

Norms of 300 General-Information Questions: Accuracy of Recall, Latency of Recall, and Feeling-of-Knowing Ratings

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Normative data were collected on 300 general-information questions from a wide variety of topics, including history, sports, art, geography, literature, and entertainment. Male and female undergraduates at two different universities made a one-word response to each question either in a response booklet or at a computer console. The reported data include the following for each question: (a) probability of recall for all 270 undergraduates, for males versus females, and for University of Washington subjects versus University of California, Irvine, subjects, (b) latency of correct recall, (c) latency of errors, and (d) feeling-of-knowing ratings for nonrecalled items. Correlations among these dependent variables, along with measures of reliability, are also reported.

Many current investigators are becoming increasingly disenchanted with research on memory for items such as nonsense syllables and instead are becoming more interested in examining memory for the kinds of general information that one encounters in the everyday world (e.g., Freedman & Landauer, 1966; Koriatic & Liebhlich, 1974; Hart, 1965; Lachman, & Lachman, in press; Squire and Slater, 1975). There are at least two (and probably more) reasons for this shift. First, forceful arguments have been made by Jenkins (1974), Neisser (1976), and others to study memory situations that are more "ecologically valid" (however, also

see Gibbs, 1979). Second, by testing memory for the answer to general-information questions (e.g., "What is the name of the navigation instrument used at sea to plot position by the stars?"), the researcher can investigate retrieval from long-term memory in a single session; this eliminates the necessity of a prior session for acquisition in which the subject learns a list of items as in the previously popular list-learning studies (e.g., Ebbinghaus, 1885). Research on memory for general information (as contrasted with nonsense syllables) has been continually popular in Europe, following the tradition of Bartlett (1932). In North America, however, widespread research on memory for general information has occurred during only the last decade or so.

Although many norms are available on the ease of recall for nonsense syllables (e.g., Glaze's norms), for unrelated words (e.g., Thorndike & Lorge's norms), and for categorized words (e.g., Battig & Montague's norms), currently no norms are available for research on general informa-

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tion. The present project attempted to fill this gap. Our goal was to provide a large set of general-information questions with the following characteristics: (1) They would come from a wide spectrum of topics; (2) they would vary in difficulty in a predictable way so that researchers could select whatever difficulty levels were desired; (3) they would avoid recent topics whose level of recallability might change dramatically over the next few years; (4) they would have relatively unambiguous one-word answers that are fairly easy to spell, at least over the first four letters, so as to be useful for research in which the answers are scored by computer; and (5) they would have levels of relative difficulty that are fairly invariant across different universities. To whatever degree was possible we wanted to provide normative data not only on the probability of correct recall but also on the latency of correct recall, and on both the latency of search termination and the feeling of knowing for nonrecalled answers.

METHOD

Items

The 300 general-information questions were developed from fact books, with the aid of almanacs, atlases, trivia books, friends, and colleagues. All questions pertained to information that was at least 10 years old so as to prevent the normative data from becoming quickly obsolete. The questions covered a wide variety of subjects including sports, geography, entertainment, history, art, and literature. Whenever possible, an attempt was made to have what appeared to the authors to be an easy question and a hard question from the same topic area (e.g., if an easy question such as "What is the capital of France?" was employed, we also selected a harder question on capitals such as "What is the capital of Finland?"). The thought was that future studies of priming and categorical relatedness might find such clusters of questions to be useful. The 300 questions are listed in Table 1.

Subjects and Design

To facilitate the replicability of the relative difficulties of the questions across different universities, one pool of subjects (53 females and 73 males) came from introductory psychology classes at the University of Washington and another pool (71 females and 73 males) came from introductory psychology classes at the University of California, Irvine. All subjects received extra course credit for their participation. We also wanted to maximize the replicability of the relative difficulties across two modes of presentation—questions presented in response booklets versus questions presented via computer—so the Washington subjects answered the questions in response booklets whereas the Irvine subjects answered the questions at computer consoles. The procedure for each of these two pools of subjects will be described separately.

Procedure

University of Washington. The subjects were tested in subgroups of approximately 25 subjects. Each subject was randomly assigned one of five different response booklets, which differed only in terms of the presentation order of the questions (five different random presentation orders were determined without restrictions). The questions appeared in upper-case letters, with 15 questions on each of 20 pages. Next to each question, there was a space for the subject to record his/her answer. The subjects answered the questions at their own rate. The cover page of the booklet contained the following instructions:

This experiment will investigate your knowledge about general kinds of information. We will go through a very large number of general information questions. For each question, PRINT your best guess in the space to the left of the question. The answer will always consist of exactly one word and will never be longer than one word. As each question is presented search your memory hard in an attempt to find the answer to the question. When you have determined the answer there is no need to waste extra time before pro-

ceeding to print it in the space. However, if you do not locate the answer immediately, give yourself a chance to find it by searching your memory a bit more. Some questions may take awhile before you locate the correct answer. The questions vary greatly in difficulty such that you will probably be able to answer some easily while others will be harder, and still others you may not know at all. If, after searching your memory, you are sure that you don't know the answer then print the word "NEXT" and proceed to the next question. Please do not return to (or look back at) any previous question after you have proceeded to the next question. And never leave an answer space blank; for every answer space, either fill in "NEXT" or fill in your best guess. However, there is no penalty for guessing and incorrect answers will not affect your score so be sure to take a guess, if you can, whenever you are unsure. We are only concerned that you get as many questions correct as you possibly can.

Now let's try a practice question. PRINT your best guess in the space to the left of the question:

_____ WHAT IS THE LAST NAME OF
THE CURRENT PRESIDENT OF THE
UNITED STATES?

Now, if you have any questions about the procedure, raise your hand. The experimenter cannot answer any questions once you begin the experiment, so if you have a question you should ask it now.

When you are ready to begin, turn to the first page and start going through the booklet. After you have finished the last question in the booklet, raise your hand to indicate that you have completed the experiment.

After finishing the 300th question, the subjects were dismissed.

University of California, Irvine. The subjects were tested via a PDP11 computer. The laboratory had five booths, with each booth containing a television monitor and a typewriter keyboard for responding. The subjects were tested in subgroups of one to five subjects, with a given subject being alone in his or her booth. Each subject received the questions in a different random order. The instructions were identical to those listed above except for additional remarks concerning how to use the typewriter keyboard. The subject was permitted to correct any typographical error before proceeding to the next question.

The time-sharing properties of the com-

puter system were such that response latencies could be determined, but only when no more than one of the five booths was in use. Therefore 43 of the subjects, randomly determined in advance of the session, were tested individually with all remaining booths inactive. Each of these subject's response latencies was recorded in terms of the elapsed time between the onset of the question and the first letter of the subject's answer. The subject was not informed that the response latencies were being recorded, and no emphasis on speed versus accuracy was given except for the remarks in the instructions reported verbatim above. After finishing the 300th question, these subjects gave feeling-of-knowing ratings for all of the items that they had answered incorrectly. The incorrect items were represented in a random order, preceded by the following instructions:

That's the end of the question-answer stage of the experiment. In the next stage we would like you to rate many of the previous items in terms of your "feeling of knowing." That is, for a given item, we would like to see how likely you think you would be to recognize the correct answer. You will give a feeling-of-knowing rating of 1 or 2 or 3 or 4 or 5 or 6 or 7 or 8 or 9 by pressing one of those numbered keys located at the top of the keyboard. If you are completely sure that you know the answer well enough to recognize it then press the "9" key. If you are completely sure that you would not recognize the answer then press the "1" key. When your feeling-of-knowing for the item is somewhere in between, then press one of the intermediate numbered keys by dividing your overall feeling-of-knowing confidence into nine different levels, going from "1" at the lowest level to "9" at the highest level. After you have typed in your feeling-of-knowing rating push the "return" key just once and we will proceed to the next question for your next feeling-of-knowing rating.

After making a feeling-of-knowing rating on every incorrectly recalled item, the subject was dismissed.

RESULTS AND DISCUSSION

The results for each item are shown in Table 1. The 300 items are ordered (and numbered from 1 to 300) in terms of overall accuracy, going from highest overall accu-

racy to lowest overall accuracy. Next to each item number are the question and (in parentheses) the answer that comprise each item, followed by (a) the probability of correct recall for the overall sample of 270 subjects, (b) the probability of correct recall for the 124 female subjects, (c) the probability of correct recall for the 146 male subjects, (d) the probability of correct recall for the 126 University of Washington (UW) subjects, (e) the probability of correct recall for the 144 University of California at Irvine (UCI) subjects, (f) the median latency of correct recall, (g) the median latency of error (i.e., amount of search time before the subject either made an erroneous response or proceeded to the next item), and (h) the median feeling-of-knowing rating if the item had not been correctly recalled.

Overall Accuracy

The probability of correct recall reported in the "All" column in Table 1 shows a good spread across the 300 items, ranging from .974 for the POPEYE item to .000 for the ACONCAGUA item. The distribution is somewhat skewed, with approximately one-third of the items having a probability of correct recall that is greater than .500 and the remaining two-thirds (from item #100 on) having a probability of correct recall that is less than .500. The middlemost item (#150, the HUNGARY item) has a probability of correct recall of .270. In general, there seem to be enough items available at any given level of accuracy that a researcher should be able to select a subset for whatever kind of distribution of item difficulty is desired (e.g., rectangular, unimodal-symmetric, unimodal-skewed). However, two of the items should probably not be employed because of possible ambiguity in the correct response; they are items #57 and #297 (e.g., in #57, for the name of the giant ocean wave, many subjects responded "TSUNAMI" instead of TIDAL, and both are correct).

Sex Differences

While selecting items for inclusion in the norms, no particular attempt was made to

choose items that would (versus would not) have different probabilities of recall across males versus females. Nevertheless, each item was examined for possible sex differences in recall. We employed a conservative alpha level of $p < .001$ for reliability in all inferential statistical tests throughout the study (in part because, as in the present case, a given test was conducted 300 times, once for each item). Table 1 indicates by an asterisk (*) in the "All" column any item that had both a reliable sex difference in the UW sample and a reliable sex difference in the UCI sample (via a binomial test of the difference between two proportions). Such sex differences occurred on only 12 items: #51, 72, 75, 85, 86, 90, 117, 126, 129, 173, 194, and 202. However, an additional 35 items had reliable sex differences in the UCI sample but not in the UW sample (#42, 61, 63, 64, 66, 70, 74, 82, 84, 87, 94, 96, 97, 109, 113, 114, 115, 119, 122, 133, 135, 154, 164, 168, 174, 178, 186, 187, 189, 205, 207, 209, 215, 227, and 231), and an additional 8 items had reliable sex differences in the UW sample but not in the UCI sample (#31, 43, 54, 92, 131, 158, 169, and 190). This illustrates that studies of sex differences should be replicated at different universities to increase the generalizability of the conclusions to "males versus females" (rather than only to "males versus females at university X"). Finally, 14 additional items did not have reliable sex differences in the UW sample and did not have reliable sex differences in the UCI sample but did have reliable sex differences when the data were combined (#10, 46, 48, 53, 59, 67, 80, 81, 93, 98, 160, 188, 234, and 255).

Although the aforementioned sets of items had sex differences in the absolute probability of correct recall, it is important to point out that the relative difficulty across the full set of items is quite similar for males and females. That is, the correlation over the 300 items (in the probability of correct recall for males versus females on each item) is +.933. Thus, one can expect similar results in terms of which items are

TABLE 1
PROBABILITY OF RECALL, LATENCY OF RECALL, AND FEELING-OF-KNOWING RATINGS FOR 300 GENERAL-INFORMATION ITEMS

Item number	Item	Probability of recall						Median latency		Median FOK
		All (N = 270)	Female (N = 124)	Male (N = 146)	UW (N = 126)	UCI (N = 144)	Median latency			
							L(C)	L(E)		
1	WHAT IS THE NAME OF THE COMIC STRIP CHARACTER WHO EATS SPINACH TO INCREASE HIS STRENGTH? (POPEYE)	.974	.960	.986	.976	.972	4.58	—	—	
2	WHAT IS THE NAME OF THE HORSE-LIKE ANIMAL WITH BLACK AND WHITE STRIPES? (ZEBRA)	.970	.952	.986	.960	.979	5.51	3.08	9	
3	WHAT IS THE NAME OF THE LONG SLEEP SOME ANIMALS GO THROUGH DURING THE ENTIRE WINTER? (HIBERNATION)	.919	.895	.938	.897	.938	6.33	—	—	
4	WHAT IS THE LAST NAME OF THE BROTHERS WHO FLEW THE FIRST AIRPLANE AT KITTY HAWK? (WRIGHT)	.919	.895	.938	.905	.931	5.42	—	—	
5	WHAT WAS THE NAME OF TARZAN'S GIRLFRIEND? (JANE)	.919	.895	.938	.921	.917	3.45	20.36	7	
6	WHAT IS THE CAPITAL OF FRANCE? (PARIS)	.915	.879	.945	.937	.896	3.55	14.38	3.5	
7	WHAT IS THE NAME OF THE MOLTEN ROCK THAT RUNS DOWN THE SIDE OF A VOLCANO DURING AN ERUPTION? (LAVA)	.915	.879	.945	.889	.938	6.55	—	—	
8	WHICH SPORT USES THE TERMS "GUTTER" AND "ALLEY"? (BOWLING)	.896	.871	.918	.905	.889	4.65	12.17	8	
9	WHAT IS THE NAME OF A DRIED GRAPE? (RAISIN)	.896	.935	.863	.881	.910	4.20	18.06	7	
10	WHICH SPORT IS ASSOCIATED WITH WIMBLEDON? (TENNIS)	.896	.823	.959	.905	.889	3.80	9.95	1	
11	WHAT IS THE NAME OF THE CRIME IN WHICH A BUILDING OR PROPERTY IS PURPOSELY SET ON FIRE? (ARSON)	.881	.847	.911	.913	.854	5.88	15.55	7	
12	WHAT IS THE NAME OF THE LONE RANGER'S INDIAN SIDEKICK? (TONTO)	.870	.831	.904	.865	.875	4.67	10.41	3	
13	WHICH PRECIOUS GEM IS RED? (RUBY)	.870	.879	.863	.873	.868	4.17	8.06	4	

14	WHAT IS THE NAME OF AN AIRPLANE WITHOUT AN ENGINE? (GLIDER)	.856	.790	.911	.873	.840	4.90	11.21	4.5
15	WHAT IS THE NAME OF THE REMAINS OF PLANTS AND ANIMALS THAT ARE FOUND IN STONE? (FOSSILS)	.852	.790	.904	.849	.854	6.44	13.08	3
16	WHAT IS THE NAME OF THE RUBBER OBJECT THAT IS HIT BACK AND FORTH BY HOCKEY PLAYERS? (PUCK)	.852	.782	.911	.873	.833	5.32	19.43	8
17	WHAT IS THE NAME FOR A MEDICAL DOCTOR WHO SPECIALIZES IN CUTTING THE BODY? (SURGEON)	.844	.815	.870	.802	.882	6.24	18.85	4.5
18	WHAT IS THE NAME OF AN INABILITY TO SLEEP? (INSOMNIA)	.837	.839	.836	.810	.861	4.04	13.53	6
19	WHAT IS THE NAME OF DOROTHY'S DOG IN "THE WIZARD OF OZ"? (TOTO)	.837	.839	.836	.825	.847	3.77	12.08	7
20	WHAT IS THE LAST NAME OF THE MAN WHO SHOWED THAT LIGHTNING IS ELECTRICITY? (FRANKLIN)	.837	.815	.856	.817	.854	6.07	15.04	9
21	WHAT IS THE NAME OF THE SPEARLIKE OBJECT THAT IS THROWN DURING A TRACK MEET? (JAVELIN)	.833	.758	.897	.833	.833	6.35	9.40	7
22	WHAT IS THE NAME OF THE SHIP THAT CARRIED THE PILGRIMS TO AMERICA IN 1620? (MAYFLOWER)	.822	.782	.856	.833	.813	5.08	10.48	8
23	WHAT IS THE LAST NAME OF THE MAN WHO RODE HORSEBACK IN 1775 TO WARN THAT THE BRITISH WERE COMING? (REVERE)	.819	.766	.863	.817	.819	7.34	19.68	8
24	WHAT IS THE TERM FOR HITTING A VOLLEYBALL DOWN HARD INTO THE OPPONENT'S COURT? (SPIKE)	.819	.758	.870	.762	.868	5.20	18.24	7.5
25	WHAT IS THE NAME OF THE SEVERE HEADACHE THAT RETURNS PERIODICALLY AND OFTEN IS ACCOMPANIED BY NAUSEA? (MIGRAINE)	.807	.839	.781	.754	.854	7.10	13.78	7
26	WHAT IS THE NAME FOR A MEDICAL DOCTOR WHO SPECIALIZES IN DISEASES OF THE SKIN? (DERMATOLOGIST)	.804	.839	.774	.746	.854	6.15	27.42	8.5
27	WHAT IS THE LAST NAME OF THE SINGER WHO RECORDED "HEARTBREAK HOTEL" AND "ALL SHOOK UP"? (PRESLEY)	.804	.790	.815	.770	.833	7.31	3.60	2

TABLE 1—Continued

Item number	Item	Probability of recall						Median latency		Median FOK
		All (N = 270)	Female (N = 124)	Male (N = 146)	UW (N = 126)	UCI (N = 144)				
							L(C)	L(E)		
28	WHAT IS THE LAST NAME OF THE FAMOUS MAGICIAN AND ESCAPE ARTIST WHO DIED OF APPENDICITIS? (HOUDINI)	.804	.798	.808	.746	.854	7.96	12.07	8	
29	WHAT KIND OF A METAL IS ASSOCIATED WITH A 50TH WEDDING ANNIVERSARY? (GOLD)	.796	.734	.849	.778	.813	6.22	8.82	8	
30	WHAT IS THE LAST NAME OF THE AUTHOR WHO WROTE "ROMEO AND JULIET"? (SHAKESPEARE)	.796	.782	.808	.794	.799	5.60	9.56	5	
31	WHAT IS THE LAST NAME OF THE BOXER WHO LATER BECAME KNOWN AS MOHAMMUD ALI? (CLAY)	.778	.645	.890	.778	.778	7.45	16.11	8	
32	WHO WAS THE EGYPTIAN QUEEN WHO JOINED FORCES WITH MARK ANTONY OF ROME? (CLEOPATRA)	.778	.782	.774	.706	.840	6.43	6.12	2	
33	WHAT IS THE NAME OF THE PROCESS BY WHICH PLANTS MAKE THEIR FOOD? (PHOTOSYNTHESIS)	.770	.710	.822	.770	.771	5.02	32.20	5	
34	WHAT IS THE NAME OF THE BIRD THAT CANNOT FLY AND IS THE LARGEST BIRD ON EARTH? (OSTRICH)	.770	.685	.842	.786	.757	6.44	13.30	7	
35	WHAT IS THE NAME OF THE THICK LAYER OF FAT ON A WHALE? (BLUBBER)	.767	.726	.801	.778	.757	5.47	10.01	4.5	
36	IN WHAT PARK IS "OLD FAITHFUL" LOCATED? (YELLOWSTONE)	.767	.702	.822	.770	.764	4.78	5.92	9	
37	WHAT WAS THE NAME OF THE SUPPOSEDLY UNSINKABLE SHIP THAT SUNK ON ITS MAIDEN VOYAGE IN 1912? (TITANIC)	.763	.677	.836	.825	.708	5.74	10.82	6	
38	ANDY GRIFFITH WAS THE SHERIFF OF WHAT TOWN ON TELEVISION'S "ANDY GRIFFITH SHOW"? (MAYBERRY)	.756	.734	.774	.730	.778	6.55	15.04	5.5	

39	WHICH TYPE OF SNAKE DO ASIAN SNAKE-CHARMERS USE? (COBRA)	.752	.702	.795	.730	.771	5.94	5.59	6
40	IN WHICH SPORT DOES A RIDER ON HORSEBACK HIT A BALL WITH HIS Mallet? (POLO)	.748	.694	.795	.778	.722	5.79	19.57	7
41	WHAT IS THE NAME FOR A CYCLONE THAT OCCURS OVER LAND? (TORNADO)	.744	.726	.760	.722	.764	6.18	8.69	8
42	WHAT IS THE ONLY LIQUID METAL AT ROOM TEMPERATURE? (MERCURY)	.741	.637	.829	.762	.722	5.85	15.18	4.5
43	WHAT IS THE NAME OF THE LARGEST OCEAN ON EARTH? (PACIFIC)	.737	.597	.856	.762	.715	5.68	6.60	7
44	WHICH PLANET WAS THE LAST TO BE DISCOVERED? (PLUTO)	.733	.669	.788	.730	.736	6.30	10.74	5.5
45	WHAT IS THE NAME OF THE LARGE HAIRY SPIDER THAT LIVES NEAR BANANAS? (TARANTULA)	.730	.742	.719	.706	.750	6.37	10.01	2
46	FOR WHICH COUNTRY IS THE YEN THE MONETARY UNIT? (JAPAN)	.730	.629	.815	.746	.715	4.42	9.28	3
47	WHAT IS THE NAME OF A DRIED PLUM? (PRUNE)	.726	.774	.685	.714	.736	5.84	11.60	4
48	IN WHICH TYPE OF SKI RACE DOES THE DOWNHILL SKIER MAKE SHARP TURNS AROUND POLES? (SLALOM)	.726	.621	.815	.770	.688	8.53	13.80	5
49	WHAT IS THE LAST NAME OF THE BASEBALL PLAYER WHO HAD THE MOST HOME RUNS IN A SINGLE SEASON PRIOR TO 1961? (RUTH)	.711	.702	.719	.706	.715	9.44	9.35	4
50	WHAT IS THE NAME OF THE LARGEST DESERT ON EARTH? (SAHARA)	.707	.677	.733	.754	.667	4.83	14.05	6
51	WHAT IS THE NAME OF THE POKER HAND IN WHICH ALL OF THE CARDS ARE OF THE SAME SUIT? (FLUSH)	.689*	.540	.815	.698	.681	6.67	12.28	8
52	WHAT IS THE NAME OF THE NAVIGATION INSTRUMENT USED AT SEA TO PLOT POSITION RELATIVE TO THE MAGNETIC NORTH POLE? (COMPASS)	.685	.597	.760	.675	.694	9.94	15.30	4
53	WHAT IS THE LAST NAME OF THE FIRST PERSON TO SET FOOT ON THE MOON? (ARMSTRONG)	.685	.581	.774	.706	.667	5.97	13.22	6.5

TABLE 1—Continued

Item number	Item	Probability of recall							
		All (N = 270)	Female (N = 124)	Male (N = 146)	UW (N = 126)	UCI (N = 144)	Median latency		
							L(C)	L(E)	Median FOK
54	WHAT IS THE CAPITOL OF RUSSIA? (MOSCOW)	.685	.556	.795	.675	.694	5.03	7.81	7
55	WHAT IS THE NAME OF THE CITY IN ITALY THAT IS KNOWN FOR ITS CANALS? (VENICE)	.681	.621	.733	.659	.701	5.49	11.48	7
56	WHAT IS THE NAME OF THE DESERT PEOPLE WHO WANDER INSTEAD OF LIVING IN ONE PLACE? (NOMADS)	.681	.589	.760	.698	.667	5.48	11.02	6
57	WHAT IS THE NAME OF A GIANT OCEAN WAVE CAUSED BY AN EARTHQUAKE? (TIDAL)	.678	.694	.664	.659	.694	8.26	9.50	8.5
58	WHAT WAS THE LAST NAME OF THE WOMAN WHO SUPPOSEDLY DESIGNED AND SEWED THE FIRST AMERICAN FLAG? (ROSS)	.678	.702	.658	.643	.708	5.60	13.24	7
59	WHAT IS THE NAME OF A YOUNG SHEEP? (LAMB)	.670	.774	.582	.651	.688	5.18	7.14	6.5
60	WHAT IS THE LAST NAME OF THE ACTRESS WHO RECEIVED THE BEST ACTRESS AWARD FOR THE MOVIE "MARY POPPINS"? (ANDREWS)	.663	.758	.582	.627	.694	6.35	20.22	6
61	WHAT IS THE WORD THAT MEANS A NAUTICAL MILE PER HOUR? (KNOT)	.656	.532	.760	.619	.688	8.83	11.51	2
62	WHICH BREED OF CAT HAS BLUE EYES? (SIAMESE)	.656	.710	.610	.651	.660	4.82	9.17	3
63	WHAT IS THE NAME OF THE ISLAND-CITY BELIEVED SINCE ANTIQUITY TO HAVE SUNK INTO THE OCEAN? (ATLANTIS)	.652	.460	.815	.643	.660	6.47	11.02	3
64	WHAT IS THE LAST NAME OF THE MAN WHO PROPOSED THE THEORY OF RELATIVITY? (EINSTEIN)	.648	.500	.774	.667	.632	5.08	7.68	9

65	WHAT IS THE LARGEST PLANET IN THE SOLAR SYSTEM? (JUPITER)	.648	.556	.726	.595	.694	4.35	6.42	8
66	WHAT IS THE LAST NAME OF THE MYTHICAL GIANT LUMBERJACK? (BUNYON)	.637	.500	.753	.675	.604	7.20	15.82	5
67	WHAT IS THE LAST NAME OF THE MAN WHO ASSASSINATED ABRAHAM LINCOLN? (BOOTH)	.633	.524	.726	.619	.646	4.94	19.95	7
68	WHAT IS THE LAST NAME OF THE ACTOR WHO PLAYED RHETT BUTLER IN "GONE WITH THE WIND"? (GABLE)	.626	.710	.555	.563	.681	6.30	9.29	3.5
69	IN WHICH GAME ARE MEN CROWNED? (CHECKERS)	.622	.613	.630	.587	.653	6.28	14.78	7
70	WHAT IS THE NAME FOR THE ASTRONOMICAL BODIES THAT ENTER THE EARTH'S ATMOSPHERE? (METEORS)	.622	.468	.753	.667	.583	8.78	8.92	7
71	WHAT IS THE NAME OF THE SMALL JAPANESE STOVE USED FOR OUTDOOR COOKING? (HIBACHI)	.622	.613	.630	.587	.653	5.40	7.79	3.5
72	WHAT IS THE NAME OF THE LIGHTEST WOOD KNOWN? (BALSA)	.619*	.419	.788	.643	.597	4.58	9.58	5
73	WHAT IS THE LAST NAME OF THE VILLAINOUS CAPTAIN IN THE STORY "PETER PAN"? (HOOK)	.619	.605	.630	.635	.604	7.30	6.68	4
74	WHAT IS THE LAST NAME OF THE FIRST PERSON TO COMPLETE A SOLO FLIGHT ACROSS THE ATLANTIC OCEAN? (LINDBERGH)	.615	.500	.712	.603	.625	7.13	11.17	6
75	WHAT IS THE TERM IN GOLF REFERRING TO A SCORE OF ONE UNDER PAR ON A PARTICULAR HOLE? (BIRDIE)	.611*	.427	.767	.643	.583	7.99	13.27	3
76	WHAT IS THE NAME OF THE LIQUID PORTION OF WHOLE BLOOD? (PLASMA)	.607	.548	.658	.619	.597	6.32	9.40	5.5
77	WHICH GAME USES A RUBBER BALL AND LITTLE METAL PIECES? (JACKS)	.607	.605	.610	.635	.583	7.10	27.47	7
78	WHAT IS THE NAME OF THE LEGENDARY ONE-EYED GIANT IN GREEK MYTHOLOGY? (CYCLOPS)	.604	.548	.651	.595	.611	5.26	9.50	3
79	WHAT IS THE NAME OF THE SHORT PLEATED SKIRT WORN BY MEN IN SCOTLAND? (KILT)	.604	.589	.616	.619	.590	5.54	10.53	2

TABLE 1—Continued

Item number	Item	Probability of recall							Median latency		Median FOK
		All (N = 270)	Female (N = 124)	Male (N = 146)	UW (N = 126)	UCI (N = 144)	Median latency				
							L(C)	L(E)			
80	WHAT IS THE UNIT OF SOUND INTENSITY? (DECIBEL)	.600	.460	.719	.603	.597	5.30	12.39	7		
81	WHAT IS THE NAME OF THE CRIME IN WHICH A PERSON PURPOSELY BETRAYS HIS COUNTRY? (TREASON)	.593	.476	.692	.571	.611	7.48	14.77	8		
82	WHAT IS THE NAME OF THE OCEAN THAT IS LOCATED BETWEEN AFRICA AND AUSTRALIA? (INDIAN)	.585	.435	.712	.635	.542	10.28	21.21	5		
83	WHAT IS THE NAME OF DEER MEAT? (VENISON)	.581	.581	.582	.651	.521	3.71	7.88	2		
84	WHAT IS THE LAST NAME OF THE COMMANDER WHO LOST THE BATTLE OF THE LITTLE BIGHORN RIVER? (CUSTER)	.578	.427	.705	.651	.514	8.08	7.55	2		
85	WHAT IS THE NAME OF AN ILLEGAL MOVE BY A BASEBALL PITCHER THAT RESULTS IN ALL RUNNERS ADVANCING ONE BASE? (BALK)	.570*	.339	.767	.548	.590	7.64	19.32	8		
86	WHAT IS THE NAME OF THE AUTOMOBILE INSTRUMENT THAT MEASURES MILEAGE? (ODOMETER)	.563*	.395	.705	.556	.569	5.17	13.75	8		
87	WHAT IS THE LONGEST RIVER IN SOUTH AMERICA? (AMAZON)	.563	.371	.726	.595	.535	5.23	10.67	3		
88	WHAT IS THE NAME OF THE LIZARD THAT CHANGES ITS COLOR TO MATCH THE SURROUNDINGS? (CHAMELEON)	.559	.468	.637	.556	.563	5.18	11.30	5		
89	WHAT IS THE NAME OF THE CHAPEL WHOSE CEILING WAS PAINTED BY MICHELANGELO? (SISTINE)	.548	.500	.589	.516	.576	5.46	8.76	7		
90	IN WHICH SPORT IS THE STANLEY CUP AWARDED? (HOCKEY)	.544*	.298	.753	.524	.563	4.02	6.86	5		

91	WHAT IS THE LAST NAME OF THE MALE STAR OF THE MOVIE "CASABLANCA"? (BOGART)	.541	.508	.568	.548	.535	6.36	6.87	2
92	WHICH GAME USES A DOUBLING CUBE? (BACKGAMMON)	.533	.395	.651	.468	.590	5.82	14.32	5
93	WHAT ANIMAL RUNS THE FASTEST? (CHEE- TAH)	.530	.387	.651	.579	.486	4.40	10.87	7
94	WHAT WAS THE NAME OF THE ZEPPELIN THAT EXPLODED IN LAKEHURST N.J. IN 1937? (HINDENBURG)	.526	.363	.664	.595	.465	8.72	10.26	4.5
95	WHAT IS THE NAME OF THE SINGER WHO POPULARIZED A DANCE KNOWN AS THE "TWIST"? (CHECKER)	.526	.508	.541	.540	.514	6.18	9.78	7
96	WHAT WAS THE LAST NAME OF THE MAN WHO WAS THE RADIO BROADCASTER FOR THE "WAR OF THE WORLDS"? (WELLES)	.522	.387	.637	.540	.507	6.99	9.15	3
97	WHAT IS THE LAST NAME OF THE MAN WHO ASSASSINATED PRESIDENT JOHN F. KEN- NEDY? (OSWALD)	.522	.411	.616	.444	.590	7.32	17.45	8.5
98	WHAT IS THE NAME OF THE UNIT OF MEA- SURE THAT REFERS TO A SIX-FOOT DEPTH OF WATER? (FATHOM)	.519	.395	.623	.603	.444	7.88	13.10	6
99	WHAT IS THE UNIT OF ELECTRICAL POWER THAT REFERS TO A CURRENT OF ONE AMPERE AT ONE VOLT? (WATT)	.511	.411	.596	.500	.521	12.12	15.32	4
100	WHAT IS THE LAST NAME OF THE AUTHOR WHO WROTE "THE OLD MAN AND THE SEA"? (HEMINGWAY)	.496	.427	.555	.516	.479	3.87	6.55	2.5
101	WHAT IS THE NAME OF THE ORGAN THAT PRODUCES INSULIN? (PANCREAS)	.493†	.427	.548	.381	.590	7.66	17.90	6
102	WHAT IS THE LAST NAME OF THE SECOND U.S. PRESIDENT? (ADAMS)	.485	.427	.534	.484	.486	5.53	10.95	5
103	WHAT IS THE NAME OF SOCRATES' MOST FAMOUS STUDENT? (PLATO)	.470	.444	.493	.397	.535	4.42	9.16	7
104	WHAT IS THE NAME OF THE EXTINCT REP- TILES KNOWN AS "TERRIBLE LIZARDS"? (DINOSAURS)	.467	.452	.479	.444	.486	7.85	11.25	2
105	WHAT IS THE LAST NAME OF THE WOMAN WHO BEGAN THE PROFESSION OF NURS- ING? (NIGHTINGALE)	.467	.556	.390	.429	.500	6.92	9.80	3

TABLE 1—Continued

Item number	Item	Probability of recall						Median latency		Median FOK
		All (N = 270)	Female (N = 124)	Male (N = 146)	UW (N = 126)	UCI (N = 144)				
							L(C)	L(E)		
106	WHAT IS THE NAME OF THE KIND OF CAT THAT SPOKE TO ALICE IN THE STORY "ALICE'S ADVENTURES IN WONDERLAND"? (CHESHIRE)	.463	.492	.438	.508	.424	6.26	12.93	4	
107	WHAT IS THE LAST NAME OF THE MAN WHO WROTE THE "STAR SPANGLED BANNER"? (KEY)	.448	.427	.466	.413	.479	4.90	10.33	6	
108	WHAT IS THE LAST NAME OF THE SCIENTIST WHO DISCOVERED RADIUM? (CURIE)	.433	.379	.479	.452	.417	4.76	8.13	3	
109	WHAT IS THE NAME OF THE FIRST ARTIFICIAL SATELLITE PUT IN ORBIT BY RUSSIA IN 1957? (SPUTNIK)	.433	.242	.596	.429	.438	5.78	9.42	7	
110	OF WHICH COUNTRY IS BUENOS AIRES THE CAPITAL? (ARGENTINA)	.430	.371	.479	.405	.451	6.55	9.14	7	
111	WHAT IS THE NAME OF THE THREE-LEAF CLOVER THAT IS THE EMBLEM OF IRELAND? (SHAMROCK)	.426	.460	.397	.444	.410	9.28	13.38	6.5	
112	WHAT IS THE NAME OF THE PALACE IN LONDON IN WHICH THE MONARCH OF ENGLAND RESIDES? (BUCKINGHAM)	.419	.411	.425	.429	.410	6.68	18.73	4	
113	WHAT IS THE NAME OF THE FURRY ANIMAL THAT ATTACKS COBRA SNAKES? (MON- GOOSE)	.411	.234	.562	.429	.396	6.27	10.93	3.5	
114	IN WHICH CITY IS THE U.S. NAVAL ACADEMY LOCATED? (ANNAPOLIS)	.407	.306	.493	.405	.410	5.96	15.60	4	
115	WHAT IS THE LAST NAME OF BATMAN'S SECRET IDENTITY IN THE BATMAN COMICS? (WAYNE)	.407	.266	.527	.349	.458	9.18	27.65	8	
116	WHAT WAS THE LAST NAME OF THE ACTOR IN THE ROLE OF PERRY MASON ON TELEVISION? (BURR)	.396	.355	.432	.405	.389	7.24	25.05	6	

117	WHICH COUNTRY WAS THE FIRST TO USE GUNPOWDER? (CHINA)	.381*	.153	.575	.357	.403	5.25	8.68	4
118	WHAT IS THE NAME OF ROY ROGERS' HORSE? (TRIGGER)	.374	.379	.370	.365	.382	5.18	11.05	4
119	WHAT ISLAND IS THE LARGEST IN THE WORLD EXCLUDING AUSTRALIA? (GREENLAND)	.374	.266	.466	.389	.361	9.62	17.83	6
120	WHAT IS THE LAST NAME OF THE MAN WHO INVENTED THE PHONOGRAPH? (EDISON)	.370	.282	.445	.389	.354	6.52	6.97	5
121	WHAT IS THE CAPITOL OF NEW YORK? (ALBANY)	.370	.290	.438	.357	.382	3.56	7.15	6
122	WHAT WAS THE LAST NAME OF BUFFALO BILL? (CODY)	.370	.242	.479	.405	.340	4.55	6.48	5
123	WHAT IS THE LAST NAME OF THE JOCKEY WITH THE MOST LIFETIME WINNERS IN HORSE RACING? (SHOEMAKER)	.367†	.306	.418	.230	.486	6.39	8.38	2
124	WHAT IS THE LAST NAME OF THE FIRST SIGNER OF THE "DECLARATION OF INDEPENDENCE"? (HANCOCK)	.367	.355	.377	.365	.368	5.68	11.35	5
125	IN WHICH GAME ARE THE STANDARD PIECES OF STAUNTON DESIGN? (CHESS)	.367	.290	.432	.294	.431	12.74	9.48	1
126	WHAT IS THE NAME OF THE MOUNTAIN RANGE IN WHICH MOUNT EVEREST IS LOCATED? (HIMALAYAS)	.356*	.177	.507	.437	.285	7.37	10.41	5
127	WHAT BRAND OF CIGARETTE WAS FIRST TO HAVE THE FLIP-TOP BOX? (MARLBORO)	.348†	.315	.377	.222	.458	6.76	7.23	1
128	WHAT IS THE LAST NAME OF THE AUTHOR WHO WROTE "OLIVER TWIST"? (DICKENS)	.344	.315	.370	.373	.319	6.93	9.05	5
129	WHAT IS THE LAST NAME OF THE AMERICAN WHO STARRED IN THE 1936 OLYMPICS (OWENS)	.341*	.129	.521	.357	.326	6.46	11.27	4
130	WHAT IS THE LAST NAME OF THE MAN WHO WAS THE VOICE OF MR. MAGOO? (BACKUS)	.341	.282	.390	.294	.382	5.58	8.31	5
131	WHAT IS THE NAME OF THE UNSUCCESSFUL AUTO THAT WAS MANUFACTURED BY THE FORD MOTOR COMPANY FROM 1957-1959? (EDSEL)	.337	.194	.459	.349	.326	5.32	15.32	3
132	WHAT IS THE LAST NAME OF THE AUTHOR OF THE BOOK "1984"? (ORWELL)	.330	.290	.363	.310	.347	6.07	7.91	7

TABLE 1—Continued

Item number	Item	Probability of recall						Median latency		Median FOK
		All (N = 270)	Female (N = 124)	Male (N = 146)	UW (N = 126)	UCI (N = 144)				
							L(C)	L(E)		
133	WHAT IS THE NAME OF THE SUBMARINE IN JULES VERNE'S "20000 LEAGUES BENEATH THE SEA"? (NAUTILUS)	.326	.161	.466	.397	.264	6.47	10.90	2	
134	WHAT IS THE NAME OF THE HILLBILLY FAMILY THAT HAD A FAMOUS FEUD WITH THE MCCOY FAMILY? (HATFIELD)	.326	.290	.356	.405	.257	5.55	18.95	6	
135	OF WHICH COUNTRY IS NAIROBI THE CAPITAL? (KENYA)	.326	.194	.438	.317	.333	7.24	10.62	4	
136	WHAT IS THE LAST NAME OF THE AUTHOR WHO WROTE UNDER THE PSEUDONYM OF MARK TWAIN? (CLEMENS)	.322	.298	.342	.270	.368	5.33	14.96	6.5	
137	WHAT IS THE NAME OF BATMAN'S BUTLER? (ALFRED)	.319	.242	.384	.270	.361	4.73	10.50	7	
138	WHAT IS THE LAST NAME OF THE ACTOR WHO PORTRAYED SARGEANT FRIDAY ON "DRAGNET"? (WEBB)	.319	.218	.404	.325	.313	6.52	12.46	6	
139	IN WHAT EUROPEAN CITY IS THE PARTHENON LOCATED? (ATHENS)	.315	.298	.329	.317	.313	6.53	7.28	4	
140	WHAT IS THE NAME OF THE COLLAR BONE? (CLAVICLE)	.311	.323	.301	.286	.333	3.71	9.70	3	
141	WHAT WAS THE LAST NAME OF THE ACTOR WHO PORTRAYED THE FATHER ON THE TELEVISION SHOW "FATHER KNOWS BEST"? (YOUNG)	.311†	.339	.288	.183	.424	6.16	25.05	7	
142	WHAT IS THE NAME OF THE ROMAN EMPEROR WHO FIDDLLED WHILE ROME BURNED? (NERO)	.311	.250	.363	.286	.333	4.88	9.98	3	
143	WHAT IS THE LAST NAME OF THE ASTRONOMER WHO PUBLISHED IN 1543 HIS THEORY THAT THE EARTH REVOLVES AROUND THE SUN? (COPERNICUS)	.304	.218	.377	.302	.306	9.92	12.05	5	

144	WHAT IS THE LAST NAME OF THE MAN WHO INVENTED THE TELEGRAPH? (MORSE)	.300	.234	.356	.262	.333	8.30	7.94	6
145	WHAT ITALIAN CITY WAS DESTROYED WHEN MOUNT VESUVIUS ERUPTED IN 79 A.D.? (POMPEII)	.300	.234	.356	.294	.306	6.25	15.42	3
146	WHAT WAS FRANK LLOYD WRIGHT'S PROFESSION? (ARCHITECT)	.296	.266	.322	.294	.299	3.31	11.10	3
147	WHAT IS THE LAST NAME OF THE MAN WHO WROTE "CANTERBURY TALES"? (CHAUCER)	.293	.266	.315	.230	.347	4.31	7.42	4
148	WHAT IS THE NAME OF THE MANSION IN VIRGINIA THAT WAS THOMAS JEFFERSON'S HOME? (MONTICELLO)	.278	.218	.329	.270	.285	5.62	11.23	4
149	WHAT IS THE LAST NAME OF THE AUTHOR WHO WROTE "BRAVE NEW WORLD"? (HUXLEY)	.270	.194	.336	.262	.278	4.00	6.82	3
150	OF WHICH COUNTRY IS BUDAPEST THE CAPITOL? (HUNGARY)	.270	.234	.301	.341	.208	4.87	10.45	6
151	WHAT WAS THE LAST NAME OF THE VENETRILOQUIST WHO PROVIDED THE VOICE FOR CHARLIE MCCARTHY? (BERGEN)	.263	.234	.288	.183	.333	8.40	8.78	2
152	WHAT IS THE NAME OF THE CONSTELLATION THAT LOOKS LIKE A FLYING HORSE? (PEGASUS)	.259	.194	.315	.230	.285	5.88	9.38	4
153	IN WHICH CITY IS HEATHROW AIRPORT LOCATED? (LONDON)	.256	.194	.308	.302	.215	5.29	6.62	2
154	WHAT IS THE LAST NAME OF THE MAN WHO FIRST STUDIED GENETIC INHERITANCE IN PLANTS? (MENDEL)	.256	.194	.308	.238	.271	6.88	7.42	2
155	WHAT IS THE NAME OF THE NAVIGATION INSTRUMENT USED AT SEA TO PLOT POSITION BY THE STARS? (SEXTANT)	.256	.161	.336	.302	.215	6.63	17.68	4
156	WHAT KIND OF POISON DID SOCRATES TAKE AT HIS EXECUTION? (HEMLOCK)	.252	.185	.308	.230	.271	4.98	9.04	4
157	WHAT IS THE LAST NAME OF THE DOCTOR WHO FIRST DEVELOPED A VACCINE AGAINST POLIO? (SALK)	.248	.210	.281	.183	.306	5.10	9.65	5
158	WHAT IS THE LAST NAME OF THE AUTHOR OF "LITTLE WOMEN"? (ALCOTT)	.248	.379	.137	.214	.278	3.85	6.58	2

TABLE 1—Continued

Item number	Item	Probability of recall							Median latency		Median FOK
		All (N = 270)	Female (N = 124)	Male (N = 146)	UW (N = 126)	UCI (N = 144)					
							L(C)	L(E)			
159	WHAT IS THE ONLY WORD THE RAVEN SAYS IN EDGAR ALLEN POE'S POEM "THE RAVEN"? (NEVERMORE)	.244	.202	.281	.206	.278	5.70	17.48	3		
160	WHAT IS THE NAME OF THE RIVER ON WHICH BONN IS LOCATED? (RHINE)	.244	.137	.336	.333	.167	7.96	9.73	3		
161	WHO WAS THE MOST FAMOUS GREEK DOCTOR? (HIPPOCRATES)	.241	.202	.274	.183	.292	4.48	10.76	3		
162	WHAT IS THE LAST NAME OF THE MAN WHO WAS PRESIDENT DIRECTLY AFTER JAMES MADISON? (MONROE)	.237	.202	.267	.230	.243	8.78	9.76	3		
163	WHAT WAS THE LAST NAME OF THE CAPTAIN OF THE BRITISH SHIP "BOUNTY" WHEN THE MUTINY OCCURRED? (BLIGH)	.233	.169	.288	.238	.229	8.08	10.00	3		
164	IN ADDITION TO THE KENTUCKY DERBY AND THE BELMONT STAKES WHAT HORSE RACE COMPRISES THE TRIPLE CROWN? (BREAKNESS)	.233	.121	.329	.230	.236	7.18	16.90	3.5		
165	IN WHICH CITY DOES THE COTTON BOWL TAKE PLACE? (DALLAS)	.233	.145	.308	.206	.257	8.66	11.83	5		
166	FOR WHICH COUNTRY IS THE RUPEE THE MONETARY UNIT? (INDIA)	.230	.202	.253	.270	.194	5.50	11.96	3		
167	WHAT IS THE PALACE BUILT IN FRANCE BY KING LOUIS XIV? (VERSAILLES)	.226	.218	.233	.230	.222	6.12	8.77	3		
168	WHAT IS THE NAME OF THE CAPTAIN OF THE PEQUOD IN THE BOOK "MOBY DICK"? (AHAB)	.222	.105	.322	.190	.250	8.93	10.37	3.5		
169	WHICH SPORT USES THE TERMS "STONES" AND "BROOMS"? (CURLING)	.222†	.089	.336	.341	.118	9.72	16.10	3		
170	WHAT IS THE CAPITOL OF DENMARK? (COPENHAGEN)	.222	.194	.247	.254	.194	6.52	9.05	3		
171	WHAT WAS THE NAME OF ALEXANDER GRAHAM BELL'S ASSISTANT? (WATSON)	.219	.153	.274	.230	.208	5.03	7.18	2		

172	WHAT IS THE LAST NAME OF THE INVENTOR OF THE STEAMBOAT "CLERMONT"? (FULTON)	.215	.161	.260	.183	.243	6.82	6.93	3
173	WHAT IS THE NAME OF GERMANY'S LARGEST BATTLESHIP THAT WAS SUNK IN WORLD WAR II? (BISMARCK)	.215*	.032	.370	.214	.215	5.88	8.41	2.5
174	THE DEEPEST PART OF THE OCEAN IS LOCATED AT WHICH TRENCH? (MARIANA)	.211	.105	.301	.198	.222	4.06	9.82	2
175	WHO WAS THE LEADER OF THE ARGONAUTS? (JASON)	.211	.129	.281	.214	.208	3.72	7.08	1
176	WHAT IS THE LAST NAME OF THE COMPOSER OF THE "MAPLE LEAF RAG"? (JOPLIN)	.207	.169	.240	.206	.208	4.78	5.11	1
177	IN WHAT ANCIENT CITY WERE THE "HANGING GARDENS" LOCATED? (BABYLON)	.207	.153	.253	.183	.229	4.28	10.47	3
178	WHAT IS THE NAME OF THE NORTH STAR? (POLARIS)	.204	.089	.301	.238	.174	4.53	7.67	4
179	WHAT IS THE LAST NAME OF THE JUDGE WHO WAS KNOWN AS "THE LAW WEST OF THE PECOS"? (BEAN)	.204	.153	.247	.190	.215	6.68	8.28	1
180	WHAT IS JOHN KENNETH GALBRAITH'S PROFESSION? (ECONOMIST)	.204	.121	.274	.143	.257	5.05	10.22	2
181	WHAT IS THE LAST NAME OF THE MAN WHO BEGAN THE REFORMATION IN GERMANY? (LUTHER)	.200	.161	.233	.190	.208	6.38	7.88	3
182	WHAT IS THE PROPER NAME FOR A BADMINTON BIRD? (SHUTTLECOCK)	.200	.153	.240	.270	.139	7.58	8.72	4.5
183	WHAT IS THE LAST NAME OF THE ACTOR WHO RECEIVED THE BEST ACTOR AWARD FOR THE MOVIE "ON THE WATERFRONT"? (BRANDO)	.196	.161	.226	.175	.215	6.66	8.53	3
184	WHAT IS THE LAST NAME OF THE MOVIE ACTOR WHO PORTRAYED SPARTACUS? (DOUGLAS)	.196	.137	.247	.167	.222	6.83	5.94	2
185	WHAT IS THE LAST NAME OF THE AUTHOR WHO WROTE "THE MURDERS IN THE RUE MORGUE"? (POE)	.196	.153	.233	.206	.188	4.63	6.02	2
186	WHAT WAS THE NAME OF THE UNION IRONCLAD SHIP THAT FOUGHT THE CONFEDERATE IRONCLAD MERRIMACK? (MONITOR)	.196	.089	.288	.175	.215	7.46	11.07	4

TABLE 1—Continued

Item number	Item	Probability of recall						Median latency		Median FOK
		All (N = 270)	Female (N = 124)	Male (N = 146)	UW (N = 126)	UCI (N = 144)				
							L(C)	L(E)		
187	WHAT WAS THE NAME OF KING ARTHUR'S SWORD? (EXCALIBUR)	.193	.097	.274	.190	.194	4.22	7.95	3	
188	WHAT WAS THE NAME OF THE APOLLO LUNAR MODULE THAT LANDED THE FIRST MAN ON THE MOON? (EAGLE)	.189	.081	.281	.167	.208	5.95	17.21	7	
189	WHAT IS THE LAST NAME OF THE MAN WHO INVENTED DYNAMITE? (NOBEL)	.185	.073	.281	.143	.222	5.40	6.31	2	
190	WHAT IS THE LAST NAME OF THE AUTHOR OF THE JAMES BOND NOVELS? (FLEMING)	.181	.065	.281	.183	.181	6.80	7.35	3	
191	WHO IS KNOWN AS "THE FATHER OF GEOMETRY"? (EUCLID)	.178	.161	.192	.111	.236	4.04	9.48	6	
192	WHAT IS THE LAST NAME OF THE AUTHOR WHO WROTE THE SHERLOCK HOLMES STORIES? (DOYLE)	.167	.105	.219	.175	.160	5.31	9.97	3	
193	WHAT IS THE LAST NAME OF THE HUSBAND-WIFE SPIES WHO WERE ELECTROCUTED IN 1951 FOR PASSING ATOMIC SECRETS TO RUSSIA? (ROSENBERG)	.159	.105	.205	.151	.167	12.29	9.17	2	
194	WHAT IS THE NAME OF THE BASEBALL PLAYER WITH THE HIGHEST LIFETIME BATTING AVERAGE IN THE MAJOR LEAGUES? (COBB)	.159*	.016	.281	.167	.153	7.40	8.97	3	
195	IN WHAT PROFESSION WAS EMMETT KELLY? (CLOWN)	.159	.145	.171	.143	.174	5.07	7.52	2	
196	WHAT IS THE CAPITOL OF DELAWARE? (DOVER)	.156	.161	.151	.190	.125	4.15	9.64	5	
197	WHAT IS THE LAST NAME OF THE DOCTOR WHO PERFORMED THE FIRST SUCCESSFUL HUMAN HEART TRANSPLANT? (BARNARD)	.152	.113	.185	.135	.167	9.48	7.62	2	

198	WHAT IS THE NAME OF THE AVENUE THAT IMMEDIATELY FOLLOWS ATLANTIC AVENUE IN THE GAME OF MONOPOLY? (VENT-NOR)	.152	.097	.199	.127	.174	12.53	17.12	6
199	WHAT IS THE NAME OF THE COMPANY THAT PRODUCES "BABY RUTH" CANDY BARS? (CURTISS)	.148	.137	.158	.127	.167	6.55	16.53	6
200	WHAT ARE PEOPLE CALLED WHO EXPLORE CAVES? (SPELUNKERS)	.144	.121	.164	.183	.111	3.35	10.47	4
201	WHAT IS THE CAPITOL OF CZECHOSLOVAKIA? (PRAGUE)	.144	.097	.185	.143	.146	4.42	5.66	3.5
202	WHAT IS THE LAST NAME OF THE FOOTBALL PLAYER KNOWN AS "THE GALLOPING GHOST"? (GRANGE)	.144*	.008	.260	.111	.174	6.63	9.72	2
203	IN WHICH CITY IS MICHELANGELO'S STATUE OF DAVID LOCATED? (FLORENCE)	.137	.113	.158	.087	.181	5.53	9.77	6
204	WHAT IS THE LAST NAME OF THE CRIMINAL WHO WAS KILLED BY FBI AGENTS OUTSIDE OF A CHICAGO MOVIE THEATER? (DILLINGER)	.137	.065	.199	.175	.104	8.72	12.10	3
205	WHAT IS THE NAME OF THE SHIP ON WHICH CHARLES DARWIN MADE HIS SCIENTIFIC VOYAGE? (BEAGLE)	.137	.065	.199	.079	.188	5.76	8.43	2
206	WHAT ARE PEOPLE WHO MAKE MAPS CALLED? (CARTOGRAPHERS)	.137	.137	.137	.198	.083	2.96	9.37	5
207	WHAT IS THE NAME OF THE PROJECT WHICH DEVELOPED THE ATOMIC BOMB DURING WORLD WAR II? (MANHATTAN)	.133	.048	.205	.127	.139	5.80	11.07	3
208	WHAT IS THE LAST NAME OF THE MAN WHO SAID "I ONLY REGRET THAT I HAVE BUT ONE LIFE TO LOSE FOR MY COUNTRY"? (HALE)	.133	.121	.144	.103	.160	7.22	16.68	7
209	WHAT IS THE LAST NAME OF THE FIRST PERSON TO CLIMB MOUNT EVEREST? (HIL-LARY)	.133	.024	.226	.119	.146	3.62	6.91	2
210	WHAT IS THE LAST NAME OF THE FRENCH AUTHOR WHO WROTE "THE STRANGER"? (CAMUS)	.122	.089	.151	.111	.132	4.32	5.95	1
211	WHAT IS THE CAPITOL OF FINLAND? (HEL-SINKI)	.119	.073	.158	.119	.118	4.23	9.72	3

TABLE 1—Continued

Item number	Item	Probability of recall						Median latency		Median FOK
		All (N = 270)	Female (N = 124)	Male (N = 146)	UW (N = 126)	UCI (N = 144)				
							L(C)	L(E)		
212	WHAT IS THE LAST NAME OF THE MOST POPULAR PIN-UP GIRL OF WORLD WAR II? (GRABLE)	.119	.129	.110	.095	.139	5.43	7.91	6	
213	WHAT IS THE CAPITOL OF CHILE? (SANTIAGO)	.115	.089	.137	.111	.118	4.48	14.72	5	
214	WHAT IS THE LAST NAME OF THE ARTIST WHO PAINTED "GUERNICA"? (PICASSO)	.111	.113	.110	.095	.125	9.21	4.58	1	
215	WHAT IS THE LAST NAME OF THE PILOT OF THE U-2 SPY PLANE SHOT DOWN OVER RUSSIA IN 1960? (POWERS)	.107	.032	.171	.063	.146	5.58	7.64	2	
216	WHAT IS THE LAST NAME OF THE PLAYWRIGHT WHO WROTE "A STREETCAR NAMED DESIRE"? (WILLIAMS)	.107	.081	.130	.095	.118	8.53	7.74	2	
217	WHAT IS THE LAST NAME OF THE ACTOR WHO PORTRAYED THE SHERIFF IN THE MOVIE "HIGH NOON"? (COOPER)	.107	.073	.137	.071	.139	5.50	8.10	3	
218	WHAT IS THE CAPITOL OF CANADA? (OTTAWA)	.104	.073	.130	.119	.090	6.28	5.28	7	
219	WHAT IS THE LAST NAME OF THE INVENTOR OF THE WIRELESS RADIO? (MARCONI)	.104	.065	.137	.111	.097	3.61	11.10	4	
220	WHAT WAS THE LAST NAME OF THE FEMALE STAR OF THE MOVIE "CASABLANCA"? (BERGMAN)	.100	.129	.075	.079	.118	4.20	7.50	3	
221	OVER WHICH RIVER IS THE GEORGE WASHINGTON BRIDGE? (HUDSON)	.096	.056	.130	.127	.069	6.16	7.87	5	
222	WHAT IS THE NAME OF THE MOUNTAIN RANGE THAT SEPARATES ASIA FROM EUROPE? (URAL)	.096	.048	.137	.111	.083	7.55	13.26	5	
223	WHAT WAS THE NAME OF THE CLOWN ON THE "HOWDY DOODY" TELEVISION SHOW? (CLARABELL)	.096	.073	.116	.103	.090	10.43	7.42	2	

224	WHAT WAS THE LAST NAME OF THE CHARACTER PORTRAYED BY ROBERT STACK ON THE TELEVISION SHOW "THE UNTOUCHABLES"? (NESS)	.093	.048	.130	.119	.069	14.09	8.00	3
225	FOR WHICH COUNTRY IS THE DRACHMA THE MONETARY UNIT? (GREECE)	.089	.056	.116	.087	.090	7.75	8.80	3
226	WHAT IS THE LAST NAME OF DAGWOOD'S BOSS IN THE COMIC STRIP "BLONDI"? (DITHERS)	.085	.065	.103	.127	.049	5.70	6.14	2
227	WHAT IS THE LAST NAME OF THE BOXER WHO WAS KNOWN AS THE "MANASSA MAULER"? (DEMPSEY)	.081	.008	.144	.056	.104	6.20	8.94	1
228	WHAT IS THE NAME OF THE CHINESE RELIGION FOUNDED BY LAO TSE? (TAOISM)	.081	.048	.110	.079	.083	13.32	10.63	5
229	WHAT IS THE LAST NAME OF THE MAN WHO CREATED THE COMIC STRIP "LI'L ABNER"? (CAPP)	.081	.056	.103	.111	.056	5.97	5.95	1.5
230	WHAT IS THE LAST NAME OF THE WOMAN WHO FOUNDED THE AMERICAN RED CROSS? (BARTON)	.081	.129	.041	.095	.069	7.97	6.45	2
231	WHAT IS THE CITY IN WHICH THE BASEBALL HALL OF FAME IS LOCATED? (COOPERSTOWN)	.081	.016	.137	.040	.118	6.95	8.32	4.5
232	WHAT IS THE NAME OF THE BRIGHTEST STAR IN THE SKY EXCLUDING THE SUN? (SIRIUS)	.078	.048	.103	.103	.056	10.96	11.37	6
233	WHAT IS THE NAME OF THE ISLAND ON WHICH NAPOLEON WAS BORN? (CORSIKA)	.078	.056	.096	.048	.104	10.05	9.22	3
234	WHAT IS THE LAST NAME OF THE BASEBALL PLAYER WHO PITCHED A PERFECT GAME IN THE 1956 WORLD SERIES? (LARSEN)	.078	.016	.130	.048	.104	4.70	10.11	2
235	WHAT IS THE CAPITOL OF JAMAICA? (KINGSTON)	.078	.040	.110	.095	.063	5.15	8.13	3
236	WHAT IS THE LONGEST RIVER IN ASIA? (YANGTZE)	.074	.040	.103	.127	.028	7.66	8.32	4
237	WHAT IS THE LAST NAME OF THE BRITISH ADMIRAL WHO WON THE BATTLE OF TRAFALGAR? (NELSON)	.074	.056	.089	.063	.083	4.44	8.17	1

TABLE 1—Continued

Item number	Item	Probability of recall							Median latency		Median FOK
		All (N = 270)	Female (N = 124)	Male (N = 146)	UW (N = 126)	UCI (N = 144)					
							L(C)	L(E)			
238	WHAT IS THE LAST NAME OF THE ACTOR KNOWN AS "THE MAN OF A THOUSAND FACES"? (CHANEY)	.074	.032	.110	.032	.111	11.32	11.29	3.5		
239	WHAT IS THE LAST NAME OF THE FIRST MAN TO RUN THE MILE IN UNDER FOUR MINUTES? (BANNISTER)	.070	.024	.110	.071	.069	7.70	7.51	4		
240	WHAT IS THE LAST NAME OF THE AUTHOR WHO WROTE "BROTHERS KARAMAZOV"? (DOSTOYEVSKI)	.070	.040	.096	.087	.056	10.83	5.75	2		
241	OF WHICH COUNTRY IS BAGDAD THE CAPITAL? (IRAQ)	.070	.040	.096	.079	.063	14.00	9.99	6		
242	WHAT IS THE LAST NAME OF THE CRIMINAL WHO WAS KNOWN AS "SCARFACE"? (CAPONE)	.067	.032	.096	.063	.069	4.52	8.60	2		
243	WHAT WAS THE NAME OF ROY ROGER'S DOG? (BULLET)	.063	.056	.068	.024	.097	6.54	7.03	2		
244	WHAT IS THE NAME OF THE AUTHOR WHO RECEIVED A PULITZER PRIZE FOR HIS WRITINGS ABOUT ABRAHAM LINCOLN? (SANDBURG)	.059	.032	.082	.063	.056	7.63	7.56	1.5		
245	WHAT IS THE LAST NAME OF THE EUROPEAN AUTHOR WHO WROTE "THE TRIAL"? (KAFKA)	.059	.032	.082	.024	.090	13.47	5.18	1		
246	WHAT IS THE LAST NAME OF THE MAN WHO CREATED THE COMIC STRIP "WOODY WOODPECKER"? (LANTZ)	.059	.024	.089	.032	.083	6.78	6.64	3		
247	WHAT IS THE NAME OF THE SUBSTANCE DERIVED FROM A WHALE THAT IS USED TO MAKE PERFUME? (AMBERGRIS)	.056	.016	.089	.048	.063	7.30	12.25	6		

248	WHAT IS THE NAME OF THE MAN WHO REMOVED THE THORN FROM THE LION'S PAW IN THE STORY FROM AESOP'S FABLES? (ANDROCLES)	.056	.056	.055	.063	.049	9.17	11.15	3
249	WHAT IS THE NAME OF THE RIVER THAT RUNS THROUGH ROME? (TIBER)	.056	.032	.075	.071	.042	15.68	11.65	3
250	WHO WAS THE FIRST RULER OF THE HOLY ROMAN EMPIRE? (CHARLEMAGNE)	.052	.040	.062	.071	.035	10.42	11.03	3
251	WHAT FAMOUS KNOT DID ALEXANDER THE GREAT UNDO? (GORDIAN)	.048	.024	.068	.063	.035	12.80	11.22	2
252	WHAT IS THE NAME OF THE INSTRUMENT USED TO MEASURE WINDSPEED? (ANEMOMETER)	.048	.024	.068	.048	.049	5.93	12.32	4
253	WHAT IS THE LAST NAME OF THE AUTHOR OF "OUR TOWN"? (WILDER)	.048	.073	.027	.040	.056	10.87	8.34	2
254	IN WHICH COUNTRY IS ANGEL FALLS LOCATED? (VENEZUELA)	.048	.016	.075	.040	.056	8.27	10.78	2
255	THE GENERAL NAMED HANNIBAL WAS FROM WHAT CITY? (CARTHAGE)	.048	.000	.089	.056	.042	11.73	11.30	3
256	WHAT IS THE LAST NAME OF THE SINGER WHO MADE A HIT RECORDING OF THE SONG "WHO'S SORRY NOW"? (FRANCIS)	.048	.081	.021	.056	.042	—	9.43	2
257	WHAT IS THE LAST NAME OF THE CUBAN LEADER THAT CASTRO OVERTHREW? (BATISTA)	.044	.032	.055	.024	.063	—	8.48	2
258	WHAT IS THE CAPITOL OF KENTUCKY? (FRANKFORT)	.044	.048	.041	.048	.042	28.10	11.80	5
259	WHAT IS THE LAST NAME OF THE ARTIST WHO PAINTED "THE PERSISTENCE OF MEMORY"? (DALI)	.041	.048	.034	.056	.028	—	6.42	1
260	WHAT IS THE NAME OF THE RUBBER ROLLER ON A TYPEWRITER? (PLATEN)	.041	.024	.055	.048	.035	6.72	11.20	4
261	WHAT IS THE LAST NAME OF THE COMPOSER WHO WROTE THE OPERA "DON GIOVANNI"? (MOZART)	.041	.032	.048	.048	.035	12.98	5.01	1
262	WHAT IS THE NAME OF THE FOUNTAIN IN ROME INTO WHICH COINS ARE THROWN FOR GOOD LUCK? (TREVII)	.041	.048	.034	.024	.056	5.34	9.47	4

TABLE 1—Continued

Item number	Item	Probability of recall						Median latency		Median FOK
		All (N = 270)	Female (N = 124)	Male (N = 146)	UW (N = 126)	UCI (N = 144)	Median latency			
							L(C)	L(E)		
263	WHAT WAS THE NAME OF THE LARGEST CONFEDERATE MILITARY PRISON DURING THE CIVIL WAR? (ANDERSONVILLE)	.037	.016	.055	.016	.056	11.85	7.56	2	
264	WHAT IS THE LAST NAME OF THE COSMONAUT WHO WAS THE FIRST PERSON TO ORBIT AROUND THE EARTH? (GAGARIN)	.037	.008	.062	.032	.042	9.32	10.01	3	
265	WHAT IS THE NAME OF THE INDIAN COLLEGE IN PENNSYLVANIA FOR WHICH JIM THORPE PLAYED FOOTBALL? (CARLISLE)	.037	.000	.068	.016	.056	6.27	13.12	2	
266	WHAT IS THE LAST NAME OF THE AUTHOR OF "THE AGONY AND THE ECSTASY"? (STONE)	.037	.048	.027	.024	.049	5.54	7.50	3	
267	WHAT IS THE LAST NAME OF THE ARTIST WHO PAINTED "AMERICAN GOTHIC"? (WOOD)	.033	.040	.027	.056	.014	—	6.52	2	
268	WHAT IS THE LAST NAME OF FLASH'S GIRLFRIEND IN THE COMIC STRIP "FLASH GORDON"? (ARDEN)	.033	.008	.055	.056	.014	13.13	7.28	1	
269	WHAT IS THE NAME OF THE FIRST MOVIE TO RECEIVE THE ACADEMY AWARD FOR BEST PICTURE? (WINGS)	.030	.032	.027	.016	.042	5.95	9.61	2	
270	WHAT IS THE LAST NAME OF THE DISCOVERER OF THE VACCINATION FOR SMALLPOX? (JENNER)	.030	.024	.034	.016	.042	20.42	10.48	5	
271	WHAT IS THE LAST NAME OF THE BOY IN THE BOOK "TREASURE ISLAND"? (HAWKINS)	.026	.040	.014	.040	.014	—	8.14	2	
272	WHAT IS THE LAST NAME OF THE BOXER WHO WON THE BOXING TITLE FROM JOHN L. SULLIVAN? (CORBETT)	.026	.000	.048	.008	.042	9.35	8.60	2	

273	WHAT IS THE NAME OF THE PLAY IN WHICH ELWOOD P. DOWD IS A CHARACTER? (HARVEY)	.026	.016	.034	.032	.021	8.62	7.36	1
274	WHAT WAS THE NAME OF THE GOLDFISH IN THE STORY OF PINOCCHIO? (CLEO)	.026	.032	.021	.008	.042	5.95	5.86	2
275	WHAT IS THE LAST NAME OF THE MAN WHO WROTE THE SONG "HOW DEEP IS THE OCEAN"? (BERLIN)	.022	.016	.027	.000	.042	32.78	6.36	1
276	WHAT IS THE LAST NAME OF THE MAN WHO IS REGARDED AS THE NATIONAL POET OF SCOTLAND? (BURNS)	.019	.024	.014	.024	.014	3.43	8.07	1
277	WHAT WAS THE LAST NAME OF BILLY THE KID? (BONNEY)	.019	.000	.034	.008	.028	25.65	7.80	3
278	WHAT IS THE LAST NAME OF THE SINGER WHOSE THEME SONG WAS "WHEN THE BLUE OF THE NIGHT MEETS THE GOLD OF THE DAY"? (CROSBY)	.019	.024	.014	.008	.028	19.68	8.98	1
279	FROM WHAT MUSICAL IS THE SONG "BAU- BLES BANGLES AND BEADS"? (KISMET)	.019	.032	.007	.008	.028	7.65	8.47	1
280	WHAT WAS THE LAST NAME OF THE ACTOR WHO PORTRAYED DR. WATSON IN THE SHERLOCK HOLMES SERIES? (BRUCE)	.019	.008	.027	.024	.014	7.12	7.70	2
281	WHAT IS THE LAST NAME OF THE MAN WHO WAS MOST RESPONSIBLE FOR PHOTO- GRAPHING THE U.S. CIVIL WAR? (BRADY)	.019	.016	.021	.016	.021	8.37	7.72	2
282	WHAT IS THE NAME OF THE VILLAINOUS PEOPLE WHO LIVED UNDERGROUND IN H. G. WELLS' BOOK "THE TIME MA- CHINE"? (MORLOCKS)	.019	.000	.034	.008	.028	45.45	7.68	2
283	WHAT IS THE NAME OF A NUMBER TWO WOOD IN GOLF? (BRASSIE)	.015	.000	.027	.016	.014	—	10.92	3
284	WHAT IS THE CAPITOL OF AUSTRALIA? (CANBERRA)	.015	.008	.021	.024	.007	—	6.30	6
285	WHAT IS THE LAST NAME OF THE POET WHO ORIGINALLY WROTE "DON JUAN"? (BYRON)	.011	.016	.007	.024	.000	—	10.02	3
286	WHAT IS THE LAST NAME OF THE TWENTY- FIRST U.S. PRESIDENT? (ARTHUR)	.011	.008	.014	.016	.007	11.85	12.38	3

TABLE 1—Continued

Item number	Item	Probability of recall							
		All (N = 270)	Female (N = 124)	Male (N = 146)	UW (N = 126)	UCI (N = 144)	Median latency		
							L(C)	L(E)	
									Median FOK
287	WHAT IS THE LAST NAME OF THE POET WHO WROTE THE LINE "INTO EACH LIFE A LITTLE RAIN MUST FALL"? (LONG-FELLOW)	.011	.000	.021	.000	.021	6.50	7.52	1
288	WHAT WAS THE NAME OF THE NUCLEAR SUBMARINE THAT SUNK IN THE ATLANTIC IN 1963? (THRESHER)	.007	.000	.014	.008	.007	—	9.98	3
289	WHAT WAS THE NAME OF GENE AUTRY'S HORSE? (CHAMPION)	.007	.000	.014	.008	.007	—	8.82	3
290	WHAT IS THE NAME OF THE LAND OF THE GIANTS IN "GULLIVER'S TRAVELS"? (BRODINGNAG)	.007	.000	.014	.008	.007	—	9.88	5
291	WHAT IS THE NAME OF THE TOWN THROUGH WHICH LADY GODIVA SUPPOSEDLY MADE HER FAMOUS RIDE? (COVENTRY)	.007	.000	.014	.000	.014	—	8.23	3
292	WHAT IS THE LAST NAME OF THE UNION GENERAL WHO DEFEATED THE CONFEDERATE ARMY AT THE CIVIL WAR BATTLE OF GETTYSBURG? (MEADE)	.004	.000	.007	.000	.007	8.92	13.13	6.5

293	WHAT IS THE LAST NAME OF THE SONG- WRITER WHO WROTE THE SONG "I LOVE PARIS"? (PORTER)	.004	.000	.007	.000	.007	—	6.23	1
294	WHAT IS THE LAST NAME OF THE FIRST WOMAN TO SWIM ACROSS THE ENGLISH CHANNEL? (EDERLE)	.004	.000	.007	.008	.000	—	6.30	3
295	WHAT IS THE LAST NAME OF THE FIRST FLIER TO FLY SOLO AROUND THE WORLD? (POST)	.004	.000	.007	.008	.000	—	10.72	4
296	WHAT IS THE LAST NAME OF THE MAN WHO SUPPOSEDLY KILLED JESSE JAMES? (FORD)	.004	.008	.000	.000	.007	—	8.92	3
297	WHAT IS THE LAST NAME OF THE FIRST AMERICAN AUTHOR TO WIN THE NOBEL PRIZE FOR LITERATURE? (HENRY)	.000	.000	.000	.000	.000	—	8.97	1.5
298	WHAT IS THE LAST NAME OF THE MAN WHO WROTE THE POEM "IT COULDN'T BE DONE"? (GUEST)	.000	.000	.000	.000	.000	—	5.15	1
299	WHO WAS THE RACEHORSE OF THE YEAR FOR MANY SUCCESSIVE YEARS IN THE 1960'S? (KELSO)	.000	.000	.000	.000	.000	—	11.85	2
300	WHAT IS THE HIGHEST MOUNTAIN IN SOUTH AMERICA? (ACONCAGUA)	.000	.000	.000	.000	.000	—	10.57	4

* Item had reliably different probability of recall across males versus females ($p < .001$) for each university.

† Item had reliably different probability of recall across the two universities ($p < .001$).

easier or harder to recall, regardless of whether the subjects are male or female.

University Differences

As Table 1 indicates, only five items differed reliably across the two universities in the absolute probability of correct recall. Items 101, 123, 127, and 141 were easier for the UCI sample than for the UW sample, and item 169 was easier for the UW sample than for the UCI sample.

Even more important, however, the relative difficulty across the 300 items was highly similar for UW subjects versus UCI subjects ($r = +.976$). This conclusion holds both for UW males versus UCI males ($r = +.967$) and for UW females versus UCI females ($r = +.962$). Considering that the UW subjects responded in response booklets while the UCI subjects responded by typing their responses at a computer console, this finding can also be interpreted to mean that the relative difficulty across the 300 items was roughly the same for testing via response booklets versus testing via computer.

Latency Data, Feeling-of-Knowing Ratings, and Relation to Accuracy Data

The latency data and feeling-of-knowing ratings shown in the last three columns of Table 1 come from 43 UCI subjects, as described previously. Although we report all of these data for completeness, the reader should be aware that the reliability varies systematically in the following way. The reliability of the median latency of correct recall, $L(C)$, is directly related to the probability of correct recall because, as that probability increases, the number of items upon which the median $L(C)$ is based will increase. By contrast, the reliability of the median latency of an error, $L(E)$, and the reliability of the median feeling-of-knowing rating, FOK, are inversely related to the probability of correct recall because, as that probability decreases, the number of items upon which the median $L(E)$ and the median FOK are based will increase. For some items near the top of Table 1, none of the 43

subjects made errors and, hence, no median $L(E)$ or median FOK is reported; for some items near the bottom of Table 1, none of the 43 subjects made correct responses and, hence, no median $L(C)$ is reported. One can estimate the number of observations upon which the median $L(C)$ for a given item is based by multiplying that item's probability of correct recall for the UCI sample by 43. Although the result is not an exact estimate—the reported probability of correct recall for the UCI sample is based on all 144 UCI subjects—such an estimate is quite good because the probability of correct recall across the 300 items is highly correlated for the 43 UCI subjects who donated latency-FOK data versus the remaining 101 UCI subjects ($r = +.968$).

Next, consider the correlations among the various dependent variables. A given correlation for any pair of dependent variables is computed over at least 276 items (the number of items can be less than 300 because of missing entries for some items, e.g., 4 items had no median FOK such that the correlation between median FOK and probability of correct recall is computed over 296 items). Although a correlation coefficient obviously should not be interpreted in a causal way, we will offer some brief remarks that might be useful for stimulating more systematic (i.e., experimental) research.

The correlation between $L(E)$ and FOK is $r = +.468$, in accord with the notion that the amount of time passing before the search is terminated is at least partially determined by the feeling of knowing; that is, people search longer for what they think they know than for what they think they do not know (Thompson, 1977; Kolers & Palef, 1976).

The correlation between $L(E)$ and the overall probability of correct recall is $r = +.352$, perhaps suggesting that the amount of search time may be partially determined by what people as a whole know and, hence, what the individual "probably" knows. Such an interpretation might imply a positive correlation between FOK and the

overall probability of correct recall and, indeed, the $r = +.566$ for these two dependent variables (i.e., FOK may be partially based on actuarial considerations). Also, although relatively small in magnitude, the correlation of $r = -.165$ between FOK and L(C) is reliable and perhaps reflects a similar tendency based on actuarial considerations, namely, that the FOK is based partially on one's prediction of how quickly an answer would be retrieved by people who can retrieve it at all.

The correlation between L(E) and L(C) is $r = -.036$, in accord with the notion that these two kinds of latency reflect different psychological processes (Millward, 1964; Nelson & MacLeod, Note 1) and should not be thought of as being interchangeable.

The correlation between L(C) and the probability of correct recall is $r = -.300$. This correlation is in the expected direction (i.e., items that are most likely to be retrieved at all tend to be retrieved faster than other items that are less likely to be retrieved at all). However, the magnitude of this correlation is not very large (e.g., either of these two variables accounts for only 9% of the variance in the other variable, even though the range is quite large in both variables) and might be less than would be predicted by a unidimensional strength theory (cf. Nelson & MacLeod, Note 1; also see Scheirer, 1971).

Scoring

One of the goals of this research was to develop a set of items that could be scored by computer as well as by hand. In the present study, after the UCI responses were scored by computer they were also scored by hand. The computer scoring consisted of counting a response as correct if and only if the first four letters of that response were correct, whereas the hand scoring (shown in the UCI column Table 1) consisted of allowing spelling errors as long as the subject appeared to have the correct response word in mind.

One can inquire about the degree of relationship between these two kinds of scoring. For instance, the computer had to

make a decision concerning the correctness of a given response in order to decide whether or not the item would be presented for a feeling-of-knowing rating. The correlation across the 300 items (from the 43 UCI subjects who went through the FOK phase) for computer scoring versus hand scoring was a very high $r = +.982$. Thus, the two methods of scoring yield essentially the same relative ordering of difficulty for these items.

Another important issue concerns the reliability of hand scoring across different judges. This issue was examined in detail for the UW data, where the use of response booklets rendered scoring by hand almost a practical necessity. Each response booklet was scored independently by two student judges, and any discrepancy in the scoring of a particular response was reconciled by a third student judge. Since there were 126 UW subjects, each of whom each went through 300 items, a total of $126 \times 300 = 37,800$ responses were scored by at least two student judges. Out of these 37,800 responses, there were discrepancies on 573 responses; hence, the probability of a discrepancy was $573 \div 37,800 = .015$ or, put differently, the interjudge reliability in terms of the probability of agreement was $1 - .015 = .985$. Thus, this set of questions appears to have answers that can be scored reliably across different student judges and reliably across computer scoring versus hand scoring.

REFERENCES

- BARTLETT, S. C. Remembering: A study in experimental and social psychology. Cambridge: Cambridge University Press, 1932.
- EBBINGHAUS, H. *Memory*. New York: Dover, 1964. (Originally published, 1885).
- FREEDMAN, J. L., & LANDAUER, T. K. Retrieval of long-term memory: "Tip-of-the-tongue" phenomenon. *Psychonomic Science*, 1966, 4, 309-310.
- GIBBS, J. C. The meaning of ecologically oriented inquiry in contemporary psychology. *American Psychologist*, 1979, 34, 127-140.
- HART, J. T. Memory and the feeling-of-knowing experience. *Journal of Educational Psychology*, 1965, 56, 208-216.

- JENKINS, J. J. Remember that old theory of memory? Well, forget it! *American Psychologist*, 1974, 29, 785-795.
- KOLERS, P. A., & PALEF, F. R. Knowing not. *Memory and Cognition*, 1976, 4, 553-558.
- KORIAT, A., & LIEBLICH, I. What does a person in a "TOT" state know that a person in a "don't know" state doesn't know. *Memory and Cognition*, 1974, 2, 647-655.
- LACHMAN, J. L., & LACHMAN, R. Age and the actualization of world knowledge. In L. W. Poon, J. L. Fozard, L. S. Cermak, D. Arenberg, & L. W. Thompson (Eds.), *New directions in memory and aging: Proceedings of the George Talland memorial conference*, Hillsdale, N.J.: Lawrence Erlbaum Associates, in press.
- MILLWARD, R. Latency in a modified paired associate learning experiment. *Journal of Verbal Learning and Verbal Behavior*, 1964, 3, 309-316.
- NEISSER, U. *Cognition and reality: Principles and implications of cognitive psychology*. San Francisco: Freeman, 1976.
- SCHEIRER, C. J. Effect of cueing, modality, and effective contiguous time on response latency in short-term memory. *Journal of Experimental Psychology*, 1971, 88, 429-432.
- SQUIRE, L. R., & SLATER, T. C. Forgetting in very long-term memory as assessed by an improved questionnaire technique. *Journal of Experimental Psychology: Human Learning and Memory*, 1975, 104, 50-54.
- THOMPSON, B. G. The feeling of knowing: Decision to terminate the search. Master's thesis from the University of Houston, 1977.

REFERENCE NOTE

1. NELSON, T. O., & MACLEOD, C. M. Response latency, response accuracy, and the concept of memory strength. Unpublished manuscript, 1979.

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