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Citation

Lynn, Steven Jay, Scott O. Lilienfeld, Harald Merckelbach, Timo Giesbrecht, Richard J. McNally, Elizabeth F. Loftus, Maggie Bruck, Maryanne Garry, and Anne Malaktaris. 2014. "The Trauma Model of Dissociation: Inconvenient Truths and Stubborn Fictions. Comment on Dalenberg et Al. (2012)." Psychological Bulletin 140 (3): 896–910. doi:10.1037/a0035570.

Published version

https://doi.org/10.1037/a0035570

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The Trauma Model of Dissociation: Inconvenient Truths and Stubborn Fictions: Comment on Dalenberg et al. (2012)

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Abstract

Dalenberg et al. (2012) argue that convincing evidence (a) supports the longstanding trauma model (TM), which posits that early trauma plays a key role in the genesis of dissociation, and (b) refutes the fantasy model (FM), which posits that fantasy proneness, suggestibility, cognitive failures, and other variables foster dissociation. We review evidence bearing on Dalenberg et al.'s eight predictions, and find them largely wanting in empirical support. We contend that the authors repeat errors committed by many previous proponents of the TM, such as attributing a central etiological role to trauma in the absence of sufficient evidence. Specifically, Dalenberg et al. leap too quickly from correlational data to causal conclusions, do not adequately consider the lack of corroboration of abuse in many studies, and underestimate the relation between dissociation and false memories. Nevertheless, we identify points of agreement between the TM and FM regarding potential moderators and mediators of dissociative symptoms (e.g., family environment, biological vulnerabilities) and the hypothesis that dissociative identity disorder is a disorder of self-understanding. We acknowledge that trauma may play a causal role in dissociation, but that this role is less central and specific than Dalenberg et al. contend. Finally, although a key assumption of the TM is dissociative amnesia, the notion that people can encode traumatic experiences without being able to recall them lacks strong empirical support. Accordingly, we conclude that the field should now abandon the simple trauma-dissociation model and embrace multifactorial models that accommodate the diversity of causes of dissociation and dissociative disorders.

The Trauma Model of Dissociation: Inconvenient Truths and Stubborn Fictions: Comment on Dalenberg et al. (2012)

The notion that people dissociate to cope with trauma has its roots in the writings of Janet (1889/1973). This trauma model (TM) remains influential among some clinical scholars (e.g., Dalenberg et al., 2012), who contend that trauma is the key player in the genesis of dissociation. Nevertheless, as we discuss later, advocates of the TM have often neglected to articulate trauma's precise role in the cause of dissociation. Critics of the TM (e.g., Giesbrecht, Lynn, Lilienfeld, & Merckelbach, 2008, 2010; Lynn, Lilienfeld, Merckelbach, Giesbrecht, & van der Kloet, 2012; Pope & Hudson, 1995) have questioned the centrality of trauma in the etiology of dissociation and dissociative disorders.[1] An early alternative to the TM, the sociocognitive model (SCM; Lilienfeld et al., 1999; Spanos, 1996), proposed that symptoms of dissociative identity disorder (DID) and perhaps related dissociative disorders result when people with co-existing or ambiguous psychological symptoms are exposed to suggestive procedures (e.g., repeated questioning about memories and personality "parts," leading questions, hypnosis, journaling; see Lynn, Krackow, Loftus, & Lilienfeld, in press), media influences (e.g., film and television), and broader sociocultural expectations (e.g., "dissociation is associated with abuse," people possess "multiple personalities") regarding the presumed clinical features of DID. The sociocognitive perspective considers implausible the classical trauma-dissociation hypothesis that people actually house multiple "personalities" (i.e., alters) or poorly defined "personality states"—which are somehow walled-off or dissociated from everyday consciousness—to defend against thoughts and feelings stemming from traumatic experiences.

As Dalenberg et al. (2012) observe, people with DID often report histories of childhood trauma. Although ethical considerations preclude directly testing the hypothesis that false memories of abuse can be elicited by suggestive methods, researchers have shown that it is possible to implant memories of false or highly implausible events, including being (a) in a crib

in childhood and viewing a mobile over the bed, (b) bullied, (c) witness to a demonic possession, (d) the victim of a vicious animal attack, and (d) a rider in a hot air balloon (Lynn et al., in press, for a review). Across 14 studies in which researchers typically asked participants to ponder false descriptions, photographs attributed to family members, or both, a weighted mean of 36% of participants remember the suggested false event, in whole or in part (Garry, 2013). If people are capable of constructing memories of complex events in the laboratory, it seems plausible that over a matter of months or years in psychotherapy, they could develop imagined or exaggerated narratives of histories of trauma to make sense of present psychological symptoms.

The fantasy model (FM)[2], as Dalenberg et al. dub it, extends the SCM. *Contra* Dalenberg et al.'s claim (p. 551), our current position is not that dissociation per se "…gives rise to fantasy proneness, suggestibility, and cognitive distortion, which in turn heighten trauma reporting." Rather, we, and other proponents of the FM, have marshaled evidence that fantasy overlaps with dissociation and that variables including fantasy proneness, cognitive distortions, and suggestibility render some individuals vulnerable to the suggestive influences emphasized by the SCM (Merckelbach, Horselenberg, & Schmidt, 2002, p. 696). For example, the FM predicts that suggestion, suggestibility, and fantasy proneness are related to inaccurate or exaggerated self-reports of trauma, and that dissociative experiences are related to fantasy activity, fantasy proneness, and cognitive failures (see Giesbrecht et al., 2008, 2010; Lilienfeld et al., 1999; Lynn et al., 2012; Spanos, 1996, for summaries of evidence supporting the SCM and FM). The FM, as accurately depicted in our Figure 1, should be contrasted with Figure 1 in Dalenberg et al. (2012; p. 552). Note that some of the variables listed as moderators/mediators (e.g., fantasy activity, negative emotionality) might also serve as antecedent variables.

We remain open to the possibility that trauma may play a nonspecific causal role in dissociation, largely because the FM is compatible with the view that a variety of stressors,

including not only highly aversive events, but also isolation and loneliness (Lynn & Rhue, 1988), can foster the propensity to fantasize, disrupt sleep, and increase vulnerability to suggestive influences (Giesbrecht et al., 2010). In fact, even people who are not especially fantasy prone or suggestible may experience occasional dissociative symptoms in the face of stress. Objective trauma may enable the emergence of dissociative symptoms in the short-term (e.g., depersonalization and derealization) by increasing stress levels, which in turn promote (a) an accurate perception of circumstances being "unreal" following totally unexpected and/or horrifying events such as a terrorist attack, natural disaster, or rape (Lynn & Pintar, 1997); (b) posttraumatic "dissociative" reactions that are the product of imagination (e.g., viewing the self from out of the body, imagining oneself in another place); and (c) disrupted sleep, which appears to predispose to certain dissociative experiences (van der Kloet, Merckelbach, Giesbrecht, & Lynn, 2012). Moreover, such stress-produced experiences may persist on a more long-term basis in certain predisposed individuals prone to negative emotionality, especially in the presence of co-existing psychopathology. Notably, the FM does not distinguish between dissociative experiences arising from fantasy versus trauma, and variables associated with the FM explain the antecedents and correlates of both trait and state dissociation (e.g., Candel & Merckelbach, 2004; Kunst, Winkel, & Bogaerts, 2011). [3]

In their review, Dalenberg et al. defend the TM and criticize the FM. We agree with several of their arguments. In particular, Dalenberg et al. acknowledge a role for biological vulnerabilities and other potential mediators and moderators (e.g., psychiatric history, developmental factors, social support) in the genesis of dissociation. Accordingly, their view is more complex and nuanced than that of some proponents of the TM (e.g., Bremner, 2009; Nijenhuis, 2011). We also concur with Dalenberg et al. that the potential effects of trauma on dissociation may be "difficult to completely parcel out from the manifold harms caused by the pathogenic family environment in which childhood sexual abuse, physical abuse, emotional

abuse, and neglect occur" (p. 576). In addition, we are gratified that the authors acknowledge that DID is in part, "a disorder of self-understanding" (p. 568) and that "those with DID have the inaccurate idea that they are more than one person" (p. 568). This concession moves a crucial element of the TM perspective decisively closer to the FM (Lilienfeld & Lynn, 2003). Some proponents of the TM (Reinders, Willemsen, Vos, den Boer, & Nijenhuis, 2012; Schlumpf, Nijenhuis et al., 2013) continue to claim or imply that the FM holds that individuals with DID typically role-play or fake the symptoms of this disorder consciously. In actuality, FM theorists have taken pains to emphasize that *role-enactment*, which flows spontaneously and is carried out with a high degree of personal involvement (Sarbin & Coe, 1972), is a more accurate description than *role-playing*, insofar as most people with DID come to believe that they house multiple personalities (Lilienfeld et al., 1999). The FM and TM now apparently agree on this latter point, yet disagree regarding how this occurs.

As Dalenberg et al. note (p. 551), we also agree that trauma may sometimes play an etiological role in dissociation, although we view this role as less central, specific, and causally necessary than they do. Additionally, we concur with Dalenberg et al. that "fantasy proneness — among other factors — may lead to inaccurate trauma reports" (p. 551). Finally, we share their view that just as TM theorists have sometimes underemphasized the role of fantasy and suggestibility in dissociation, FM theorists have at times dismissed any potential role of trauma in dissociation (Dalenberg et al., 2012, p. 566).

Despite this common ground, we find that several of Dalenberg's et al.'s. crucial contentions fail to withstand careful scrutiny. Moreover, the Dalenberg et al. review does not convincingly support a specific causal link between well-documented trauma and dissociation in cross-sectional or in longitudinal studies, nor does it falsify the FM, as they assert (p. 29). In our reply, we examine Dalenberg et al.'s key arguments in light of the eight predictions they believe afford clear tests of the TM and the FM.

Prediction 1. Dalenberg et al. state that, “The TM predicts a consistent positive relationship across studies between trauma and dissociation” (p. 553), whereas proponents of the FM “argue that dissociation is a psychological process *causally unrelated* to antecedent traumatic or stressful events” (p. 551; emphasis added).

Comment. Dalenberg et al.’s characterization of the FM is incomplete and does not reflect our current position. FM theorists hold that (i) there may be a modest link between dissociation and trauma (Lynn et al., 2012, p. 50) and (ii) recent, high-impact stressors can contribute to state (short-term) dissociation in many individuals (Giesbrecht et al., 2008, p. 623), as exemplified by derealization during peritraumatic panic attacks (Bryant & Panasetis, 2001). In fact, because the FM posits that fantasy or fantasy proneness sometimes contribute to erroneous reports of past adverse events and dissociation, this model (iii) implies a positive association between self-report measures of dissociation and trauma.

Even so, empirical support for Prediction 1 is not uniformly strong. On the one hand, all the correlations between trauma and dissociation in Dalenberg et al.’s Table 1 are in the predicted direction. Only 2% of the correlations fall at or below .1, indicative of a small effect size (Cohen, 1988); across all studies there is an overall medium effect size of r = .32. On the other hand, the correlations between trauma and dissociation are often modest and variable in magnitude, as the significant Q statistic confirms (p. 559). Forty percent of the comparisons yield rs between trauma and dissociation below .30, and only 6 percent of the correlations equal or exceed .50, signifying a large effect size.

Moreover, Dalenberg et al.’s Table 1 omits several studies that run counter to their position. For example, it omits one study (Romans, Martin, Morris, & Herbison, 1999) that found nonsignificantly *lower* levels of dissociation among sexually abused than nonsexually abused participants in a randomly selected community sample of 354 New Zealand women. Another study (Sanders & Giolas, 1991), not cited by Dalenberg et al. obtained a correlation of r = .44

between scores on the Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986) and scores on a child abuse questionnaire. Yet when a clinical researcher blind to the dissociative status of participants provided trauma ratings derived from hospital records [interrater agreement (Kappa) for sexual abuse = 1.0], the trauma-dissociation correlation became *negative* and nonsignificant (r = -.21), suggesting that assessments of trauma unbiased by knowledge of psychiatric status may yield substantially lower estimates of the trauma-dissociation link. Future research is needed to ascertain the relative accuracy of hospital records versus self-report measures of sexual trauma. In another study (Otte et al., 2005) not cited by Dalenberg et al., dissociation (DES) scores did not vary as a function of abuse history in a sample of pathology-free (i.e., no current Axis I psychiatric disorder) police academy recruits with and without self-reported childhood trauma experiences.

Dalenberg et al. reviewed findings from four studies that compared trauma rates for patients with and without dissociative disorders (see their Table 2). Dalenberg et al. concluded, "Trauma history was found in 50%-100% of individuals in all studies (with the exception of the Turkish study by Sar, Akyüz, & Dogăn, 2007)" (p. 560). Yet in two of the studies (all with uncorroborated abuse), sexual abuse rates ranged from 9.6% (Sar et al., 2007) to 51.2% (Duffy, 2000) and physical abuse rates ranged from 18.3% (Sar et al., 2007) to 57.3% (Duffy, 2000) in patients with dissociative disorders. All of these percentages raise questions regarding the causal role of physical and sexual abuse in dissociation. Moreover, when any type of event is considered, including neglect, highly aversive events—at least those that are self-reported—do *not* necessarily precede the onset of dissociative disorders; in two studies 39.1% (Sar et al., 2007) and 24.4% (Duffy, 2000) of DID patients reported no trauma or neglect of any kind.[4] The reasons for the extremely low percentage of reported abuse in the Sar et al. study are unknown; the possibility that cultural factors contribute to Turkish women's reluctance to report abuse cannot be excluded. In sum, even allowing for substantial underreporting of trauma, these

results render implausible the hypothesis that trauma invariably precedes dissociative disorders. As we discuss later, however, it is unclear whether Dalenberg et al. view trauma as a necessary antecedent of dissociation, rendering the implications of these findings for the TM ambiguous.

In addition, many studies in Dalenberg et al.'s Tables 1 and 2 are difficult to interpret in light of substantial comorbidity between dissociation and other psychological disorders. For example, the studies in Table 2 report very high levels of comorbidity of DID with 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 abuse (72%, Duffy, 2000). Dissociative disorders also overlap substantially with acute stress disorder; self-mutilation; suicidal or aggressive behavior; schizoaffective disorder; schizophrenia; posttraumatic stress disorder (PTSD); sexual, eating, sleep, and avoidant and obsessive-compulsive personality disorders (Eliason, Ross, & Fuchs, 1996; Lynn et al., 2011; Simeon, 2009).

According to the FM, these comorbid conditions and the elevated negative emotionality (including trait anxiety and depression) often associated with them may contribute substantially to dissociation (Goldberg, 2001; Kwapil, Wrobel, & Pope, 2002; Muris, Merckelbach, & Peters, 2003). For example, Wolfradt and Meyer (1998) reported a correlation of $r = .75$ ($p < .001$) between the DES and trait anxiety, and Condon and Lynn (in press) reported a correlation of $r = .40$ ($p < .001$) between the DES II and depression, a condition highly associated with negative emotionality. Accordingly, dissociation appears to be a nonspecific marker of negative emotionality, although the reasons for this association require further research to ascertain. Perhaps negative emotionality enhances dissociation by means of an anxiety-related attentional bias that inflates reports of momentary bodily sensations and depression-related memory bias for past symptoms (Suls & Howren, 2012). Indeed, people with high levels of negative emotionality (neuroticism) overestimate retrospectively the extent to which they experience

negative emotions (Robinson & Clore, 2002) and exhibit negative biases in "attention, interpretation, and recall of information, increased reactivity, and ineffective coping" (Ormel et al., 2013) not specific to any disorder. These findings highlight the complexities of interpretation of trauma-dissociation findings in the presence of comorbid psychopathology.

Abuse may in some cases contribute to dissociation directly, but the robust covariation between numerous psychological conditions on the one hand, and trait dissociation and dissociative disorders on the other, render it difficult to isolate abuse *per se* as the central causal agent of dissociation. Accordingly, Dalenberg et al.'s exclusion of studies involving college samples is a missed opportunity. Although they correctly observe that such samples are "likely to be biased in favor of low impairment" (p. 559), such samples are also less likely to be contaminated by symptom and disorder comorbidity than are those they examined. Had they included these samples, Dalenberg et al. would have been able to test whether the college vs. non-college status moderates the abuse-dissociation link. Lacking this comparison, and prospective studies, one cannot claim that abuse causes trait dissociation in nonclinical samples

Moreover, complexities and potential confounds in the measurement of trauma make it difficult to know what types of evidence would count as inconsistent with the TM. For example, it is unclear where Dalenberg et al. draw the admittedly fuzzy line between traumatic and nontraumatic events. Indeed, the measures of trauma in some studies cited by Dalenberg et al. appear suspect. Somer, Dolgin, and Saadon (2001), for instance, used a measure of traumatic stressors that included such poorly defined items as "parentification," and Twaite and Rodriguez-Srednicki's (2004) measure asked subjects whether they had heard "lewd or lascivious jokes" (p. 24). In Kisiel and Lyons's (2001) research, one of the measures of dissociation included an item on sexual behavior, which the authors contended "could have presented a confound...as dissociation was hypothesized to mediate risky behaviors" (p. 1038). Dalenberg et al. laud Collin-Vezina and Hebert's (2005) investigation of children assessed for

alleged sexual abuse, but the researchers did not specify how the evaluation of abuse was conducted, whether standardized abuse measures were administered, or whether the researchers who evaluated the children for dissociation were blind to abuse status.

The implications of many findings regarding trauma and dissociation for the TM remain unclear because Dalenberg et al. do not explicate their view of the precise causal role of trauma in dissociation. As Meehl (1977) noted, a causal agent may be necessary and sufficient, necessary, sufficient, or merely a risk factor that increases the likelihood of an outcome. To their credit, Dalenberg et al. acknowledge the role of potential mediators and moderators in the trauma-dissociation link (e.g., fantasy proneness), but they do not clearly explicate their views regarding (a) the crucial question of whether trauma is a necessary antecedent of dissociation and (b) if trauma is not necessary for dissociation, under which conditions (i.e., in the presence of which moderators) would one expect it not to contribute to dissociation. Given that Dalenberg et al. do not delineate any non-trauma pathways to dissociation, they may leave readers with the impression that they view trauma as a necessary precursor to dissociation. Accordingly, it is difficult to evaluate whether high levels of dissociation in the absence of self-reported trauma would falsify the TM.

Moreover, the TM provides little guidance regarding how to interpret findings that are mixed or conflicting in support of the theory. For example, in a study of preschool aged children, Macfie, Cicchetti, and Toth (2001a) found that dissociation in the clinical range was associated with physical abuse (17 percent of the children), but not with sexual abuse or neglect (0 percent). In fact, the authors found a nonsignificant *negative* correlation between scoring in the clinical range of dissociation with sexual abuse (r = -0.11, p > 0 .10) and a nonsignificant correlation (r = 0.14, p = 0.07) between a measure of dissociation and the number of subtypes (e.g., physical abuse, sexual abuse, neglect) of maltreatment. These findings raise further questions about the boundary conditions of the TM, as Dalenberg et al. are largely silent on the question of what

correlational findings would call the TM into question. It is incumbent on proponents of the TM to make more explicit the precise causal role of trauma in dissociation.

Prediction 2. Dalenberg et al. predict that the relation between trauma and dissociation will (i.) emerge in samples with well-established assessment procedures for trauma and (ii.) continue to be evident when objective (rather than self-report) measures of trauma are used (p. 553).

Comment. As we will document, all published studies of trauma cited by Dalenberg et al. in support of this prediction contain either (a) one or more serious methodological flaws—including lack of experimenter or interviewer blindness, failure to corroborate an abuse or trauma history, and problems in documenting abuse — or (b), for various reasons (e.g., serious medical problems that confound interpretation) we discuss, warrant a more circumspect interpretation of the data supporting the link between trauma and dissociation.

Some studies cited by Dalenberg et al. are marked by a lack of blindness, thereby raising the possibility of diagnostic bias. Lack of blindness can cut both ways. Raters aware of abuse status may be more likely than blinded raters to diagnose dissociative disorders, whereas individuals aware of dissociative disorder status might be more likely to interpret ambiguous childhood events as reflecting abuse or maltreatment and use suggestive interviewing techniques. In some studies, diagnoses of DID were (i.) not made blindly of trauma reports (Coons, 1994; Coons & Milstein, 1986); (ii.) made only after records (many almost certainly containing trauma histories) were thoroughly reviewed (Coons, 1994); and (iii.) made when standardized diagnostic interviews were not completed for all patients in the sample (Coons & Milstein, 1986), or some (Coons, 1994) participants. In Carlson, Dalenberg, Armstrong, Daniels, Loewenstein, and Roth (2001), the write-up of procedures is insufficiently clear to determine whether interviewers were blind to or able to infer participant diagnosis, and test-retest reliability was available for only a small number of participants. Although Dalenberg et al.

claim that Hornstein and Putnam's (1992) research was based on documented histories of diverse maltreatment, (i.) it is unclear how such maltreatment was documented; (ii.) the researchers did not use structured or standardized diagnostic interviews with participants, as none was available at the time; (iii) the interviews were apparently not conducted independently of knowledge of the participants' abuse status; and (iv.) the trauma index was "a crude measure that consisted of adding up the categorical types of trauma reported to have occurred" (p. 1083). Notably, Hornstein and Putnam (1992) stated, "Most of these children were labeled as chronic liars" (p. 1080).

Another challenge to evaluating the methodology of the studies cited by Dalenberg et al. and the scientific status of the TM is that documentation of abuse was often vague, sometimes consisting only of reports of psychological disturbance in mothers (Lewis, Yeager, Swica, Pincus, & Lewis, 1987; see Lilienfeld et al., 1999, for a discussion). In still other studies, one cannot rule out the suggestive influence of therapist or observer bias when diagnoses of DID were made only following long-term treatment (Coons & Milstein, 1994), or when mental health practitioners claimed to have validated reports of abuse (e.g., Reyes-Pérez, Martíniez-Taboas, & Ledesma-Amador, 2005). Future researchers should conduct a sub-analysis of studies with blinded diagnosticians to determine if blindness moderates the reported link between abuse and dissociation.

Dalenberg et al. argue that the most valid results derive from longitudinal studies of the long-term sequelae of childhood events because these studies incorporate objective measures of early trauma. Nevertheless, their literature review does not tell the whole story. Measurement ambiguities and potential confounds in some studies preclude clear interpretation of the findings. For example, Macfie, Cicchetti, and Toth (2001b) examined dissociation prospectively in maltreated and non-maltreated children (ages 3-4). During preschool, scores on a measure of dissociation based on ratings of children's narrative responses to a standard story stem task

(Attachment Story Completion Task (ASCT; Bretherton, Ridgeway, & Cassidy, 1990) were higher in the group of maltreated children at initial testing and follow-up a year later. Although this measure correlated with several measures of childhood dissociation, the narrative measure included items tapping aspects of fantasy proneness, including codes for "reality/fantasy confusion, self/fantasy boundary dissolution, and "grandiose child" (p. 241), raising the possibility that the narrative measure captures both fantasy proneness and dissociative symptoms and rendering interpretation of the findings ambiguous. Moreover, 6 of the remaining 9 codes that constituted the measure do not appear specific to dissociation (i.e., taunting, competition, verbal conflict, dishonesty, controllingness, and immediate resolution of loss), yet they correlated in the range of *r* =. 25 -.47 with the Child Dissociative Checklist (Putnam, Helmers, & Trickett, 1993), again raising questions about what the narrative measure assesses. Moreover, highly imaginative children's narratives might have been more rich and elaborated than those of other children, contributing to higher scores on the stem measure of dissociation.

In one of the most comprehensive longitudinal studies (Carlson, 1998), the teacher rating scale used to assess dissociation consisted of five items that included "explosive and unpredictable behavior," "strange behavior," and "gets hurt a lot, accident-prone," confused or seems to be in a fog," and "stares blankly," that may not be specific to dissociation. Moreover, the link between a measure of early caregiving and the DES in adolescence was a modest *r* = .21.

Ogawa, Sroufe, Weinfield, Carlson, and Egeland (1997) followed "high-risk" children from impoverished backgrounds for 19 years. Although they documented modest positive correlations between childhood dissociation and childhood trauma, they noted that the "… checklist measures of dissociation were not explicitly designed to capture dissociation" (Ogawa et al., 1997, p. 876), a crucial caveat omitted by Dalenberg et al. Importantly, child sexual abuse did not significantly predict dissociation for 19 year olds.

In other studies, the findings do not provide uniform or unambiguous support for the TM. For example, although Noll, Trickett, and Putnam (2003) found that abuse status predicted observer-rated dissociation in children (r = .36), it did not predict dissociation seven years later when tested in a model that included depression and anxiety. Trickett, Noll, Reiffman, and Putnam (2001) found that participants who were abused violently by multiple perpetrators, when re-assessed seven years after initial testing, responded comparably to nonabused community participants with regard to dissociative experiences (e.g., depersonalization/derealization, absorption, amnesia) and reported even higher global competence than did the latter individuals.

Another prospective study found no significant relation between childhood sexual abuse and dissociation (only verbal abuse predicted dissociation) in a sample of low-income young adults followed from infancy to age 19 (Dutra, Bureau, Holmes, Lyubchik, & Lyons-Ruth, 2009). The researchers report that 18% of participants "had maltreatment charges substantiated by the state, such that self-report was not relied on for those cases. Early state-documented maltreatment did not predict later dissociation, however" (p. 387).

In their longitudinal study of dissociation involving a representative of 3,275 participants in the UK followed from childhood to adulthood, not cited in Dalenberg et al.'s review, Lee, Kwok, Hunter, Richards, and David (2010) found that teacher-estimated anxiety at age 13, but not potentially traumatic early adverse experiences, including participant-reported parental death or divorce and accidents up to age 24, significantly predicted depersonalization symptoms when participants were assessed at 36 years old. In this study, sexual and physical abuse were not assessed.

In the lone longitudinal study that Dalenberg et al. cited that involved dissociation in response to stressful medical procedures (Diseth, 2006), in this case, for anorectal anomalies and Hirschsprung disease, Dalenberg et al. note that dissociation was highly correlated with the total number of hospitalizations (r = .76, p < .01; Dalenberg et al. incorrectly cite r = .79).

Nevertheless, hospital admissions were almost as highly correlated with distressing physical symptoms (e.g., r = .64, fecal incontinence), casting doubt on the specific link between traumatic medical procedures and dissociation, independent of disturbing physical symptoms caused by the condition itself. Moreover, substantial comorbidity in the sample of patients born with anorectal anomalies (i.e., 57% received a nondissociative DSM-III-R diagnosis) raises questions about the specific role of trauma in producing dissociation. In summary, we contend that strong or consistent conclusions are unwarranted from the evidence adduced by Dalenberg et al. under Prediction 2.

Prediction 3. Dalenberg et al. state that "… most or all studies of the effect of trauma-relevant treatment on dissociative symptoms found results supporting the TM" (p. 561) Specifically, posttraumatic dissociative symptoms should increase and then diminish over time and in response to treatment "as the trauma becomes more integrated into cognitive systems and trauma related emotions…." dissipate (p. 562). The authors further state that "The FM…makes no prediction of relationship to time or trauma-based treatment…other than proposing that treatment might increase dissociative symptoms…" (p. 553).

Comment. The FM is agnostic with respect to the time course of dissociative symptoms, either naturally occurring or after treatment. Still, symptoms may decline in patients assessed shortly following a trauma or at other times of distress, due to several nonspecific factors, including regression to the mean and natural coping processes, and these factors may explain improvement in dissociative symptoms following psychological treatment (e.g., Lilienfeld, Ritschel, Lynn, Cautin, & Latzman, 2013). However, Dalenberg et al. imply incorrectly that the FM posits increases in dissociative symptoms following psychotherapy. In fact, the FM holds that increases in trauma reports and self-understanding of possessing multiple personalities should occur following only *suggestive* therapeutic procedures, such as leading questions and guided imagery (Lilienfeld et al., 1999). We have no quarrel with the noncontroversial assertion

that randomized controlled trials will show that treatments that effectively reduce distress and enhance coping skills will tend to alleviate dissociative symptoms. In part, this is because such symptoms covary with other symptoms, such as those of mood and anxiety disorders, which consistently decline after effective psychotherapy.

Prediction 4. Dalenberg et al. posit that trauma will account for variance in dissociation beyond that predicted by fantasy proneness, but not vice versa. Dalenberg et al. conclude "…in each case fantasy proneness did relate to trauma history and dissociation, but trauma history did have an increment over fantasy proneness in … predicting the DES" (pp. 562-563).

Comment. Dalenberg et al.'s conclusion seems misleading. In a study of 1,229 male substance abuse patients, the fantasy proneness-dissociation correlation was $r = .41$, whereas the child abuse-dissociation correlation was $r = .26$ (Pekala et al., 1999-2000). When fantasy proneness and child abuse were entered as predictors in a regression analysis, the authors found that fantasy proneness explained 11% of the dissociation variance, whereas the various forms of child abuse *together with* parental dysfunction explained 11% in the dissociation variance (see Pekala, Angelini, & Kumar, 2001 for a replication). Thus, fantasy proneness is a crucial, albeit not the only, relevant variable.

Dalenberg et al. contend that (i.) the correlation between dissociation and fantasy proneness may be due to content overlap among scales measuring these constructs (e.g., items assessing absorption), and (ii.) fantasy proneness and dissociation may correlate spuriously through their shared connection to trauma history. Yet Pekala et al. (1999-2000) found that even after eliminating absorption items from the DES, fantasy proneness still accounted for significant variance in dissociation. Others have reported similar findings after eliminating magical thinking items from a fantasy proneness measure and depersonalization/derealization items from a schizotypy measure (Giesbrecht, Merckelbach, Kater, & Sluis, 2007; Merckelbach & Giesbrecht, 2006).

To evaluate further the links among trauma, fantasy, and dissociation, we used structural equation modeling (SEM) to compare the TM and FM. Recall that the TM hypothesizes that trauma leads directly to dissociation, which increases levels of fantasy proneness (Model 1). In contrast, the FM predicts that dissociation overlaps with fantasy proneness, inflating trauma reports (Model 2).

A Web of Science search identified 11 studies associated with the combined search terms *trauma*, *fantasy*, and *Dissociative Experiences Scale* (see our Table 1). Two papers were excluded because the authors did not provide the necessary information upon request (Thomson et al., 2009, 2011). We restricted our analysis to the type of studies (i.e., those that included all three measures of the constructs of dissociation, fantasy, and trauma) that Dalenberg et al. relied on to support their initial argument regarding Prediction 4.

We employed two-stage meta-analytic SEM modeling (Cheung & Chan, 2005) using the metaSEM package (Cheung, 2013) within the R statistical environment (R Core Team, 2013). Given that the assumption of homogeneity of correlation matrices was violated (Q = 41.33, df = 24, p =. 02), we used a random-effects model. We calculated fit using the Root Mean-Square Error of Approximation (RMSEA), Standardized Root Mean Squared Residual (SRMR), Tucker Lewis Index (TLI), and Comparative Fit Index (CFI). We defined acceptable fit as an RMSEA and SRMR of 0.09 or smaller supplemented by TLI and CFI of .95 or greater (see Hu & Bentler, 1998, 1999). Our Table 2 shows the fit statistics and parameter estimates for both models. As can be seen, neither model completely fulfilled these criteria for acceptable fit.

Therefore, in a next step, we tested the extent to which fantasy proneness mediates the relation in the full (i.e., saturated) models. For Model 1, the total statistical effect of trauma on dissociation and fantasy proneness was r =. 0.29 ($CI_{95\%}$: 0.22 - 0.37) and r = 0.13 ($CI_{95\%}$: 0.06 - 0.20), respectively, whereas the total effect of dissociation on fantasy was r = 0.40 ($CI_{95\%}$: 0.34 - 0.45). The standardized indirect effect of trauma on dissociation through fantasy proneness and

its 95% likelihood-based confidence interval (see Cheung, 2009) was r = 0.12 ($CI_{95\%}$: 0.09 - 0.15). For Model 2, the total statistical effect of dissociation on fantasy proneness and trauma self-reports was r = 0.43 ($CI_{95\%}$: 0.38 - 0.49) and r = .23 ($CI_{95\%}$: 0.15 - 0.32), respectively, whereas the total effect of fantasy proneness on trauma was r = .14 ($CI_{95\%}$: 0.07 - 0.21). The standardized indirect effect of dissociation on trauma through fantasy proneness and its 95% likelihood-based confidence interval was r = .06 ($CI_{95\%}$: 0.03 - 0.10). These findings highlight the relevance of fantasy as a mediator between trauma and dissociation.

Although our SEM did not support either model unambiguously, it affirmed the importance of fantasy proneness. Still, the analysis does not permit a determination of whether the relation between dissociation and trauma, which is partially mediated by fantasy proneness, indicates that (i.) fantasy fuels trauma self-reports (ii.) fantasy functions as a defense or coping mechanism following trauma exposure, or (iii.) both a and b. We acknowledge the possibility that fantasy and imagination can in some cases be used to regulate attention to create a sense of separation or distance from aversive events and thereby promote feelings of "unreality," as in conditions marked by depersonalization/derealization. The avoidance-based nature of such responses increases the likelihood that they will recur, proliferate, and generalize maladaptively as a consequence of negative reinforcement of anxiety reduction (Lynn, Condon, & Colletti, 2013).

Prediction 5. Dalenberg et al. predict that contrary to the FM, the relation between dissociation and false memory/suggestibility should be weak and inconsistent (p. 553).

Comment. As the TM predicts, laboratory studies examining the relation between dissociation and false memory/suggestibility have typically yielded at best weak or modest correlations. Inspection of Table 4 in Dalenberg et al. (p. 564) reveals that 49 percent of the correlations (N = 47)[5] fall at or above .1 (i.e., Cohen's standard for a small effect size), and only 20% of the correlations fall at or above .3 (i.e., Cohen's standard for a medium effect size). No

correlation is equal to or greater than *r* = .50, Cohen's standard for a large effect size. Although these findings may not provide strong support for the FM, they are well in the range of typical correlations between personality and performance in brief, single session laboratory paradigms, as opposed to designs that aggregate behavior over many situations or occasions (see Block, 1977; Epstein, 1979).

But a full reckoning of research on the link between dissociation and false memory-memory distortion/suggestibility requires a comprehensive examination of all studies including those that relied on variants of the DES to assess dissociation and research (Polage, 2012) published after Dalenberg et al.'s (2012) review had appeared. Unlike Dalenberg et al., we believe that studies employing the DES-C (Wright & Loftus, 1999) should not be excluded. This latter measure contains the identical items as its parent measure but instead asks participants to compare themselves with others. The DES-C minimizes, but does not consistently eliminate, skew and floor effects (Giesbrecht et al., 2008; Larøi, Billieux, Defeldre, Ceschi, & Van der Linden, in press), compared with the original DES. Although Dalenberg et al. reported that they could find "no published evidence showing that the DES-C is in fact a measure of dissociation" (p. 554), total scores on the DES-C are related to fantasy proneness (Merckelbach, 2004, Study 2; Schelleman-Offermans & Merckelbach, 2010); risk of self-harm in the general population (Batey, May, & Andrade, 2010); intrusive images following an aversive film (Hagenaars & Krans, 2011); depression and post-traumatic symptoms (Larøi et al., in press); and peritraumatic panic attacks (Nixon & Bryant, 2006), supporting its convergent validity. Nevertheless, the correlations between the DES and the DES-C are at best moderate (Wright & Loftus, 1999), suggesting that the two scales may measure different aspects of dissociation (see Larøi et al., in press).

The studies that Dalenberg et al. did not review in their Table 4, which we summarize below, almost all used the DES-C, with the single exception of Polage (2012). The following studies report significant relationships between measures of dissociation and (i.) errors in

response to misleading questions (Wright & Livingston-Raper, 2002), (ii.) imagination inflation (Heaps & Nash, 1999), (iii.) false recognition/recall in the Deese-Roediger-McDermott (DRM) memory illusion paradigm (DeHon, Bastin, & Larøi, 2008; Monds, Paterson, Kemp, & Bryant, 2013/false recall for traumatic stimuli), (iv.) false memories of a bus explosion (Ost, Granhag, Udell, & Roos af Hjelmsäter (2008); (vi.) and false reports of events from childhood that did not occur (Ost, Foster Costall, & Bull, 2005). Moreover, Polage (2012) found that high DES subjects were more likely than were low DES subjects to believe lies they earlier fabricated about childhood events. The former participants were also more likely to inflate their beliefs in the lied event, but not the control event, leading the authors to conclude that "dissociative tendencies may underlie belief in false events" (p. 338). Studies reported nonsignificant relationships between the DES-C and memory include a study of false confessions (Horselenberg, Merckelbach, Smeets, Franssens, Peters, & Zeles, 2006) and a study using the DRM paradigm (Wright, Startup, & Matthews, 2005).

If we examine only the studies enabling computation of correlations (N = 486, k = 6), all of the above investigations, with the exception of Monds et al., 2012; Ost et al., 2008; Horselenberg et al., 2006, revealed a range of values of r = -0.13, ns (Wright et al., 2005), to r = .65, p < .001 (Polage, 2012). In addition, we performed a random-effects meta-analysis of the effect sizes across these studies, and found a medium mean weighted effect size of r = .30, p < .001. These results suggest a somewhat more sanguine picture of the dissociation-false memory/suggestibility link than implied by Dalenberg et al. Moreover, this value may underestimate the true effect size, because studies of undergraduates often have restricted ranges on measures of dissociation. At the same time, substantial unknown sources of variance remain to be accounted for in these laboratory paradigms.

In addition, studies Dalenberg et al. do not mention evidence for inappropriate or exaggerated reports by highly dissociative individuals that prompt concern about the authenticity

of their reported memories and symptom reports. For example, Johnson, Edman, and Danko (1995) reported that people with high dissociation scores are especially likely to endorse "bad things" items such as "I have been short-changed in shops." Similarly, dissociative symptoms correlate (r = .51) with endorsement of a highly diverse constellation of non-credible and atypical symptoms (e.g., "Sometimes when writing a phone number, I notice that the numbers come out backwards even though I don't mean to do it." "When I hear voices, I feel as though my teeth are leaving my body") on the 75-item Structured Inventory of Malingered Symptomatology (Giesbrecht & Merckelbach, 2006), a widely used measure of symptom exaggeration that possesses adequate psychometric properties (Wisdom, Callahan, & Shaw, 2010). Future research will be needed to rule out the possibility that a subset of these experiences reported reflect genuine undetected organic symptoms and that a correlation of dissociation with symptom exaggeration still obtains when researchers eliminate a small number of items on the scale that may be construed as tapping dissociative experiences (e.g., "At times, I've been unable to remember the names or faces of close relatives so that they seem like complete strangers")." Nevertheless, research not relying on the SIMS also supports a link between dissociation and symptom exaggeration. For example, in a sample of inpatients with DID or dissociative disorder not otherwise specified (DDNOS), Stadnik, Brand, and Savoca (2013) found a significant association between DES scores and the symptom exaggeration scale of the Personality Assessment Inventory (PAI). Almost two-thirds of the sample scored above the cut-off for the exaggeration scale.

One could speculate that dissociative psychopathology causes symptom exaggeration, but Merten and Merckelbach's (2013) review points out that the reverse – intentional symptom exaggeration is conducive to reported dissociative symptoms– might be as plausible. For example, Kong, Allen, and Glisky (2008) evaluated inter-identity memory transfer in DID patients and control participants instructed to simulate/ malinger symptoms of DID. The

researchers found that 29% of the patients and 34% of the experimental malingerers performed significantly below chance level, implying intentional underperformance. Additionally, dissociative symptoms are linked to paranormal beliefs and experiences (e.g., reported precognition; Wolfradt, 1997; Zingrone & Alvarado, 1994). These findings suggest that dissociative individuals tend to adopt lenient standards for reporting unusual experiences.

Prediction 6. The TM predicts that dissociation should relate to decreased narrative cohesion and increased memory fragmentation (Dalenberg et al., 2012, pp. 553-554).

Comment. In their meta-analysis of 16 studies, Bedard-Gilligan and Zoellner (2012) concluded that a strong *self-reported* association between dissociation and memory fragmentation is not confirmed by objective measures of fragmentation (e.g., structured coding measures using either trained raters or objective/standardized indices such as the Linguistic Inquiry and Word Count program; Pennebaker, Francis, & Booth, 2001), contradicting Dalenberg et al.'s assertion (see also Rubin, Berntsen, & Bohni, 2008). Moreover, Bedard-Gilligan and Zoellner (2012) found that trait dissociation was inconsistently associated with self-reports of memory fragmentation. The authors also noted that a number of third variables might explain any correlation between dissociation and fragmentation, including time since the trauma (i.e., fragmentation may increase with time), current symptoms, inaccurate retrospective reports, pre-existing memory impairments, and medication use. Still, the FM does not exclude the possibility that highly aversive events can produce memory fragmentation. Stressors might interfere with encoding, and anxiety, cognitive failures (e.g., attentional lapses), and the intrusion of fantasy-related material during recall might compromise narrative cohesion.

Prediction 7. Dalenberg et al. (2012) predict that dissociative individuals will be especially likely to "forget" or experience difficulty accessing important facets of memory (p. 554). However, at a later time, they may somehow recall these memories with no degradation in their accuracy, compared with continuous memories. They state, "Across all samples—

abused or nonabused, clinical, nonclinical, and experimental—it has been found that … recovered memories and continuous memories were equally accurate…" (p. 567). In contrast, although the FM leaves open the possibility that certain recovered memories are genuine and as accurate as continuous memories, it posits that others may be inaccurate and stem from fantasy, suggestive influences, or both.

Comment. Citing four studies, one unpublished (Palesh, 2001), Dalenberg et al. assert that in samples of abused adults who have not been diagnosed with psychiatric disorders, "dissociation… typically differentiates between those with continuous and those with recovered memories" (p. 567). Yet two of the published studies showed that participants reporting recovered memories of childhood sexual abuse (CSA) were more likely to exhibit false memories on the DRM paradigm (Clancy, Schacter, McNally, & Pitman, 2000; Geraerts, Smeets, Jelicic, Van Heerden & Merckelbach, 2005) compared with those reporting continuous memories of CSA or reporting no abuse. These studies do not confirm that participants' abuse memories were false, but they suggest a propensity to form false memories in those reporting recovered memories of CSA. Although some question the ecological validity of this paradigm (Freyd & Gleaves, 1996; but see Roediger & McDermott, 1996 for a rejoinder), individuals who report recovering (presumably false) memories of past lives (Meyersburg, Bogdan, Gallo, & McNally, 2009) and space alien abduction (Clancy et al., 2002) likewise exhibit heightened false memory effects on the DRM.

Although the author of the third published study (Melchert, 1999) reported that "dissociative traits were found to be weakly associated with recovering abuse memories" (p. 1172), he added that many descriptions of these recollections "do not suggest a lack of conscious access to the memories" (p. 1171). That is, not having thought about an abuse episode for several years does not mean that the person was *incapable* of remembering it

during the time when her or she did not think about it. Indeed, amnesia means that the person encoded the episode and is incapable of accessing it.

Citing two studies (Dalenberg, 1996; Williams, 1995), Dalenberg et al. claim that recovered and continuous memories are equally accurate (i.e., corroborated at equal rates), but their interpretation of both investigations is problematic. Williams's (1995) research team interviewed 129 women whose medical records indicated that they had been assessed for possible CSA, yet 12 women affirmed that there had been a time when they had not remembered their abuse. Dalenberg et al. interpret this finding as evidence of "corroboration for the accounts of trauma from those recovering from dissociative amnesia" (Dalenberg et al., 2012, p. 577). Nevertheless, one cannot assume amnesia merely because people say they have not thought about something in many years, nor can one assume that the reason for the (alleged) forgetting is that a dissociative mechanism has prevented access to the memory *because* the forgotten experience was so emotionally traumatic (Loftus, Polonsky, & Fullilove, 1994; McNally, 2003, pp. 206-207). Although sexual abuse is morally reprehensible, it is not always traumatic in the sense of provoking terror in its victims (McNally, 2012). Indeed, studies on corroborated, undeniably traumatic events have yet to uncover convincing evidence of dissociative amnesia— that people encode *trauma*, yet become *incapable* of recalling it through the mechanism of dissociative amnesia (for reviews, see McNally, 2003, pp. 186-228; Piper, Pope, & Borowiecki, 2000; Pope, Oliva, & Hudson, 1999).

Dalenberg (1996) reported that 17 patients undergoing psychotherapy for problems associated with sexual abuse they had never forgotten remembered additional abuse episodes that perpetrators corroborated as often as they did the always-remembered episodes. Although she interpreted these recollections as evidence of patients recovering from dissociative amnesia, ordinary memory mechanisms easily explain these findings. Indeed, it is little wonder that discussing certain abuse episodes would cue additional recollections in

people with extensive histories of CSA. Moreover, if dissociative amnesia were the mechanism that had hitherto prevented recollection of these memories, it is unclear why this presumably powerful mechanism did not block recollection of abuse memories that patients had never forgotten. Finally, these cases differ dramatically from those of canonically controversial memories where patients with no histories of abuse allegedly recall horrific trauma of which they were entirely unaware of having experienced.

Dalenberg et al.'s claim of equivalent accuracy of continuous and recovered memories of abuse rests on equal rates of corroboration. Yet the literature on corroboration is more complex than Dalenberg et al. imply. McNally, Perlman, Ristuccia, and Clancy (2006) found that only one of 38 adults (3%) who reported recovered memories of CSA could corroborate the abuse, whereas 20 of 92 (22%) continuous memory cases provided corroboration.[6] In another study of 66 people reporting recovered memories of CSA, only one claimed corroboration (Geraerts, Jelicic, & Merckelbach, 2006a). Geraerts et al. (2006b) recruited 23 women from local newspapers who had recovered memories of CSA, eight of whom (35%) had recovered them in therapy and only one of these women provided corroboration. In contrast, 19 of the 55 women (35%) in the continuous memory group provided potentially corroborative information. In another study, Geraerts et al. (2007) were unable to corroborate any CSA memories surfacing during suggestive therapy, whereas the corroboration rate for CSA memories recalled outside of therapy did not differ from the rate for continuous memories of CSA.

One fundamental problem with the TM is that it flies in the face of well-established mechanisms of memory. As TM theorist D. Spiegel (1997) contended, traumatic dissociative amnesia — a trauma-related inability to recall important personal information that is too extensive to be explained by ordinary forgetfulness (American Psychiatric Association, 2013) — is not subject to the same rules as ordinary forgetting. Dissociative amnesia, which is one of the

criteria for DID, is ostensibly “more, rather than less, common after repeated episodes; involves strong affect; and is resistant to retrieval through salient cues” (Spiegel, p. 6). This is why some TM theorists have recommended therapeutic techniques to recover these allegedly dissociated (or repressed) memories. As Brown, Scheflin, and Hammond (1998) wrote, “Indeed, for some victims, hypnosis may provide the only avenue to the repressed memories” (p. 647). Yet repetition ordinarily improves memory for a class of events, and intense affect enhances the encoding of the central features of an event, rendering it readily recallable and retrievable through salient cues (McNally, 2003). As the phenomenon of PTSD demonstrates, victims of trauma typically remember it all too well (Porter & Peace, 2007).

The “classical” view of DID is that it is marked by “relatively stable, fixed ‘two-way’ amnestic identities” (Dalenberg et al., 2012, p. 568). We were pleased that Dalenberg et al. now reject this contention. In fact, researchers have found little or no evidence for inter-identity amnesia when they used objective measures (e.g., behavioral tasks or event- related potentials) of memory (Giesbrecht et al., 2010). In their analysis of laboratory research on inter-identity amnesia in DID, Dalenberg et al. write that these experiments “did not test autobiographical memory in DID, presumably the type of memory most importantly affected in these patients” (p. 568). However, since the publication of Dalenberg et al.’s article, Huntjens, Verschuere, and McNally (2012) did precisely that. Using a concealed information task, they found clear evidence of transfer of autobiographical memory across alters. Reaction time data confirmed that the identity supposedly amnesic for autobiographical information associated with the identity harboring the allegedly dissociated memories of CSA recognized personal information associated with the traumatized identity. These results falsify the notion of complete inter-identity amnesia in DID, and shift the burden to proponents of the TM to explain exactly how people come to view themselves as possessing multiple discrete personalities (see Lilienfeld et al., 1999, for the FM account of this phenomenon).

Prediction 8. Biological indices, including neuropsychological and psychophysiological measures, should distinguish highly dissociative and nondissociative individuals, especially in fear-relevant situations (Dalenberg et al., 2012, p. 554, 569).

Comment. As Dalenberg et al. note, both the FM and TM are consistent with the view "that biological research might be informative for the understanding of dissociation" (p. 569). Accordingly, this prediction does not discriminate between these two models. For example, the evidence cited by Dalenberg et al. suggesting a genetic component to dissociation is entirely consistent with the FM view that heritable, dispositional factors (e.g., suggestibility, fantasy-proneness, subtle neuropsychological deficits) may increase the likelihood of dissociation. Moreover, we agree that individuals with dissociative disorders may display marked psychophysiological responses to "stimuli reminiscent of trauma" (p. 574) compared with nondissociative individuals. From the FM perspective, this may occur even in the absence of actual trauma because the "trauma" possesses a psychological reality (p. 574). Indeed, people who claim abduction by space aliens exhibit marked psychophysiological responses when recalling these "memories" (McNally, Lasko, Clancy, Macklin, Pitman, & Orr, 2004). This conclusion extends to functional neuroimaging studies that compare the responses of dissociative patients with those of nondissociative individuals to emotionally evocative stimuli or personally relevant memories (e.g., Reinders et al., 2012). [7]

A research line that is largely ignored in Dalenberg et al.'s review is the psychopharmacology of dissociative symptoms. Some drugs, notably ketamine, have been shown to produce severe dissociative symptoms along with memory dysfunctions in healthy volunteers (e.g., Morgan, Mofeez, Brandner, Bromley & Curran, 2004). We consider this type of study important insofar as it may shed light on the issue of whether dissociative reactions may occur in the absence of a history of trauma.

Conclusions

In sum, Dalenberg et al. (i.) tenaciously defend Janet's (1889/1973) notion that trauma is *the* root cause of dissociation, (ii.) are selective in their evaluation of the literature and alternative explanations for dissociation, and (iii.) mischaracterize a number of core tenets the FM. Still, there are encouraging indicators of common ground across theoretical perspectives. Dalenberg et al. recognize the importance of mediators and moderators, acknowledge that DID is a disorder of self-understanding, imply that the link between trauma and dissociation is not inevitable, and move the debate forward by articulating the key tenets and predictions of the TM.

In our view, little will be accomplished by hewing to the simplistic, outdated trauma-dissociation model that Janet proposed more than a century ago. In this respect, Dalenberg et al.'s acknowledgement of the causal complexity of dissociation, although insufficiently accommodating of third-variables and alternative explanations, is an advance over many previous treatments of the trauma-dissociation linkage. Modern-day theoreticians, researchers, and clinicians are remiss to ignore a host of variables, including fantasy proneness, suggestibility, suggestion, co-occurring disorders, cognitive failures, neurological deficits, and, yes, the potential repercussions of trauma, in their quest to achieve a comprehensive account of dissociation and dissociative disorders.

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Table 1. Studies investigating dissociation in combination with fantasy and trauma

		Correlation (*r*)			Measure of	
	N	DES-Fantasy	DES-Trauma	Fantasy-Trauma	Fantasy	Trauma
Merckelbach et al. (2002)	109	0.53	0.24	0.28	CEQ	CTQ
Pekala (1999)	1229	0.41	0.22	0.26	ICMI	CAT
Pekala (2001)	77	0.48	0.25	0.28	ICMI	CAT
Giesbrecht et al. (2007)	185	0.52	0.38	0.23	CEQ	CTQ
Cicero & Kerns (2010)	381	0.32	0.16	0.15	Novelty subscale of ECI	CTQ
Van der Boon et al. (2010)	86	0.23	0.27	0.22	CEQ	TEC;
Geraerts et al. (2006b)	114	0.43	0.36	0.34	CEQ	CTQ
Merckelbach & Jelicic (study 1; 2004)	43	0.50	0.33	0.24	CEQ	CTQ
Merckelbach & Jelicic (study 2; 2004)	127	0.49	0.49	0.25	CEQ	CTQ

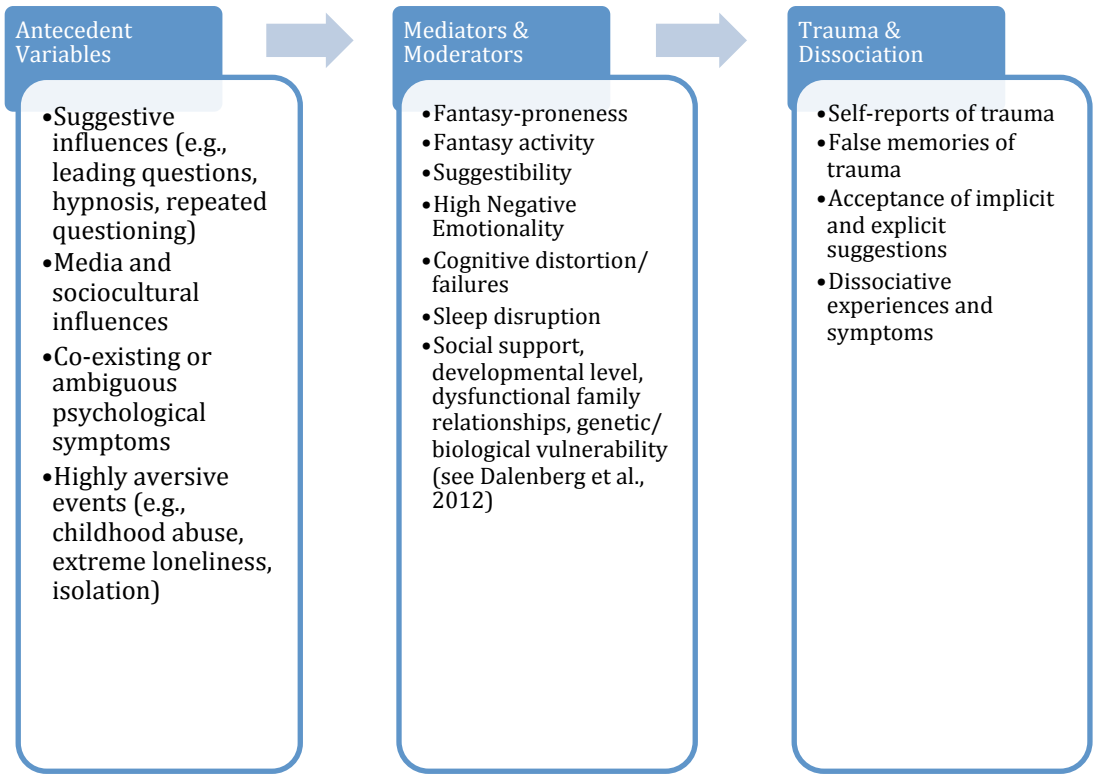
Note. DES, Dissociative Experiences Scale; CEQ, Creative Experiences Scale; ICMI, Inventory of Childhood Memories and Imaginings; ECI, Emotional Creativity Inventory; CTQ, Childhood Trauma Questionnaire; CAT, Child Abuse and Trauma Scale; TEC, Traumatic Experiences Checklist.

Table 2. Fit indices of Model 1, where trauma leads to dissociation and consequently increases fantasy and Model 2, where dissociation increases fantasy leading to higher levels of trauma reports.

	Parameter estimate (95% CI)		χ^2	*df*	RMSEA	SRMR	TLI	CFI
Model 1	Trauma to dissociation: 0.33 (0.25 - 0.40)	Dissociation to fantasy: 0.44 (0.39 -0.50)	13.99	1	0.07	0.06	0.86	0.95
Model 2	Dissociation to fantasy: 0.46 (0.41 - 0.52)	Fantasy to trauma: 0.27 (0.20 - 0.33)	26.79	1	0.10	0.10	0.72	0.91

Note. RMSEA = root mean-square error of approximation, SRMR = Standardized Root Mean Square Residual, NFI = Bentler-Bonnet normed-fit-index; CFI = comparative-fit-index

Figure 1


Antecedent Variables
•Suggestive influences (e.g., leading questions, hypnosis, repeated questioning)
•Media and sociocultural influences
•Co-existing or ambiguous psychological symptoms
•Highly aversive events (e.g., childhood abuse, extreme loneliness, isolation)
Mediators & Moderators
•Fantasy-proneness
•Fantasy activity
•Suggestibility
•High Negative Emotionality
•Cognitive distortion/ failures
•Sleep disruption
•Social support, developmental level, dysfunctional family relationships, genetic/ biological vulnerability (see Dalenberg et al., 2012)
Trauma & Dissociation
•Self-reports of trauma
•False memories of trauma
•Acceptance of implicit and explicit suggestions
•Dissociative experiences and symptoms

End Notes

[1]When we use the term “dissociation,” we typically refer to dissociative experiences or symptoms, not to a literal “splitting” of different aspects of consciousness or “multiple personalities.”

[2]Although in this article we adopt Dalenberg et al.’s terminology for the sake of continuity, their use of the term “fantasy model” does not fully capture the fact that our perspective is best described as a multifactorial framework for understanding dissociative symptoms and experiences.

[3]Because the FM focuses primarily on DID, the relevance of the FM to other dissociative disorders (e.g., dissociative amnesia, depersonalization/derealization disorder) has not been well elucidated.

[4]Although not directly pertinent to the present discussion, Sar et al. (2007) note, “In a logistic regression analysis (that took dissociative disorder diagnosis as the dependent variable and five types of childhood abuse and neglect as independent variables), sexual abuse, physical neglect, and emotional abuse predicted a dissociative disorder (p. 173)."

[5]Dalenberg et al. list 48 correlations in their Table 4. Nevertheless, contra to their report of a correlation of -.30 in Horseleberg et al. 2003, the latter authors did not compute a correlation between the DES and internalization of a false suggestion of a performed action, so our calculation of percentages is based on an N of 47 correlations, rather than 48 used by Dalenberg et al.

[6]Accuracy of a memory and corroboration of the memory are not necessarily the same thing. Although it is reasonable to conclude that a corroborated memory is an accurate one, we cannot assume that an uncorroborated memory is inaccurate.

[7]Reinders et al (2012) compared the brain responses of DID patients with those of healthy participants instructed to simulate DID in response to trauma-related autobiographical memories. Differences between the groups in their responses are difficult to interpret given that the memories of simulating participants were extremely unlikely to possess the same emotional impact as those of DID patients, most of all of whom presumably believed the extremely disturbing memories they recalled.

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