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Self–Nonself-Segregation and Reality Monitoring

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Differentiated, field independent individuals are presumably better able to separate the self from the nonself than less differentiated, field dependent individuals (Witkin, Goodenough, & Oltman, 1979). This should have important implications for *reality monitoring* (Johnson & Raye, 1981): the process of determining whether a memory originated in thought processes (internal) or in perception (external). In Experiment 1, field dependent and independent subjects were asked to discriminate between internal and external sources of memories. Field independent subjects were more accurate at identifying the origin of their memories (they made fewer reality monitoring confusions) than were field dependent subjects. When subjects were asked to discriminate between two external sources of memories (Experiment 2) or between two internal sources of memories (Experiment 3), field independent subjects did not show the source discrimination advantage. Recognition memory also varied across experiments with field independent subjects showing an advantage in some (Experiments 1 & 2) but not all (Experiment 3) cases. The results are discussed in terms of an overreliance by field dependent subjects on the sensory, semantic, and contextual detail characteristic of externally derived memories; and, a lesser awareness by these subjects of their own cognitive operations.

Recent work in personality psychology has begun to attract the attention of cognitive psychologists. This is due, in part, to the growing realization that ideographic approaches can contribute much to a more complete understanding of the ways people encode, store, elaborate, and retrieve information. The work of Witkin, Goodenough, and colleagues on psychological differentiation (Witkin, Dyk, Faterson, Goodenough, & Karp, 1962; Witkin & Goodenough, 1981; Witkin, Goodenough, & Oltman, 1979) holds particular promise.

According to Witkin et al. (1979), the tendency to function in a differentiated or less differentiated fashion is manifest in all of one's psychological and physiological activities. Less differentiated individuals are said to approach the world in a global, *field dependent* (FD) manner; more differentiated individuals approach the world in an analytical, *field independent* (FI) manner. One important facet of differentiation is self–nonself-segregation. Self and nonself are more clearly segregated for FI individuals, and FI individuals rely more heavily on internally generated information than do FD individuals. On the other hand, FD individuals do not clearly segregate self and nonself and rely more heavily on externally supplied information. The differences in cognitive restructuring and social competence associated with FI and FD individuals are seen as derivatives of self–nonself-segregation.

The differences in self–nonself-segregation suggested by differentiation theory have important consequences for memory. Several of the implications of field dependence–independence have already received attention in the literature (e.g., Davis & Frank, 1979; Goodenough, 1976). However, a direct investigation of how individuals differ in their ability to separate the information in memory supplied by an external stimulus (nonself) from the information in memory supplied by the individual (self) has not been reported. This ability or tendency is particularly important because most current theories of

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memory contend that memories comprise joint contributions of the environment (nonself) and the individual (self). Stimuli are processed and elaborated by the comprehender, and the resulting memory comprises information supplied by the external event and self-generated information. Distinguishing memories derived from internal events from those derived from external events is called *reality monitoring* (Johnson & Raye, 1981).

Although people are usually quite accurate at determining the origin of their memories, they will sometimes confuse the origin of a memory. Individuals will claim that a memory originating in an external stimulus was created internally or that memory for an internally generated thought or imagination was due to an external event. A considerable amount of recent empirical evidence suggests that reality monitoring errors can take several forms. The frequency with which one thinks about an object increases the estimate of how often that object was actually presented (e.g., Johnson, Raye, Wang, & Taylor, 1979). Information only imagined may later be reported as having been heard or read (e.g., Raye, Johnson, & Taylor, 1980). Information merely heard or read may later be reported as having been generated (e.g., Raye & Johnson, 1980). We all make these reality monitoring errors. A number of everyday examples of reality monitoring failures have been confirmed empirically. For example, we confuse what we said in a conversation with what another said (Raye & Johnson, 1980); and we can even confuse covertly generated words with words overtly generated by another (Johnson, Raye, & Durso, 1980).

Investigations of individual differences in reality monitoring have focused on its development. Surprisingly, children perform as well (or as poorly) as do adults at discriminating memories of external and internal events (Foley, Johnson, & Raye, 1983; Johnson, Raye, Hasher, & Chromiak, 1979). Although this result suggests that reality monitoring abilities develop rapidly and that individual differences may be difficult to find, it does not rule out the possibility that adults will differ in their ability to identify the origin of their memories. Differentiation theory supplies a theoretical viewpoint from which one would expect to find individual differences in reality monitoring.

According to differentiation theory, FD individuals should be more likely to confuse the origins of memories than FI individuals. This disadvantage for FD people should, however, only occur when discriminating internal and external events (self–nonself). Other discriminations, such as discriminating between two external sources (nonself–nonself) or two internal sources (self–self), should not be a function of self–nonself-segregation. The primary purpose of the current experiments is to test the prediction that field dependent people are poorer reality monitors.

Most researchers investigating FI–FD effects in memory have used recall procedures to test memory. This choice of retrieval environment follows quite naturally from the notion that FI and FD individuals differ in their ability or tendency to reorganize the input material. However, it may also be the case that FI and FD individuals differ in their ability to determine whether or not a piece of information retrieved from memory during search is one that is to be reported.

One way to minimize the role of memory search processes in order to focus on discrimination processes is to use a recognition memory test. In recognition, search and organization are reduced relative to a recall procedure because the item is presented to the subject during testing. The subject then, presumably, simply decides if the item was one presented earlier (Anderson, 1976). If the differences observed in recall are due solely to differences in reorganization and search, then we may not observe any differences in recognition memory. The few studies of FI–FD in recognition memory (Bennink & Spoelstra, 1979; Nahinsky, Morgan, & Oeschger, 1979), however, have reported better recognition memory by FI persons. Thus, a secondary purpose of the current studies is to add to this literature on recognition memory and to investigate the generalizability of the apparent FI superiority in memory.

Experiment 1

The first experiment was designed to examine the ability of FI and FD subjects to identify the source of internally and externally generated memories. Highly stereotypical sentences were read to subjects by an actor on videotape. Half of the sentences were complete and half of the sentences required subjects to generate a one-word completion to the sentence frame. Subjects were then given a list of single words some of which had been heard on the videotape, some of which had been generated by the subject, and some distractor items that were new to the experiment. Subjects responded "heard," "thought," or "new" to each word. It was expected that FI subjects would have better recognition memory for the items presented or generated during the first part of the experiment. Further, of those items remembered, it was expected that FI subjects would be better able to identify the origins of their memories.

Method

Subjects. Subjects were 48 undergraduate females at the University of Oklahoma who participated in partial fulfillment of a research familiarization requirement for an introductory psychology course.

Materials. A pool of 100 sentences in which the terminal word was highly predictable from the sentential context was created (e.g., Frozen water is called ice; For breakfast I had scrambled eggs). The terminal word of each sentence was omitted and the sentences were presented to 150 judges from the same pool as our subjects. The judges completed the sentence frames by supplying a last word. Forty sentences with 100% completion agreement were chosen as the materials to be used in the experiment.

Two sentence presentation lists were prepared. For List *a*, half the sentences were selected at random to have the last word omitted; the remaining half were complete. List *b* was identical to List *a* except that the sentences complete in list *a* were incomplete in List *b*, and the sentences incomplete in list a were complete in List *b*. In this way, materials were counterbalanced over conditions such that each sentence appeared as complete and as incomplete for an equal number of subjects by the end of the experiment.

The sentences were randomly ordered in both lists with the restriction that internal and external items occur equally frequently throughout the lists. Ten additional buffer sentences (half complete, half incomplete) were added to the initial and terminal serial positions of both lists to reduce the effects of primacy and recency. A female actor was videotaped while reading the sentences. Sentences were read in a monotone voice at a 7 s rate. Field dependence–field independence was assessed using the Group Embedded Figures Tests (GEFT; Witkin, Oltman, Raskin, & Karp, 1971).

Procedure. Subjects were tested in groups of 5 to 10. They were seated in front of a video monitor and were told that they would be presented with a series of sentences, some of which would be missing the final word. The example, "Humpty Dumpty sat on a ______," was used. Subjects were asked to rate the trueness of the sentence; if the final word was omitted they were to complete the sentence by thinking the word to themselves before rating its trueness. The trueness rating was on a Likert-format scale and served as a cover task to ensure attention to the sentences and to the generation of the missing words. (As the results will indicate, recognition of the generated words tended to be superior to the presented words, suggesting that subjects were attending to the task and were generating the missing words.) No mention was made of the recognition memory test that was to follow.

Subjects were then given the GEFT. In addition to providing an index of FD–FI, the GEFT served as a convenient retention interval distractor task.

Following completion of the GEFT, subjects were presented with a list of 60 words. Included in this list were the 20 words that ended the complete sentences (external), 20 words that were generated by the subject to complete the sentence frames (internal), and 20 words that did not appear anywhere in the acquisition sentences and that were inappropriate responses to the sentence frames (foils). Assignment of words to serial position was random. Subjects were asked to identify the source of each word as either new, as one they heard on the tape, or as one they thought (i.e., generated) in completing a sentence. Thus, subjects responded "thought," "heard," or "new" to internal, external, and foil words.

Finally, as a manipulation check, subjects were given a list of all sentences in their incomplete form and were asked to complete the sentences by writing an appropriate word in the blank.

Results and Discussion

The GEFT was scored for each subject. The upper third of the distribution (FI) and the lower third of the distribution (FD) were retained for the analyses. The mean GEFT score for FD subjects was 6.7; the mean GEFT score for FI subjects was 15.9. No FD score was greater than 9 and no FI score was lower than 14.

In the postexperiment manipulation check, subjects always supplied the expected word for our sentence frames; thus, no items were excluded from the analyses. The frequency of each type of response, "thought," "heard," or "new," for each type of stimulus, internal, external, and foil, was computed for each subject. Differences between these raw frequencies for FI and FD individuals reflect differences in both response criteria and in sensitivity (Healy & Kubovy, 1978; Swets, Tanner, & Birdsall, 1961). In order to eliminate differences in response biases between FI and FD individuals, signal detection analysis was employed (Green & Swets, 1974).

Signal detection analysis involves the comparison of two distributions. One distribution is usually referred to as a noise distribution and the other as a signal distribution. The distance between the mean of the signal distribution and the mean of the noise distribution in standard deviation units is d′. The larger the value of d′, the more distant are the two distributions, and the easier it is for a person to discriminate between a signal and noise. This is a measure of true discrimination uncontaminated by response bias.

For the recognition memory analyses, the noise distribution corresponds to the new items in the recognition test. There are two signal distributions, one for each source of the old items (i.e., internal and external). In these cases, d′ is a measure of recognition sensitivity. The larger the d′, the easier it is to discriminate a target from a foil.

For the origin confusions analyses, the distribution of remembered external items was compared with the distribution of remembered internal items. In this case, d′ was a measure of how likely subjects were to identify correctly the origin of their memories. The larger the value of d′ in this case, the better able subjects were to discriminate internal memories from external memories.

Recognition memory. A response of "thought" or "heard" was taken as an indication that the item had been recognized as old. Frequencies of old responses to internal items, old responses to external items, and the number of false alarms (i.e., thought plus heard responses to foils) were computed. Measures of sensitivity for recognition memory, d'_{mem}, were computed for both internal and external items for FI and FD individuals. A z score of 3.9 was used in the calculation of d′ if a subject made no false alarms. Mean d'_{mem} values appear in Table 1. A 2 × 2 (Style [FI,FD] × Source [Internal,External]) mixed model analysis of variance (ANOVA) was applied to the d'_{mem} values. All tests were at an alpha level of .05.

FI individuals showed better recognition memory than did FD individuals, $F(1, 30) = 9.66$, $MS_e = 1.56$. Whereas internal events tended to be recognized better than external ones, in agreement with previous work (e.g., Slamecka & Graf, 1978), the tendency did not reach significance in this study; there was no interaction of style and source, suggesting that the superior memory for FI individuals was obtained for items the subjects thought as well as for items the subjects heard. The finding of superior memory for FI individuals is consistent with a number of other findings in the literature (e.g., Davis & Frank, 1979; Goodenough, 1976). The current results extend this pattern from recall to long-term recognition memory (cf., Bennik & Spoelstra, 1979; Nahinsky et al., 1979) and suggest that the superiority is unaffected by whether the memory was internally or externally generated.

Origin confusions. To obtain a measure of subjects' tendency to confuse the origins of their memories, we considered only those items remembered as old, assuming that in order for an origin confusion to occur the item must be remembered. As a result, the ability to identify the origin of the memory is uncontaminated by any differences in recognition memory between FI and FD individuals. We then computed a d'_{conf} (i.e., d′ confusions) score as a measure of the separation of the distributions of remembered external items and remembered internal items for each subject. We defined a hit in this instance as correctly responding "thought" to an internal item; a false alarm was then a response of "thought" to an external item. (Defining a hit as a response of "heard" to an external item and false alarm as "heard" to an internal item would, of course, yield the same estimates of underlying sensitivity.) In either case, a d'_{conf} of 0, for example, indicates maximal confusion (or zero reality monitoring) because the distribution of internal memories completely overlaps the distribution of external memories.

Both groups of individuals produced a number of confusions, providing support for the generality of previous research reporting reality monitoring errors (e.g., Johnson & Raye, 1981). Mean d'_{conf} scores for FI and FD individuals appear in Table 1. The d'_{conf} score for FI individuals was reliably greater than for FD individuals, $F(1, 30) = 6.29$, $MS_e = .780$. FD individuals were more likely to report having heard an item they generated or to report having thought an item they heard, than were FI subjects.

These results are quite consistent with the predictions derived from differentiation theory. FI individuals' tendency to segregate self and nonself is reflected in their ability to discriminate internal and external memories.

Table 1
d' Values for Internal and External Events as a Function of Level of Differentiation

Style	Recognition memory: Thought	Heard	*M*	Confusions
FD	.94	.54	.74	.71
FI	1.85	1.57	1.71	1.40
M	1.40	1.06	—	—

That FD individuals are less likely to differentiate these sources is shown directly in the lower d'_{conf} scores (higher confusions) for reality monitoring.

However, it may be the case that FD individuals are less able to discriminate any two memories, regardless of whether one was internally generated and the other externally generated. The differences observed here may not be due to self–nonself-segregation differences, but to a more general ability to discriminate any two memories. Two additional experiments were conducted to evaluate this alternative possibility. In Experiment 2, subjects were required to discriminate between two external sources of memories, and Experiment 3 required subjects to discriminate between two internally generated memories. In these experiments, we were also interested in whether the recognition memory advantage exhibited by FI individuals would be observed in all cases.

Experiment 2

Method

Subjects. Subjects were 48 female undergraduates from the same pool as Experiment 1. Again, only the 32 subjects in the upper and lower tertiles were ultimately used in the analyses.

Materials. Only completed versions of the sentences from Experiment 1 were used in this study. Two female actors on videotape read the sentences. The actors had a close physical resemblance, dressed similarly, and attempted to behave similarly while reading the sentences. The actors read the sentences in the order they had occurred in Experiment 1. One actor read the sentences that were complete in Experiment 1, and one actor read the completed versions of the sentences that were incomplete in Experiment 1. As in the first experiment, 2 tapes were made in order to counterbalance actor and materials.

During the test phase, subjects were asked to identify the source of each word as being uttered by one actor, the other actor, or neither (i.e., new). Except for these changes, the methodology was identical to Experiment 1.

Results and Discussion

The FI subjects had a mean GEFT score of 16.3 compared with a mean of 4.8 for the FD subjects. No FD score was greater than 9 and no FI score was lower than 14. The manipulation check again resulted in no exclusions.

Recognition memory. Analyses similar to those of Experiment 1 were performed on the d'_{mem} scores. Results appear in Table 2. FI individuals again showed superior recognition memory compared to FD individuals, $F(1, 30) = 4.52$, $MS_e = 2.70$. Memory was unaffected by the speaker and no interaction was observed. Thus, our speakers were equally well-remembered, as would be hoped, and the FI advantage in memory was present with both speakers.

Origin confusions. Confusions were also treated as in Experiment 1. Again d'_{conf} near 0 indicates a greater tendency to confuse the

Table 2
d' Values for Two External Sources as a Function of Level of Differentiation

Style	Recognition memory: Speaker A	Speaker B	*M*	Confusions
FD	1.18	.69	.94	.18
FI	1.46	1.52	1.49	.28
M	1.32	1.11	—	—

source of the memory. Mean d'_{conf} scores also appear in Table 2. Note that both FI and FD subjects had low sensitivity scores, indicating they had a difficult time identifying the source of the memory. However, as the data and analysis indicate, confusions were not affected by style, $F < 1$: FI individuals did not show the superior discrimination that they showed when memories came from internal and external sources. Thus, the advantage shown by FI individuals in Experiment 1 is not mirrored in an advantage in discriminating one external memory from other external memories.

Experiment 3

In this experiment we asked subjects to discriminate between two internally generated memories. They generated completions to all of the sentence frames; for half of the frames they were also asked to write down the answer they generated. Despite the fact that for half of the items, the task yielded an external product, the source of this information originated within the subject; other results have shown that whether or not subjects overtly produce what they generate is relatively unimportant compared with whether the information was generated or simply perceived (Johnson, Raye, Foley, & Foley, 1981).

Method

Subjects. Subjects were 48 female undergraduates from the same pool as the previous experiments. The 32 extreme scores on the GEFT were again retained for the analyses.

Materials. The sentences from Experiment 1 were used as stimulus materials. However, in this instance, all the final words of the sentences were omitted. One female actor was videotaped reading the sentence frames. In this experiment subjects were instructed to generate the completion for each sentence prior to judging its trueness. On half of the sentences, the Likert scales on the response sheet were preceded by a blank line; the other half were not. Subjects were told to write the word on the reponse sheet if a blank was provided and to generate the word covertly otherwise. Creation of two response sheets in this experiment was analogous to the creation of two videotapes in previous experiments and again allowed us to counterbalance assignment of words to the written and thought conditions. During the test of incidental memory, subjects were asked to decide whether each word was one they wrote, one they only thought, or one that was new. Except for these changes, the methodology was identical to the previous experiments.

Results and Discussion

The FI subjects had a mean GEFT score of 15.2 compared to a mean of 5.8 for the FD subjects. No FD score was greater than 9 and no FI score was lower than 13. The manipulation check again resulted in no exclusions.

Recognition memory. Analyses were again similar to Experiment 1. Mean d'_{mem} scores appear in Table 3. Written items were recognized more often than items only thought, $F(1, 30) = 20.76$, $MS_e = .237$. More interestingly, the memory advantage found for FI individuals in the previous experiments did not materialize in this experiment, either as a main effect or an interaction with source.

Origin confusions. Confusions were also treated as before. Mean d'_{conf} scores appear in Table 3. The analysis showed no evidence that FI individuals made fewer origin confusions than FD individuals, as they had in Experiment 1 ($F < 1$). If anything, FD individuals were better at discriminating two internally generated memories than FI individuals. This result, together with the similar finding of Experiment 2, suggests that FI individuals are not generally superior to FD individuals in their ability to discriminate the sources of memories. Only if one memory comes from an external source and one comes from an internal source do FI individuals show better discrimination.

General Conclusions

The primary finding of the current studies was that the ability to discriminate internal and external sources of memory is a function of field dependence-field independence. Field independent subjects are better able to discriminate internally (self) generated memories from externally (nonself) generated memories; because field independent individuals were no better than field dependent individuals at discriminating two external sources or two internal sources, this advantage cannot be attributed to superior discrimination abilities in general. Thus, field independent individuals show superior performance in a reality monitoring task but not in other memory discrimination tasks.

The reality monitoring model developed by Johnson and Raye contains several com-

Table 3
d′ Values for Two Internal Sources as a Function of Level of Differentiation

	Recognition memory			
Style	Thought	Written	*M*	Confusions
FD	1.75	2.16	1.96	2.22
FI	1.89	2.60	2.25	1.53
M	1.82	2.38	—	—

ponents that suggest that FD–FI dimension should account for individual differences in reality monitoring. Johnson and Raye (1981) contend that internally generated memories *typically* differ from externally derived memories along four particular dimensions: Memories originating in external sources are assumed to (a) have more spatial and temporal contextual attributes; (b) they tend to have more sensory detail; (c) they are assumed to be semantically detailed relative to the tendency for internally generated thought to be more schematic; and (d) external events are processed more automatically and tend to be characterized by fewer cognitive operations (e.g., search, imagery, decision processes) coded in the trace; memories generated from internal processes of thought and imagination typically have more information about the cognitive operations used to create the memory.

Johnson and Raye (1981) argue that subjects are able to use these differences between the classes of memories to distinguish internally generated and externally generated memories. Errors occur for a particular individual when a memory exists that is atypical of its class along these dimensions. Some information in the memory is suggestive of an external event while other information in the memory is suggestive of an internal event. The reality monitoring model and differentiation theory, considered jointly, suggest two possible loci for the individual differences reported in this article.

The first locus centers on differences between field dependent and independent persons in their weighting of the four dimensions. Field dependent individuals may be poorer at identifying the origin of internal and external memories because they rely on fewer dimensions than do field independent persons. Differentiation theory would lead us to expect that field dependent persons would weight the three dimensions characteristic of external events heavily while supplying almost no weight to the cognitive operations dimension (i.e., ignoring this information). Thus, the memories of field dependent and field independent individuals do not differ, but rather the field dependent individuals do not make use of all the information in the memory trace when deciding the origin of the memory.

The second locus of the difference between field dependent and independent persons may be in the memory traces themselves. It is possible that the memory trace of an internal event may be more similar to the memory trace of an external event for field dependent subjects, and therefore any discrimination between internal and external traces would be more difficult for these individuals than for field independent persons. Even though field dependent persons consider all the information in the memory trace, the information present is not as useful.

Either of these hypotheses can explain the origin confusions data reported in this article. In Experiment 1, the reality monitoring discrimination, field dependent subjects may not have used, or may not have had information in the memory traces allowing them to identify the origin of the memory. In Experiment 2, the amounts of cognitive operations, sensory detail, contextual detail, and semantic detail in the two memory traces should not have been useful in identifying which speaker uttered the target word. In line with this, neither group of subjects performed very well on this discrimination task. However, this poor performance does not distinguish between the two possible loci; because none of the four dimensions was useful in discriminating between two external sources, we cannot determine whether field dependent subjects tended to ignore some of the dimensions, or whether that information was considered, but not useful.

Finally, in Experiment 3, because both sources were internal, the amount of cognitive operations information in the traces could not be a useful cue to the origin of the memory. To make the discrimination, subjects had to rely on other information, particularly sensory detail, in order to make the discrimination. The fact that field dependent subjects tended to perform somewhat better than field independent subjects is consistent with the notion that they can use information characteristic of external events more effectively. However, because the cognitive operations information was of little use in this task, we cannot be certain whether field dependent subjects did not use this information, or whether it was not registered in their memory traces.

Thus, the origin confusions data do not allow one to choose between the "dimension-weighting" and the "similar-trace" hypotheses. In fact, these two possibilities may not be mutually exclusive. For example, field dependent subjects may have little cognitive operations information registered in their memory traces (similar-trace), and in addition, may not rely on the little information that is registered (dimension-weighting).

However, the dimension-weighting hypothesis presents a better explanation of the patterns of recognition memory across the three experiments. Either dimension-weighting or similar-trace hypotheses could explain the overall advantage in memory for field independent subjects in Experiments 1 and 2: Field dependent subjects do not rely on critical information in deciding if an event occurred previously (dimension-weighting), or that critical information is not well represented in the trace (similar-trace). The absence of a memory difference in Experiment 3, however, seems to pose more problems for a similar-trace hypothesis than it does for a dimension-weighting hypothesis.

Dimension-weighting would hold that the memory advantage of field independent subjects was lost in Experiment 3 because all subjects had to rely on the same information in order to determine if the item had been presented earlier. When field dependent subjects are forced to consider the same information that field independent subjects do naturally, then their memory performance rises to the level of the field independent person. The similar-trace hypothesis cannot, in its simple form, explain the improvement in memory for field dependent subjects. The similar-trace hypothesis must contend that, because of the context in which the items were being encoded in Experiment 3 (i.e., in the context of written items), information not normally encoded in the trace is now being encoded and subsequently used during recognition. This contention must hold even though the subjects did not expect a memory test. Allowing the similar-trace hypothesis this kind of flexibility during encoding makes it a viable explanation for the current data.

However, both hypotheses are now similar in an important respect. Neither suggests that differences in memory between field dependent and field independent persons are due to differences in abilities. Both emphasize the tendency for different individuals to rely on different information, either during retrieval (dimension-weighting), or encoding (similar-trace). Comparable memory can be obtained when the two groups of individuals are constrained to generate or use the same information.

This article provided information to further our understanding of self–nonself segregation and its role in cognitive processing. The reality monitoring model used in conjunction with differentiation theory aided in narrowing the theoretical explanations of the observed results to an extent that neither alone could have done. In fact, the search for individual differences in reality monitoring was guided by the theoretical developments in differentiation research. Although researchers in different areas have shared methodologies, we believe that attempts to gain either a nomothetic or an ideographic understanding of how people process and remember information requires collaboration at a theoretical level as well.

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