DIAN Psychometric Codebook

Paper-and-pencil tests

LETTER FLUENCY-FAS

Date added: 1/09

Reference: Modeled after word fluency test developed by:
Thurstone, L. E., & Thurstone, T. G., (1949). *Examiner manual for the SRA Primary Mental Abilities Test.* Chicago: Science Research Associates.

FLUF LETTER FLUENCY LETTER F

Participants name as many words beginning with the letter F as they can for 1 minute.

Range: 0 and above High score = good

FLUA LETTER FLUENCY LETTER A

Participants name as many words beginning with the letter A as they can for 1 minute.

Range: 0 and above High score = good

FLUS LETTER FLUENCY LETTER S

Participants name as many words beginning with the letter S as they can for 1 minute.

Range: 0 and above High score = good

LETFLU FLUF + FLUA + FLUS

WORD LIST RECALL - Immediate

Date added: 1/09

Reference: Designed for this project by David A. Balota.

Participants listen as the examiner reads one of six lists of 16 unrelated words at the rate of approximately 1 per second and then recall as many of the 16 words as possible in any order. Participants hear a different list at subsequent assessments.

LIST Number of the list read to participants at this assessment.

Range: 1-6

WORDIM Number of words recalled.

Range: 0 - 16 High score = good

MINI MENTAL STATE EXAM

Date added: 1/09

Reference: Folstein, M.F., Folstein, S.E., & McHugh, P.R. (1975). Mini-mental State: A practical method for grading the cognitive state of patients for the clinicians. *Journal of Psychiatric Research, 12*, 189-198.

MMSE Scored according to the UDS guidebook.

Range: 0 - 30 High score = good

WMS-R LOGICAL MEMORY IA - Immediate

Date added: 1/09

Reference: Wechsler, D. (1987). *Manual: Wechsler Memory Scale-Revised.* San Antonio, Texas: Psychological Corporation.

LOGIMEM Only Story A is administered. Scored according to WMS-R manual

Range: 0-25 High score = good

WMS-R DIGIT SPAN FORWARD

Date added: 1/09

Reference: Wechsler, D. (1987). *Manual: Wechsler Memory Scale-Revised.* San Antonio, Texas: Psychological Corporation.

Administered according to WMS-R manual. Scored according to UDS guidebook, which yields two scores:

DIGIF Total number of trials correct prior to two consecutive errors at the same digit length

Range: 0 - 12 High score = good

DIGIFLEN Digit span forward length

Range: 0 - 8 High score = good

WMS-R DIGIT SPAN BACKWARD

Date added: 1/09

Reference: Wechsler, D. (1987). *Manual: Wechsler Memory Scale-Revised.* San Antonio, Texas: Psychological Corporation.

Administered according to WMS-R manual. Scored according to UDS guidebook, which yields two scores:

DIGIB Total number of trials correct prior to two consecutive errors at the same digit length

Range: 0 - 12 High score = good

DIGIBLEN Digit span backward length

Range: 0 - 7 High score = good

CATEGORY FLUENCY - ANIMALS

Date added: 1/09

Reference: Goodglass, H. & Kaplan, E. (1983). *Boston Diagnostic Aphasia Examination Booklet*, III, ORAL EXPRESSION, J. Animal Naming (Fluency in Controlled Association). Philadelphia: Lea & Febiger.

ANIMALS Participants name as many different animals as they can for 1 minute.

Range: 0 and above High score = good

CATEGORY FLUENCY - VEGETABLES

Date added: 1/09

VEG Similar to Category Fluency-Animals.

Range: 0 and above High score = good

TRAILMAKING A AND B

Date added: 1/09

Reference: Armitage, S.G. (1945). An analysis of certain psychological tests used for the evaluation of brain injury. *Psychological Monographs, 60* (1, Whole No. 177), 1-48.

TRAILA The score is the number of seconds spent in connecting 25 numbered circles in sequential order. Time limit is 150 seconds.

Range: 0 - 150 High score = poor

TRAILARR Number of commission errors

The score is the number of errors of commission made while connecting 25 numbered circles in sequential order within the 150 second time limit.

Range: 0 – 40 High score = poor

TRAILALI Number of correct lines

The score is the number of lines correctly connected to 25 numbered circles in sequential order within the 150 second time limit.

Range: 0 – 24 High score = good

TRAILB The score is the number of seconds spent connecting numbered circles (1-13) to letters of the alphabet (A-L) in alternating sequential order. Time limit is 300 seconds.

Range: 0 - 300 High score = poor

TRAILBRR Number of commission errors

The score is the number of errors of commission made while connecting numbered circles (1-13) to letters of the alphabet (A-L) in alternating sequential order within the 300 second time limit.

Range: 0 – 40 High score = poor

TRAILBLI Number of correct lines

The score is the number of lines correctly connected between numbered circles (1-13) and letters of the alphabet (A-L) in alternating sequential order within the 300 second time limit.

Range: 0 – 24 High score = good

WAIS-R DIGIT SYMBOL

Date added: 1/09

Reference: Wechsler, D. (1981). *Manual: Wechsler Adult Intelligence Scale - Revised*. New York: Psychological Corporation.

WAIS This is an enlarged Digit Symbol form that measures 15 x 24 cm rather than 9.5 x 13 cm as in the standard WAIS-R. Otherwise

administered and raw scored according to WAIS-R manual.

Range: 0 - 93 High score = good

WMS-R LOGICAL MEMORY IIA - DELAYED

Date added: 1/09

Reference: Wechsler, D. (1987). *Manual: Wechsler Memory Scale-Revised.* San Antonio, Texas: Psychological Corporation.

MEMUNITS Administered after WAIS-R Digit Symbol in prescribed UDS order, and scored according to WMS-R manual

Range: 0-25 High score = good

BOSTON NAMING TEST - 30 (ODD NUMBERED ITEMS)

Date added: 1/09

References: Kaplan, E., Goodglass, H., & Weintraub, S. (1983). *Boston Naming Test scoring booklet*. Philadelphia: Lea & Febiger.

Goodglass, H., & Kaplan, E. (1983). *The assessment of aphasia and related disorders* (2nd ed.). Philadelphia: Lea & Febiger.

Mack, W. J., Freed, D. M., Williams, B. W., & Henderson, V. W. (1992). Boston Naming Test: Shortened versions for use in Alzheimer's disease. *Journal of Gerontology: Psychological Sciences, 45*, P154-P158.

Fisher, N. J., Tierney, M. C., Snow, W. G., & Szalai, J. P. (1999). Odd/even short forms of the Boston Naming Test: Preliminary geriatric norms. *Clinical Neuropsychologist, 13*, 359-364.

Begin at item 1 and present all 30 (odd numbered) items in order. Allow 20 seconds for each response. If participants give a response that indicates a misperception of the picture, administer the printed stimulus cue. Allow 20 seconds for response. If response following stimulus cue is incorrect, the printed phonemic cue is given. The total score is the number of items named correctly to include those named following given stimulus cues.

BOSTON Total correct

Range: 0 - 30 High score = good

WORD LIST RECALL - Delayed

Date added: 1/09

WORDDEL Number of words from word list recalled after delay interval.

Range: 0 - 16 High score = good

Personality

INTERNATIONAL PERSONALITY ITEM POOL (IPIP)

Date added: 1/09

Reference: Goldberg, L. R. (1999). A broad-bandwidth, public domain, personality inventory measuring the lower-level facets of several five-factor models. In I. Mervielde, I. Deary, F. De Fruyt, & F. Ostendorf (Eds.), *Personality Psychology in Europe*, Vol. 7 (pp. 7-28). Tilburg, The Netherlands: Tilburg University Press.

Administered and scored 120 items according to instructions on web site: http://ipip.ori.org

Factor scores

NEUR	Neuroticism factor score	
	Range: 0 - 120	High score = greater neuroticism
EXTRA	Extraversion factor score	
	Range: 0 - 120	High score = greater extraversion
OPEN	Openness factor score	
	Range: 0 - 120	High score = greater openness
AGREE	Agreeableness factor score	
	Range: 0 - 120	High score = greater agreeableness
CONSCIEN	Conscientiousness factor score	
	Range: 0 - 120	High score = greater conscientiousness

Facet scores (six for each factor): For each facet score

Range: 0 - 20 High score = more of characteristic

Neuroticism

ANX	Anxiety
ANGER	Anger

DEPRESS	Depression
SELFCON	Self-consciousness
IMMOD	Immoderation
VULNER	Vulnerability
	Extroversion
FRIEND	Friendliness
GREGAR	Gregariousness
ASSERT	Assertiveness
ACTIVE	Activity level
EXCITE	Excitement seeking
CHEER	Cheerfulness
	Openness
IMAG	Imagination
ARTIST	Artistic interests
EMOTION	Emotionality
ADVENT	Adventurousness
INTELL	Intellect
LIBERAL	Liberalism
	Agreeableness
TRUST	Trust
MORAL	Morality
ALTRU	Altruism
COOP	Cooperation

MODEST	Modesty
SYMPATH	Sympathy
	Conscientiousness
EFFIC	Self-efficacy
ORDER	Orderliness
DUTI	Dutifulness
ACHIEVE	Achievement striving
DISCIP	Self-discipline
CAUTIOUS	Cautiousness

ELSMEM Computerized Battery Description

(variable name for data set in left margin)

READING SPAN

Reference: Daneman, M., & Carpenter, P.A. (1980). Individual differences in working memory and reading. *Journal of Verbal Learning and Verbal Behavior, 19*, 450-466.

Participants must remember the last word of sentences presented on the computer screen while judging if the sentence makes a statement that is true or false. The number of sentences read prior to recall increases from 1 to 7 in blocks of three trials for each span length (i.e., number of sentences read prior to recall). For example, on each trial in the first block, the participant reads the sentence and judges if it is true or false; the next screen displays question marks and the participant immediately recalls the last word of the sentence. On each trial of the second block, the participant reads the first sentence and judges if it is true or false, then reads the second sentence and judges if it is true or false, is presented with the screen with question marks and then recalls the last word of each of the two preceding sentences. For a trial to be scored as correct the order of the recalled words must be the same as the order in which the sentences were presented. The test is discontinued when the participant fails to get at least two correct trials in a block of three trials.

One of two scores can be used: readspan or readtot.

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readspan Reading span length

The number of sentences in each trial for the last block of trials for which participant had at least two correct trials.

Range: 0 – 7 High score = good

readtot Reading span total correct trials

The total number of correct span trials through the block for which participant had at least two correct trials (i.e., block that determined the variable readspan).

Range: 0 – 21 High score = good

PAIR BINDING

Reference: Naveh-Benjamin, M. (2000). Adult age differences in memory performance: Tests of an associative deficit hypothesis. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 26*, 1170–1187.

Participants study a list of 24 unrelated word pairs presented one pair at a time with each pair on the screen for 3 seconds. Then participants see 36 pairs, again presented one pair at a time; 12 are intact studied pairs, 12 are rearranged pairs of studied words, and 12 are new pairs. Participants are to press the P key if the pair is an intact studied pair and Q if it is not.

intact Number of intact pairs correctly identified (i.e., a P response).

Range: 0 - 12 High score = good

mixed Number of mixed (rearranged) correctly identified (i.e., a Q response).

Range: 0 - 12 High score = good

new Number of new pairs correctly identified (i.e., a Q response).

Range: 0 - 12 High score = good

SIMON TASK

References: Simon, J.R. (1969). Reactions toward the source of stimulation. *Journal of Experimental Psychology, 81*, 174-176.

Castel, A.D., Balota, D.A., Hutchison, K.A., Logan, J.M., & Yap, M.J. (2007). Spatial attention and response control in healthy younger and older adults and individuals with Alzheimer's disease: Evidence for disproportionate selection breakdowns in the Simon task. *Neuropsychology, 21,* 170-182.

The participant sees a large arrow pointing to the right (60 trials) or left (60 trials) on the computer and presses the P key when the arrow points right and the Q key when it points left. One third of the trials represent the neutral condition; the arrows (half pointing right, half point right) are shown in the middle of the screen. One third of the trials represent the congruent condition; arrows pointing right are shown on the right side of the screen and arrows pointing left are shown on the left side of the screen. The remaining third of the trials reflect a mismatch between the direction of the arrow and the position on the screen; arrows pointing right are on the left side and arrows pointing left are on the right side. Response latencies (RT) and accuracy are recorded for each trial.

simerror Percentage of errors on all 120 trials.

Range: 0 to 100 Low score = good

Prior to calculating the remaining three scores, the data are trimmed. First, trials with RTs of 200 ms or less are deleted. Then trials that are 3 SDs or more away from the mean of the correct trials are deleted.

simonrt Mean RT of all trials after trimming.

Range: 200 and above Low score = good

simonsd SD of RTs from all trials after trimming.

Range: 0 and above Low score = good

simon Simon coefficient of variation = simonsd / simonrt

Range: 0 and above Low score = good

SWITCHING

Reference: Rogers, R.D., & Monsell, S. (1995). Costs of a predictable switch between simple cognitive tasks. *Journal of Experimental Psychology: General, 124*, 207-231.

Participants see letter-digit pairs (e.g., N14) in the center of the screen. In the first block of 50 trials (10 practice, 40 test) they press the P key if the letter is a vowel and the Q key if it a consonant. For the next 50 trials (10 practice, 40 test) they press the P key if the digit is even and the Q key if it is odd. In the final block of 62 mixed trials (10 practice, 52 test) the instructions (consonant and vowel or odd and even) that are shown in the lower right and lower corners of the screen change every two trials. Thus, the participant makes consonant vowel decisions for two trials and then the odd even decisions and so forth. Response latencies (RT) and accuracy are recorded for each trial. Practice trials are not included in the scoring.

switcher Percentage of errors out of 132 trials.

Prior to calculating the remaining three scores, the data are trimmed. First, trials with RTs of 200 ms or less are deleted. Then trials that are 3 SDs or more away from the mean of the correct trials are deleted.

switchrt Mean RT of all correct trials after trimming.

Range: 201 and above Low score = good

switchsd SD of RTs from all correct trials after trimming.

Range: 0 and above Low score = good

switch Switching task coefficient of variation = switchsd / switchrt

Range: 0 and above Low score = good

COMPUTATION SPAN

Reference: Conway, A.R.A., Kane, M.J., Bunting, M.F., Hambrick, D.Z., Wilheim, O., & Engle, R.W. (2005). Working memory span tasks: A

methodological review and user's guide. Psychonomic Bulletin & Review, 12, 769-786.

Participants see an addition or subtraction problem (e.g., 7 - 4 = 3) and press the P key if the answer is correct and the Q key if it is wrong. Participants are asked to remember the second number of the problem (e.g., 4). Participants then recall the second number of the equation by entering 4. There are two additional trials involving one equation. Then the number of equations in a trial increases to two (i.e., two second numbers must be recalled). There are 3 trials at each of seven span lengths (1, 2, 3, 4, 5, 6, and 7). For a trial to be scored as correct the order of the recalled numbers must be the same as the order in which the equations were presented. The test is discontinued when the participant fails to get at least two correct trials in a block of three trials.

cspan Computation span length

The number of equations in each trial for the last block of trials for which participant had at least two correct trials.

Range: 0 – 7 High score = good

cspantot Computation span total correct trials

The total number of correct span trials through the block for which participant had at least two correct trials (i.e., block that determined the variable cspan).

Range: 0 to 21 High score = good

SEMANTIC CATEGORIZATION

Reference: Smith, E. E., Shoben, E. J. & Rips, L. J. (1974). Structure and process in semantic memory: A featural model for semantic decisions. *Psychological Review, 1*, 214-241.

Participants read a category label (e.g., fruit) and press the P key if the word following the category label (e.g., apple) belongs to that category and the Q key if it does not (e.g., lettuce). There are 6 practice trials, which are not counted in the scoring. Then there are 80 *yes* and 80 *no* trials. Accuracy and latency (RT) are recorded for each trial.

scerryes Percentage of semantic categorization errors on the 80 yes trials.

Range: 0 to 100 Low score = good

scerrno Percentage of semantic categorization errors on the 80 no trials.

Range: 0 to 100 Low score = good

Prior to calculating the remaining three scores, the data are trimmed. First, trials with RTs of 200 ms or less are deleted. Then trials that are 3 SDs or more away from the mean of the correct trials are deleted.

semcatrt Mean RT of all correct trials after trimming.

Range: 201 and above Low score = good

semcatsd SD of RTs from all correct trials after trimming.

Range: 0 and above Low score = good

semcatcv Coefficient of variation = semcatsd / semcatrt

Range: 0 and above Low score = good

PAPER FOLDING (also referred to as **Visual Spatial Test 2** until July 1, 2012)

Reference: Salthouse, T.A., Mitchell, D.R., Skovronek, E., & Babcock, R.L. (1989). Effects of adult age and working memory on reasoning and spatial abilities. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 15*, 507-516.

Consider a square piece of paper that is folded from one to four times; punch a hole in the folded paper. Then unfold the paper and spread it flat. There will be an array of holes on the unfolded paper. Participants see a representation of the unfolded paper on the computer screen. They must mentally fold the display into an object that represents the folded paper. Participants indicate their responses by choosing one of five multiple choice answers. Time limit is 10 min.

paper The score is the number correct.
Range: 0 - 12 High score = good

DROPPED TESTS

SPATIAL RELATIONS (also referred to as **Visual Spatial Test 1**)

Date dropped from DIAN battery: 7/1/2012

Reference: Salthouse, T.A., Mitchell, D.R., Skovronek, E., & Babcock, R.L. (1989). Effects of adult age and working memory on reasoning and spatial abilities. *Journal of Experimental Psychology: Learning, Memory, and Cognition, 15*, 507-516.

Participants see a picture of a paper display on the computer screen; they must mentally fold the display into an object. Participants indicate their response by choosing one of four multiple choice answers. Time limit is 10 min.

spatial The score is the number correct.

Range: 0 - 20 High score = good