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Interidentity Memory Transfer in Dissociative Identity Disorder

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Controversy surrounding dissociative identity disorder (DID) has focused on conflicting findings regarding the validity and nature of interidentity amnesia, illustrating the need for objective methods of examining amnesia that can discriminate between explicit and implicit memory transfer. In the present study, the authors used a cross-modal manipulation designed to mitigate implicit memory effects. Explicit memory transfer between identities was examined in 7 DID participants and 34 matched control participants. After words were presented to one identity auditorily, the authors tested another identity for memory of those words in the visual modality using an exclusion paradigm. Despite self-reported interidentity amnesia, memory for experimental stimuli transferred between identities. DID patients showed no superior ability to compartmentalize information, as would be expected with interidentity amnesia. The cross-modal nature of the test makes it unlikely that memory transfer was implicit. These findings demonstrate that subjective reports of interidentity amnesia are not necessarily corroborated by objective tests of explicit memory transfer.

Keywords: dissociative identity disorder, memory, amnesia

Dissociative identity disorder (DID), formerly known as multiple personality disorder, is defined as the presence of two or more identities or personality states that recurrently take control of a person's behavior (American Psychiatric Association, 2000). These identities are accompanied by amnesia beyond that of ordinary forgetfulness, termed *interidentity amnesia* (IIA).

DID is a diagnosis surrounded by controversy, with many critics disagreeing over how to conceptualize alter identities. A literal interpretation from the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed., text rev.; *DSM–IV–TR*; American Psychiatric Association, 2000) criteria would define identities as separable person-like states with idiosyncratic memories, personal history, and personality traits. One common view is that identities are manifested as a coping mechanism for traumatic experiences in childhood, with findings of identity-specific physiological profiles (Putnam, Zahn, & Post, 1990) and anatomical changes (Vermetten, Schmahl, Lindner, Loewenstein, & Bremner, 2006) being levied as support for this theory. Given this posttraumatic perspective, one would expect compartmentalized memory processes to result in IIA between identities. An alternative explanation argues that alter identities derive from social construction. According to this sociocognitive theory, identities are created by patients who adopt the DID narrative as an explanation that fits their lives, resulting in the self-construal of multiple identities (Merckelbach, Devilly, & Rassin, 2002; Spanos, 1994). Identities are not conceptualized as truly distinct identities with clear-cut disruptions in consciousness and memory but rather as a metaphor used by the individual for explaining subjective experiences. According to this hypothesis, amnesia between identities would unfold via normal mnemonic processes such as self-distraction or strategies aimed at prohibiting recall (Spanos, 1994).

As in many *DSM–IV–TR* disorders, self-reports of symptoms are sufficient for diagnosis, with no objective tests required. Given the debate over IIA and its centrality to diagnosis, emphasis needs to be placed on developing objective measures to corroborate the presence of IIA as a veridical phenomenon. However, the literature on assessments of IIA is surprisingly scant and has provided mixed conclusions. Many researchers have found evidence of memory transfer across identities on implicit, or unconscious, tasks such as word-fragment completion, sequence learning, and masked-word recognition, and IIA on explicit memory tasks (those requiring conscious recollection) such as story recall and cued recall (Allen & Movius, 2000; Elzinga, Phaf, Ardon, & Van Dyck, 2003; Huntjens et al., 2002, 2006; Ludwig, Brandsma, Wilbur, Bendfeldt, & Jameson, 1972; Nissen, Ross, Willingham, Mackenzie, & Schacter, 1988), although these findings have not been entirely consistent (Eich, Macaulay, Loewenstein, & Dihle, 1997; Huntjens, Postma, Woertman, van der Hart, & Peters, 2005; Peters, Uyterlinde, Consemulder, & van der Hart, 1998).

Preserved implicit memory with little-to-no explicit memory is not inconsistent with amnesic syndromes, as individuals with organic amnesia also show this pattern. However, explicit tasks are obvious assessments of memory and could be influenced by the perceived demand characteristic that DID should result in IIA. Implicit tasks, by contrast, are generally not obvious tools for assessing memory and may not elicit the same pattern of amnesic responding. It is unclear to what extent the results of previous IIA studies are influenced by these demand characteristics. Researchers in many of the previous studies used tasks in which IIA could be easily feigned (e.g., a recall task). Given the sociocognitive

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hypothesis, it is important to rule out simulation as a causal factor in IIA (whether intentional or not). Recent studies have shown that DID patients and nonsymptomatic control participants instructed to simulate DID can produce the same pattern of responding on memory tasks (Huntjens et al., 2005, 2006; Huntjens, Peters, Woertman, van der Hart, & Postma, 2007). Results showing that simulating control participants are able to mimic the amnesic performance of DID patients are inconclusive, as similarity in performance does not necessitate similarity in etiology. Finding that nonsymptomatic control participants, despite their best efforts, cannot produce the same pattern of IIA found in DID patients would be more conclusive and would suggest that DID patients are experiencing memory alterations that are unlikely to be simulated.

Researchers have attempted to examine this issue by creating paradigms in which IIA is difficult to simulate. Silberman, Putnam, Weingartner, Braun, and Post (1985) as well as Huntjens, Postma, Peters, Woertman, and van der Hart (2003) used paradigms to examine if information learned in one identity (Identity 1) would interfere with memory for new information learned by a different identity reporting IIA (Identity 2). In individuals with IIA, Identity 1's memories should remain compartmentalized and not affect Identity 2. Individuals with normal memory should be unable to inhibit the interference from Identity 1's stimuli. In both studies, researchers found evidence of memory transfer and no difference in performance between patients and simulating control participants, concluding that DID patients did not show evidence of a superior ability to compartmentalize memories. In a recent study, Huntjens et al. (2007) used a similar task but added emotionally valenced words, again finding no evidence of complete IIA between identities.

The memory transfer found in these studies could be partially explained by implicit effects. The present study attempted to rule out this possibility by differing presentation modality at study and at test. Cross-modal manipulations significantly decrease implicit memory but have minimal effects on explicit memory. Cross-modal priming has been found to be significantly smaller than within-modal priming (or even nonexistent) in both normal and amnesic populations (Blum & Yonelinas, 2001; Carlesimo, Marfia, Loasses, & Caltagirone, 1996; Graf & Schacter, 1985; Hicks & Starns, 2005; Köhler & Moscovitch, 1997; Rajaram & Roediger, 1993). The cross-modal manipulation in the present study ensured that findings of memory transfer would be attributed to explicit memory rather than implicit effects. Modality changes affect priming primarily during perceptual but not conceptual encoding; thus, participants made syllable-judgment encoding instructions in the current study to ensure perceptual encoding of the stimuli.

In addition, Huntjens et al. (2003, 2007) used separate recognition and list discrimination tasks to assess memory transfer, meaning that Identity 2 was exposed to Identity 1's words in the recognition test and again in the list discrimination test. This repetition leads to increased familiarity for Identity 1's words, making the list discrimination task more difficult for Identity 2. The exclusion task employed in the current study improves on this paradigm by allowing for these decisions to be made with only one stimulus presentation.

The present study examined the extent of explicit memory transfer between identities in an exclusion paradigm whereby amnesia is difficult to simulate. In addition, a cross-modal manipulation was employed to mitigate any possible implicit effects. If DID is characterized by veritable IIA, there presumably should be no transfer of information (explicit or implicit) across identities in this paradigm.

In the exclusion task, Identity A heard List A words, and Identity B (an identity with reported IIA for Identity A) heard List B words. Identity B was subsequently given a visual exclusion memory test for List A, List B, and distractor words, requiring the participant to decide whether each word was from List B or not from List B (i.e., "excluding" A and distractors). DID participants with no memory for List A should easily exclude List A words, as they should correctly classify any recognized words as from List B and unrecognized words as not from List B. In contrast, participants with memory for both lists may recognize a word but would need to decide from which list it came in order to accurately exclude only List A words—a more difficult list discrimination. Thus, IIA should lead to superior exclusion performance in DID participants compared to matched control participants instructed to simulate the disorder.

Method

Participants

DID participants. Community practitioners referred 8 potential participants on the basis of inclusion criteria (i.e., a diagnosis of DID, at least a one-way IIA between two identities, the ability to voluntarily switch between identities). Of the 8 potential participants, 7 were confirmed by interview to meet DID criteria, and these participants completed both sessions of the study. One participant (diagnosed with dissociative disorder not otherwise specified) completed the background interview but did not meet DID criteria. Thus, the results of the 7 participants (6 females) are reported here.

Control participants. Thirty-five control participants with no reported dissociative symptoms were recruited from the community and compensated for their time. Four to 6 control participants were matched to each patient on the basis of age, gender, and education.

Materials

There were three lists of 24 neutral words matched for frequency, valence, and length in the exclusion task. Counterbalancing across participants ensured that each list was presented equally as List A, List B, or distractors. These lists were presented auditorily to a validation sample of 29 nonclinical, nonsimulating pilot participants who were asked to make syllable judgments for each word. To test for evidence of priming, an implicit visual word-identification test was given. Participants were not significantly better at identifying previously heard words than distractors (53% and 49%, respectively; *ns*), suggesting that the cross-modal manipulation effectively reduced implicit priming effects. The exclusion test was piloted on an additional 23 nonclinical, nonsimulating pilot participants to ensure the task was of adequate difficulty.

Several other measures were also given: the Dissociative Experiences Scale (DES; Bernstein & Putnam, 1986), a forced-choice recognition test derived from the Logical Memory Stories as well as the Logical Memory Immediate and Delayed Recall test from the Wechsler Memory Scale—Third Edition (WMS–III; Wechsler,

1997b), and Vocabulary from the Wechsler Adult Intelligence Scale—Third Edition (WAIS–III; Wechsler,1997a).

Procedure

DID participants—Session 1. During the first visit, participants were interviewed by two of the authors (Lauren L. Kong and John J. B. Allen) using the Structured Clinical Interview for *DSM–IV* Dissociative Disorders (Steinberg, 1993), with consensus ratings taken to confirm DID diagnoses. During this visit, patients completed the DES and Vocabulary test.

DID participants—Session 2. Participants chose two identities who would participate in the study—Identity A and Identity B (an identity with reported amnesia for Identity A). Identity A was presented with List A auditorily via computer, being told "This is List A" and asked to decide whether each word was more than one syllable. Participants were to respond "yes" or "no" by pressing keys. Stimulus presentation was self-paced. Subsequently, participants heard Logical Memory stories A and B once, with an immediate recall test following each story. Participants were then asked to switch to Identity B, a process that took 1–30 min, depending on the participant.

After the status of Identity B was confirmed by self-report, amnesia of Identity A's experiences in the lab was verified by verbal inquiry (e.g., Identity B had no knowledge of what had been done since arrival). All participants reported complete amnesia, except for Participant D6 who remembered drinking water and pressing keyboard keys but no other details. Identity B was presented with List B (being told "This is List B") and asked to make the same syllable judgment. Following this task, the Logical Memory Delayed Recall test was administered, during which all participants denied memory for both stories, except for Participant D6 who remembered two items from Story B. Participants also completed a forced-choice recognition test for the Logical Memory stories. Identity B was then given the self-paced exclusion task wherein words from List A and List B and distractors were presented visually. Participants were asked to decide if each word was from List B or not from List B, responding "yes" or "no" by pressing keys. Throughout the session, identity status was confirmed to check for any evidence of rapid switching.

Control participants. Control participants visited the laboratory once and were asked to simulate DID. They were given detailed information about features of the disorder relevant to the study, including the presence of different identity states and the properties of IIA. Once it was established that participants understood the symptoms of the disorder, they spent time creating an imagined identity and were asked to provide several detailed characteristics about this new identity. Participants were instructed to simulate IIA between identities. During pre- and poststudy inquiries, all participants but 1 reported that they understood the instructions and felt that they were able to simulate DID as best they could. The data from that 1 participant were not included in the study, resulting in 34 control participants for analysis. After being given all Session 1 tests with the exception of the Structured Clinical Interview for *DSM–IV* Dissociative Disorders, control participants were asked to assume the role of a DID patient, to complete the Session 2 tests, and to switch identity in the same order as did the patients.

Results

Demographics and Basic Test Performance

Table 1 presents the demographics and scores for the DID participants and the mean demographics and mean scores of their respective control participants for the WAIS–III Vocabulary test, DES, Logical Memory Immediate Recall test, and Logical Memory forced-choice recognition test within a 95% confidence interval. Significant differences are indicated where the patient score exceeds the confidence interval for the control group.

Table 1
Demographics and Neuropsychological Test Scores for Dissociative Identity Disorder (DID) Participants and Control Participants (Ctrl)

Participant	Age	Education	Vocab	DES	LM Recall	LM Recognition
D2	51	16	53	21[d]	23	16[d]
D2 Ctrl[b], *M* (95% CI)	53 (50.2–55.8)	16 (15.6–16.3)	48.40 (43.4–53.4)	9.03 (−0.6–18.7)	25.60 (21.9–29.3)	9 (5.9–12.1)
D3	49[d]	19[d]	54	81[d]	33[d]	6[d]
D3 Ctrl[a], *M* (95% CI)	47 (45.7–48.2)	18 (17.2–18.8)	49.50 (44.4–54.6)	11.91 (7.6–16.2)	16 (8.5–21.6)	13.50 (7.1–20.0)
D4	36	14	34	77[d]	15[d]	12[d]
D4 Ctrl[a], *M* (95% CI)	34 (29.7–38.3)	15 (13.3–16.7)	45.25 (33.3–57.3)	11.94 (5.1–18.8)	28.75 (23.8–33.8)	7.25 (5.8–8.7)
D5	46	14[d]	35[d]	82[d]	8[d]	7[d]
D5 Ctrl[b], *M* (95% CI)	45 (42.3–47.7)	15 (14.3–15.7)	50.60 (44.2–57.0)	10.18 (2.7–17.7)	26.60 (22.5–30.7)	9.80 (7.2–12.4)
D6	54	19	59[d]	71[d]	19[d]	13[d]
D6 Ctrl[c], *M* (95% CI)	54 (51.8–56.2)	18 (16.7–19.3)	53.67 (49.7–57.6)	7.35 (1.9–12.8)	29.17 (27.1–31.3)	8.67 (5.1–11.8)
D7	53	13[d]	32[d]	29[d]	13[d]	15
D7 Ctrl[b], *M* (95% CI)	53 (51.5–54.5)	14 (13.2–14.8)	51.20 (45.2–57.2)	6.28 (2.8–9.8)	24 (20.7–27.3)	12 (7.1–16.9)
D8	36	16	36[d]	34[d]	18[d]	13[d]
D8 Ctrl[b], *M* (95% CI)	36 (34.0–38.0)	16 (15.2–16.8)	27.40 (36.5–56.7)	12.82[a] (7.2–18.5)	27.40 (21.2–33.7)	8.20 (4.1–11.9)
DID totals	46.43	16.21	43.29	56.48[d]	18.4	9.71
Ctrl totals	46.57	16.21	49.56	9.64	25.64	11.71

Note. Age and education are presented in years. Control participants' mean values are within a 95% confidence interval. Vocab = Wechsler Adult Intelligence Scale—Third Edition Vocabulary test; DES = Dissociative Experiences Scale; LM Recall = Wechsler Memory Scale—Third Edition Logical Memory Immediate and Delayed Recall test; LM Recognition = Wechsler Memory Scale—Third Edition Logical Memory forced-choice recognition test.
[a] $n = 4$. [b] $n = 5$. [c] $n = 6$. [d] The value is outside a 95% confidence interval.

Exclusion Memory Performance

Identity B's memory was assessed with a repeated measures analysis of variance with patient status (DID or control participant) as the between-subjects factor and list (List A, List B, or distractors) as the within-subjects factor. The number of "yes" responses was the dependent measure, indicating that the participants believed that the word came from List B. A "yes" response to List B words was a correct answer, whereas "yes" to List A or to distractors was incorrect. Multivariate tests of significance were used for repeated measures factors to avoid problems with the violation of the sphericity assumption. Effect sizes for multivariate tests are equivalent to 1-Wilks's lambda, and eta squared estimates of effect size are presented for univariate follow-up tests or simple between-group comparisons. Figure 1 reveals the significant main effect of list, Wilks's $\lambda = 0.27$, $F(2, 38) = 51.0$, $p < .001$. Contrast coded comparisons revealed that both groups were more likely to respond "yes" to previously learned lists than to the unlearned list as was indicated by more "yes" responses to List A words, $F(1, 39) = 92.1$, $p < .001$, $\eta^2 = .70$, and to List B words, $F(1, 39) = 92.6$, $p < .001$, $\eta^2 = .70$, than to distractors. No significant difference was found between List A and List B words, $F(1, 39) = 3.29$, $p < .10$, $\eta^2 = .08$. Although DID participants revealed a trend to less frequently endorse any item as recognized—main effect of group, $F(1, 39) = 2.9$, $p < .10$, $\eta^2 = .07$—there was no hint of an interaction of list by group, Wilks's $\lambda = 1.0$, $F(2, 38) = .009$, $p > .99$, indicating that the DID participants and control participants did not differ in their pattern of responses across lists. Figure 2 illustrates the consistency of the effect, showing exclusion results for each DID participant and his or her respective control participants. As shown by Figure 2, it was difficult for each and every DID participant to exclude List A words that were learned by Identity A when trying to identify List B words learned by Identity B.

Assessment of Possible Malingering

The Logical Memory forced-choice recognition test is a 24-item two-alternative forced-choice test that was given to Identity B to identify evidence of cross-modal implicit memory transfer or systematic avoidance (i.e., performance below chance). None of the DID participants performed significantly above chance, indicating no evidence of implicit transfer. Two DID participants (D3 and D5) performed significantly below chance as calculated by a binomial probability distribution ($p < .008$ and $p < .02$). Twelve control participants performed significantly below chance, and 3 scored significantly above chance.

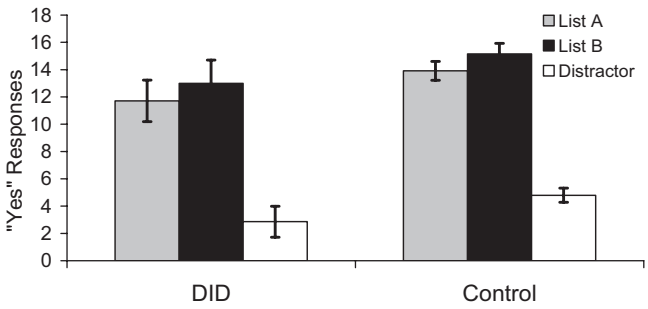

Figure 1. Mean number of "yes" responses given by Identity B in the exclusion task for List A, List B, and distractor words are presented. For dissociative (DID) participants ($n = 7$) and control participants ($n = 34$), List A and List B items were acknowledged significantly more often than distractor items, but the number of "yes" responses did not differ between List A and List B, indicating that Identity B had difficulty excluding words from List A when trying to identify words from List B.

Discussion

Both simulating control participants and DID participants claimed to have no subjective memory for previous events after switching to their amnesic identity, yet both groups demonstrated evidence of memory transfer on the cross-modal exclusion task, a task that makes implicit memory transfer unlikely. As expected, control participants had difficulty with this task, as explicit memory for List A led to difficulty in discriminating between the two lists. Moreover, the exclusion test raw scores of the simulating control group were almost identical to that of the nonsimulating pilot group.

In DID patients, IIA, if present, should have produced an equal ability to reject both List A and distractor words. DID participants were aptly able to reject distractor words but not List A words. The subjective experiences of amnesia reported by the DID group were not objectively substantiated by their memory performance on the exclusion task. These findings suggest that amnesic barriers between identities may not be as impermeable as subjectively perceived by patients. These results are consistent with key aspects of the sociocognitive perspective, namely the tenet that identities may not be distinct entities with separable memories but rather may function as heuristics that guide cognitive processes. These findings do not address the role of trauma in the etiology of DID and are thus neutral with respect to whether trauma can produce DID. They do however fail to support the prediction of the posttraumatic perspective of memory compartmentalization across identities.

Neuropsychological Tests

On the Logical Memory forced-choice recognition test, Identity B responses of 35% of control participants and 28% of DID participants were consistent with systematic avoidance of stimuli from the stories encountered by Identity A. This suggests that some identities, despite denying knowledge of the stories, had memory that they were unwilling to acknowledge. Several patients scored outside the 95% confidence interval of their respective control group on the Logical Memory Immediate and Delayed Recall test, suggesting sub par intraidentity memory.

DES scores of the DID participants were bimodally distributed, with four scores in the 71–82 range and three scores in the 21–34 range. The DES is intended as a screening instrument rather than a diagnostic tool (Carlson & Putnam, 1993), and there is no reason to suspect that the lower DES group differed diagnostically from the higher DES group. There were no qualitative differences in performance on any of the neuropsychological tasks and, most important, there were no response differences between the high- and the low-DES groups on the exclusion task, as all patients showed the same pattern. It is interesting that the 3 patients with the lowest DES scores had been diagnosed with DID for the longest length of time. It is possible that living with DID over time

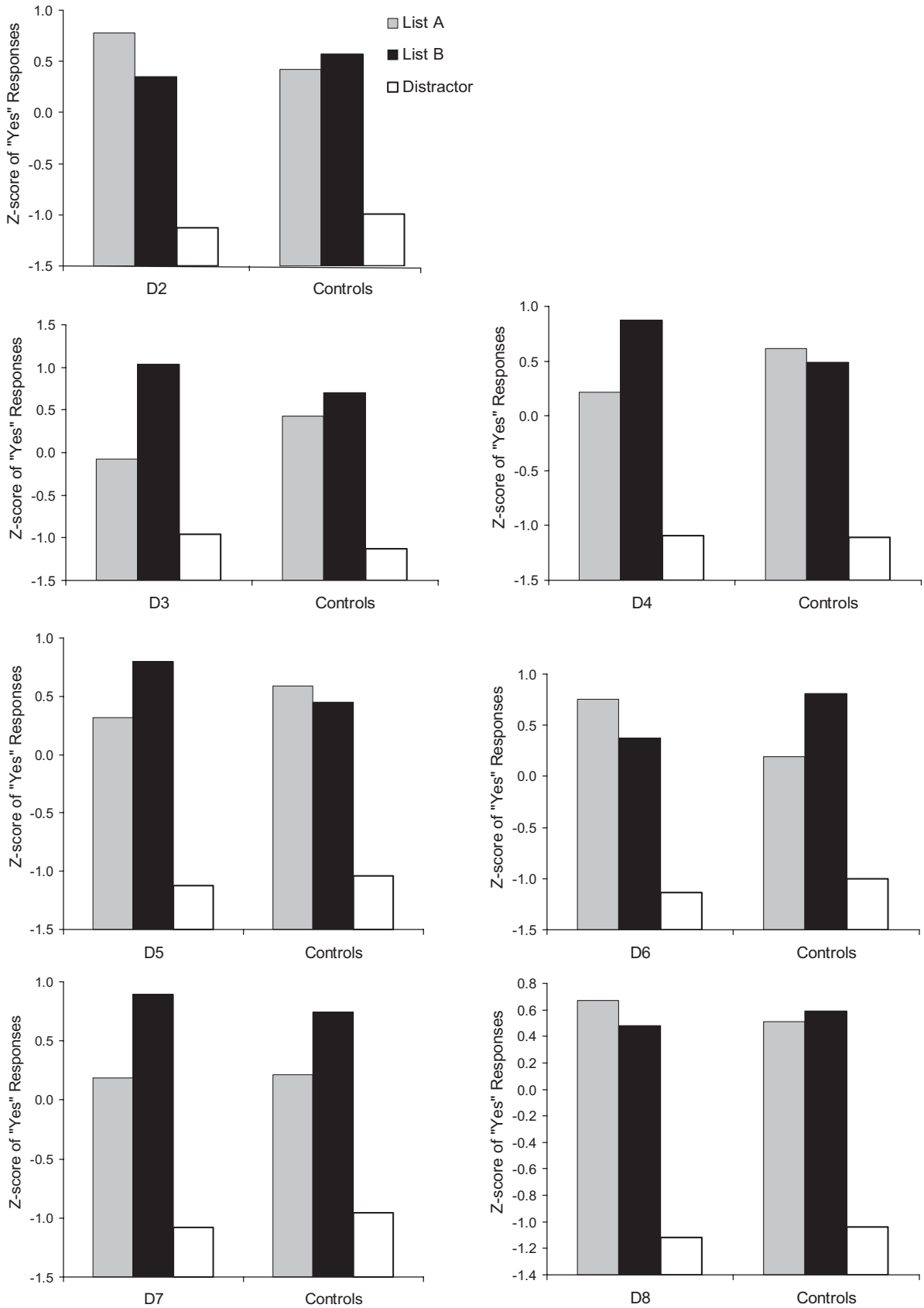

Figure 2. Individual exclusion results for each dissociative identity disorder (DID) participant and matched control participants are presented. Scores are within-subject *z*-transformed across the three lists in order to remove the overall trend for DID patients to say "yes" less often. Each list's *z* score is the number of "yes" responses for that list minus the mean across all three lists, divided by the *SD* of the three lists, conducted individually for each participant, with larger *z* scores reflecting more "yes" responses.

resulted in greater adjustment and acceptance of symptoms as a part of daily life, leading to lower DES scores.

Caveats and Conclusions

Although amnesia was found on certain tasks (e.g., story recall), a more objective memory test showed evidence of memory transfer. These findings of interidentity memory transfer may not necessarily apply to all DID participants; a larger sample would increase the generalizability of these findings. In addition, DID may be a heterogeneous phenotype, with some cases of DID characterized by complete IIA interspersed amongst other cases that show memory transfer (e.g., due to integration work in therapy) and cases that are the result of misdiagnosis, malingering, or iatrogenic reasons (Coons & Milstein, 1994; Draijer & Boon, 1999). Moreover, the present study tested only one possible pairing of identities within the patients in this study, allowing for the possibility that other identities may have demonstrated better compartmentalization. The posttraumatic perspective might predict that amnesic barriers would be more distinct in identities responsible for dealing with traumatic memories (cf. Nijenhuis & Den Boer, 2007). Psychobiological differences when processing traumatic memories have been found between trauma-related identities and neutral/trauma-avoidant identities (Hermans, Nijenhuis, van Honk, Huntjens, & van der Hart, 2006; Reinders et al., 2003), suggesting that these identity types may also differ in their level of memory compartmentalization. Similarly, it might be predicted that trauma-related stimuli may lend themselves more to compartmentalization between identities than neutral stimuli (although many researchers have found amnesia using neutral stimuli). The DID patients in the present study, however, reported subjective IIA with the limited identity-pairings and the neutral stimuli used, which nevertheless illustrates explicit memory transfer despite reported amnesia.

There were no significant differences in the pattern of exclusion performance between DID participants and simulating control participants, although similarity in responding does not necessarily indicate similarity in causal mechanisms. DID participants may not be intentionally feigning amnesia in the same way control participants do, but may instead suffer from metamemory problems in that they are convinced that they truly do not have memory for the experiences of another identity (as suggested by Huntjens et al., 2006). Thus, these findings of explicit memory transfer do not of necessity suggest intentional malingering by all of the DID participants.

The results of the present study suggest that in a sample of patients meeting *DSM–IV–TR* criteria for DID, subjective reports of IIA are not necessarily confirmed by objective memory assessments. Nissen et al. (1988) have suggested that implicit memory tests are a necessary but not sufficient condition for demonstrating interidentity memory transfer. The present study illustrates, however, that implicit tests are not necessary to demonstrate interidentity memory transfer, and explicit memory tests that are designed to be objective and difficult to simulate can reveal memory transfer between subjectively amnesic identities.

References

Allen, J., & Movius, H. (2000). The objective assessment of amnesia in dissociative identity disorder using event-related potentials. *International Journal of Psychophysiology, 38,* 21–41.

American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.

Bernstein, E. M., & Putnam, F. W. (1986). Development, reliability, and validity of the dissociation scale. *Journal of Nervous & Mental Disease, 174,* 727–734.

Blum, D., & Yonelinas, A. (2001). Transfer across modality in perceptual implicit memory. *Psychonomic Bulletin & Review, 8,* 147–154.

Carlesimo, G., Marfia, G., Loasses, A., & Caltagirone, C. (1996). Perceptual and conceptual components in implicit and explicit stem completion. *Neuropsychologia, 34,* 785–792.

Carlson, E., & Putnam, F. (1993). An update on the Dissociative Experiences Scale. *Dissociation: Progress in the Dissociative Disorders, 6,* 16–27.

Coons, P., & Milstein, V. (1994). Factitious or malingered multiple personality disorder: Eleven cases. *Dissociation: Progress in the Dissociative Disorders, 7,* 81–85.

Draijer, N., & Boon, S. (1999). The imitation of dissociative identity disorder: Patients at risk, therapists at risk. *The Journal of Psychiatry & Law, 27,* 423–458.

Eich, E., Macaulay, D., Loewenstein, R., & Dihle, P. (1997). Memory, amnesia, and dissociative identity disorder. *Psychological Science, 8,* 417–422.

Elzinga, B., Phaf, R., Ardon, A., & Van Dyck, R. (2003). Directed forgetting between, but not within, dissociative personality states. *Journal of Abnormal Psychology, 112,* 237–243.

Graf, P., & Schacter, D. (1985). Implicit and explicit memory for new associations in normal and amnesic subjects. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 11,* 501–518.

Hermans, E., Nijenhuis, E., van Honk, J., Huntjens, R., & van der Hart, O. (2006). Identity state-dependent attentional bias for facial threat in dissociative identity disorder. *Psychiatric Research, 141,* 233–236.

Hicks, J., & Starns, J. (2005). False memories lack perceptual detail: Evidence from implicit word-stem completion and perceptual identification tests. *Journal of Memory and Language, 52,* 309–321.

Huntjens, R., Peters, M., Woertman, L., Bovenschen, L., Martin, R., & Postma, A. (2006). Inter-identity amnesia in dissociative identity disorder: A simulated memory impairment? *Psychological Medicine, 36,* 857–863.

Huntjens, R., Peters, M., Woertman, L., van der Hart, O., & Postma, A. (2007). Memory transfer for emotionally valenced words between identities in dissociative identity disorder. *Behaviour Research and Therapy, 45,* 775–789.

Huntjens, R., Postma, A., Hamaker, E., Woertman, L., van der Hart, O., & Peters, M. (2002). Perceptual and conceptual priming in patients with dissociative identity disorder. *Memory & Cognition, 30,* 1033–1043.

Huntjens, R., Postma, A., Peters, M., Woertman, L., & van der Hart, O. (2003). Interidentity amnesia for neutral, episodic information in dissociative identity disorder. *Journal of Abnormal Psychology, 112,* 290–297.

Huntjens, R., Postma, A., Woertman, L., van der Hart, O., & Peters, M. (2005). Procedural memory in dissociative identity disorder: When can interidentity amnesia be truly established? *Consciousness and Cognition: An International Journal, 14,* 377–389.

Köhler, S., & Moscovitch, M. (1997). Unconscious visual processing in neuropsychological syndromes: A survey of the literature and evaluation of models of consciousness. In M. Rugg (Ed.), *Cognitive neuroscience* (pp. 305–373). Cambridge, MA: The MIT Press.

Ludwig, A., Brandsma, J., Wilbur, C., Bendfeldt, F., & Jameson, D. (1972). The objective study of a multiple personality: Or, are four heads better than one? *Archives of General Psychiatry, 26,* 298–310.

Merckelbach, H., Devilly, G., & Rassin, R. (2002). Alters in dissociative identity disorder metaphors or genuine identities? *Clinical Psychology Review, 22,* 481–498.

Nijenhuis, E., & Den Boer, J. (2007). Psychobiology of traumatization and

trauma-related structural dissociation of the personality. In E. Vermetten, M. Dorahy, & D. Spiegel (Eds.), *Traumatic dissociation: Neurobiology and treatment* (pp. 219–236). Washington, DC: American Psychiatric Publishing.

Nissen, M., Ross, J., Willingham, D., Mackenzie, T., & Schacter, D. (1988). Memory and awareness in a patient with multiple personality disorder. *Brain and Cognition, 8,* 117–134.

Peters, M., Uyterlinde, S., Consemulder, J., & van der Hart, O. (1998). Apparent amnesia on experimental memory tests in dissociative identity disorder: An exploratory study. *Consciousness and Cognition, 7,* 27–41.

Putnam, F., Zahn, T., & Post, R. (1990). Differential autonomic nervous system activity in multiple personality disorder. *Physical Review, 31,* 251–260.

Rajaram, S., & Roediger, H. (1993). Direct comparison of four implicit memory tests. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 19,* 765–776.

Reinders, A., Nijenhuis, E., Paans, A., Korf, J., Willemsen, A., & den Boer, J. (2003). One brain, two selves. *NeuroImage, 20,* 2119–2125.

Silberman, E., Putnam, F., Weingartner, H., Braun, B., & Post, R. (1985). Dissociative states in multiple personality disorder: A quantitative study. *Psychiatric Research, 15,* 253–260.

Spanos, N. (1994). Multiple identity enactments and multiple personality disorder: A sociocognitive perspective. *Psychological Bulletin, 120,* 42–59.

Steinberg, M. (1993). *Structured clinical interview for DSM–IV dissociative disorders (SCID-D).* Washington, DC: American Psychiatric Association.

Vermetten, E., Schmahl, C., Lindner, S., Loewenstein, R., & Bremner, J. (2006). Hippocampal and amygdalar volumes in dissociative identity disorder. *American Journal of Psychiatry, 163,* 630–636.

Wechsler, D. (1997a). *Wechsler Adult Intelligence Scale—Third Edition*. San Antonio, TX: Psychological Corporation.

Wechsler, D. (1997b). *Wechsler Memory Scale—Third Edition*. San Antonio, TX: Psychological Corporation.

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