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Dissociation and its disorders

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Review

Dissociation and its disorders: Competing models, future directions, and a way forward☆

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HIGHLIGHTS

- Assesses strengths/weaknesses of sociocognitive and posttraumatic dissociation models
- Provides systematic narrative review of variables not considered by either perspective
- Reviews hyperassociativity, set shifts, emotion regulation, sleep, meta-consciousness
- Variables play role in dissociation, schizophrenia, borderline personality disorders.
- Discusses limitations in knowledge, unresolved issues

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ABSTRACT

Dissociative experiences and symptoms have sparked intense scrutiny and debate for more than a century. Two perspectives, the trauma model (TM), which postulates a direct and potent causal link between trauma and dissociation, and the sociocognitive model (SCM), which emphasizes social and cognitive variables (e.g., fantasy-proneness, media influences, suggestibility, suggestion, cognitive failures), currently vie for support. The intensive focus on controversies has stymied progress in understanding dissociation as much, if not more, than it has inspired research that transcends a single perspective. We assess strengths and limitations of these two perspectives and contend that neither provides a complete account of dissociation symptoms, which occur in the presence of many disorders. We provide a novel, narrative review of the link between dissociation and dissociative disorders and sleep disruptions, hyperassociativity, set shifts, deficits in meta-consciousness, and impaired self-regulation. We suggest that these transtheoretical variables (a) play a role in disorders that covary extensively with dissociative disorders (i.e., borderline personality disorder, schizophrenia spectrum disorders) and (b) provide the basis for overlapping foci of interests and potential collaborations among proponents of competing theoretical camps. Finally, we discuss limitations in knowledge and unresolved issues for future workers in the field to pursue.

1. Introduction

Some people experience periodic disruptions in their sense of who they are, their past, and their ongoing experiences. These disturbances, called dissociative symptoms, have provoked intense controversy, as they have defied researchers' and theorists' concerted efforts to provide a fully satisfactory explanation of their origins. Competing theories of dissociation have cleaved along two fault lines: One that zeroes in on the traumatic antecedents of dissociation, called the trauma model (TM) and another, called the sociocognitive model (SCM), with a broader focus on social, cognitive, and cultural determinants of dissociation.

☆ Dissociative symptoms are also prominent in posttraumatic stress disorder (PTSD), acute stress disorder, and panic disorder, among other disorders, but more than a cursory discussion of dissociation in the context of these disorders is beyond the scope of this article.

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In this review, our goal is not to argue that the SCM is superior to the TM, or vice versa, nor to advance a theory that fully integrates the two discrepant viewpoints, which would be premature given the current status of knowledge. Rather, we evaluate these two perspectives and suggest a way forward that proposes variables relevant to formulating the beginnings of a transtheoretical and transdiagnostic framework on dissociation and dissociative disorders. In so doing, we argue that a comprehensive account of dissociation must extend beyond the reach of the TM and the SCM and closely consider variables neither perspective emphasizes.

More specifically, we advance hypotheses regarding the etiology of dissociative symptoms and disorders pertinent to impairments in self-awareness and reflection (i.e., meta-consciousness); cognitive, associational, and affective processes (i.e., "hyperassociation" and shifting cognitive-affective-behavioral sets called "set shifts," emotion regulation); and sleep disruptions. We derive hypotheses pertinent to sleep disruptions and impaired emotion-regulation from a corpus of research that boasts significant empirical support. Other hypotheses, relevant to meta-consciousness and set shifts, are grounded on a less firm yet emerging empirical footing and referred to sporadically in the literature not allied to either theoretical camp. Finally, we advance an entirely novel hypothesis related to rapid shifts in associations (i.e., hyperassociation) that one of the authors formulated based on clinical observations but that also finds support in a number of studies we identified.

We will argue that the variables we feature are also relevant for understanding borderline personality disorder and schizophrenia spectrum disorders, which covary extensively with dissociative symptomatology (Lyssenko et al., 2017). Such covariation underscores one of our core contentions: Dissociative symptoms are transdiagnostic and can be understood in terms of variables that cut across a variety of disorders. We also suggest that these variables can stake out common ground for researchers who embrace both the PTM and the SCM and who posit trauma and non-trauma pathways to dissociation. Before concluding, we suggest that the quest to identify biological correlates or determinants of dissociation also provides a fruitful area of collaboration for proponents of competing perspectives. Our analysis is based on an aggregation of empirical studies, literature reviews, and expert observations. Accordingly, in the concluding section, we evaluate the strength of the research base and discuss limitations in our knowledge and delineate future research directions that could bear fruit of potential collaboration among adherents of both the TM and the SCM.

2. The Trauma Model of Dissociation

Before we present in some detail the literature on the variables under study, we place our efforts in the context of the TM and SCM, critiques and limitations of these models, and recent movements toward a rapprochement of these disparate views. The TM can be traced to Janet (1889/1973), who described dissociation as an unconscious defensive or coping response to highly aversive events. Janet's seminal descriptions echo in modern conceptualizations of dissociation as an automatic response that provides emotional escape from unbearable psychic pain (Gershuny & Thayer, 1999). More recently, Dalenberg et al. (2012, p. 551) described dissociation as "…a phylogenetically important aspect of the psychobiological response to threat and danger that allows for automatization of behavior, analgesia, depersonalization, and isolation of catastrophic experiences to enhance survival during and in the aftermath of these events." Dalenberg et al. (2012) argued that the relation between trauma and dissociation was consistent and moderate in strength and remained significant even when objective measures of trauma were used (p.550).

According to the TM, the traumatic antecedents of dissociation are most evident in the three major dissociative disorders in the Diagnostic and Statistical Manual of Mental Disorders, fifth edition (DSM-5; American Psychiatric Association, 2013):

1. *Depersonalization/derealization disorder* (DDD): depersonalization (feelings of being an outside observer of the self and detachment from the self) and derealization (feelings of detachment or unreality regarding circumstances or the environment predominate);
2. *Dissociative amnesia*: the inability to recall important autobiographical information inconsistent with ordinary forgetting; the events forgotten are usually of a traumatic or otherwise stressful nature;
3. *Dissociative identity disorder* (DID; formerly called multiple personality disorder): a severe disruption of identity characterized by two or more distinct personality states and recurrent gaps in the recall of everyday events.

2.1. Critiques of the TM

The TM has not escaped criticism (see Giesbrecht, Lynn, Lilienfeld, & Merckelbach, 2008; Lilienfeld et al., 1999; Lynn, Berg, et al., 2014; Lynn, Lilienfeld, et al., 2014; Merckelbach & Muris, 2001; Merckelbach & Patihis, 2018; Spanos, 1996) centered on the following seven points:

(1) The strength of the correlations between highly aversive events and dissociation in nonclinical (range $r = -.013$ (ns) to $r = .44$; Dalenberg et al., 2012; Patihis & Lynn, 2017) and in clinical samples (range from $r = -.14$ (ns) to $r = .63$; Dalenberg et al., 2012) is highly variable, with only 5% of correlations equaling or exceeding $r = .50$, indicating a large effect.
(2) Sizable minorities of dissociative disorder patients report no trauma or neglect (39.1%, Sar, Akyüz, & Dogan, 2007; 24.4%, Duffy, 2000; Laddis & Dell, 2012; Vogel et al., 2009).
(3) Studies differ in how highly aversive or traumatic events are defined, which render conclusions about the meaning of correlations across studies less clear-cut, although many studies use the well-validated Dissociative Experiences Scale (Bernstein & Putnam, 1986).
(4) The great majority of relevant studies are based on self-reports and cross-sectional designs subject to retrospective recall biases, social desirability, confirmation biases, context effects, and implicit pressures to answer consistently or adopt an acquiescent ("yea saying") response set (Council, 1993, 1996; Lemons & Lynn, 2016; Merckelbach, Boskovic, Pesy, Dalsklev, & Lynn, 2017; Merckelbach & Muris, 2001). Prospective studies not uncommonly reveal no robust link between childhood abuse and dissociation in adulthood (see Giesbrecht et al., 2008; Lynn et al., 2019; but see Bremner, 2010; Dalenberg et al., 2012).
(5) Merckelbach et al. (2017) examined 14 correlations between dissociative symptoms and scores on tests of symptom validity (i.e., the tendency to endorse atypical or rare symptoms of many kinds): Ten were greater than $r = 0.40$, and 5 were greater than $r = 0.50$, suggesting dissociation scores may be inflated by over-endorsement of rare or unlikely symptoms (e.g., "I have headaches that are so severe my feet hurt") or experiences.
(6) Many studies that support a trauma-dissociation link do not obtain objective evidence/corroboration of child abuse, and some studies do not diagnose DID independent of knowledge of abuse reports or suggestive influences after long-term treatment (e.g., Coons, 1998; Coons, Bowman, & Milstein, 1988).
(7) Numerous studies that link trauma and dissociation also report substantial overlap between dissociative experiences and dissociative disorders and other psychological disorders (Soffer-Dudek, 2014), including major depression (91.5%, Duffy, 2000; 89.5% for men, Ross & Ness, 2010; 67.8% for women, Sar et al., 2007), borderline personality disorder (74.4%, Duffy, 2000; 68.4% for women, Ross & Ness, 2010), and substance use disorder (72%, Duffy, 2000). Dissociative disorders also overlap substantially with acute stress disorder; schizophrenia spectrum disorders; posttraumatic stress disorder (PTSD); sexual, eating, sleep, and panic

disorders; and avoidant and obsessive-compulsive personality disorders (Boysan, 2016; Lynn, Berg, et al., 2014; Soffer-Dudek, 2014). In Lyssenko et al.'s (2017) meta-analysis, people suffering from dissociative disorders, PTSD, borderline personality disorder, and conversion disorder produced the highest DES scores, although dissociative symptoms were present in many disorders and considerable heterogeneity was evident among findings. Accordingly, questions exist regarding whether dissociation and trauma are best characterized as nonspecific rather than specific causal antecedents or concomitants of many mental disorders (Lilienfeld & Treadway, 2016).

3. The SCM

According to the SCM (see Lilienfeld et al., 1999; Lynn et al., 2019; Spanos, 1996) fantasy-proneness, media influences (portrayals of dissociative disorders in books, films, television programs, and social media), suggestibility, a tendency to over-report/exaggerate symptoms, and cognitive failures/memory lapses contribute to self-reports of trauma, dissociative experiences, and the diagnosis of dissociative disorders (Giesbrecht et al., 2008). The conviction that one harbors multiple personalities may arise when individuals seek to explain puzzling psychopathology (e.g., affective instability, rapidly shifting moods) in terms of different "personalities" based on books, movies, and television programs such as *The Three Faces of Eve*, *Sybil,* and the *United States of Tara*. Therapist cueing or strong and misleading suggestions (e.g., "You were abused and developed dissociative symptoms to cope") can create or facilitate belief in "different selves" and inaccurate memories of abuse. Complex, persisting false memories (e.g., bullied as a child, taken on a ride in a hot air balloon, witnessing an exorcism; see Lynn, Berg, et al., 2014) can be shaped by suggestion and suggestive misinformation targeted at symptoms can engender symptom escalation (Merckelbach, Jelicic, & Pieters, 2011). Moreover, measures of fugue/dissociative amnesia are related to false memories (Belliveau & Kunzendorf, 2015).

3.1. Critiques of the SCM

The following seven points rebut the critique of the TM and point to limitations in the SCM perspective (Brand et al., 2018; Bremner, 2010; Dalenberg et al., 2012, 2014; Vissia et al., 2016):

(1) Weak correlations between trauma and dissociation in non-clinical samples may be explained by low levels of clinical trauma, dissociation, or both. Dissociation theories generally pertain to clinical-level dissociation. Moreover, the link between trauma and dissociation is disclosed across many clinical populations (Dalenberg et al., 2012), and sociocognitive influences do not necessarily disqualify the role of trauma.
(2) Dalenberg et al. (2012) reported that the effect size of the trauma-dissociation link was not reduced significantly when objective or corroborated indices of trauma were used.
(3) Dissociation and fantasy-proneness may "correlate spuriously in part through their common connection through trauma history" (p. 562, Dalenberg et al., 2012). Still, it is as yet uncertain whether fantasy fuels self-reported trauma, fantasy functions as a coping mechanism following trauma exposure, or both (see Merckelbach, Horselenberg, & Schmidt, 2002).
(4) Studies have typically yielded mixed findings or weak or modest correlations (Dalenberg et al., 2012; see Patihis, 2018, for an explanation based on the Dual Encoding Interference hypothesis) between false memory/suggestibility and dissociation. Nevertheless, Dalenberg et al. (2012) rightly contend that the fact TM researchers often fail to include measures of suggestibility and SCM researchers often fail to include measures of trauma "leaves much room for collaborative endeavors" (p. 566) between proponents of the TM and the SCM. Indeed, Janet (1889/1973) long ago recognized that trauma and suggestibility could both play a role in hysteria (dissociation), which presaged the idea that suggestibility and trauma need not be "either-or" as determinants of dissociative psychopathology
(5) The fact that increases in the rate of diagnoses of dissociative disorders (DID) occurred coincident with media events that dramatize dissociation does not provide strong evidence for the SCM. Increased awareness via the media could facilitate (a) more systematic and higher rates of diagnosis of DID as distinct from schizophrenia, for example, and (b) might account for increases in the number of personality states/identities during psychotherapy (Piper, 1997), a finding proponents of the SCM view as supportive of their model. Moreover, in some cultures (e.g., China, Turkey) with little or no exposure to popular media, researches can identify and diagnose DID (Akyüz, Doğan, Ar, Yargic, & Tutkun, 1999; Ross et al., 2008; Xiao et al., 2006).
(6) Researchers have contended the SCM claim that DID treatment can be harmful and induced by iatrogenic influences in psychotherapy (see Brand, Loewenstein, & Spiegel, 2014; Elzinga, van Dyck, & Spinhoven, 1998).
(7) Studies in which college students role-play DID (e.g., Spanos, Weekes, & Bertrand, 1985; Stafford & Lynn, 2002), presumably based on sociocultural narratives, will not necessarily generalize to patients in psychotherapy and do not provide a compelling explanation for DID based on the SCM (e.g., Gleaves, 1996). Moreover, simulation studies that compare people diagnosed with DID and people simulating DID are sometimes marred by flaws (Boysen, 2014), and some simulation studies arguably support the PTM (e.g., Reinders et al., 2016; Schlumpf et al., 2014; Vissia et al., 2016, but see Merckelbach, Lynn, & Lilienfeld, 2016 for a rebuttal and Brand et al., 2016 for a counter-rebuttal).

4. Toward common ground

In the not-too-distant past, some scholars (e.g., Kluft, 1984) used the term "alters" to describe personality states. These alters presumably displayed different voices, vocabularies, accents, hand preferences, visual acuity and so on, inviting a literal interpretation of alters. The possibility of finding common ground between the TM and the SCM models begins with a consensus that people with DID are not, in reality, a conglomeration of indwelling entities, despite their subjective conviction that this is so. That is, individuals with DID hold the mistaken belief that they house separate selves.

Research has failed to detect consistent objective evidence (e.g., behavioral tasks, event related potentials) of distinct personalities segregated by impermeable amnesic barriers (e.g., Huntjens, Verschuere, & McNally, 2012; Kong, Allen, & Glisky, 2008), although evidence exists for decreased connectivity or coherence in brain rhythms (Hopper et al., 2002) and differences in brain connectivity in patients with dissociative disorders (Farina et al., 2014). Still, such differences, which may imply less integrated mental functioning (see Soffer-Dudek, Todder, Shelef, Deutsch, & Gordon, 2019 for findings related to dissociative absorption), do not presuppose the existence of alter personality states.

Many advocates (Dalenberg et al., 2012) of the TM now view DID as "a disorder of self-understanding" (p. 568) and acknowledge that "those with DID have the inaccurate idea that they are more than one person" (p. 568), a perspective aligned with the SCM. Adherents of the TM (Dalenberg et al., 2012) have made other concessions to the SCM or expanded the purview of potential determinants of dissociation beyond trauma in their recognition that (a) "fantasy proneness—among other factors—may lead to inaccurate trauma reports" (p. 551); (b) the effects of trauma on dissociation may be difficult to completely parse from broader aspects of pathogenic family environment or dynamics (e.g., poor communication, hostility in the home) in which childhood sexual

abuse, physical abuse, emotional abuse, and neglect occur (see Dalenberg et al., 2012, p. 576); and (c) value resides in considering non-trauma antecedents of dissociation, including biological vulnerabilities and other potential mediators and moderators (e.g., psychiatric history, developmental factors) of the genesis of dissociation in the service of developing more complex models of response to trauma (Dalenberg et al., 2012).

In turn, proponents of the SCM (Lynn, Berg, et al., 2014) have conceded that the potential repercussions of trauma in dissociation and dissociative disorders are well worth exploring. Furthermore, the SCM remains agnostic with respect to whether trauma is in some cases directly causally related to dissociation and concedes that the role of trauma may be indirect, as we will see, via disrupted sleep, impaired emotion regulation, or increased stress levels.

Although there have been some tentative moves toward rapprochement, clashing views of dissociation have provoked considerable defensiveness on the part of proponents on both sides, inhibited rigorous self-examination of entrenched stances, and contributed to insularity and "closedness" regarding the viability of broadening the landscape of determinants of dissociation and focal points for the study of dissociation and dissociative disorders. We aim to depart from this deeply ingrained and by now predictable pattern of discourse, which has stifled potential expansion of the boundaries of knowledge regarding transtheoretical ways of understanding dissociation and dissociative disorders.

To do so, we conducted a literature review of pertinent topics with the intention to be systematic and extensive, but not exhaustive or comprehensive, as the aims of our article were focused on pre-determined variables, yet informed and refined via scrutiny of the literature. We do not systematically review the dissociative subtype of posttraumatic stress disorder or PTSD at large given space constraints and the scientifically unsettled nature of this PTSD subtype. To the extent possible, we rely on empirical sources, but also draw on selected theoretical sources to facilitate our goal of posing novel hypotheses to be explored.

To conduct our review, we searched for the terms "dissociation" and "dissociative disorder", including depersonalization and derealization (note that depersonalization and derealization are now considered a single disorder: depersonalization/derealization, DSM-5), dissociative amnesia, and dissociative identity disorder, paired, each in turn, with the terms sociocognitive model of dissociation, trauma model of dissociation, sleep, emotion regulation, meta-consciousness, meta-cognition, alexithymia, hyperassociation, set shifts, borderline personality disorder, schizophrenia, psychosis, and schizotypy. We also searched for emotion regulation, meta-consciousness and meta-cognition, alexithymia, hyperassociation, sleep, fantasy, and set shift conjoined with borderline personality and schizophrenia/schizotypy/psychosis. Because "dissociation" and "set shift" are terms with multiple connotations in scientific psychology (e.g., learning, memory), we restricted our search to cases in which the terms were used in reference to dissociation as a personality trait or state or clinical dissociation in the context of psychopathology. We limited our search to publications written in English. Our search encompassed electronic search engines Google Scholar and PsycINFO, and we examined titles, abstracts, reference lists, and publications to identify relevant publications. From this review, we identified 687 publications that we inspected more carefully for relevance. Based on the criteria, our methodology yielded 253 articles cited.

5. Key terms and overview

5.1. Meta-consciousness

Before we present our analysis, we define several important terms key to the variables under consideration: meta-consciousness, hyperassociation, and set shifts. *Meta-consciousness*, as we use the term here, is intended to designate a broad conceptual terrain that is closely related to yet extends metacognition (capacity to be aware of and comprehend one's mental states and infer the inner states of others/theory of mind) to include the ability to articulate the link between subjective experiences and behaviors and their cognitive, affective, and situational antecedents and potential consequents. Meta-consciousness overlaps with "mentalization" or "reflective functioning," including the ability to mentally represent and understand which, when, and how emotions are experienced, skills believed essential to emotion regulation and cognitive inhibition (Efklides, 2008; Gross, 1998; Thompson, Dizén, & Berenbaum, 2009), alongside beliefs regarding the self and others (Fonagy, Gergely, & Jurist, 2004). Meta-consciousness also encompasses self-consciousness, or the knowledge or ability to experience or monitor thoughts, feelings, and sensations (Kunzendorf, 1987). Meta-consciousness is reflected in and can be undermined by *alexithymia*, the inability to identify and elaborate on emotions, which is a robust correlate of dissociative pathology (see Merckelbach et al., 2017 review), particularly depersonalization/derealization (discussed in this context in the literature primarily as depersonalization).

We suggest that stable and coherent self-representations, which promote the ability to identify and monitor thoughts and feelings, facilitate the integration of thoughts, feelings, and actions prerequisite for self-regulation, linking actions with outcomes, and engaging in adaptive prospection. When lack of such self-awareness and integration occurs across situations and emotional states, it compromises adaptive processing of emotions and falls squarely in the domain of dissociation (Grabe, Rainermann, Spitzer, Gänsicke, & Freyberger, 2000), although some have conceptualized depersonalization/derealization as an anxiety condition (Holmes et al., 2005). In the case of DID, insofar as individuals do not actually possess separate selves, their disorder can be construed as an impairment in self-perception and self-awareness; that is, in meta-consciousness.

Other researchers share our view that dissociation represents an impairment in meta-consciousness, often accompanied by degradation in self-regulatory functions. Berenbaum, Raghavan, Le, Vernon, and Gomez (2003) classified both alexithymia and dissociation as disorders of emotion disconnections. Similarly, Roberts and Reuber (2014) argue that dissociation represents an impairment or disconnect between aspects of emotional processing or a failure to integrate emotional information into self-representations and awareness. Liotti and Prunetti (2010) described dissociation as an exemplar of metacognitive failure, which they link to trauma-related disorders, and describe the latter as deficits in identifying emotions, defects in source memory, and problems in regulating memories and thoughts. Oathes and Ray (2008) reported that high dissociators' sensitivity to emotional stimuli functioned to avoid elaboration of negative emotion after initial emotional processing. In a highly traumatized sample, alexithymia and an inability to implement emotion regulation strategies were meaningful predictors of dissociation, even when trauma was controlled statistically (Powers, Cross, Fani, & Bradley, 2015), and among Italian adults, participants with higher levels of dissociation scored significantly lower on empathy (Schimmenti & Caretti, 2016; see also Chiu, Paesen, Dziobek, & Tollenaar, 2016) and theory of mind and higher on alexithymia compared with other participants (see also Schimmenti, 2016)

Difficulties in meta-consciousness, specifically alexithymia, are related to poor interoceptive sensitivity (e.g., awareness of sensations), as well as to fantasy-proneness, hypnotic suggestibility, suggestibility, symptom over-reporting, and sleep problems (Dienes & Perner, 2007; Merckelbach et al., 2017; Merckelbach, Prins, Boskovic, Niesten, & Campo, 2018). Moreover, measures of mindfulness are negatively correlated with dissociation (DES; $r = -.53$; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; $r = -.29$, Walach, Buchheld, Buttenmüller, Kleinknecht, & Schmidt, 2006), implying relatively poor monitoring/meta-consciousness. Chiu et al. (2016b) reported that highly dissociative individuals frequently misidentified self-generated items as experimenter-generated. We posit that source monitoring

deficits among highly dissociative individuals increase the likelihood they will confuse actual and imagined events and ascribe their behaviors to dissociated personalities.

Adults' failure to develop healthy parent-child attachments and to assist children in regulating emotions and transitioning across affective states could impair meta-consciousness and create difficulties in developing a coherent or unitary sense of self and in self-regulation in later life (Carlson, Yates, & Sroufe, 2009; Liotti, 2009; Schore, 2009). Schimmenti (2017), for example, found that alexithymia and deficits in theory of mind fully mediated the relation between dissociation and emotional neglect in childhood and argued that problems with mentalizing and regulating affect activated dissociative processes.

We suggest that the fundamental (mis)attribution error (Ross, 1977) in DID is to attribute shifting cognitive-emotional-behavioral sets to multiple selves. What is often referred to as "dissociation," can thus be construed as a pronounced lack of or distorted self-awareness, accompanied by a failure or dysfunction in the ability to regulate, integrate, elaborate, monitor, and comprehend the relations among emotions, thoughts, sensations, and memories and the situational, social, and personal circumstances that elicit or impact them.

5.2. Self-control and self-regulation

Finding links among impaired meta-consciousness, self-regulation, and dissociation would not be surprising insofar as if individuals fail to identify or elaborate emotions, it would impede their ability to intentionally implement self-regulation and deautomatize habitual avoidance reactions (Palmer & Alfano, 2017). Researchers have well-documented (see Dorahy, 2006) problems in executive control, self-regulation, and cognitive inhibition in dissociation and dissociative disorders as assessed by (a) the classic Stroop test; (b) inhibition on flanking digits on a continuous performance task; (c) generation of random numbers; and (d) memory and cognitive inhibition (Bregman-Hai et al., 2018; Chiu et al., 2010; Chiu, Yeh, Huang, Wu, & Chiu, 2009; Merckelbach, Muris, & Rassin, 1999). Studies of daytime EEG activity in highly dissociative individuals have found that parameters signaling reduced attentional control (e.g., attenuated P300, Kirino, 2006; decreased theta activity, Krüger, Bartel, & Fletcher, 2013) are associated with dissociative experiences. In patients with DID, cognitive inhibitory capacities appear to be intact in neutral conditions, but are particularly impaired in emotional contexts, implying that negative emotions disrupt cognitive inhibitions (e.g., Dorahy, McCusker, Loewenstein, Colbert, & Mulholland, 2006; Dorahy, Middleton, & Irwin, 2005). Finally, Briere (2006) found that affect dysregulation was a univariate and multivariate predictor of dissociative symptoms among trauma exposed participants.

5.3. Hyperassociativity and set shifts

We define *hyperassociativity* (or *hyperassociation*) as increased activation and fluency of (often weakly) semantically and emotionally related concepts and networks following the activation of a specific concept, emotion, or memory (see Horton, 2017; Horton & Malinowski, 2015). In subsequent sections, we contend that the interplay of normative associative and dysfunctional hyperassociative processes is an important substrate of dissociative symptoms.

To elaborate with a clinical example, Lynn et al. (2019) briefly described, and we here amplify, an account of six patients with a previous diagnosis of DID (prior to therapy with Lynn) who exhibited a pronounced tendency to hyperassociate. Lynn ascertained that these patients all met the existing DSM criteria for DID at the time of the therapy. Each patient responded in a rapid-fire manner with associations to their thoughts, feelings, and behaviors and to external stimuli (e.g., therapist comments, ambient noises). Hyperassociations were often accompanied by strong affect, affect shifts, and avoidance or neglect of the topic at hand, which disrupted the thread of the discussion. For example, a patient discussing how her father harshly disciplined and berated her when she did not complete homework, abruptly and with abandon began to recount a joyful interaction with a beloved pet with accompanying changes in her demeanor appropriate to these seemingly disparate associational threads. Patients often reported depersonalization/derealization that accompanied a lack of monitoring of associations and/or they experienced difficulty in recalling the conversation, implying a lack of control or coherence of associative processes. Meta-consciousness was, in turn, compromised: Emotions were neither identified, monitored, nor reportedly *experienced* by the patient, consistent with alexithymia, during cascades of associations. Often, *felt* emotions were absent, producing a disquieting experience of numbness and psychological distance from both the experienced (or unexperienced in this case) self and surroundings characteristic of DDD. As feelings, infused with self-reflection and intention, ordinarily steer goal-directed behaviors and enhance cognitive and behavioral control, the patients, seeming to lack such internal rudders, displayed rapid shifts from extreme overmodulated to undermodulated emotional states. In the face of triggers of negative emotions, hyperassociativity animated the fragmentation of autobiographical memory and cognitive-emotional dysregulation.

Repeated hyperassociation in response to increasingly predictable triggers appeared to consolidate response sets into perdurable, readily accessed, and increasingly automatized cognitive-behavioral-affective associational networks. To observers and patients, abrupt shifts in associational patterns, accompanied by lack of self-regulation, could be construed as distinct personality states. Among the patients–all of whom in previous therapies came to view themselves as "multiple personalities"– hyperassociative episodes were often attributed to another "identity." In short, patients who hyperassociate in this manner paradoxically appear to be dissociated. Relatedly, Oppenheimer (2002, p. 97), writing from a psychodynamic tradition, in an article that garnered little attention, contended that DID is actually an "associative identity disorder" and claimed that it was "the result of deficient integrative and associative processes..." Hyperassociation can also be observed in healthy individuals, although associative processes are typically better regulated, modulated, linked with contextual and task demands, steered toward goal achievement, and rarely prone to severe cognitive-emotional dysregulation.

Empirical findings are relevant to the hyperassociativity hypothesis. Scroppo, Drob, Weinberger, and Eagle (1998) reported that Rorschach inkblot test stimuli administered to patients with DID triggered "an automatic and complex flow of associations, an apparently uncontrolled but intense process…" (p. 281). Sutin and Stockdale (2011) found that high dissociators' self-defining memories were more affectively incongruent and less visually coherent compared with the memories of low dissociators. Loosening of associations of autobiographical memories is significant in that such memories maintain a sense of self-consistency, identity coherence, and stability across affective states and changing circumstances. Conversely, the lack of such consistency can contribute to a tenuous, unstable, and fragmented sense of self and identity (Chiu, Lin, Yeh, & Hwu, 2012): Individuals with high (nonclinical) levels of dissociation-proneness exhibited less integrity of the self-concept and a more polarized and compartmentalized sense of self (Chiu, Chang, & Hui, 2017)

In the DID literature, hyperassociative phenomena have not been explicitly labeled as such, but similar phenomena have been called "set switching" (Chiu et al., 2009; p. 214). The term "set" should not be understood to be isomorphic with "personality" or "identity" in DID. Rather, we define set per Chiu et al. (2012) as an internal constellation (in our terms, network of associations) of contextual representations of cognition, mood states, behavioral schemata, and the sense of self (see Kennedy et al.'s, 2004 description of schemas in relation to dissociation). We hypothesize that hyperassociation fuels set shifting in response to internal and external stimuli, particularly in the presence of low levels of meta-consciousness, self-regulation, and inhibition and

high levels of negative affect. Hyperassociativity is thus fundamental to dissociation.

Research supports the association of shift sets with high dissociation. Chiu et al. (2009) reported that in the face of negative emotion high (nonclinical) dissociators disengage from one task to rapidly shift to another task, particularly under conditions of intense affect. They posited that rapid set shifts (i.e., "switches") engender difficulties in sustained attention, disrupt integration of thought processes, and interfere with a coherent interpretation of the internal and external world. Chiu et al. (2010) found that set shifts mediated inefficient memory inhibition and the forgetting of previously uninhibited autobiographical memories among nonclinical individuals with high levels of dissociation. Intrusive memories could disrupt the flow of normative associations, and hyperassociativity and set shifts could engender the failure to integrate and organize encoded information (Dorahy, 2006), further contributing to a dissociative presentation.

Chiu et al. (2009) suggested that set switching could divert attention to contend with negative emotion. Relatedly, Dorahy (2006) described how high dissociators shift awareness away from threat-related affective stimuli and on to non-affective stimuli to defend against or avert anxiety. We suggest that stimulus-bound activation of associations can increasingly interconnect and organize memory nodes into more discrete and coordinated patterns that translate to more perdurable cognitive-affective-behavioral sets. Avoidance-based set shifts can become an increasingly stimulus-bound, rigid, and maladaptive vehicle for creating a credible feeling of distance or separation from aversive events, whether veridical or imagined (Lynn, Condon, & Colletti, 2013). Set shifts that promote acute or instant escape or avoidance from negative emotions in the short run could be highly rewarding, via negative reinforcement, in the long run, proliferate, and become deeply ingrained, automatized, and compartmentalized with repetition.

6. Dissociation, hyperassociation, and the sleep-wakefulness continuum

The sleep-dissociation perspective we present in the next few sections provides an overarching account for how highly aversive events and negative emotions disrupt the sleep-wake cycle and predispose to dissociative symptoms and can also help to explain why there is overlap among trauma, dissociation, cognitive failures, memory problems, emotional dysregulation, and fantasy-proneness. As a consequence, this perspective suggests intriguing possibilities for finding common theoretical ground and even integration across the PTM and SCM (Lynn, Berg, et al., 2014).

Based on an emerging but increasingly robust literature, poor sleep and unusual sleep-related experiences provide a non-trauma pathway to dissociation, reflecting the continuum between sleeping and waking life and the changeable quality of human consciousness. Researchers have characterized the boundaries among waking, sleep, and dreaming as fluid and overlapping (Mahowald, Cramer Bornemann, & Schenck, 2011; Mahowald & Schenck, 2005). Many dissociative experiences and nonpathological daydreaming can be located in the middle of a continuum of dreaming on one end and alert, focused attention, with meta-consciousness and self-regulation capacities fully intact, on the opposite end (van Heugten-van der Kloet et al., 2015). Hyperassociativity marks the transition of waking to sleep onset (Schacter, 1976) and appears characteristic of REM sleep (Stickgold, Hobson, Fosse, & Fosse, 2001). Hyperassociativity is also observed in dissociative individuals whose daytime mentation reflects continuity or fusion with dream-like experiences (Lynn, Berg, et al., 2014; Soffer-Dudek, 2017; van Heugten-van der Kloet, Merckelbach, & Lynn, 2013). Diminished reality monitoring, self-referential and self-reflective processing/meta-consciousness, and increased hyperassociativity, as well as more bizarre and vivid fantasy-like content typically distinguish the dream from the wake state (Cernis et al., 2014; D'Agostino, Castelnovo, & Scarone, 2013; Kunzendorf, Hartmann, Cohen, & Cutler, 1997; Llewellyn, 2016; Malinowski & Horton, 2015). Yet the same cognitive activities that generate images during dreaming are active throughout the sleep-wake cycle (Domhoff, 2010), and the contents of ordinary daydreams can be even more bizarre than nocturnal dreams (Lehrfeld, Jopp, & Somer, 2016; Wollman & Antrobus, 1986).

The concept that depersonalization/derealization blurs the line between sleep and dreaming and possesses a dream-like quality is not new. Hughlings Jackson, the famed 19th century neurologist, described dissociation in terms of "the dreamy state" (Meares, 1999, p. 1850). Schilder (1928) commented: "[t]o the depersonalized individual the world appears strange, peculiar, foreign, dream like" (p. 120). Levitan (1967) described depersonalization as a compromise state between dreaming and waking (p. 157), and Arlow (1966) contended that the basis of depersonalized states was a dissociation between the observing and the experiencing self, suggestive of deficits in meta-consciousness and in the normal integration of emotions, cognitions, and self-awareness during dreaming. Moreover, metacognition, self-referential processing, and problems in reality monitoring, diminished in DDD, are also attenuated in dream states (D'Agostino et al., 2013). Most recently, Llewellyn (2009, 2011, 2016) observed that dissociation reflects a discontinuity in consciousness and an interrupted sense of reality that reflects a continuity between waking and dreaming mentation. In this view, the unpredictable and disturbing infiltration of dreamlike mentation during the day lends a disquieting air of unreality to experiences, triggers anxiety and hyperassociativity, compromises meta-consciousness, and initiates episodes of depersonalization/derealization. The jarring, disruptive, and dysregulated disjuncture between waking dreamlike experiences and the reality-based demands of everyday life are likely fundamental to DDD and other dissociative disorders.

6.1. Research on sleep and dissociation

Over the past two decades, research has increasingly confirmed the relation between sleep and dissociation, following the seminal contributions of Watson and colleagues (Koffel & Watson, 2009; Watson, 2001). Studies have revealed a link between dissociative and other unusual experiences and anomalous sleep experiences (e.g., hypnagogic and hypnopompic hallucinations, sleep paralysis, narcoleptic tendencies, vivid dreams, nightmares). van der Kloet, Merckelbach, Giesbrecht, and Lynn (2012) reviewed 23 clinical and nonclinical studies and found that with one lone exception, the studies yielded correlations between measures of sleep disturbance and dissociation ranging from $r = 0.30 - 0.55$. Barton, Kyle, Varese, Jones, and Haddock (2018) reported effect sizes in a similar range. Vannikov-Lugassi and Soffer-Dudek (2018) found that sleep quality was associated with dissociative experiences and that poor sleep was a key variable in accounting for the relation between rumination and dissociation (see also Yıldırım, Boysan, & Yılmaz, 2018). van der Kloet et al. (2013) tested patients experiencing insomnia who spent one night in a sleep clinic. The researchers reported a significant correlation ($r = 0.40$) of dissociative symptoms with unusual sleep experiences (e.g., narcoleptic symptoms, sleep paralysis, nightmares), but not with trauma ($r = 0.10$). Most importantly, longer REM sleep periods predicted dissociation (see also van Heugten-van der Kloet, Huntjens, Giesbrecht, & Merckelbach, 2014). van Heugten-van-der Kloet et al. (2014) found that DID patients and PTSD patients reported more sleep problems, lower sleep quality, and higher levels of cognitive failures and fantasy-proneness compared with healthy participants. Although unusual sleep experiences predicted inclusion in the DID group, lower sleep quality and cognitive failures predicted PTSD group membership. Watson, Stasik, Ellickson-Larew, and Stanton (2015) examined a more comprehensive range of psychopathology using interview-based diagnoses and self-reported symptoms and found that although anomalous sleep experiences were related to a broad span of psychopathology, they exhibited particularly strong links to dissociation and positive symptoms of psychosis/schizotypy.

Highly suggestive evidence for a causal relation between sleep and dissociation comes from studies that find increases in dissociation following sleep prevention and decreases in dissociation following sleep hygiene methods. Giesbrecht, Smeets, Leppink, Jelicic, and Merckelbach (2007) deprived participants of sleep for one night (24-hours sleep prevention), which produced a substantial increase in dissociative symptoms not accounted for in terms of demand characteristics or mood changes. In another study (Selvi, Kiliç, Aydin, and Özdemir 2015) one night of sleep deprivation increased dissociative symptoms and mitigated the ability to suppress thoughts consciously. van Heugten-van der Kloet, Giesbrecht, and Merckelbach (2015) prevented participants from sleeping for 36 h and found dissociative symptoms and sleepiness intensified during the night, while mood deteriorated and sleep loss impaired memory for emotional material, especially among highly dissociative individuals. In contrast, an intervention geared to improve sleep via sleep hygiene in a mixed inpatient sample at a private clinic (van der Kloet, Merckelbach, et al., 2012) decreased dissociation. Suggestive, albeit limited, evidence for a causal relation between sleep and dissociation was also found in an experience sampling study in which poor sleep quality was related to increased daily dissociation over a 40-day period in a person with DDD (Poerio, Kellett, & Totterdell, 2016).

According to Van Heugten-van der Kloet et al. (2013), excessive REM sleep, microsleep episodes during the day, or both, fuel fluid and hyperassociative cognition typical of dissociative disorders. We argue that sleep disturbance and unusual sleep experiences, in particular, can persist to an attenuated degree in everyday life and push waking consciousness more toward the dreaming end of the sleep-wakefulness continuum (van Heugten-van der Kloet, Cosgrave, Merckelbach, Haines, Golodetz, & Lynn, 2015; Watson, 2001). van Heugten-van der Kloet, Cosgrave, Merckelbach, et al. (2015) found that fewer hours of sleep and poorer sleep quality predicted greater bizarreness in photos and captions among individuals who participated in a "creative photo contest." Soffer-Dudek et al. (2017) reported (a) that when high functioning non-pathological participants were sleep deprived, they reported increases in dissociative symptoms and (b) that trait dissociative absorption predicted increases longitudinally in sleepiness and increased sleepiness after recovery sleep. That is, dissociators continued to experience elements of the sleep state while awake. Consistent with our view, the authors suggested that dissociative absorption represents difficulty in regulating and controlling conscious states and that disruption in the sleep-wake cycle exacerbated such difficulties.

When sleep-like experiences spill into everyday life, we hypothesize that it fosters (a) highly associative, fantasy-based thinking during waking hours, in keeping with many findings that support a robust relation between fantasy-proneness and dissociative experiences (Giesbrecht et al., 2008); and (b) problems in executive/cognitive control and monitoring and failures of cognitive inhibition that accompany hyperassociativity and set shifts that are present in DDD (Guralnik, Schmeidler, & Simeon, 2000) and perhaps to a greater extent in DID (Dorahy et al., 2005). In terms of hyperassociativity, awakening from dreams is accompanied by an enhanced tendency to link weakly associated words compared with strongly associated words, in contrast with waking responses to primes (Stickgold, Scott, Rittenhouse, & Hobson, 1999). Similarly, individuals high in dissociative absorption, after awakening immediately from "impactful" dreams (i.e., "existential" and "transcendent") associated with intense affect (but not nightmares or mundane dreams), scored higher on a measure that combined an index of associative fluency with the ability to report unrelated associations. In the same study, individuals high in dissociative absorption following significant loss (including traumatic loss) scored poorly post-dream on the ability to integrate concepts (Kuiken, Porthukaran, Albrecht, Douglas, & Cook, 2018).

Sleep deprivation and disruptions exert neurocognitive effects during daily activity and interfere with adaptive executive functioning and emotion regulation that accumulate over time (Goel, Rao, Durmer, & Dinges, 2009; Gruber & Cassoff, 2014); this interference could be exacerbated in individuals high in dissociation. Sleep-related difficulties also plausibly contribute to overreporting of unusual experiences and difficulties in discriminating true from false memories. Indeed, sleep-deprived individuals report more memory commission errors than do comparison participants (Blagrove & Akehurst, 2001), a finding common among highly dissociative individuals (Giesbrecht et al., 2008). Frenda, Patihis, Loftus, Lewis, and Fenn (2014) found that false memories were increased in a misinformation task after participants were sleep deprived for 24 h during event encoding. Moreover, we hypothesize that extensive or vivid daydreaming and waking fantasy activity, which are immersive cognitive activities, and which we suggest are fueled by sleep disruptions, interfere with memory encoding and reality testing (Merckelbach et al., 2017). In short, sleep disturbances engender multiple sequelae that relate to impairments in cognitive and affective function and control of high relevance to dissociative experiences.

7. Stress, trauma, and dissociation

We previously contended that sleep disturbances represent a potential non-trauma path to dissociative phenomena. In this section, we argue that disrupted sleep can also play a prominent role in the relation between traumatic experiences and dissociation: When adverse or negative experiences in the daytime produce arousal and disrupt sleep, and when unusual dream-like experiences intrude on waking consciousness, we hypothesize that these experiences (a) engender feelings of depersonalization/derealization and hyperassociation in response to emotional stimuli and (b) degrade emotion regulation that interferes with the ability to cope with the sequelae of highly adverse events that in turn disrupts sleep in a recursive manner.

What applies to trauma in our discussion may apply equally to more generalized life stressors (e.g., emotional distress; see Briere & Runtz, 2015) and even to personality traits such as negative emotionality (Watson, 2001), which predispose individuals to appraise ambiguous life events in an aversive light. There is ample reason to question whether the severe etiological agents on which the TM typically focuses, such as childhood sexual abuse, should be relegated to a special category divorced from a host of stressful and negative events more generally. The TM would do well to more clearly distinguish the effects of so-called "traumatic events" from those of generalized stressors and daily life stress.

Nevertheless, we concur with TM proponents that one potential pathway from trauma to dissociation involves the link between negative emotions and dissociation. Such emotions can be triggered by poor sleep, highly aversive events and their reminders, repercussions of difficulties in naming and accessing emotions, poor self-regulation, hyperassociation, and set shifts potentially related to trauma-related internal or external cues (Chiu et al., 2016a). One possible scenario is that negative stimuli ignite an affect-charged network of memories and somatic associations (Yates & Nasby, 1993) related to aversive events, which unfold automatically with little awareness (meta-consciousness) of the source and effects of the trigger and the resultant set shift. Highly dissociative individuals, particularly those who experience intense negative emotions, exhibit impaired (a) sustained focused attention and attentional control in response to distracting stimuli; (b) autobiographical memory; and (c) inhibitory functions, engendering difficulties in self-regulating and forming coherent, controlled mental associations, especially when cognitive resources are taxed (Soffer-Dudek, 2014).

Researchers have documented robust associations among life stressors, sleep, psychological distress, negative emotions, and dissociation. For example, negative affect statistically predicts unusual sleep experiences (Fassler, Knox, & Lynn, 2006), and life-stressors and psychological distress predict an increase in unusual sleep-related experiences (e.g., nightmares, hypnagogic hallucinations, elevated dream

recall) over a three-month period (Soffer-Dudek & Shahar, 2009), consistent with the possibility that daily experiences influence sleep experiences, as well as with the notion of cross-state continuity of sleeping and dreaming (see also Soffer-Dudek, 2016; Soffer-Dudek & Shahar, 2010). The relation between trait dissociation and daily unusual sleep experiences appears to be restricted to high daily stress, whereas the relation between daily stress and sleep-related experiences appears restricted to individuals high in trait dissociation (Soffer-Dudek & Shahar, 2011).

Soffer-Dudek (2017) argued that psychological arousal carries over from the daytime to nocturnal consciousness in unusual sleep experiences (e.g., sleep paralysis) that can become manifest in dreamlike, fantasy-based cognition, difficulties in focusing in response to distracting stimuli (Soffer-Dudek, 2014), and in poor attentional control (Williamson, Feyer, Mattick, Friswell, & Finlay-Brown, 2001), cognitive failures, and memory problems (Hairston & Knight, 2004). Alfasi and Soffer Dudek (2018) found that difficulties in identifying emotion, a facet of trait alexithymia, moderated the relation between unusual sleep experiences and daily stress.

One possible reason for problems in the sleep-wake cycle is the intrusion of disturbing trauma-related memories into the stream of consciousness during sleep. We further hypothesize that (a) sleep disruptions and unusual sleep experiences are related to set shifts, although this contention is more speculative and has yet to be evaluated and that (b) set shifts will be associated with high levels of aversive tension (i.e., unpleasant high arousal with a corresponding lack of meta-consciousness) and corresponding difficulties with identifying emotions such as guilt, fear, or anger (Daly, Lancee, & Polivy, 1983) in DDD and in DID.

Acute traumatic events could contribute to both hyperassociation, as expressed in avalanches of thoughts that are not easily inhibited (e.g., "This isn't real! "What's happening here? This can't be happening. What do I do?") and to depersonalization/derealization associated with transient stressful events and hyperarousal (Soffer-Dudek, 2014; Sterlini & Bryant, 2002). Experiences of depersonalization/derealization are often fraught with anxiety and accompanied by cognitive disorganization, attention difficulties, impairments in monitoring and controlling thoughts and reactions, and difficulties in engaging in self-reflection and identifying feelings (Guralnik et al., 2000; Simeon et al., 2000): This cascade of responses swamps cognitive and emotional resources and compromises adaptive coping strategies, which engender feeling "numbed" and "unmoored" in relation to thoughts, strong emotions, and the surroundings.

Another possibility to be explored in future research is that repeated traumatic situations instantiate such reactions on a long-term basis in response to cues related to past adverse events. We anticipate that such cues engender response sets related to (a) cognitive and behavioral avoidance; (b) excessive and escapist fantasy (see research on maladaptive daydreaming, which is related to dissociation; Bigelsen, Lehrfeld, Jopp, & Somer, 2016; Somer, Lehrfeld, Bigelson, & Jopp, 2016); (c) felt detachment (depersonalization/derealization); and (d) set shifts that undermine the sense of a coherent sense of self and reality, as in the case of DID.

8. Dissociation and co-occurring disorders: borderline personality and schizophrenia spectrum dsisorders

8.1. Borderline personality disorder

If the transdiagnostic perspective we have advanced is valid, then we should be able to find evidence for the relevance of the variables we identified in disorders that overlap meaningfully with dissociative disorders. In the next sections, we document considerable support for the transdiagnostic generalizability of our prior findings to two such disorders: BPD and schizophrenia spectrum disorders.

DSM-5 (American Psychiatric Association, 2013) includes in the criteria for BPD "identity disturbance: markedly and persistently unstable self-image and sense of self" and "transient, stress-related paranoid ideation or severe dissociative symptoms" (p. 663). Interpersonal difficulties and unstable relationships are also linked to dissociative experiences among individuals with BPD (Gunderson, 2007). In contrast with individuals without BPD, individuals with BPD are considerably more likely to meet diagnostic criteria for a dissociative disorder. Higher frequencies of dissociative symptoms are associated with more severe psychopathology among BPD patients. Female patients with BPD reported dissociative symptoms an average of 17%–20% of the previous 24 h, and 33%–42% reported severe symptoms (Stiglmayr, Shapiro, Stieglitz, Limberger, & Bohus, 2001). In contrast, six of 55 comparison participants (11%) reported significant dissociative symptoms across the same period. Şar, Akyüz, Kuğu, Öztürk, and Ertem-Vehid (2006) observed that 72.5% of individuals in a college population with BPD had a dissociative disorder, compared with 18% of participants with no BPD. In 21 patients with BPD, 24% were diagnosed with DID, 29% with dissociative amnesia and depersonalization disorder, and 24% with dissociative experiences not otherwise specified (Korzekwa, Dell, Links, Thabane, & Fougere, 2009). Across 27 studies, compared with healthy individuals, people with BPD score much higher on the DES (mean 27.9 vs. 8–12, healthy samples) and similar to individuals with PTSD (Lyssenko et al., 2017).

High rates of overlap between BPD and dissociative psychopathology may arise not only from common symptoms, but also from common variables we cited (Fonagy & Luyten, 2009). For example, theoretical models of BPD posit emotion and cognitive dysregulation, excessive emotional sensitivity and diminished cognitive inhibition, and affective-reactivity and lability, as cardinal features (e.g., Carpenter & Trull, 2013; Crowell, Beauchaine, & Linehan, 2009; Krause-Utz et al., 2017; Linehan, 1993). Barnow et al. (2012) observed exaggerated startle response in female inpatients and outpatients with BPD. Stiglmayr et al. (2001) linked dissociative symptoms to longer and more intense episodes of aversive tension in female BPD patients (see also Stiglmayr et al., 2008), whereas Sajadi, Arshadi, Zargar, Honarmand, and Hajjari (2015) reported that among students, borderline personality features correlated with dissociative experiences, problems in emotional regulation, and negative schema. Following a dissociation induction, BPD patients respond with inefficient cognitive inhibition compared with healthy participants (Winter et al., 2015), although Ebner-Priemer et al. (2005) reported that highly dissociative BPD patients exhibited a reduced startle response. Krause-Utz, Walther, Lis, Schmahl, and Bohus (2018) found that acute dissociation served as a regulatory strategy to contend with negative emotions among BPD patients.

Alexithymia and impaired meta-consciousness (often described as "mentalization" in BPD) play a role in BPD symptoms (Bateman & Fonagy, 2010), as they do in dissociative conditions. Traumatized BPD patients can be distinguished from other psychiatric participants and matched controls in their lower ratings on their awareness of their own and others' mental states (Fonagy et al., 1996). Korzekwa, Dell, and Pain (2009) noted that problems with mentalization are associated with both dissociation and BPD (see also Liotti, 2005), and Evren, Cınar, and Evren (2012) reported an association of alexithymia with dissociation and borderline personality features in male substance-dependent inpatients. Gaher, Hofman, Simons, and Hunsaker (2013) found that alexithymia mediated the link between trauma exposure and borderline symptoms among college students. Moreover, patients with BPD exhibit a dysfunctional empathic capacity, which could account for behavioral problems (Harari, Shamay-Tsoory, Ravid, & Levkovitz, 2010). Schilling et al. (2012) found no differences between BPD patients and healthy controls in mind-reading capacity, but the patients were more confident in their mind reading ability, which the researchers speculated might have far more severe social consequences "than incorrect judgments that are associated with some doubt" (p. 325).

Like dissociative disorders, sleep problems, including regular nightmares, are commonly reported in BPD (Lereya, Winsper, Tang, &

Wolke, 2017), and increased dream anxiety is correlated with dissociative symptoms and early traumatic experiences (Semiz, Basoglu, Ebrinc, & Cetin, 2008). Moreover, emotional dysregulation is strongly associated with poor sleep quality in BPD (Grove, Smith, Crowell, & Ellis, 2016). Selby (2013) observed that BPD symptoms were a daytime consequence of chronic poor sleep and were associated with difficulty initiating and maintaining sleep, as well as waking earlier than desired. He contended that sleep and BPD were related synergistically and reciprocally.

Finally, we hypothesize that BPD patients possess a hyperassociative vulnerability marked by easily-activated, cascading, and difficult-to-inhibit and regulate response sets, and a temperamental vulnerability to high neuroticism, high impulsivity, and negative urgency (i.e., disposition toward rash action when experiencing extreme negative emotion; Cyders & Smith, 2008). Rapid mood and mental shifts; impulsivity; hyper-reactivity; and seemingly "irrational," confusing, and intense interpersonal reactions associated with BPD (Barazandeh, Kissane, Saeedi, & Gordon, 2018; Selby & Joiner Jr, 2009) could be mistakenly interpreted as emerging disparate personalities, contributing to the high diagnostic overlap between DID and BPD.

8.2. Schizophrenia spectrum disorders

Like BPD, schizophrenia spectrum disorders (SSDs) are related to dissociation, sleep disturbances/unusual experiences, and impairments in associational processes and meta-consciousness. Ross and Keyes (2004) proposed a dissociative subtype of schizophrenia with an estimated prevalence of between 25% and 40% of individuals diagnosed with schizophrenia. Subsequent studies reported subtype prevalence in clinical samples of approximately 25% (Laferriere–Simard, Lecomte, & Ahoundona, 2014; Ross & Keyes, 2009). In a comprehensive review, Renard et al. (2016) concluded that dissociative symptoms were present in SSDs and that positive and negative symptoms often evident in schizophrenia are also present in dissociation. Interestingly, the authors found that dissociation in SSDs was also associated with trauma. Renard, Pijnenborg, and Lysaker (2012) reported findings consistent with the hypothesis that dissociation represents a unique dimension of psychopathology in schizophrenia, which can be distinguished from positive, negative, cognitive, and posttraumatic stress disorder symptoms.

Other research supports a connection between SSD symptoms and dissociation. Varese, Udachina, Myin Germeys, Oorschot, and Bentall's (2011) hallmark experience-sampling study found that dissociation predicted auditory hallucinations, particularly in response to stress and could be considered a precipitant of auditory hallucinations. Furthermore, Freeman et al. (2013) found that worry induction in psychotic patients produced feelings of unreality of self and surroundings, "perceptual alterations," and "temporal disintegration" but not increased hallucinations (Freeman et al., 2013). Cernis et al. (2014) found that greater endorsement of dissociative experiences was associated with higher paranoia and anxiety in psychotic patients and that the association between paranoia and anxiety was no longer significant when controlling for dissociation. Moskowitz, Barker-Collo, and Ellson (2005) reported strong correlations among dissociation, psychoticism, and paranoid ideation among university students and suggested that dissociative experiences may "underlie some (or even all) psychotic symptoms" (p. 722).

Associative disturbance, including hyperassociation, is prominent in schizophrenia. Bleuler (1911/195) first observed that schizophrenia is marked by associations that lose their normal coherence. Maher (1972, 2003) proposed that loosened associations and deficits in inhibitory control in schizophrenia are the product of hyperactive associational networks. More recently, researchers have discerned a link between frequency of word associations (i.e., hyperassociativity) and individuals with schizotypy, schizophrenia, and relatives of people with schizophrenia (Lenzenweger, Miller, & Manschreck, 2007; Manschreck, Merrill, Jabbar, Chun, & DeLisi, 2012). Manschreck et al. (2012) have gone so far as to suggest that "hyperactivity of associations" (i.e., hyperassociativity) is a biomarker for schizophrenia (p. 101).

Sleep disturbance is common among individuals with schizophrenia, with estimates ranging from 30-80% (Cohrs, 2008), and poor sleep quality is associated with greater symptoms (Afonso, Brissos, Cañas, Bobes, & Bernardo Fernandez, 2014). Llewellyn (2009) described schizophrenia as a "state of mind/brain 'trapped' in-between waking and dreaming" (p. 572), whereas Mishara, Lysaker, and Schwartz (2013) translated Mayer-Gross's (1932) comments to read: "The schizophrenia patient may be characterized as an 'awake sleeper." (p.8).

In a review of 44 studies, Barton et al. (2018) determined that insomnia was associated with psychotic-like, dissociative, and hypomanic experiences. Among individuals on the schizophrenia spectrum, sleep disturbance is manifested in nightmares, with correlates in everyday experiences. Fifty-five percent of patients with psychotic symptoms reported weekly nightmares, with more distressing nightmares associated with a diversity of daytime symptoms (e.g., anxiety, depression, problems with working memory; Sheaves, Onwumere, Keen, Stahl, & Kuipers, 2015). Even among 12-year-old children, nightmares predict psychotic-like symptoms (Fisher et al., 2014), and nightmares at that age predict psychotic experiences at age 18 (Thompson et al., 2015).

Schizotypy is related to sleep and dissociation. Kelly (2016) reported that among college students with frequent nightmares, the only two measures that predicted unique variance in nightmares were schizotypy (i.e., unusual perceptual experiences) and hypomania, with elevated hypomania scores reflecting potential difficulties in self-regulation and hyperassociativity. Koffel and Watson (2009; see also Watson, 2001) suggested that unusual sleep experiences, dissociation, and schizotypy define a common domain of unusual or anomalous experiences: In their review, unusual sleep experiences were specific to dissociation and schizotypy compared with other daytime symptoms, including substance abuse, anxiety, and depression. More recently, Peña-Falcón, Pascualena-Nagore, and Perona-Garcelán (2018) documented correlations among quality of sleep and hallucination-proneness, unusual sleep experiences, and dissociation and found that unusual sleep experiences fully mediated the relation between hallucination-proneness and sleep quality.

Chmielewski and Watson (2008) reported that all five factors of the Schizotypal Personality Questionnaire (Raine, 1991) correlated with a composite dissociation score (see also Merckelbach & Giesbrecht, 2006). Startup (1999) documented moderately large correlations between dissociation and schizotypy measures of cognitive disorganization and unusual experiences, with childhood abuse accounting for only a small (but significant) amount of variance in both dissociation and unusual experiences. Tan, Ng, Chin, Chua, and Hong (2018) found that high experiential permeability (maladaptive aspects of openness to experience) facets (i.e., odd and eccentric, unrestricted self) were associated with schizotypy, psychoticism, dissociation, and sleep disturbances (see also Ashton & Lee, 2012).

Researchers have secured robust correlations between measures of fantasy-proneness and schizotypy (Merckelbach, Horselenberg, & Muris, 2001; Watson, 2001), indicative of a shared liability with dissociative conditions. Giesbrecht, Merckelbach, Kater, and Sluis (2007) reported that fantasy-proneness, cognitive failures, and childhood trauma combined explained 58% of the dissociation-schizotypy link. Knox and Lynn (2014) replicated the association among unusual sleep experiences, dissociation, and schizotypy. The correlation between unusual sleep experiences and both schizotypy and dissociation remained significant and positive even when the measures were administered in separate test contexts.

Watson (2001) contended that the interrelations of schizotypy, absorption, and fantasy-proneness reflect a common trait of transliminality, defined as a "tendency for psychological material to cross (trans) thresholds (limines) into or out of consciousness" (p. 853; Thalbourne &

Houran, 2000). Carhart-Harris (2007) suggested that the (transliminal) emergence of dreamlike states during waking is associated with bursts of medial temporal lobe theta and slow wave activity (2–8 Hz). Hartmann and Kunzendorf's (2006) review concluded that dreams of persons with "thin" (transliminal) boundaries (e.g., fluid, hyperassociative, over-inclusive thinking) between conscious and nonconscious material are more bizarre and emotional, compared with individuals with "thick" boundaries. Moreover, transliminality is a robust predictor of both unusual sleep-related experiences and lucid dreaming over 3-months (Soffer-Dudek & Shahar, 2009), consistent with Watson's (2001) transliminality hypothesis.

We suggest that schizotypy, like dissociation, is associated with fantasy-proneness as well as hyperassociation and impaired inhibition and meta-consciousness, as is the case with schizophrenia. Pec, Bob, and Lysaker (2015, p. 59) suggest that deficits in what they call *synthetic metacognition*—"the capability to synthesize intentions, thoughts, feelings, and connections between events, and to integrate them into larger complex representations of self and others"—are present in both dissociation and schizophrenia and impair self-regulatory functions. Moreover, people with schizophrenia exhibit greater metacognitive deficits compared with community and clinical samples (Lysaker et al., 2015). Quiles, Prouteau, and Verdoux (2013) highlighted the ubiquity of metacognitive deficits in schizophrenia and contended that metacognition moderates the association between functional impairment and cognitive deficits. According to a meta-analytic review of 47 studies (Kobayashi, Boarts, & Delahanty, 2007), schizophrenia was negatively associated with emotion management and positively associated with alexithymia and dissociation.

The findings reviewed suggest common moderators/mediators of the link between dissociation and both BPD and SSDs, including sleep disruptions/unusual sleep experiences, hyperassociativity, difficulties in self-regulation, set shifts, and deficits in metacognition. Yet the influence of these variables can likewise be seen in other disorders, particularly those that co-occur with dissociative disorders, as manifested in the predominance of catastrophic dysregulated thinking in anxiety-related conditions; flashbacks and startle reactions in PTSD; affective instability in bipolar disorder; hypomania, ruminative thinking and negative response sets in depression; ADHD; and habitualized response patterns in substance use disorders. Soffer-Dudek (2014) reported that dissociative mechanisms are evident in OCD, panic attacks, and depression. She argued that a sense of amnesia–reflected in poor confidence in reality monitoring—is prominent in OCD, whereas depersonalization/derealization is implicated in depression due in part to sleep alterations and in panic disorder due to proximal stress, catastrophic interpretations of dissociative episodes, and physiological factors.

Dissociation in PTSD shares similarities with a dissociative subtype of highly hypnotically suggestible individuals. In addition to a history of stressful life events and episodes of depersonalization/derealization, the groups share similar brain activation regions associated with disruptions in sustained attention, cognitive control, and working memory (Terhune & Cardeña, 2015), generally consistent with our framework. Moreover, PTSD and/or posttraumatic stress symptoms are associated with sleep problems (Kobayashi et al., 2007) and impaired emotion regulation and meta-cognition (Mazloom, Yaghubi, & Mohammadkhani, 2016; Takarangi, Nayda, Strange, & Nixon, 2017). We suggest that dissociative symptoms are transdiagnostic because variables reviewed related to dissociative symptoms are also common to symptoms across diverse diagnoses.

9. A potential domain for collaboration: biological etiology

The search for biological contributors of dissociation represents possible shared terrain for PTM and SCM researchers to tread. Clearly, all of the transtheoretical variables we reviewed will be found to have brain correlates that could be the focus of research by adherents of both the TM and SCM at a more granular level of analysis. It is also evident that biological models could be associated with trauma and non-trauma models of dissociation. For example, there are pharmacological means by which hyperassociative, fragmented, rapidly shifting, and dreamlike-cognition play a role in dissociative experiences: The anesthetic ketamine typically produces dream-like states of depersonalization/derealization, as do cannabinoids and other hallucinogens (Simeon, 2004). Moreover, 3,4-MDMA (3,4-Methylenedioxymethamphetamine), cannabis, and cocaine all induce acute dissociative symptoms (van Heugten-van der Kloet et al., 2015). Research converges on the conclusion that psychedelics induce a sense of depersonalization/derealization experience marked by dilution or loss of a sense of ownership over one's body (see Millière, Carhart-Harris, Roseman, Trautwein, & Berkovich-Ohana, 2018).

Consistent with these findings, researchers have developed neurobiological models of dissociative disorders. For example, Sierra and Berrios (1998) proposed that "indifference to pain" and "mind emptiness" in depersonalization could arise when the right dorsolateral prefrontal cortex is activated and the anterior cingulate is inhibited reciprocally. The neurological literature is replete with unique examples of patients with sustained damage to connections between the ventral portions of the visual pathway and temporal-limbic association cortices who subsequently lost their ability to be affectively influenced by visual stimuli (Bauer, 1982; Sierra, Lopera, Lambert, Phillips, & David, 2002) and experience a peculiar loss of meaning accompanying objects in their visual worlds, resulting in persistent feelings of derealization.

Neuroimaging studies, albeit limited in number, hold promise in identifying correlates of hyperassociation and set shifts. In a small neuroimaging study of DID, Reinders et al. (2014) exposed patients ($n = 11$) and matched DID-simulating healthy comparison subjects ($n = 16$) to autobiographic script-driven imagery while they monitored brain activation using positron emission tomography (PET). According to the authors, their findings suggest that DID involves alternations between a hypo-aroused and a hyper-aroused identity state (what we term here a set). They contended that the hypo-aroused state involves overmodulation of emotional regulation, along with hyperactive prefrontal cortex, cingulate, posterior association areas, and parahippocampal gyri, and that the hyper-aroused identity state involves undermodulated emotion regulation accompanied by a hyperactive amygdala, insula, and dorsal striatum.

The hypothesis is that undermodulation reflects a failure of prefrontal inhibition (see Brand, Lanius, Vermetten, Loewenstein, & Spiegel, 2012). As a consequence, limbic hyperactivity would be manifested in symptoms and florid displays of pathology marked by fantasy, flashbacks, and set shifts seen in DID. Overmodulation, in contrast, would reflect a state of frontal hyperinhibition reflected in symptoms of numbing, alexithymia, and derealization and depersonalization. As Krause-Utz et al. (2017) suggested, overmodulated states of detachment disrupts executive functions, including attention, learning, and memory.

We hypothesize that the transition from an overmodulated to an undermodulated state (see also Chiu et al., 2017; Ditzfeld & Showers, 2014) triggers hyperassociation and set shifts. Alternatively, the shift from an undermodulated to an overmodulated state dampens hyperassociation and set shifts, followed by the return to an overmodulated state via homeostasis or reaction to internal or external triggers of negative emotion in an unstable, recursive fashion. Interestingly, sleep loss is associated with hyper-exaggerated emotional reactivity to positive and negative stimuli in a bidirectional manner (Goldstein & Walker, 2014). Relatedly, Soffer-Dudek (2017) has argued that sleep phenomena (e.g., hypnagogic hallucinations, vivid or recurrent dreams) associated with dissociative experiences are related to "uncontrolled nocturnal rumination: the uninhibited lingering of distress in the sleeper's consciousness" and that intrusion of arousal into dreaming might be related to hyperassociation (i.e., "increased association") and "enhanced continuity of waking and dreaming" but also in avoidance

manifested in segregating memories and emotions (i.e., dissociative mechanisms), for example, which in turn produce increased intrusion, likewise implying a bi-directional process.

Although the preceding conceptualization admittedly pivots largely on a single study and requires corroboration in large samples, it potentially accommodates the counterintuitive findings that dissociative symptoms are positively correlated with both fantasy-proneness (Giesbrecht et al., 2008) and alexithymia (Merckelbach et al., 2017). Given that impoverished fantasy is a central feature of alexithymia (Sifneos, 1973), the constellation of dissociation-fantasy-alexithymia is difficult to understand unless one considers the oscillations of under- and over-modulation typical in dissociation or one argues that such a relation reflects a generalized bias toward reporting pathology or unusual experiences.

Our framework is consistent with an emerging perspective that construes consciousness—cognition, emotional regulation, and behavior more specifically—as a sequential process that involves transitions across different sleep-wake states, mental sets, and associated emotions (see Rabinovich & Varona, 2017). This framework accommodates dissociation as involving sequential or serial "detachment" (a sense of separation from the self, as evident in DDD) and compartmentalization (inability to deliberately control actions or cognitive processes that would normally be amenable to such control; see Bernstein-Carlson & Putnam, 1993). Neurobiological correlates of dissociation, including inter-hemispheric communication and default mediation of self-referential processing, are likely to be relevant to delineating pathways to dissociation. A full review of such mechanisms goes well beyond the scope of this article, but they are well described elsewhere (see Dalenberg et al., 2012; Bob, 2003; Simeon et al., 2000; van der Kruijs et al., 2014; Whitfield-Gabrieli & Ford, 2012).

10. Limitations in our knowledge and future directions

Our systematic review encompasses many potential antecedents of dissociative symptoms. Nevertheless, it is intended to be provisional. We have interleaved hypotheses throughout our presentation that await empirical evaluation. A clear priority is to ascertain the role of each variable in dissociation and to determine whether the variables represent correlates, as opposed to vulnerability factors, for dissociative symptoms and experiences. We recognize the importance of elaborating the web of interrelations and causal networks among them (Borsboom & Cramer, 2013) and formulating rival causal models and testing them using such approaches as structural equation modelling and network analyses (Borsboom & Cramer, 2013). Although some causal models may not survive testing, eliminating error and evaluating mediating variables will be indispensable to generating more refined and valid hypotheses. For example, although the association, if not causal relation between sleep and dissociation is increasingly well documented, this relation itself may well be mediated by other variables that are, in turn, worthy of exploration. For example, in one study, the relation between sleep and dissociation was no longer significant when mood was controlled statistically (Weiss & Low, 2017); however, longitudinal research is necessary to assess true mediation over time rather than statistical mediation.

To take future dissociation research in novel and useful directions, we suggest that researchers use the NIMH Research Domain Criteria (RDOC), as these criteria seem particularly suited to distinguishing and elucidating the transtheoretical variables we review at different levels of analysis. For example, whereas the TM and the SCM center on specific events (e.g., trauma, media influences, suggestions in psychotherapy) that are antecedents to dissociation, the elements of RDOC most pertinent to the transtheoretical variables are closely related to the negative valence and arousal (repercussions of trauma, stress, situational and intrapersonal triggers) domains and, perhaps more prominently to cognitive domains (i.e., deficits in meta-consciousness and emotion regulation, hyperassociation, set shifts, consequences of sleep disruptions). Accordingly, although it is beyond the scope of our review to propose a comprehensive theoretical scheme based on RDOC, the latter framework nevertheless holds promise to provide a viable matrix and pathway for studying and characterizing a variety of mechanisms of dissociation that bridge theoretical perspectives.

Currently, the most ample and convincing empirical support exists for the relations between both sleep and dissociation and stressful life events and dissociation, with sleep as a potential mediator. Still, much of this research is correlational, rather than prospective, and does not permit unambiguous causal inferences. For example, it is imperative to determine the extent to which "sleep abnormalities (are) caused by posttraumatic and dissociative factors, and not the other way around" (Brand et al., 2018, p. 385). Hence, researchers will need to determine the specificity and causal direction of the links among stress, sleep, and dissociation.

Evidence is accumulating that dissociative individuals experience serious deficits in meta-consciousness, self-regulation, and executive functioning, and are prone to set shifts, particularly in response to negative stimuli. Still, work is needed to decipher the role of hyperassociation in set shifts, stress, sleep problems, fantasy, propensity toward dissociation, and deficits in meta-consciousness. Hyperassociativity should also be studied in terms of the fluidity and "associability" of affective states, subject to varying levels of cognitive control and meta-consciousness. It will also be crucial to determine facets of dissociation (e.g., depersonalization/derealization, absorption, amnesia) most consistently associated with sleep disruptions and impairments in meta-consciousness.

Much is to be learned about meta-consciousness, as the broad term can refer to beliefs about the self and others; self-awareness; and the ability to monitor, predict, and experience cognitive-affective states. Programmatic study of these potentially diverse constructs and processes has not yet been undertaken with respect to dissociative disorders. Certainly, the least empirical support exists for how DID narratives develop. Klein (2012, 2014) reminds us of how little we know regarding criteria associated with perceptions of "self" and "sameness of the self," how narratives of multiple selves take shape and crystallize, and how people come to identify with some aspects of their experience while they disown or segregate others.

Studies of the developmental antecedents of dissociation are a priority, including the formation of childhood attachments with caregivers, to determine how fragmented vs. coherent self-narratives form in nurturing and aversive environments. Such work could illuminate the potentially defensive function of dissociation, such as experiential avoidance and deficits in meta-consciousness, as well as the adaptive function of engagement in constructive fantasy. Longitudinal research on the impact of negative arousal on identity formation and dissociation would be useful, as well as of the short-term impact of triggers of negative arousal on state dissociation and the variables reviewed. These latter studies could incorporate experience sampling methodologies, which tend to be associated with high ecological validity.

Our review focused more on the similarities rather than the differences among dissociative disorders, BPD and schizophrenia spectrum disorders. Future research should address salient differences among these disorders. For example, although DID patients generally maintain contact with reality, whereas psychotic patients do not, disturbances in identity and impairments in emotion-regulation, sleep, and meta-consciousness have not been systematically compared across the disorders reviewed.

One limitation of our review is that questions persist regarding the extent to which dissociation and dissociative processes in non-clinical samples can be generalized to clinical populations of patients with DID (e.g., pro: Soffer-Dudek et al., 2019; vs. con: Van Der Hart, Nijenhuis, Steele, & Brown, 2004), for example. Accordingly, it would be worthwhile to contrast the influence and relevance of etiological variables we proposed in predicting dissociation across clinical vs. non-clinical samples.

Another potential limitation is that we did not address dissociative amnesia in detail. Dissociative amnesia has long been scientifically controversial, and an extensive discussion of this debate goes beyond the scope of this article. Some have questioned the very existence of the phenomenon and suggested that the experience of trauma is typically highly memorable, salient, and therefore not readily forgotten, barring brain injury or substance abuse (McNally, 2003; Pope, Hudson, Bodkin, & Oliva, 1998; but see Dalenberg et al., 2012).

Rival explanations for reports of dissociative amnesia include undetected organic causes, malingering, or a conscious reluctance or unwillingness to think about extremely distressing events (Kihlstrom, 2005; McNally, 2003). Moreover, it can be challenging, if not impossible, to distinguish amnesia from encoding failure. Accordingly, amnesia remains controversial, and we do not intend to resolve this controversy here (McNally, 2009). An adequate evaluation of models of dissociative amnesia must await more compelling corroboration of reports of such amnesia. "Hyman's maxim" reminds us not to explain the causes of a phenomenon until one can confirm that this phenomenon exists (Hall, 2014).

11. Conclusion

The intensive focus, and some might say fixation, on controversies has stymied progress in understanding of dissociation as much, if not more, than it has inspired research and theory that transcends a single perspective. The role of stress and trauma in sleep disturbances, hyperassociation, disturbed meta-consciousness and self-regulation, fantasy, and set shifts, for example, provide fertile ground for convergences and collaborations across theoretical divides, as does the possibility that sociocognitive influences shape self-narratives in DID. Collaboration regarding optimal ways of measuring hyperassociation and set shifts using neurobiological, laboratory indices, and self-report measures would be valuable. Adherents of different perspectives could also find common cause in the study of genetic and other biological variables and liabilities for hyperassociativity, poor sleep, and problems in self-regulation and executive functioning. We hope our present offering expands opportunities for transtheoretical investigations that traverse perspectives traditionally viewed as irreconcilable.

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