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Night-time experiences and daytime dissociation: A path analysis modeling study

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ABSTRACT

Dissociative symptoms may be the by-products of a labile sleep–wake cycle (Koffel and Watson, 2009a). This may help to explain why dissociation overlaps with fantasy proneness and cognitive failures. Using path analysis, we tested to what extent data gathered in a nonclinical, predominantly female sample ($N=139$) supported two conceptual models. The first model assumes that unusual sleep experiences increase fantasy proneness and cognitive failures, which in turn encourage trait dissociation and reports of trauma. The second model assumes that trauma leads to dissociative experiences both directly and through its influence on sleep. In this cross-sectional design, the data were reasonably well described by both models. Importantly, in both models, unusual sleep experiences serve as antecedents of trait dissociation. Our analysis underlines the importance of unusual sleep experiences and may inspire treatment intervention focusing on sleep normalization.

1. Introduction

The *Diagnostic and Statistic Manual of Mental Disorders* defines dissociation as "a disruption in the usually integrated function of consciousness, memory, identity, or perception of the environment" (DSM-IV-TR; American Psychological Association, 2000, p. 519). Dissociation is often viewed as a continuum ranging from benign to pathological experiences, with depersonalization and dissociative identity disorder situated at the pathological end (Giesbrecht and Merckelbach, 2008; Holtgraves and Stockdale, 1997; Irwin, 2001). Over the past decades, numerous studies have assessed the prevalence of dissociative symptomatology in various populations. General population surveys found that dissociative disorders may affect 3.3–11.2% of the population (Loewenstein, 1994; Murphy, 1994; Waller and Ross, 1997). Moreover, dissociative symptoms are common in certain clinical groups, such as mood disorders, post-traumatic stress disorder (PTSD), and persons with schizotypal traits (Brand and Loewenstein, 2010; Galbraith and Neubauer, 2000; Giesbrecht and Merckelbach, 2008). Research has also documented a link between sleep paralysis and dissociative symptoms in people who report childhood trauma experiences (McNally and Clancy, 2005). This finding dovetails with the work of Watson (2001) and Koffel and Watson (2009a) who presented evidence to the effect that daytime dissociation is associated with problematic sleep–wake state boundaries, which may be precipitated by trauma.

It is well established that good sleep conveys cognitive benefits, while sleep problems may undermine cognitive efficiency (Walker and Stickgold, 2006). Sleep problems are usually defined as having trouble falling asleep, experiencing awakenings during the night, waking up too early, or not feeling rested after a night's sleep. However, sleep problems may also entail unusual sleep experiences such as having nightmares or vivid dreams, recurring dreams, sleep paralysis, and hypnagogic or hypnopompic hallucinations (Soffer-Dudek and Shahar, 2009; Soffer-Dudek et al., 2011). Sleep problems are common in the general population. For instance, it is estimated that a third of the Dutch population now and then experiences sleep problems, with 15% suffering from insomnia (Fonds Psychische Gezondheid, 2009). Most importantly, disruptions in sleep patterns figure prominently in mood and anxiety disorders, schizophrenia, and borderline personality disorder (Benca et al., 1992; Morin and Ware, 1996). For example, 70–91% of the patients diagnosed with PTSD suffer from sleep problems such as falling asleep or staying asleep, and up to 71% of them report nightmares (Maher et al., 2006).

In a pioneering study on dissociation and sleep in two large student samples, Watson (2001) observed that unusual sleep experiences (e.g., vivid dreams, hypnagogic hallucinations) are related to dissociative symptoms. Since then, a number of studies have replicated this observation (Giesbrecht and Merckelbach, 2004; Watson, 2003; Van der Kloet et al. 2011; see for a review:

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Van der Kloet et al., 2012). There is also anecdotal evidence that suggests an intimate relationship between dissociation and cataplexy (LaVia and Brewerton, 1996), a hallmark feature of narcolepsy, and people suffering from Depersonalization Disorder often state that their symptoms are most pronounced when they feel tired (Simeon and Abugel, 2006). Furthermore, researchers have found a substantial overlap between dissociative experiences and nightmare frequency (Agargun et al., 2003; Levin and Fireman, 2002; Soffer-Dudek and Shahar, 2011), as well as dreaming states (Barrett, 1994). Moreover, one sleep deprivation study in healthy people reported that sleep loss intensifies dissociative symptoms (Giesbrecht et al., 2007).

Taken together, these studies suggest that dissociative symptoms may be the by-products of a labile sleep–wake cycle (Koffel and Watson, 2009a; Van der Kloet et al., 2012). This view assumes thin boundaries between the sleeping and waking states (e.g., Hartmann, 1991). These thin boundaries would allow for the intrusion of dreamlike content into the waking state, which would set the stage for dissociative symptoms. This conceptualization of dissociation sometimes referred to as *cross-state continuity*. It is based on the assumption that "some structures and processes implicated in nightmare production are also engaged during the expression of pathological signs and symptoms during the waking state" (Levin and Nielsen, 2007, p. 483). The link between sleep and dissociation appears to be rather specific in that dissociation is related to unusual sleep phenomena that are difficult to control. Thus, nightmares and waking dreams are related to dissociative symptoms and schizotypy, while insomnia and lassitude seem to be related to mood and anxiety (Koffel and Watson, 2009b).

The relation between sleep and dissociation is even more apparent when exploring the sleep-related dissociative disorders. This group of dissociative episodes arises at night, and they are viewed by some researchers as re-enactments of previous trauma and may sometimes involve violence or injury. However, unlike the parasomnias, these unwanted behaviors arise from wakefulness and occur near sleep–wake transitions (Warren, 2013). Again, this observation dovetails with the concept of cross-state continuity.

The sleep-dissociation link may help to explain why dissociation overlaps with fantasy proneness and cognitive failures. Fantasy proneness is usually defined as a disposition to engage in vivid and extensive fantasizing. Several studies in clinical (Boom et al., 2010; Kunst et al., 2011) and non-clinical samples (Merckelbach et al., 2000a; Giesbrecht and Merckelbach, 2006; Rauschenberg and Lynn, 1995) found a positive correlation between dissociative symptoms, as measured by the Dissociative Experiences Scale (DES; Bernstein and Putnam, 1986) or the Peri-traumatic Dissociative Experiences Questionnaire (PDEQ; Marmar et al., 1997), and fantasy proneness, as measured by the Creative Experiences Questionnaire (CEQ; Merckelbach et al., 2001). Cognitive failures refer to everyday slips and lapses (Broadbent et al., 1982) and are frequently reported by highly dissociative individuals (Giesbrecht et al., 2004; Levin et al., 2004; Merckelbach et al., 2002, 1999) and dissociative patients alike (Dorahy et al., 2006; Simeon et al., 2009).

As to the interrelationships between these three trait variables, the following remarks are in order. First, conceptually, fantasy proneness can be considered a close cousin of absorption, one of the subscales of the DES (Rauschenberg and Lynn, 1995). Second, empirical research has found time and again that cognitive failures and fantasy proneness are correlates of dissociative tendencies (Giesbrecht and Merckelbach, 2006; Merckelbach et al., 2005). Thus, they tap into a common domain. For example, Watson stated that "measures of dissociation, schizotypy, and sleep-related experiences define a common domain that is characterized by intense and unusual cognitive/perceptual phenomena" (Watson, 2001, p. 527). Third, and taking this one step further, one could speculate that chronic sleep disturbances have two distinct consequences: dreamlike mentation during waking states and cognitive dysfunction, both constituting – or at least overlapping with – two prominent dimensions of the DES: absorption and amnesia (Van der Kloet et al., 2012). Yet, this is a tentative model, and in the absence of empirical evidence, the relationships could as well be reversed (i.e., habitual dissociation promoting absorption and cognitive failures).

There is some debate as to whether or not childhood trauma is a necessary causal antecedent of dissociative symptomatology (Lynn et al., 2012; Giesbrecht et al., 2008; Bremner, 2010; Dalenberg et al., 2012). That fantasy proneness and cognitive failures correlate with dissociation is an important fact to consider for theories on the origins of dissociative symptoms. Specifically, some authors have argued that the combination of fantasy proneness and cognitive failures may lead to biased reports of traumatic childhood events. First, fantasizers may confuse imagined events with factual autobiographical memories. Second, this tendency may lower respondents' criteria for reporting ambiguous events as traumatic in nature, thus exhibiting a positive response bias, or in more extreme cases, a tendency to confabulate (Giesbrecht et al., 2008; Merckelbach and Jelicic, 2004). Of course, such an interpretation is far removed from the view that dissociation is a defensive response to childhood trauma (Spiegel et al., 2011; Dalenberg et al., 2012).

Germane to this debate is a study by Merckelbach et al. 2002 who contrasted a model in which (self-reports of) trauma causally precede dissociation and a concurrent model in which heightened levels of fantasy proneness and cognitive failures constitute dissociation and together precede self-reports of trauma. Their structural equation modeling results performed on data gathered in an undergraduate sample led the authors to conclude that the data provided a similar degree of support to both models (Merckelbach et al., 2002).

The structural equation modeling (SEM) approach of Merckelbach et al. (2002) did not take sleep disturbances as a potential antecedent of dissociation into account. With this in mind, the present study built on these previous findings and investigated whether data gathered in an undergraduate sample would support a model in which sleep disturbances precede dissociative symptoms. Using path analyses we compared two models. Specifically, we tested whether the data are best described by trauma being associated with dissociative experiences both directly and through its influence on sleep (model 1), or by unusual sleep experiences fueling fantasy proneness and cognitive failures, which in turn constitute trait dissociation and contribute to reports of trauma (model 2).

2. Method

2.1. Participants and procedure

Participants were 139 undergraduate students (122 women) with a mean age of 21.4 years (*range*: 17–32 years). They received written and oral information about the study, after which they gave written informed consent. Participants completed a baseline screening, containing self-report questionnaires, via the user-friendly software program EMIUM (Janssen, 2008). They kept a diary for 3 weeks, 3 days per week, twice a day. This diary involved self-report measures on dreams and night-time experiences, but also measures of state dissociation, sleepiness, and mood during the day. After completion of all questionnaires, participants were rewarded with course credits or a small monetary reward. For the purpose of the present paper, we restrict our analyses to data from the baseline screening (i.e., DES, ISES, CFQ, CEQ, CTQ-SF). The study was approved by the standing ethical committee of the Faculty of Psychology and Neuroscience, Maastricht University, The Netherlands.

Model 1 (the Trauma-Dissociation model) was based on the original model 1 from Merckelbach et al. 2002. To this model, we added the ISES as variable between CTQ and DES. Then, we discussed the different concepts and theories within a team of experts and came up with a number of possible, contrasting models. The final model 2, as presented in this paper, resulted as the most theoretically interesting and contrasting to model 1. Model 2 (the Sleep-Dissociation model) has an alteration regarding the placement of CTQ, which is in line with Merckelbach et al. (2002). Moreover, we have contrasted the placement