FACTRETRIEVAL: A program for assessing someone's recall of general-information facts, feeling-of-knowing judgments for nonrecalled facts, and recognition of nonrecalled facts

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FACTRETRIEVAL is a program that presents up to 240 general-information questions from the Nelson and Narens (1980b) norms. The program is divided into three main routines: recall, feeling-of-knowing for nonrecalled facts, and recognition of nonrecalled facts.

General-information questions such as "What is the last name of the man who invented the phonograph?" and "What is the capital of Chile?" are presented singly on a video monitor, and the subject types an answer to each question on a typewriter keyboard. This sequence continues until the subject fails to recall a preset number of facts or exhausts the entire pool of questions (to date, we have never encountered the latter situation).

The program can be terminated at this point or continued with a feeling-of-knowing routine in which relative feeling-of-knowing judgments occur on all possible paired comparisons of the nonrecalled items (see Nelson & Narens, 1980a). For each pair of questions, the subject chooses the question to which he/she believes that he/she is more likely to recognize the correct answer. For example, the subject might judge the answer to "What is the capital of Chile?" to be more likely to be recognized than the answer to "What is the last name of the man who invented the phonograph?" This stage produces a rank ordering of feeling-of-knowing judgments for nonrecalled items. After all $N(N-1)/2$ possible paired comparisons of the nonrecalled items are completed, some of these paired comparisons are repeated to assess the subject's retest reliability on the feeling-of-knowing judgments. Finally, an eight-alternative forced-choice (8AFC) recognition test occurs for each of the nonrecalled items. The seven distractors are drawn from the same general category as the correct answer (e.g., for the item "What is the capital of Chile?" the eight recognition alternatives are Santiago, Caracas, Lima, Acapulco, Quito, Curacao, Valparaiso, and Bogota). The correlation between the subject's feeling-of-knowing judgments and subsequent recognition performance provides a measure of the feeling-of-knowing validity for that subject. A statistical analysis routine computes the various summary statistics described below (and is discussed in greater detail in Nelson & Narens, 1980a).

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Input. There is a menu from which the investigator can specify whichever options are desired (described in the "Options" section below). Then the investigator needs only to input a subject-file name under which the data will be stored and a seed number to activate the random-number generator for the presentation order of the general-information questions. Instructions for the subject and practice trials are included in the program.

Output. The program saves an extensive amount of data for each subject. First, a table of recall performance is displayed that shows for each trial (1) the trial number, (2) a number indicating which general-information question was presented, (3) correctness of the subject's response (to minimize the effect of spelling errors, a response is scored as correct if the first two letters match the first two letters of the correct answer), (4) the subject's response, (5) the response latency (optional), and (6) the correct answer (from the Nelson-Narens, 1980b, norms).

Next, the subject's feeling-of-knowing choice is shown for each of the paired comparisons, including each of the retested paired comparisons.

Then a table of summary statistics is displayed that shows (1) the total number of recall trials before reaching the preset criterion for the number of items nonrecalled, (2) the proportion of correct recall, (3) a rank-ordered listing of each nonrecalled item (based on the number of times that a given item was chosen over all other items during the feeling-of-knowing judgments), (4) the correctness of recognition performance on each item, and (5) the recognition alternative that the subject selected for each item.

The output also displays the number of intransitivities in the feeling-of-knowing paired comparisons (i.e., if Item *i* is chosen over Item *j* and Item *j* is chosen over Item *k*, then an intransitivity occurs if Item *k* is chosen over Item *i*). For each intransitivity, the three items composing the intransitive triple are listed.

Finally, the Goodman-Kruskal gamma correlation is computed for the feeling-of-knowing rank and recognition performance (i.e., feeling-of-knowing validity).

Hardware. The program is written in APPLESOFT BASIC for an Apple computer with 48K, one or two disk drives, an optional Mountain Computer clock card (required for response latencies), and an optional printer.

Options. The program provides the investigator with the following five options: (1) Stages—(a) general-information recall only, (b) general-information recall and 8AFC recognition for nonrecalled items, or (c) general-information recall, feeling-of-knowing judgments for nonrecalled items, and 8AFC recognition for nonrecalled items; (2) predetermined choice of either the number of nonrecalled items or the number of trials before termination of the general-information

recall stage; (3) presence or absence of response latencies for recall and recognition; (4) presence or absence of retested paired comparisons to assess feeling-of-knowing reliability; and (5) one or two disk drives (if the latter, the program will be in Drive 1 and the data will be stored in Drive 2).

Availability. Complete listing of the program, including text files of instructions to subjects and 240 general-information questions with distractors for 8AFC recognition, is available for \$3 to cover copying and mailing costs from Thomas O. Nelson, Psychology Department (NI-25), University of Washington, Seattle, Washington 98195. For a copy of the complete program on diskette

(and a brief instruction manual) at no charge, send a blank 5.25-in. diskette with self-addressed return mailer and specify 3.3 or 3.2.1 DOS.

REFERENCES

- NELSON, T. O., & NARENS, L. A new technique for investigating the feeling of knowing. *Acta Psychologica*, 1980, **46**, 69-80. (a)
 NELSON, T. O., & NARENS, L. Norms of 300 general-information questions: Accuracy of recall, latency of recall, and feeling-of-knowing ratings. *Journal of Verbal Learning and Verbal Behavior*, 1980, **19**, 338-368. (b)

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