# DISSOCIATIVITY, IMAGERY VIVIDNESS, AND REALITY MONITORING

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**ABSTRACT**
*The study examined if dissociativity (the tendency to dissociate spontaneously) was related to a) reality monitoring (ability to distinguish actual from imagined events) and b) vividness of visual imagery ability. Participants ($n$ = 220) completed the Dissociative Experiences Scale (DES), Questionnaire of Imagery Vividness, and completed a reality monitoring task that required subjects to view slides of common objects 2, 5, or 8 times and imagine them 2, 5, or 8 times at each presentation frequency level. Participants later estimated how often each stimulus was presented. An analysis of covariance (with imagery as covariate) revealed support for Johnson, Taylor, and Raye's (1977) finding of reality monitoring deficits. However, dissociativity (as measured by the DES) was unrelated to reality monitoring deficits. Furthermore, vividness of imagery scores and dissociativity were uncorrelated.*

In recent years the concepts of dissociation and reality monitoring have attracted much attention from clinicians and experimental psychologists alike, perhaps due to the intense debate that surrounds the issue of recovered memory. This study attempted to link dissociation and memory experimentally by examining if dissociativity , the tendency to spontaneously dissociate in everyday life (Carlson & Putnam, 1989), is related to reality monitoring, the ability to distinguish actual from imagined events (Johnson & Raye, 1981). The study also investigated the relationship between dissociativity and vividness of imagery ability since some research (e.g., Giola & Sanders, 1992) suggests these two constructs should be related.

***Dissociativity***

Dissociation, defined as "disconnection or disengagement regarding the self and/or the environment" (Cardeña, 1994, p. 23), is often implicated in memory loss, dissociative disorders, daydreaming, and hypnosis. According to Van der Kolk and Fisler (1995), in everyday life, dissociation may occur in the forms of "ongoing depersonalization" and "spacing out" resulting in compartmentalization of experience in which the various elements of experience are not integrated into a unitary experience. Consequently, experiential elements may be stored in the form of isolated sensory and affective fragments. Dissociation is often viewed as a coping mechanism to deal with stress and traumatic experiences, but continued reliance on dissociation to cope with stress will interfere with one's capacity to "fully attend to one's life's ongoing challenges" (Van der Kolk & Fisler, 1995, p. 513). The severity of dissociation is correlated with various psychopathological conditions such as somatization, bulimia, self-mutilation, and borderline personality disorder. Its most severe form tends to occur in people who suffer from dissociative identity disorder in which "separate identities seem to contain the memories related to different traumatic incidents" (p. 513).

Although dissociation is commonly implicated in memory problems, there appears to be little empirical work in understanding the role of dissociation in memory. Van der Kolk and Fisler (1995) found a significant correlation ($r$ = .54, $p < .01$) between scores on the Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986) and lack of narrative memory (the ability to tell a coherent story about what happened during a traumatic event). They interpreted these results to suggest that people's traumatic experiences are initially stored as sensory fragments without semantic components. Barrett (1992, 1996) differentiated between

high fantasy-prone individuals and high dissociators. She found that while both tended to become absorbed in books, films, plays, stories, and lose track of time, surroundings, and sense of identity, high dissociators were more likely to report amnesia for particular events.

The main concern of interest to the present study was to examine if dissociativity (as measured by the DES) was related to reality monitoring confusion, the inability to discriminate between actual and imagined events (Johnson & Raye, 1981). Reality monitoring confusions may be conceptualized as a dissociation problem in which a person has lost access to cues that contextualize the origin of a memory. Specifically, we wanted to determine if people who are high (relative to low) in dissociativity may have greater difficulty in distinguishing the sources (external or internal) of their memories. However, before we develop the possible relationship between dissociativity and reality monitoring more fully, we will review some of the relevant work on reality monitoring done by Johnson and her colleagues, especially since the conceptualization and methodology used in the present study were based on their work.

***Reality Monitoring***

Johnson and Raye (1981) defined reality monitoring as the process involved in attributing events of either external (actual perception) or internal (imagined or mental) origins to memories. Although most people are remarkably adept at remembering the origin or source of information (Reed, 1992), to err in this process is also an ordinary occurrence. Initial research (Johnson, Taylor, & Raye, 1977) on reality monitoring supported the hypothesis that people do confuse the sources of their memories.

Johnson et al. (1977) tested reality monitoring difficulties by manipulating the frequencies with which participants both viewed and generated words internally (mentally) and asked participants later to judge either the frequency with which they viewed each word or the frequency with which they generated each word internally. In general, their results showed that participants were sensitive to the frequency of occurrence of externally and internally generated words. Nevertheless, how often an externally presented stimulus was judged to have occurred was influenced by the number of times the participant was required to generate it internally. This finding that "internally generated events increased the apparent Frequency of Externally generated events" was labeled the IFE effect (Johnson, Taylor, & Raye, 1977, p. 118). Conversely, to a lesser degree results also revealed that "externally generated events Increased the apparent Frequency of Internally generated events" which was labeled the IFI effect (p. 118). In a subsequent study, Johnson, Raye, Wang, and Taylor (1979) found that good, relative to poor, imagers were more likely to confuse the source of their memories (seeing or imagining).

Johnson and Raye (1981) proposed that the ability to accurately distinguish external from internal memories may be based on the type and amount of information stored in the memory trace during acquisition. Memories derived from external, vis-a-vis internal, events have more contextual, sensory, and detailed information stored in the memory trace; memories derived from internal or mental events have more cognitive processes such as reasoning, inferring, and imagining associated with the memory trace. Finally, Johnson, Nolde, and De Leonardis (1996) indicated that source (memory origin) monitoring failure may play a significant role in memory distortions and illusions (including false memories, misinformation effects, and misattributions of memory origins; see also Johnson, Hastroudi, and Lindsay, [1993]).

***Dissociativity and Reality Monitoring – The Present Study***

In a recent review article, Rogers (1995) suggested that dissociation and reality monitoring may be implicated in recovered memories. She suggested that absorption, fantasy proneness, and hypnotic susceptibility may affect the ability to discriminate between actual and mental events. She argued that adults and children suffering from dissociative disorders may "at times be prone to source monitoring errors" (Rogers, 1995, p. 694). Hyman and Billings (1995, cited in Hyman & Pentland, [1996]) found that dissociativity, as measured by the DES, was significantly correlated with the creation of false memories in an experimental setting. Furthermore, Hyman and Pentland (1996) interpreted the DES to be a "measure of individual differences of difficulties in reality monitoring" (p. 104).

Kunzendorf and Karpen (1996-97) observed reality testing deficits in college students were related to the Dissociation/Amnesia and Absorption factors of the DES. Specifically, they found that

> subjects exhibiting above-median scores on the Dissociation/Amnesia factor of the DES took longer to discriminate perception from vivid imagery than from faint imagery, as if they failed to monitor the greater 'central inervation' behind more vivid, more percept-like imagery. Among such subjects, those exhibiting below-median scores on Absorption/Imagination had double trouble discriminating perceptual sensations from imaged sensations – as if they first failed to *monitor directly* the 'central innervation' of vividly imaged sensations, and then, failed to *infer correctly* the imaginal nature of all imaged sensations which were phenomenally less vivid than perceptual sensations. (p. 235)

Given these and results from previous studies, Kunzendorf and Karpen (1996-97, p. 235), these authors suggested that the dissociative, psychotic, and hypnoidal tendencies in

college students are reflective of first stage both direct and inferential source monitoring deficits.

In general, there is little empirical work supporting the notion that dissociativity is a factor in reality monitoring failure. The primary purpose of the present study was to examine if the tendency to dissociate was related to reality monitoring using a task such as the one used by Johnson and her colleagues. If high (relative to low and medium) dissociators tend to "space out" or suffer "ongoing depersonalization" more often, and as a result do not fully store the sensory and affective components of experiences (Van der Kolk & Fisler, 1995, p. 513), it is possible that reality monitoring differences would exist among low, medium, and high dissociators.

The method used to test reality monitoring was adapted from Johnson, Raye, Hasher, and Chromiak (1979) and Johnson, Raye, Wang, and Taylor (1979). Participants viewed slides of common objects 2, 5, or 8 times and imagined the common objects 2, 5, or 8 times at each of the presentation frequencies (i.e., presentation and imagination frequencies were combined factorially for each participant). Pictures, as opposed to words, were used because we were interested in examining reality monitoring of visual rather than an auditory stimuli. Participants later judged the presentation frequencies of each object. Imagery vividness (ability to experience vivid imagery) was included as a covariate, given the finding that good imagers were more likely to suffer from source confusions than poor imagers (Johnson, Raye, Wang, & Taylor, 1979). It was anticipated that high dissociators (relative to lows and mediums) would not only show deficits in estimating the presented frequencies, but also show deficits in reality monitoring ability (i.e., highs would be more apt to show the IFE effect than would lows and mediums).

### *Dissociativity and Visual Imagery Vividness*

Although the variable visual imagery was included to serve as a covariate in the test of the hypothesis relating dissociativity to reality monitoring, we decided also to examine the relationship between dissociativity and the ability to experience visual imagery vividly. There is some, but indirect evidence that these two constructs should be related.

Giolas and Sanders (1992) found that high dissociators, relative to low, reported significantly less suffering when instructed to use imagery as a coping response to an ischemic pain procedure. They argued that high dissociators were more effective because they were more experienced in utilizing imagery as a means to minimize suffering. They also suggested that people who are highly imaginative are highly dissociative as well.

Kirsch and Council (1992) noted that imagery vividness is conceptually related to absorption, imaginative involvement, and fantasy-proneness and that it correlates moderately with hypnotizability. They further asserted that it is not clear how the aforementioned concepts actually differ. Additionally, there is considerable evidence that these variables show moderate to high correlations with each other (see Crawford, 1982; Ijzendoorn & Schuengel, 1996; Lynn & Rhue, 1988; Sutcliffe, Perry, & Sheehan, 1970; Putnam & Carlson, in press).

Relating dissociation with imagery, Lynn, Rhue, and Green (1988) suggested that dissociation is synonymous to "an imagination-based cognitive strategy" (p. 140), and that both imagination and fantasy are mechanisms used to dissociate from the environment. If this hypothesis is true, then a measure of the tendency to dissociate should correlate highly with a measure of imagery vividness ability.

## METHOD

### *Participants*

Participants were 220 students from psychology, sociology, and anthropology classes at West Chester University. Participants volunteered for the study and they could terminate their participation at any time during the study with impunity.

### *Instruments and Materials*

Bernstein and Putnam's (1986) 28-item self-report Dissociative Experiences Scale (DES) was used to assess participants' tendency to spontaneously dissociate (alterations in memory, identity, depersonalization, and derealization) in the context of daily activities (see also Putnam & Carlson, in press). The DES is perhaps the most widely researched measure of dissociativity (Carlson & Putnam, 1989) and is considered to be reliable and valid (Ross, 1989).

Pekala's (1980) Questionnaire of Imagery Vividness, a modification of Sheehan's (1967) modified Betts Questionnaire upon Mental Imagery, was used to measure participants' imagery vividness ability. The Questionnaire of Imagery Vividness is a 24-item questionnaire that purports to measure visual, auditory, gustatory, tactile, olfactory, kinesthetic, and organic imagery ability. Reliability data for the Questionnaire of Imagery Vividness was not available from previous work. However, the internal consistency reliability computed for the present study data was found to be .90 for the entire scale (24 items) and .88 for the visual imagery scale (13 items); the latter reliability was computed separately since visual imagery was used as a covariate in the present study.

Eighteen slides of commonly recognizable objects (e.g., banana, keys, car) served as stimuli for the reality monitoring task. The slides were made from children's books illustrations.

### *Design*

A 3x3x3 between by within subjects' analysis of covariance factorial design was used. The first independent (between) variable was level of dissociativity (low, medium, or high); the second independent (within) variable was slide

TABLE 1

ANCOVA Results for Dissociativity and Reality Monitoring

(Covariate Visual Imagery)

| | MS | DF | F | p |
|---|---|---|---|---|
| **Between Subjects** | | | | |
| Dissociativity | 10.64 | 2 | 0.46 | 0.635 |
| Error | 23.36 | 216 | | |
| **Within Subjects** | | | | |
| Presentation | 1145.71 | 2 | 450.65 | 0.000 |
| Error | 2.54 | 434 | | |
| Imagination | 119.76 | 2 | 87.55 | 0.000 |
| Error | 1.37 | 434 | | |
| **Interactions** | | | | |
| Dissociativity x Presentation | 16.84 | 4 | 6.23 | 0.000 |
| Error | 2.54 | 434 | | |
| Dissociativity x Imagination | 2.18 | 4 | 1.59 | 0.175 |
| Error | 1.37 | 434 | | |
| Presentation x Imagination | 7.44 | 4 | 5.83 | 0.000 |
| Error | 1.27 | 868 | | |
| Dissociativity x Presentation x Imagination | .52 | 8 | 0.40 | 0.918 |
| Error | 1.27 | 868 | | |

presentation frequency (2, 5, or 8 times); and the third independent (within) variable was slide imagination frequency (2, 5, or 8 times). Visual imagery ability was used as a covariate since Johnson, Raye, Wang, and Taylor (1979) found that good imagers produced a greater IFE effect than do poor imagers.

The 18 slides were randomly assigned to the nine conditions produced by factorially combining the three levels of two within subjects' variable – slide presentation frequency (2, 5, or, 8) and slide imagination frequency (2, 5, or 8). Thus, six slides were presented two times, six slides were presented five times, and six slides were presented eight times. Likewise, six slides were imagined two times, six slides were imagined five times, and six slides were imagined eight times.

There were 20 alternating slide presentation and slide imagination trials with nine slides either presented or imagined on each trial. For example, on trial 1, nine slides were presented to participants. On trial 2, participants were asked to imagine nine slides. The slide presentation and slide imagination trials alternated in this fashion until all 20 trials were completed.

Certain restrictions were implemented for the reality monitoring task so that it was carried out in a uniform fashion by all participants. One restriction was that a slide had to be presented to participants before it could be imagined. Participants were instructed to imagine objects exactly as they appeared in the slides, which would not be possible if they had not seen the objects before imagining them. Another restriction was that slides, whether presented or imagined, were not repeated within trials; that is, a slide that was to be presented two times was not presented twice within the same trial, but was randomly presented twice across the ten presentation trials.

***Procedure***

Participants were tested in groups of 16 to 46. They filled out the DES and the Questionnaire of Imagery Vividness and then engaged in the reality monitoring task. Slides were presented to participants for four seconds on presentation trials. On imagination trials the experimenter gave the name of an object every five seconds, and asked the participants to imagine the object. These time parameters were used by Johnson, Ray, Hasher, and Chroniak (1979) so as to allow greater time for the image to develop.

After 20 trials (ten each of alternating presentation and imagination) the experimenter tested participants' memo-

ry. The experimenter presented each slide in a random order and asked the participants to judge the number of times they actually saw the slide of the object. The participants had not been informed prior to this that their memory for frequency of presentations would be tested. This was made clear by repetition and verified by asking the participants if they understood the task. Participants were given up to ten seconds to transcribe their frequency judgements corresponding to 18 slides on a sheet of paper numbered 1-18.

TABLE 2

Mean Judged Presentation Frequencies as a Function of Presentation and Imagination Frequencies

| | Imagination Frequency | Presentation Frequency 2 | 5 | 8 |
|---|---|---|---|---|
| Low Dissociators | 2 | 3.00 | 4.73 | 6.06 |
| | 5 | 3.93 | 5.43 | 6.47 |
| | 8 | 4.13 | 6.12 | 6.83 |
| Medium Dissociators | 2 | 3.18 | 4.95 | 6.82 |
| | 5 | 3.67 | 5.63 | 6.90 |
| | 8 | 3.98 | 6.48 | 7.38 |
| High Dissociators | 2 | 3.72 | 4.90 | 6.18 |
| | 5 | 3.99 | 5.28 | 6.31 |
| | 8 | 4.33 | 5.97 | 6.68 |

## RESULTS

### *Preliminary Analysis*

An examination of the frequency distribution for the DES scores suggested the following cut-off scores to identify the low, medium, and high dissociators respectively: 7.99 and lower (20th percentile), 8.00 - 24.99 (21st and 79th percentiles), and 25.00 and above (80th percentile). The mean DES scores for the three groups were: low = 5.25 ($\underline{n}$ = 46), medium = 14.55 ($\underline{n}$ = 127), and high = 33.89 ($\underline{n}$ = 47). The mean of the high group corresponds to cut-off scores used in the screening for Dissociative Identity Disorder and/or Post-Traumatic Stress Disorder (Carlson & Putnam, 1992; Ross, 1989).

### *Main Analysis*

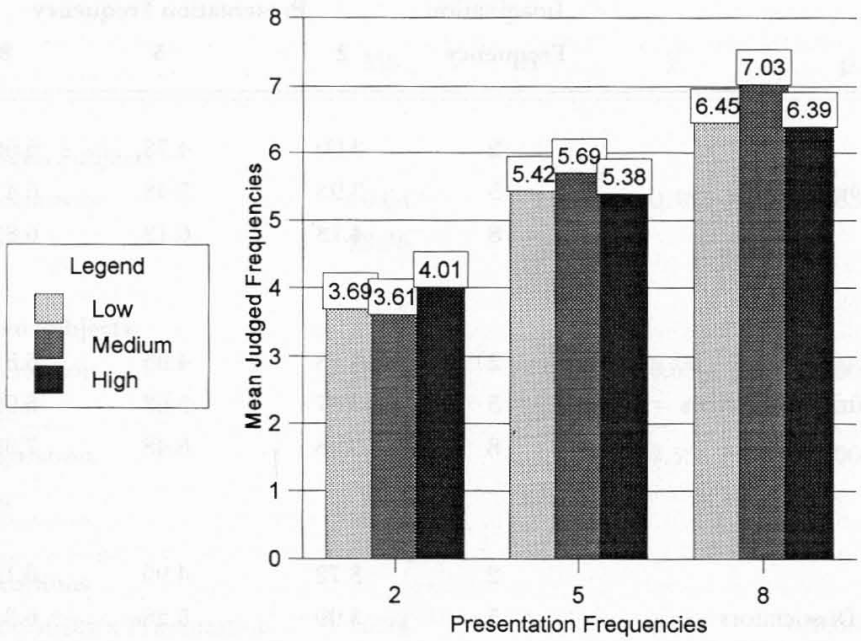
A 3x3x3 analysis of covariance (ANCOVA) with visual imagery as a covariate was conducted using frequency judgments as the dependent variable. In Tables 1 and 2, the variable presentation refers to the number of times slides were actually presented (2, 5, or 8), and the variable imagination refers to the number of times slides were imagined (2, 5, or 8). Table 1 shows that the main effect of dissociativity was not significant ($\underline{p} > .05$), but its interaction with presentation was significant ($\underline{p} < .001$). It may be noted that the results did not change when analysis did not include the covariate. It might be argued that the total imagery scale may have served as a better covariate than the visual imagery scale; however, the extremely high correlation of 0.91 between the two rules out that possibility. Furthermore, the main effects of presentation frequency and imagination frequency, and their interaction with each other, were significant ($\underline{p} < .001$). The other sources of variance were not significant.

The presentation frequency main effect was further analyzed using Scheffè's post-hoc procedure. The results revealed that the three means (3.71, 5.57, and 6.78) for the three levels of presentation frequency (2, 5, 8) were significantly different from each other ($\underline{F}$ values ranged between 63.41 and 408.16, $\underline{p} < .001$). Post-hoc analyses for the main effect of imagination frequency, using Scheffè's procedure, revealed the three means (4.89, 5.33, and 5.83) for the three levels of imagination frequency were significantly different from each other ($\underline{F}$ values ranged between 15.49 and 70.69, $\underline{p} < .01$).

The significant interaction between dissociativity and presentation is shown in Figure 1. Simple main effects computed to test differences among the three groups of dissociators at each level of presentation frequency were not significant using Scheffè's procedure ($\underline{F}$'s ranged between .07 and 4.46, $\alpha = .05$). Simple main effects comparing pairwise differences among presentation frequencies at each level of dissociativity were all significant ($\underline{F}$'s ranged between 14.18 and 237.73; $\alpha = .05$) with the exception of two comparisons. These were a) low dissociators did not significantly differ on presenta-

FIGURE 1

Dissociativity (Low, Medium, and High) and Presentation Interaction




tion frequencies of 5 and 8 ($F = 7.79$; $\alpha = .05$), and b) high dissociators did not significantly differ on presentation frequencies of 5 and 8 ($F = 7.70$; $\alpha = .05$ ).

***Dissociativity and Imagery Vividness***

The correlations between dissociativity and visual imagery vividness and total imagery scale score based upon the entire Questionnaire of Imagery Vividness scale were .02 and .01 ($n = 220$; $p > .10$) respectively. The correlation between the visual imagery and total imagery scale was .91, $p < .001$.

## DISCUSSION

Although not of primary interest to the present study, we would like to note that consistent with previous work of Johnson and her colleagues, the results showed support for the IFE effect inasmuch as the main effect of imagination was significant; that is, as imagination frequency increased so did the frequency judgments of actual slide presentations. These results were similar even though the nature of test stimuli (words or pictures) differed in the work of Johnson and her colleagues' studies and this study. Although the presentation-imagination interaction was significant, it was extremely weak relative to the main effects of both presentation and imagination. Thus, the interaction does not substantially alter the findings of the main effects.

***Dissociativity and Reality Monitoring***

The main effect of presentation frequency was extremely strong compared with the dissociativity-presentation interaction. Furthermore, the simple main effects of the interaction did not reveal any significant differences among the levels of dissociativity at each level of presentation frequency. These results suggest that all participants had the tendency to give higher estimates with increased presentation frequencies.

The main effect of imagination was significant, but neither the dissociativity-imagination interaction, nor the three way interaction dissociativity-presentation-imagination were significant. These results suggest that the IFE effect did not differ with the level of dissociativity, that is, the high, medium, and low dissociators showed the same level of reality monitoring confusion.

These results seem contrary to Rogers' (1995) assertion that dissociativity would be a factor in reality monitoring, and Hyman and Pentland's (1996) assertion that DES is a measure of individual differences in reality monitoring. Rather, the results may better be interpreted to imply that not every situation of reality monitoring would be found difficult by dissociative individuals. As Ijzendoorn and Schuengel (1996) noted, that if "dissociation is conceptualized as a defense mechanism, it should be present in cases where defense is functional – at least in the short run" (p. 366).

Ross (1989) found that a) the severity of dissociation tends to be positively correlated with trauma and b) dissociation serves as a defense mechanism to cope with traumatic events in one's life. It seems possible that the capacity for dissociation may be used less frequently in non-threatening environments, as might have been the case with the type of stimuli used in the present study. Thus, high dissociators may not have differed from low or medium dissociators on the reality monitoring task because they were in a non-threatening environment where dissociation as a defense mechanism would be unnecessary. In a recent study, Johnson, Nolde, and DeLeonardi's (1996) observed that emotion may

play an important role in source (memory origin) confusion, particularly in situations in which "emotion induces embellishments or distortion of an event, especially combined with repeated rehearsal of the embellishment, imagined events would take on the perceptual and semantic characteristics of real events, and result in reality monitoring failures..." (Johnson et al., 1996, p. 151). Thus, high (relative to low) dissociators, by nature, may not have problems with source monitoring in everyday, ordinary tasks. Nevertheless, they may suffer source confusion when dealing with personally relevant emotional events inasmuch as they would focus their attention on the content of the message at the expense of attending to the peripheral details (which help later in determining the source of the message). It is also likely that in highly emotional contexts, high dissociators may completely ignore the message and its source altogether.

A study by Hashtroudi, Johnson, Vnek, and Ferguson (1994, cited by Johnson et al., 1996) found that older adults (mean age = 70 years) showed a significant source monitoring deficit relative to young adults (mean age = 20 years) in conditions in which the participants were asked to think about their own emotion; but they showed no significant deficit when they were asked to attend to factual aspects. Hashtroudi et al. (1994) suggested that when older people focused internally on their own feelings, they were less likely to process external perceptual information. However, Johnson et al. (1996) pointed out that these results do not imply that young adults' ability for source monitoring is not affected by affective manipulations since under some conditions, when young adults focus on their own affective responses, they showed relatively poor source accuracy. Borrowing from Morris, Bransford, and Franks (1977), Johnson et al. (1996) suggested that some type of "transfer appropriate emotional processing" occurs, that is, "the relation between emotion and memory will depend on the specific nature of the perceptual and reflective processing that the emotion promotes and the nature of memory tasks individuals later face..." (Johnson et al., 1996, p. 149). Thus, it would be interesting to replicate this study using anxiety-provoking and/or emotionally laden stimuli where high dissociators would be more likely to utilize dissociation as a defense mechanism.

The present study was limited in that participants were college students who were not screened for dissociative disorders, even if their DES scores suggested the possibility of such conditions. Replication of this study using psychiatric patients diagnosed with dissociative disorders may provide greater understanding of the memory processes used to discriminate real and imagined events for those individuals. It would also be of interest to compare individuals whose repressed memory claims have been validated with those whose claims have been invalidated. A recent debate in this area suggests that some individuals who claim repressed memory are really experiencing difficulty distinguishing fact from fantasy (see Rogers, 1995). Finally, given the work by Barrett (1992, 1996), fantasy-proneness might be an interesting variable to correlate with reality monitoring ability.

***Dissociativity and Imagery Vividness Ability***

Although prior research (Giolas & Sanders, 1992; Lynn, Rhue, & Green, 1988) implicates the use of imagery and other imagination-based strategies by high dissociators, the present study results revealed that dissociativity was uncorrelated significantly with visual imagery. Also, dissociativity did not correlate significantly with the total imagery scale of the Questionnaire of Mental Imagery. It is possible that imagination-based strategies, while being able to benefit from the ability to image vividly, do not necessarily depend on it. High dissociators may be able to use a variety of imagination-based strategies (e.g., internal dialogue) when needed. Further research in this area is necessary to clarify these results.

## CONCLUSION

The present study was an initial attempt to investigate the relationship between dissociativity and reality monitoring. Results suggest that dissociativity was unrelated to reality monitoring deficits. The results are probably best interpreted to imply that not all situations of reality monitoring may be difficult for high dissociators. Future studies might find it more useful to look at clinical populations employing anxiety-provoking or emotionally-laden materials to see, if in these contexts, perception and imagination may be confused. ■

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