seven met the criteria for life time PTSD. None of the participants in the CONTROL group met either of these criteria. As shown in Table 1, only the two clinical groups attained PTSD scores. The scores are a summation of trauma-related symptoms and the intensity level for each symptom. The DID group scored higher than the DD group, both with regards to current and life time PTSD, but these differences were not significant.

Dissociative level

Dissociative levels (Table 1) as measured by the DES varied slightly but not significantly across the clinical groups with mean scores of 43.00 in the DID group and 40.50 in the DD group. The CONTROL group had a mean score of 10.42 and scored significantly lower than both the DID group ($F(1, 26) = 14.77, p = .001$) and the DD group ($F(1, 26) = 12.59, p = .002$).

Startle alone

Reflexes to the noise alone habituated across Trials in the CONTROL and DD groups but not in the DID group (Group by Trials interaction ($F(22, 286) = 1.82, p < .005, \eta^2 = .10$). This was confirmed by trend analyses that showed linear trends in the CONTROL and DD groups ($F(1,26) = 7.25$ and 4.62 , respectively, $ps < .05$), but not

in the DID group ($F < 2$, $p = .18$) (Figure 1). There was also a significant interaction of Task by Trials ($F(11, 286) = 2.88$, $p < .002$, $\eta^2 = .09$) due to more pronounced habituation in the Task condition.

Insert Figures 1 and 2 about here

PPI

To ascertain that PPI was in fact observed, t-tests from 0 were performed. For the CONTROL group, significant inhibition of startle was seen at the 30, 60, 90, 120 and 150 ms SOAs ($t(12) < -4.70$, $ps < .001$) and not at the 420 ms SOA ($t(12) = -1.80$, $p = .11$). The same pattern was seen in the DD group, where significant inhibition was seen at the SOAs from 30 to 150 ms ($t(7) < -4.25$, $ps < .004$), whereas there was no inhibition at the 420 ms SOA ($t(7) = -2.06$, $p = .08$). In the DID group, however, significant PPI was seen at all SOAs ($t(7) < -4.20$, $ps < .004$).

There were significant main effects of Task ($F(1, 26) = 20.10$, $p < .01$, $\eta^2 = .42$) due to increased PPI during the Task condition compared to the No-task condition (means of $-.62$ and $-.35$, respectively). There was also a main effect of SOA ($F(5, 130) = 15.71$, $p < .01$, $\eta^2 = .34$). This was due to increased PPI at the 90 ms SOA compared to the 30 ms SOA ($ps < .05$). There was also less PPI at the 420 ms SOA compared to the other five SOAs ($ps < .0001$).

There was an interaction of Group x SOA ($F(10, 130) = 2.00$, $p < .04$, $\eta^2 = .08$). Figure 2 shows that the CONTROL group displayed strong and reliable PPI. The DID

group displayed somewhat weaker PPI compared to the CONTROL group at the shorter SOAs, but there was a tendency to more inhibition in the DID group compared to the CONTROL group at the 420 ms SOA in the Task condition ($p = .064$). The DID group did not display the hyperbolic PPI function usually observed at the present SOAs. This was confirmed in a trend analysis where significant quadratic trends were seen in the CONTROL and DD groups ($F_s(1, 26) = 36.53$ and 10.66 , respectively, $ps < .01$), but not in the DID group ($F = 3.38$, $p = .077$).

Finally, the interaction of Task by SOA ($F(5, 130) = 2.97$, $p < .02$, $\eta^2 = .09$) was due to increased PPI in the Task compared to the No-task condition at the 30, 60, 90, 120, and 150 ms SOAs ($ps < 0001$). No other main effects or interactions were significant ($F < 1$).

Discussion

Startle reflexes to the startle-eliciting stimulus alone were of the same magnitude in all three groups. Thus, any differences in PPI could not be attributed to differences in startle magnitudes. Moreover, by presenting the PPI data as proportion of difference from control, the effect of between-group differences in startle magnitudes on PPI were reduced or eliminated (Blumenthal et al 2004).

The interaction of Group by Trials in the startle alone data was due to a lack of habituation in the DID group. Figure 1 shows that responding in the DID group was variable across Trials compared to the DD and CONTROL groups where habituation was orderly across Trials. This was supported by significant linear trends in the CONTROL and DD groups, but not in the DID group. A lack of habituation indicates

heightened vigilance in the DID group as these participants did not inhibit the response to the intense noise bursts as was observed in the other two groups. Reduced habituation of the startle reflex has been related to hypervigilance (Orr et al 2002). It might also be explained in accordance with Davidson et al (2004) as a disability to classify loud noises as redundant information and hence stop reacting to them. The present data suggests that such an underlying pathology is present in DID, but not necessarily in other dissociative disorders.

The variability in startle reflexes across trials in the DID group could be related to the order of presentation of stimuli. Startle-eliciting stimuli presented alone were interleaved with prepulse trials in the present experiment. Thus, dishabituation, ie, the recovery of a habituated reflex due to presentation of a novel stimulus, probably played a role in the results and mostly so in the DID group. According to the classic habituation theory of Groves and Thompson (1970), dishabituation reflects the general process of sensitization or arousal, and this seems to have been increased in the DID group.

There was significant PPI in all three groups. The interaction of Group by SOA, however, indicated aberrant PPI among participants diagnosed with DID compared to non-diagnosed controls. At the 420 ms SOA, PPI in the DID group did not return to baseline levels as it did in the group of healthy volunteers and the DD group. This was supported by significant quadratic trends in the DD and CONTROL groups, but not in the DID group. Thus, the prepulse seems to have occupied controlled attentional resources for a longer time period in the DID group compared to the other two groups. The data from the CONTROL and DD groups indicate that these groups analyzed the

prepulse, as evidenced by significant PPI, and then shifted their attention away from the prepulse, as evidenced by a return of startle reflex magnitudes, to baseline levels. Inhibition of startle reflexes at 420 ms indicates that attention was not shifted away from the prepulse in the DID group, and that the prepulse still occupied resources in this group. This finding is highly unusual and indicates extended processing of prepulses in the DID group. One possible explanation is that significant PPI at the 420 ms SOA reflects an inhibitory process that protects the individual from an intrusive stressor, ie, the startle-eliciting stimulus. This has been described as a defining characteristic of dissociation (Perry and Pollard 1998; Nijenhuis et al 1998; van der Kolk et al 1996).

Closer scrutiny of the PPI data from the DID group reveals somewhat reduced but still normal PPI in this group for the first 120 ms after prepulse onset. Maximum PPI was seen at 90 ms, which is normal with acoustic stimuli at the stimulus intensities used in the present study, and slightly decreased PPI was seen at 120 compared to 90 ms. However, at 150 ms, PPI again increased in the DID group. It is interesting that the “break” in the normal PPI function occurs between 120 and 150 ms, when stimulus processing is assumed to shift from automatic to controlled processes (Dawson et al 1997). Thus, it seems that preattentive automatic processing was normal in the DID group, but that more controlled attentional processing was directed to the prepulse compared to the two other groups. Thus, the PPI data support the conclusion that the protective process hypothesized to inhibit the effect of intrusive stressors in high dissociators is a controlled voluntary process, and does not occur at an automatic preattentive level as hypothesized by Nijenhuis et al (1998).

How reduced habituation of startle in the DID group relates to increased voluntary attention to the prepulse remains to be answered. Reduced habituation may indicate that the DID group found the startle stimulus more unpleasant. Since the prepulse signaled the occurrence of the startle-eliciting noise, the prepulse could have allowed individuals in the DID group to direct their attention elsewhere, ie, to the prepulse with a consequent inhibition of startle reflexes. It is therefore suggested that this voluntary direction of attention away from the intrusive stressor reflects a defining characteristic in DID.

Differences in startle or PPI could not be attributed to arousal, dissociative level or gender. General arousal, as assessed by the Bond and Lader scale (1974), did not vary across Groups and regarding dissociative level, there was only a minor difference between the two clinical groups. There were relatively more males in the Control group compared to the other two groups, and prepulse inhibition has been shown to be sensitive to menstrual cycle at SOAs of 120 ms and shorter (Jovanovic et al 2004). In the present study a between-group difference was seen at 420 ms, whereas there were no differences between the groups at the shorter SOAs. Thus, the gender of the participants was most likely not the reason for the accentuated PPI in the DID group at 420 ms. A separate ANOVA that only included women confirmed this.

The DID group was more distressed than the DD group in terms of PTSD symptoms but the differences between these groups on measures of current and life time PTSD were not statistically significant. This may rule out the possibility that the differences in startle and PPI between the DID and the DD groups are attributable to degrees of PTSD-severity. Rather, we may infer that these differences are related to

the division between pathological and non-pathological dissociation (Waller et al 1996), with the DD group reflecting the non-pathological category of dissociation and the DID group reflecting the pathological.

We must be cautious in our generalizations primarily due to the small samples in the two clinical groups and secondarily, because the non-dissociative comparison group was not optimally matched to the clinical groups in terms of medication. Furthermore, participants were screened for psychiatric co-morbidity and substance abuse only within the framework of the SCID-D and not by the use of a more extensive assessment tool for co-morbidity. In addition, all participants joined the study through self-selection. Also, the different samples were recruited by different means. For example, the DID group was mainly recruited via direct contact with mental care institutions and the CONTROL group was recruited via a newspaper advertisement and email. Even though there are no obvious reasons why this should make a difference for the results, these issues should be considered in future studies. Lastly, there may have been underreported levels of anxiety and distress in the CONTROL group. The CAPS, basically mirroring the structure of the PTSD diagnosis as defined in the DSM-IV, is not a very "fine-masked" instrument for measuring traumatic exposure. Scores are only attained when subjects report having experienced one or more traumatic event (reflecting Criterion A in the DSM-IV diagnosis), which none of the participants in the CONTROL group did. Optimally, we could have used an assessment tool that captured stress-related symptoms irrespective of traumatic incidents.

In summary, the present findings of reduced habituation of startle reflexes and increased PPI in persons with DID suggest the operation of a voluntary process that directs attention away from unpleasant or threatening stimuli. Aberrant voluntary attentional processes may thus be a defining characteristic in DID. In future studies it might be advisable to use longer SOAs than the 420 ms used in this study to investigate the time-course of PPI in persons with DID. Any tendencies detected in the present experiment might be more pronounced in response to threatening stimuli. It may be considered to use threatening stimuli as prepulses or to use fear conditioning procedures as in Davis et al (1989) or Sasaki and Hanamoto (2007). After fear conditioning, individuals with DID should attend to the conditioned stimulus, and this could increase its impact on the processing of the startle stimulus.

In clinical terms, our findings support the notion that persons with DID consciously redefine their perceptions of the environment when this environment starts to become unpleasant and intrusive. In this process the individual seems to change point of view on demand and is able to alter his or her experience in the situation by rerouting the perception of the stimuli observed.

A growing body of research is emerging that deals directly with decomposing the psychophysiological mechanisms of DID (Reinders et al 2003; Williams, Haines, and Sale 2003). Undoubtedly, persons with this condition have a unique sense of the world and unique cognitive capabilities. In order to understand these capabilities, we will need to combine a wide variety of experimental and clinical research. Ultimately, this will have important clinical implications, given that more precise knowledge about pathological dissociation and DID with regards to clinical, cognitive and

psychophysiological features can ensure that more precise therapeutic judgments are made.

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Table 1 Mean scores and standard deviations for the DID, DD and CONTROL groups on the DES and the CAPS reflecting dissociative level and current/life time PTSD, respectively.

Measures	Groups		
	DID	DD	CONTROL
	Mean (N) SD	Mean (N) SD	Mean (N) SD
DES	43.00 (8) 25.70	40.50 (8) 20.00	10.42 (13) 8.31
Current PTSD	76.75 (8) 10.11	44.87 (8) 38.52	0.00 (13) 0.00
Life time PTSD	97.50 (8) 8.14	82.00 (8) 33.70	0.00 (13) 0.00

Startle alone: Group by Trials

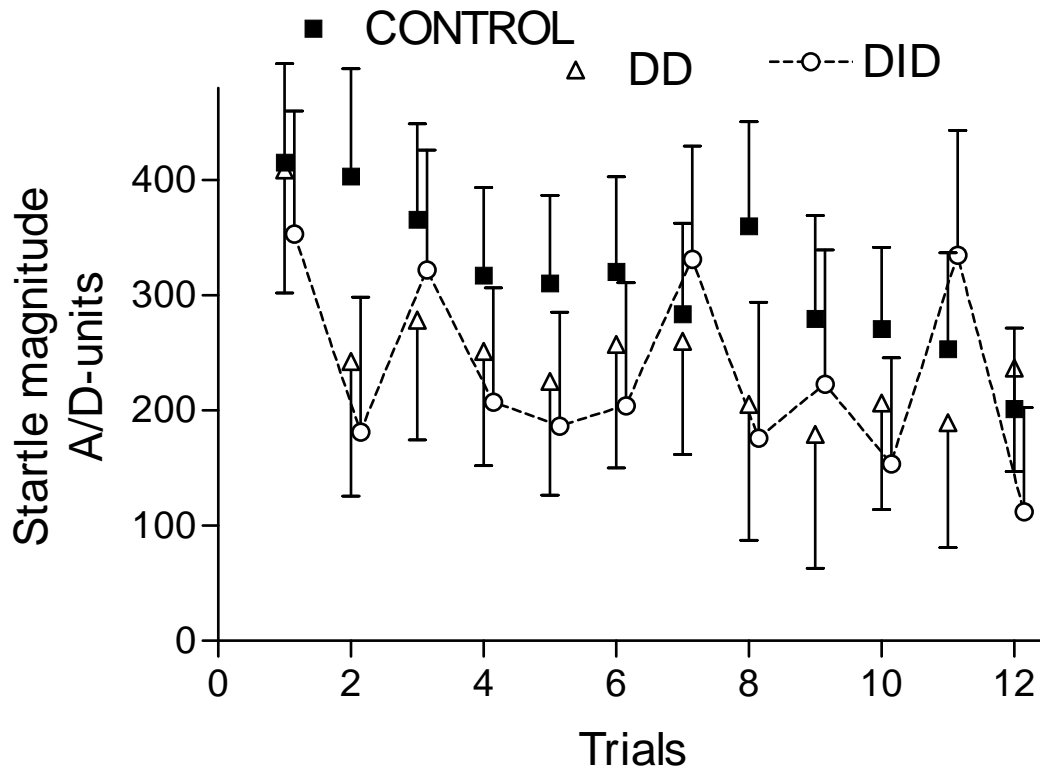


Figure 1 Group by Trials interaction: Mean startle reflex magnitudes across the 12 startle-alone trials for each group. Error bars indicate 1 standard error of the mean.

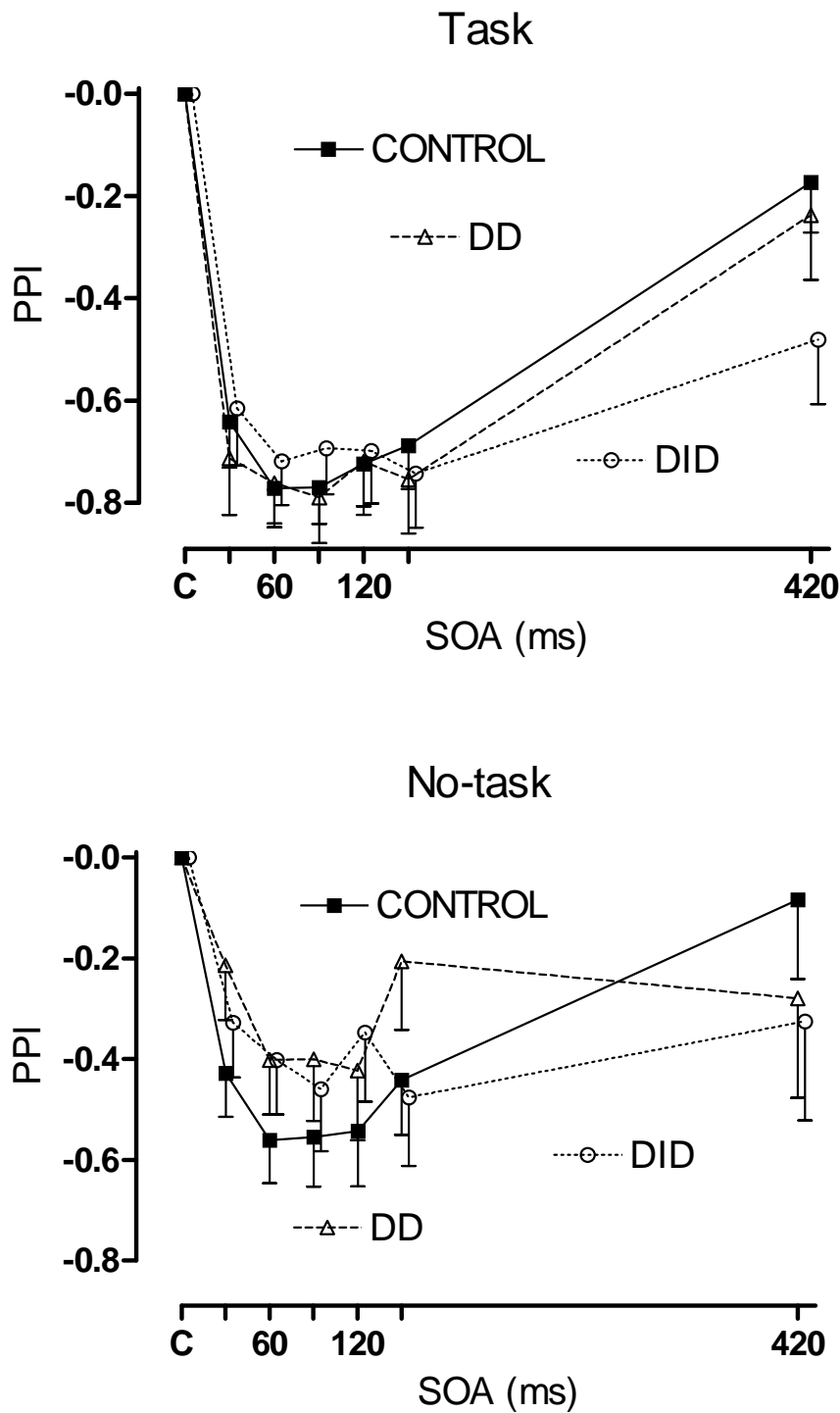
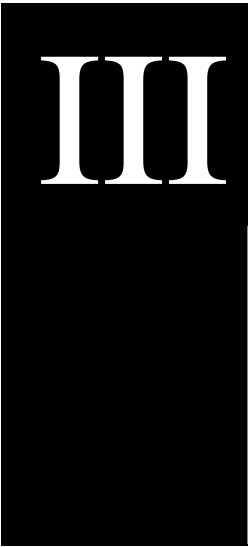


Figure 2 Group by Task by SOA interaction: Mean PPI across stimulus onset asynchronies (SOAs) in milliseconds for each group in the Task and No-task conditions. C refers to startle alone control levels. Error bars indicate 1 standard error of the mean.



Exploring Personal Construct Theory and Dissociative Identity Disorder

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Abstract

13 patients with dissociative identity disorder (DID), 13 with other mental disorders, and 10 non-diagnosed comparison participants were given Kelly rep grids. Contrary to predictions, displaying alternate personalities does not imply a more multidimensional level of thinking. Instead, the normal control group had the greater degree of complexity in comparison to both clinical groups. A notable clinical observation was that DID patients, compared to non-DID participants, had a greater understanding and speed in completing the rep grid. Findings are discussed in terms of the advantages of personal construct theory to shed a clearer light on the construct of dissociation.

Keywords: DID, Personal construct theory, rep grid

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Introduction

Dissociation, as a construct in psychology, sprang primarily from the work of Pierre Janet (1923). It referred to the splitting up of thought processes into compartments and sometimes the loss of conscious awareness of certain of these compartments. To describe these compartmentalized sectors of thought, sometimes lost to recall, Janet used the term subconscious. Morton Prince (1906) introduced instead the term co-conscious to subsume dissociative events. He did this to emphasize that these various compartments could maintain an equal status of awareness with normal levels of awareness. One important theoretical implication from this work emphasized that psychogenic amnesia was secondary, i.e., subsumed by, the dissociative processes rather than being a separate phenomenon.

Dissociation therefore emerged as part of a different construct network from Freud's psychoanalytic construct of repression (1943). Among other definitions, Freud defined repression as the warding off from conscious awareness that which is painful. Repressions, when viewed collectively, were subsumed by constructs of preconscious and unconscious, respectively (Cromwell, 1956). The latter constructs subsumed not only repressed material but also biological urges never fully on a conscious level.

From the beginning, dissociation was associated with psychological trauma. Although a history of trauma was found in only 44% of Janet's dissociated patients (van der Kolk, Brown, & van der Hart, 1989), this is far beyond chance expectation.

Although the two constructs, dissociation and repression, arose from different theoretical networks, they held in common an association with trauma and psychologically painful experience. Both constructs, each rejected by the alternate theorist,

had the benefit of abundant keen observation of clinical cases and a systematic relationship to their respective theories. Both constructs lacked the benefit of the Wiener Kreis (Bergman, 1954), the psychometric (Stevens, 1946) influence upon operational criteria, technical methods of reliability, and the constructivist and philosophy of science emphasis upon rules of theory structure.

Since these beginnings the construct of dissociation has become more objectified in two major ways. One way concerns the formal typology (DSM-IV; APA, 1994) with operational criteria for DID. The other has been as a collective group of personality features: (a) imaginative absorption (such as daydreaming, reading, or other activity that reduces awareness of current time, space, and self); (b) depersonalization (the loss of personal identity) and derealization (the loss of the place of self in time and space); and (c) psychogenic amnesia (a failure in memory of some aspects of experience) (Bernstein & Putnam, 1986). While attaining this increased empirical status, dissociation has lost the benefit of a systematic conceptual framework as when initially defined. One benefit of this empirical shift in recent years has been that the features of imaginative absorption are found to bear no empirical link to the other features of dissociation. On the other hand, depersonalization and derealization not only bear an empirical link to each other but also to psychogenic amnesia as an expression of ascending severity (Langelle, 1996). This latter research lent an aspect of construct validity to the earlier work of Janet and Prince for the superordinate construct of dissociation.

Another empirical outcome is that, among patients with mental disorders, a small but distinctive group exists that fit only the criteria for dissociative identity

disorder (DID; APA, 1994). This category includes what Prince previously called multiple personality disorder. Furthermore, dissociation is a part of the criteria that characterize the latter day concept of posttraumatic stress disorder (PTSD; APA, 1994). This construct of event-referenced trauma involves dissociation, anxiety, and depression.

Personal construct theory and Kelly (1955) rep grid methodology would appear to be an appropriate framework to investigate the purported features of dissociation. For example, the DSM (APA, 1994), like all typologies, affords hypotheses that would link dissociation constructs to the total person as an observational unit (i.e., element of classification). In contrast, a personal construct framework provides the theoretical possibility of the same individual having certain constructs constellations, or hierarchies dissociated and having others not dissociated.

Various questions have been framed about dissociation in terms of the orthogonal and hierarchical groupings of personal constructs. The relationship of focal traumatic events, such as combat (Sewell, 1991; Sewell, Cromwell, Farrell-Higgins, Palmer, Oldhe, & Patterson, 1996) and rape (Foa & Rothbaum, 1998), have been studied in relation to conceptual structure. Sewell found combat veterans with PTSD to have less elaboration of the implicit poles of constructs related to the focal traumatic combat event. Also, they had more concrete polarized constructs than combat veterans without the development of PTSD. Foa and Rothbaum (1988) found that the traumatized victims of rape were impaired in formulating a narrative report of what happened to them. In another study, Sewell (1996) found situation rep grid dimensions of traumatic event elaboration to discriminate between who would and

would not persist in posttraumatic symptoms for over 60 days following witness of a restaurant massacre killing 23 people. He and others also addressed whether the alternate personalities purported by DID victims, when used as separate element columns in a rep grid test, related to the "original self" column, to each other, or to other actual acquaintances (Cromwell, Sewell, & Langelle, 1996).

The DID diagnosis, like other mental disorders, is more easily characterized demographically in a small country such as Norway, where a national register exists to record and review all mental disorders within a common set of criteria. The purpose of the present research is to continue a query of the utility of dissociation and the DID construct within the theoretical framework of Kelly's personal construct theory. In particular, the questions here ask whether members of the DID group in fact differ from psychiatric and non-psychiatric control participants on the dimension of cognitive complexity. Cognitive complexity is "the capacity to construe social behavior in a multidimensional way. A more cognitively complex person has available a more differentiated system of dimensions for perceiving others' behavior than does a less cognitively complex individual" (Bieri et al. 1966, p. 185). One might assume that displaying alternate personalities implies a more multidimensional level of thinking. Hence a greater complexity among DID patients would be expected.

Method

Participants

A group of 13 women diagnosed with DID, and scoring in the critical range (> 30, mean 41.70) on the DES (Dissociative Experience Scale; Bernstein & Putnam, 1986)

were recruited from a search among mental health clinics in Norway and designated as the DID group. With a mean age of 31.0 (range 21-51) all had a history of at least one hospitalization for the designated mental disorder, but only three were currently in treatment. Seven were chronically disabled and six were either working or studying at college/university level.

A group of 10 women, inpatients with diagnoses other than DID and no clinical evidence or history of alternate personalities, were recruited from different mental health clinics through a formal written invitation by clinicians at the respective clinics. Designated the CC group, all patients were hospitalized and in extensive rehabilitation programs. Of those accepting invitation (mean age 31.9, range 20-50), four were diagnosed with major depressive disorder, three with bipolar disorder, one with schizophrenia, one with both anxiety and obsessive-compulsive disorder, and one with both eating disorder and PTSD.

The participants designated as the NC group (13 women, mean age 37.6, range 27-51) were recruited from employees at the institutions where the CC group was hospitalized. Those volunteering had higher education levels than the clinical groups (16.2 years, as compared to 14.7 for DID and 13.7 for CC).

The research was approved by the Regional Committee for Medical Research Ethics in Health Region V in Norway, and was conducted according to the Declaration of Helsinki. Written informed consent was obtained from all participants and no monetary reward was given.

Materials

The DES (Dissociative Experiences Scale; Bernstein & Putnam, 1986) is a 28-item self-report questionnaire which provides a general measure of the level of dissociative experiences in everyday life. Participants are required to circle the percentage of time (given in increments of 10% ranging from 0% to 100%) that they have had the kind of experience described within each item. A total score is computed as the mean of the responses to the 28 items. From normative data high dissociators are usually identified at a mean score above 30.

Dissociative diagnosis was determined through the SCID-D (Steinberg, 1995). The SCID-D is a 276 item structured clinical interview used in order to make DSM IV (APA, 1994) dissociative identity disorder diagnosis. It also includes registration of demographic data, work history, treatment history, somatic disease, substance abuse, and family history of mental disorder. The schedule has an overall interrater reliability of 0.68 (kappa), a sensitivity of 90%, and a specificity of 100% for the diagnosis of DID. A SCID-D interview usually takes about 90 minutes. The clinical interviews were administered by one research assistant who had been trained specifically for this task.

Being required to adapt the instrument to Norwegian language, the Kelly Role Construct Repertory Test (Rep Grid; Kelly, 1955) was administered as a paper and pencil test. As shown in Table 1, a total of 22 elements were used. Elements were self, parents, siblings, close relatives and others. In the DID group four of the elements (column memberships) consisted of “alternate personalities” (columns 10, 11, 12, and 13) defined by the participants. Since the two other groups did not have DID, the

alternate personalities were replaced by ratings of self in four different situations respectively (e.g., "Yourself - in a classroom").

“Perpetrator” (column 9), used in the DID group, designated a person who had conducted severe sexual or physical abuse or the closest equivalent for the examinee. In the two other groups “a person who has hurt you the most” replaced this. It was explained that such a person could also include any person by whom the participant had been sexually or physically abused.

Table 1 about here

Procedure

Participants in the DID group underwent a thorough clinical assessment with the DES and the SCID-D to ascertain their diagnostic status with regard to DID.

Regarding the Kelly Rep Grid, all procedures were translated into Norwegian language for administration. Participants generated their own constructs from randomly grouped triads of elements. For each triad, they were asked to indicate ways in which two elements were alike and the opposite of the third. Twenty-two bipolar construct dimensions were thus elicited. Afterwards the participants filled in the 22 x 22 matrix where every element was scored on respective bipolar dimensions using a five-point scale.

Design and analyses

The grids were analyzed with regard to intensity with Flexigrid, a software program developed by the third author. Intensity is a classical measure of cognitive complexity and refers to the average correlation in the grid, arrived at by squaring all the correlations, adding them together and then taking the square root. A lower amount of correlations in the grid, i.e., lower intensity, is indicative of higher levels of cognitive complexity. One-way ANOVA (SPSS for Windows, version 11.5) was used to compare intensity in the groups, followed up by independent sample t-tests with prior hypotheses. Levene's test for equality of variances was used. None were found to be significant. The distributions were thus considered not to deviate from normal. A statistical power analysis was performed post hoc on the intensity differences between the DID and NC groups, and this is presented in the Results section. Furthermore, clinical observations were made in the test situation by the test leader (first author).

Results

Cognitive complexity

The three groups DID, CC, and NC, were found to differ in intensity [$F(2,33) = 3.364$, $p < 0.05$], the operational index for cognitive complexity (DID mean = .467; CC mean = .403, NC mean = .396). Groups were then compared by t-test with a priori predictions. Contrary to predictions, intensity of the DID group was significantly above the NC group ($p = 0.019$ corrected $< .05$; power, 64.6%), with a similar but non-significant trend to be also above the CC group. A graphic illustration of this is provided in Figure 1.

Figure 1 about here

Education and age

The three groups differed in educational level ($F(2,33) = 4.669, p = 0.016$; DID 14.8 years, CC group 13.7 years, NC 16.2 years). Breakdown analysis by t-test indicated a significant difference between NC and CC ($t(5) = 3.591, d = 21, p = 0.002$) with the NC group being higher in educational level than the other groups. No significant group differences occurred with regard to age.

Clinical observations

The three groups differed with regard to (1) how the participants related to the test-rules and the test situation and (2) how quickly they elicited the constructs (both construct poles and contrasts). The DID group had very little difficulty in understanding the rules of the test situation. They needed less instruction than the other two groups and after only a couple of rounds, they became nearly autonomous: After each presentation of triads, and without further explanations, they presented their pole - opposites. Only to a minor degree did they need assistance. Most of the participants in the DID group finished the session in 45 minutes, some of them finished in less than 30 minutes. The other two groups had far greater difficulties in spontaneously eliciting constructs and they needed a lot of assistance in terms of guiding questions. They seemed to have great difficulties in comprehending what the test leader was looking

for. Consequently, the sessions in which constructs were elicited stretched out for these groups, often lasting for 90 minutes, and with an average length of approximately 60 minutes.

Discussion

The major hypothesis of this study, that a link exists between cognitive complexity and DID, was not borne out. Our investigation disclosed group differences among the DID, CC, and NC groups. However, the direction of the differences did not support the hypothesis. Displaying alternate personalities does not imply a more multidimensional level of thinking. Instead, the normal control (NC) group had the greater degree of complexity. A number of explanations are available that might explain this result. A prominent one is that the dissociating of thinking and the report of alternate personalities helps to counter or simplify a multidimensional cognitive system. A second possibility is that the higher education level found among the volunteering employees of the NC group accounts for the low intensity level in this group.

Another issue that might bear upon the higher level of intensity in the DID group compared to the non-DID groups is the presence of disattention epochs among people with psychopathology. Dingemans, Space, and Cromwell (1986) found that while completing the rep grid, people with schizophrenia display epochs of disattention for brief periods and then restore their attention to task with normal high levels of test-retest reliability. Such a phenomenon, if found to be more general in psychopathology, would compromise the intensity measure of cognitive complexity unless repeated testing were conducted to remove this disattention related epoch

variance from the intensity measure. In sum, however, no evidence is found in this study to link intensity with a DID pathology as such.

How easy is it for people to generate constructs? Before the era of computer-assisted administrations of rep grids individual differences in time to complete a rep grid were obvious and well known. Perhaps the most important finding of this study has been the unexpected observation that the DID group displayed a greater ease and speed of completion of the rep grid task. Indeed, the members of the DID group had less difficulty understanding the rep grid instructions, required less assistance and were faster and more autonomous in completing the test.

Two notions are offered as bases to prompt further research on this topic. One possibility is that the DID group members have a more advanced social skill in role thinking and role conceptualization. Along with that comes vulnerability for dissociation in this prolific role taking ability. As suggested by Cromwell et al. (1996), they appear to think in terms of "person icon" configurations rather than in construct-contrast configurations.

Another possibility is that the speed differences between DID and non-DID persons may be viewed in terms of the dimension of reflectivity vs. impulsivity. In this case the non-DID person, with or without other mental disorder, may do more self-monitoring and second guessing of their response with each step in completing the rep grid. The DID persons would be viewed as acting more immediately without these contemplations.

Acknowledgment

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Table 1 Elements divided into five categories; real acquaintances, others, alter personalities, self, and perpetrator/hurting person.

Categories	Elements	
Real acquaintances:	1. Father (or “father figure”) 3. Brother (or friend) 5. Aunt 7. Teacher 16. Friend #1 18. Therapist # 1	2. Mother (or “mother figure”) 4. Sister (or friend) 6. Uncle 8. Neighbor 17. Friend # 2 19. Therapist # 2
Others:	15. Prime minister 21. Movie star # 1	20. Royal person 22. Movie star # 2
Alters:	10. Alter #1/Yourself – in a sport situation 12. Alter #3/Yourself – in a classroom	11. Alter #2/Yourself – when you are abandoned 13. Alter #4/Yourself – as a child
Self:	14. Yourself – the way you are these days	
Perpetrator:	9. Perpetrator/Person who has hurt you the most	

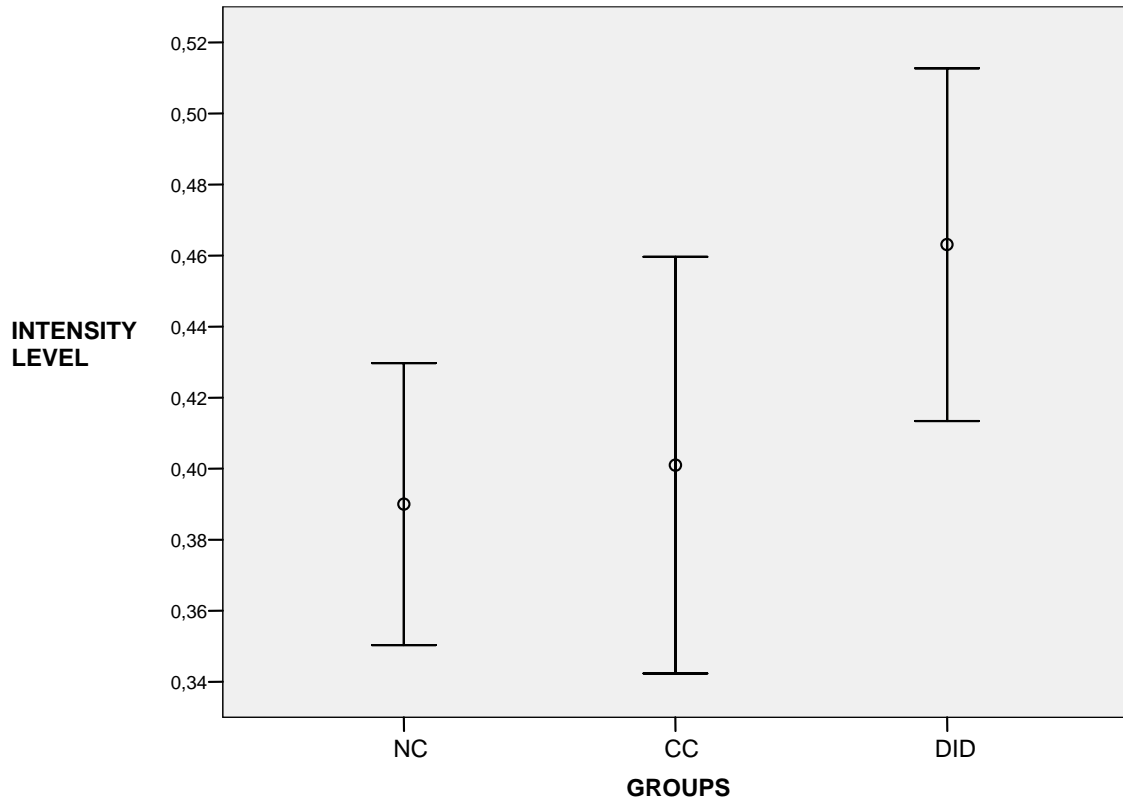


Figure 1 Illustration of the intensity variance and mean intensity level within the three groups; the non-diagnosed comparison group (NC), the clinical comparison group (CC) and the dissociative identity disorder group (DID).



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