

Rejoinder to Spanos, Bertrand, and Perlini

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In their comment on Kihlstrom and Wilson's (1986) failure to find disorganized clustering in post-hypnotic amnesia, Spanos, Bertrand, and Perlini (1988) commit a number of factual errors, and misinterpret and misrepresent both our findings and their own.

In the early 1970s, Kihlstrom and Evans reported that hypnotizable subjects who remembered at least some of the items in a standardized hypnotic susceptibility scale, despite a suggestion for complete amnesia, tended not to recall these items in the order in which they had been administered; insusceptible subjects, by contrast, tended to recall the items sequentially (Evans & Kihlstrom, 1973; Kihlstrom & Evans, 1971). Sometime later, Spanos and Bodorik (1977), following up on an earlier unsuccessful study by Coe and his colleagues (Coe, Taul, Basden, & Basden, 1973), obtained a strong disruption in category clustering in a group of hypnotic subjects, but not in un hypnotized subjects who had received task-motivation suggestions for amnesia. They concluded, "the results of the present study support Evans and Kihlstrom's (1973) contention that suggested amnesia involves a temporary breakdown of the organizational strategy used by subjects to aid recall" (p. 302).

Recently, Wilson and Kihlstrom (1986) attempted a conceptual replication of Spanos's own findings by using a 16-item wordlist, but they failed to find evidence of disorganized clustering during amnesia. Spanos, Bertrand, and Perlini (1988) take our 1986 experiment to task on a number of grounds. Furthermore, in a personal communication (March 5, 1987) Spanos has provided us with a draft manuscript (Spanos, Perlini, and Bertrand, 1987) that repeats the essential criticisms, generalizes them to another of our studies (dealing with subjective organization rather than category clustering), and reports an experiment in which they have been able to replicate their earlier work with a 16-item list. Although we have no quarrel with the empirical findings of Spanos, Perlini, and Bertrand (1987), we take issue with their assertion that our major analyses "failed to correctly test for the disorganized clustering effect" (Spanos et al., 1988, p. 378; see also Spanos, Perlini, & Bertrand, 1987, pp. 3-4). This assertion is simply incorrect, and just one of the ways in which they misrepresent and misinterpret both our findings and their own.

Spanos et al. (1988) argue that proper tests of the disorganiza-

tion effect eliminate "full recallers"—those who recall all the critical items, despite the suggestion for amnesia—from consideration. The studies of Kihlstrom and Evans (Evans & Kihlstrom, 1973; Kihlstrom & Evans, 1979), which originally raised the issue of disorganization, did in fact include all subjects except those whose amnesia was so dense as to preclude calculation of a meaningful organization score. The rationale for this procedure was clear: Kihlstrom and Evans argued that disorganization was an unobtrusive index of amnesia, subtly revealing the impact of the suggestion even in those who failed to pass the standard criterion established for the item. The logic of the claim applies to all subjects who fail to pass amnesia—even those who recall everything. In declining to exclude from the experiment those subjects who recalled all of the critical items, Kihlstrom and Wilson (1984) were simply following a methodology that one of us had established earlier, and for which a perfectly good rationale exists. This point was made clearly by Kihlstrom and Wilson (1984, pp. 205-206), and reiterated by Wilson and Kihlstrom (1986, p. 267). Spanos et al. (1988) may prefer their own method of analysis, but they should not tout it as the canonical statement of the disorganization hypothesis.

Similarly, Spanos et al. (1988) argue that the disorganization hypothesis does not predict a relation between disorganization and hypnotizability independently of amnesia. This is also quite curious, because this is precisely the hypothesis tested in the earliest experiments of Kihlstrom and Evans (1971, 1979). It is a cardinal principle of hypnosis research that any effect of hypnosis should be correlated with hypnotizability, which is why the rigorous assessment of hypnotizability is such a critical issue for the field (Kihlstrom, 1985a). Because response to post-hypnotic amnesia is correlated with hypnotizability, and disorganization is hypothesized to be a property of amnesia, disorganization should be correlated with hypnotizability regardless of the level of recall. In fact, Kihlstrom and Evans (1979) found differences in temporal organization between groups of hypnotizable and insusceptible subjects who had been matched for level of recall.

Spanos et al. (1988) claim that there is only a low to moderate correlation between hypnotizability and amnesia, and they cite a study by Kihlstrom and Register (1984) to support their case. This may be true for the Harvard Group Scale of Hypnotic Susceptibility Form A, the procedure studied by Kihlstrom and Register, and for reasons having largely to do with the group-administered format of the scale (see also Kihlstrom & Evans, 1976, 1977). However, the claim is emphatically not true for the

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Stanford Hypnotic Susceptibility Scale. Hilgard (1965) reported correlations of 0.69 for Form A/B and 0.85 for Form C of that scale. In our experiments (Kihlstrom & Wilson, 1984; Wilson & Kihlstrom, 1986), subjects were classified into hypnotizability groups based on the Stanford Form C, which since 1962 has been the standard against which the validity of all other hypnotizability scales have been judged.

Let us grant, for the sake of discussion, that the prescription offered by Spanos et al. (1988) for a proper test of the disorganization hypothesis is in fact correct; the fact is, we performed it. Table 5 of our article (Wilson & Kihlstrom, 1986) showed the correlation between category clustering on the amnesia test and the extent of amnesia, defined (as Spanos et al., 1988, prefer) as the difference between amnesia and postamnesia tests of recall. Using adjusted ratio of clustering (ARC), the preferred measure of category clustering, the correlation was a nonsignificant $-.28$ ($N = 40$). For the record, Wilson & Kihlstrom (1986, Table 2) showed that the corresponding correlation for subjective organization was a nonsignificant $+.06$, again with $N = 40$. We did not fail to test for the disorganized clustering effect, but we certainly failed to find it.

Spanos et al. (1988) imply that we misinterpreted a study by Coe et al. (1973) as failing to find an amnesic effect on clustering. They assert that Coe et al. made the same error as Wilson and Kihlstrom (1986) in "lumping together" amnesics and full recallers. For the reasons noted earlier, this procedural choice was not an error, but rather a method dictated by the original disorganization hypothesis.

It is true, as Spanos et al. (1988) state, that Radtke-Bodorik and her colleagues repeated Coe et al.'s (1973) study by extending the number of acquisition trials with a 35-item list, and found a significant disorganization effect on clustering (Radtke-Bodorik, Planas, and Spanos, 1980). We recognized this positive result clearly in our article, but we also noted that the effect was much weaker than what had been consistently obtained with a 9-item list. Using a 9-item list, Spanos, Stam, and their colleagues (Spanos, Stam, D'Eon, Pawlak, & Radtke-Bodorik, 1980) reported an average drop of 28% in their "partial recallers" across three separate studies; Spanos and D'Eon (1980) reported a drop of 61%. With a 35-item list, however, the corresponding values of ARC in the study by Radtke-Bodorik et al. (1980) represented a drop of only 10%. Using a 16-item list, we obtained a drop of only 13% in our group of hypnotizable subjects. We did not have access to the unpublished manuscript by Ham, Radtke, and Spanos (1981), but a copy has been provided by Spanos (personal communication, May 6, 1987). It used a 12-item list, and yielded a drop of only 12% for the "partial recallers." More recent studies have yielded somewhat stronger effects (Spanos, Perlini, & Bertrand, 1987; Wagstaff & Carroll, 1987). However, on the basis of the evidence available to us at the time we wrote our article, we were completely justified in concluding that the disorganized clustering effect appeared to be negatively correlated with list length.

Spanos et al. (1988) assert that the failure of Wilson and Kihlstrom (1986) to obtain a disorganized clustering effect was due to our use of a relatively small sample in which amnesics and full recallers were "lumped into a single group" (p. 379)—a charge repeated in the draft manuscript (Spanos, Perlini, & Bertrand, 1987, pp. 3–5, 10). Later, they assert that we did find

the effect, and attribute its failure to reach acceptable levels of statistical significance to our sample size. However, they fail to report that the sample of hypnotic subjects used by Wilson and Kihlstrom ($N = 40$) was *larger* than the sample ($N = 27$) used by Spanos and Bodorik (1977) in the study that originally obtained a significant disorganized clustering effect. Moreover, they fail to report that Kihlstrom and Wilson (1984) obtained a massive temporal disorganization effect in an even *smaller* sample ($N = 35$) using the same methodology.¹ In fact, a major thrust of our 1986 article was to point out the weak effect of amnesia on category clustering (and subjective organization as well, although Spanos et al. (1988) do not address themselves to this portion of our report) compared with its effect on temporal organization. For example, the correlation between the adjusted intertrial repetitions (ITR) measure of temporal organization (see Footnote 1) and the extent of amnesia, as defined in the preceding paragraph, was $-.83$ (for further comparison, the drop in adjusted ITR during amnesia for the hypnotizable subjects amounted to 70%). In fact, then, our experiment had quite enough power to detect an amnesic effect on category clustering, had one been present in the data.

Spanos et al. (1988) assert that the disorganization effect is clearly predicted on theoretical grounds, but they neglect to mention which theoretical grounds. Kihlstrom and Evans's original studies on temporal disorganization were generated by, and interpreted in terms of, theoretical considerations derived from the cognitive psychology of learning and memory (Kihlstrom & Evans, 1979; for later developments, see Kihlstrom, 1985b). Because posthypnotic amnesia is a retrieval failure, and retrieval reflects (in part) organized search and reconstructive processes, Kihlstrom and Evans (1971, 1979; Evans & Kihlstrom, 1973) hypothesized that amnesia reflected a disruption of sequentially organized memory retrieval. When we (Wilson and Kihlstrom, 1986) conducted our studies of subjective organization and category clustering, we hoped to confirm the findings of Spanos and his colleagues, even though initial data gathered by Kihlstrom (1980; see Wilson & Kihlstrom, 1986, Footnote 1) had been negative. Nevertheless, although we had earlier obtained a strong temporal disorganization effect, we failed to repeat our success with these alternative organizational schemes.

Spanos et al. (1988) assert that we provided no theoretical reason why temporal organization should yield such different results from subjective organization and category clustering. Certainly the difference is inexplicable from a social-psychological framework. However, we did in fact offer a tentative account

¹ In addition, Spanos, McLean, and Bertrand (1987, Footnote 1) claimed to have uncovered a computational error in the paper by Kihlstrom and Wilson (1984). In an anonymous review (March 25, 1986) and a later personal communication to Bertrand, who had sent us a preprint of the revised article (April 27, 1987), we informed the authors that the apparent computational error was in fact a misprint: a statement that the maximum value of both pair frequency (PF) and intertrial repetitions (ITR) is 13.13 should refer to PF alone, although the essential point applies to ITR as well. The footnote implies that our data analysis is somehow mathematically incorrect, when in fact their own analysis accepts our argument as valid, and their replication confirms our reported results.

based on information-processing models of memory organization and retrieval (Wilson & Kihlstrom, 1986, pp. 271-272). This account will have to be reevaluated on the basis of newly developing evidence. In that way, at least, the forthcoming replication failure of Spanos, Perlini, & Bertrand (1987) is informative. But the present analysis of Spanos et al. (1988) is merely inaccurate and misleading.

References

- Coe, W. C., Taul, J. H., Basden, D., & Basden, B. (1973). Investigation of the dissociation hypothesis and disorganized retrieval in posthypnotic amnesia with retroactive inhibition in free-recall learning. *Proceedings of the 81st Annual Convention of the American Psychological Association*, 8, 1081-1082.
- Evans, F. J., & Kihlstrom, J. F. (1973). Posthypnotic amnesia as disrupted retrieval. *Journal of Abnormal Psychology*, 82, 317-323.
- Ham, M. L., Radtke, H. L., & Spanos, N. P. (1981). *The effects of suggestion type and the experience of involuntariness on the breaching of hypnotic amnesia*. Unpublished manuscript, Carleton University.
- Hilgard, E. R. (1965). *Hypnotic susceptibility*. New York: Harcourt, Brace, & World.
- Kihlstrom, J. F. (1980). Posthypnotic amnesia for recently learned material: Interactions with "episodic" and "semantic" memory. *Cognitive Psychology*, 12, 227-251.
- Kihlstrom, J. F. (1985a). Hypnosis. *Annual Review of Psychology*, 36, 385-418.
- Kihlstrom, J. F. (1985b). Posthypnotic amnesia and the dissociation of memory. In G. H. Bower (Ed.), *The psychology of learning and motivation* (Vol. 19, pp. 131-178). New York: Academic Press.
- Kihlstrom, J. F., & Evans, F. J. (1971). Posthypnotic amnesia as disorganized retrieval. *Proceedings of the 79th Annual Convention of the American Psychological Association*, 6, 775-776.
- Kihlstrom, J. F., & Evans, F. J. (1976). Recovery of memory after posthypnotic amnesia. *Journal of Abnormal Psychology*, 85, 564-569.
- Kihlstrom, J. F., & Evans, F. J. (1977). Residual effect of suggestions for posthypnotic amnesia: A reexamination. *Journal of Abnormal Psychology*, 86, 327-333.
- Kihlstrom, J. F., & Evans, F. J. (1979). Memory retrieval processes in posthypnotic amnesia. In J. F. Kihlstrom & F. J. Evans (Eds.), *Functional disorders of memory* (pp. 179-218). Hillsdale, NJ: Erlbaum.
- Kihlstrom, J. F., & Register, P. A. (1984). Optimal scoring of amnesia on the Harvard Group Scale of Hypnotic Susceptibility, Form A. *International Journal of Clinical and Experimental Hypnosis*, 32, 51-57.
- Kihlstrom, J. F., & Wilson, L. (1984). Temporal organization of recall during posthypnotic amnesia. *Journal of Abnormal Psychology*, 93, 200-208.
- Radtke-Bodorik, H. L., Planas, M., & Spanos, N. P. (1980). Suggested amnesia, verbal inhibition, and disorganized recall for a long word list. *Canadian Journal of Behavioral Science*, 12, 87-97.
- Spanos, N. P., Bertrand, L. D., & Perlini, A. H. (1988). Reduced clustering during hypnotic amnesia for a long word list: A reply to Wilson and Kihlstrom. *Journal of Abnormal Psychology*, 97, 378-380.
- Spanos, N. P., & Bodorik, H. L. (1977). Suggested amnesia and disorganized recall in hypnotic and task-motivated subjects. *Journal of Abnormal Psychology*, 86, 295-305.
- Spanos, N. P., & D'Eon, J. L. (1980). Hypnotic amnesia, disorganized recall, and inattention. *Journal of Abnormal Psychology*, 89, 744-750.
- Spanos, N. P., McLean, J. M., & Bertrand, L. D. (1987). Serial organization during hypnotic amnesia under two conditions of item presentation. *Journal of Research in Personality*, 21, 361-374.
- Spanos, N. P., Perlini, A. H., & Bertrand, L. D. (1987). *Disorganized clustering during hypnotic amnesia for a sixteen-item list of categorized words*. Unpublished manuscript, Carleton University, Ottawa, Ontario, Canada.
- Spanos, N. P., Stam, H. J., D'Eon, J. L., Pawlak, A. E., & Radtke-Bodorik, H. L. (1980). The effects of social-psychological variables on hypnotic amnesia. *Journal of Personality and Social Psychology*, 39, 737-750.
- Wagstaff, G. F., & Carroll, R. (1987). The cognitive-simulation of hypnotic amnesia and disorganized recall. *Medical Science Research*, 15, 85-86.
- Wilson, L., & Kihlstrom, J. F. (1986). Subjective and categorical organization of recall during posthypnotic amnesia. *Journal of Abnormal Psychology*, 95, 264-273.

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