Penn Web-Based Computerized Neurocognitive Battery (WebCNP) Test Descriptions and Scoring Variables

University of Pennsylvania

Department of Psychiatry/ Neuropsychiatry Section

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Cognitive Domains Tested

Test	**Domain**
AIM	Abstraction and Mental Flexibility
CJOLO	Spatial Ability
CPF	Face Memory
CPFd	Face Memory
CPW	Verbal Memory
CPWd	Verbal Memory
CTAP	Motor
EDF40	Emotion
ER40	Emotion
LNB2	Working Memory
MPRAXIS	Sensory-Motor
PCET	Abstraction and Mental Flexibility
PCPT-nl	Attention
PLLT	Verbal Memory
PLLTd	Verbal Memory
PLOT	Spatial Ability
PVOC	Verbal Ability
sPVRT	Language
sVOLT	Spatial Memory
sVOLTd	Spatial Memory

Test Title: aim
Current Version: 3.00
Aliases: Penn Abstraction, Inhibition and Working Memory Task, AIM.
Estimated Duration:
N = 512; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
4.2 to 20.7	**8.6**	6.4	7.5	8.6	9.9	11.5

Cognitive Domain Tested: abstraction, concept formation and working memory

Test Description
The AIM is a measure of abstraction and concept-formation, with and without working memory [1,3]. It is divided into two separate question types, which the participant practices before starting the task. During the first question type, the participant sees two pairs of stimuli on the top of the page (one to the left and one to the right) and one single stimulus on the mid-bottom of the page. His/her task is to decide with which pair the stimulus on the bottom best belongs. The participant then clicks with the mouse on the pair he/she thinks fits the bottom stimulus the best and receives immediate feedback for his/her answer. The feedback is a presentation of the word "correct" or "incorrect". The task moves automatically onto the next question after the feedback is presented. In the second question type, the bottom stimulus flashes for less than a second and then the two pairs of stimuli appear on the top. This type of trial also measures working memory: the ability of the participant to keep the bottom stimulus in his/her mind so that he/she can choose with which pair of top stimuli the bottom stimulus best belongs. Like the first type of question, the second trial type presents feedback and moves on to the next question.
Once the task begins, the participant has 10 seconds to answer each trial. There are 60 questions total, 30 based on the first trial type and 30 based on the second (working memory) type. The criteria for best fit must take into consideration color and shape and of all stimuli figures.

There is one alternate form of the AIM: the AIM-B.

Rules & Variables
The test is scored based on the number of correct or incorrect responses, divided into blocks of trials and the Median Response time for each category and its blocks.

Scoring Variables List:

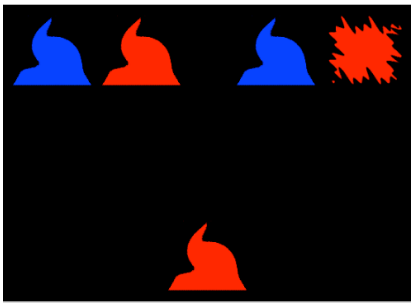
Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	2.00
A1 (AIM Correct Responses for Items 1-10)	0-10
A2 (AIM Correct Responses for Items 21-30)	0-10
A3 (AIM Correct Responses for Items 41-50)	0-10
AM1 (AIM Correct Responses for Items 11-20)	0-10
AM2 (AIM Correct Responses for Items 31-40)	0-10
AM3 (AIM Correct Responses for Items 51-60)	0-10
A1RTCR (Median Response Time for correct A1 Trials)	0-10000
A2RTCR (Median Response Time for correct A2 Trials)	0-10000
A3RTCR (Median Response Time for correct A3 Trials)	0-10000
A1RTER (Median Response Time for incorrect A1 Trials)	0-10000
A2RTER (Median Response Time for incorrect A2 Trials)	0-10000
A3RTER (Median Response Time for incorrect A3 Trials)	0-10000

AM1RTCR (Median Response Time for correct AM1 Trials)	0-10000
AM2RTCR (Median Response Time for correct AM2 Trials)	0-10000
AM3RTCR (Median Response Time for correct AM3 Trials)	0-10000
AM1RTER (Median Response Time for incorrect AM1 Trials)	0-10000
AM2RTER (Median Response Time for incorrect AM2 Trials)	0-10000
AM3RTER (Median Response Time for incorrect AM3 Trials)	0-10000
AIM_NM (Sum of A1, A2, and A3)	0-30
AIM_M (Sum of AM1, AM2, and AM3)	0-30
CRRT_NM (Mean of A1RTCR, A2RTCR, and A3RTCR)	0-10000
CRRT_M (Mean of AM1RTCR, AM2RTCR, and AM3RTCR)	0-10000
AIMTOT (Sum of AIM_NM and AIM_M)	0-60

Scoring Variables Notes:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above.
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.
A1, A2, A3 = 30 trials using abstraction and concept formation and no working memory component.
AM1, AM2, AM3 = 30 trials using abstraction with the working memory component.

Test Screenshot



References

[1] Gur RC, Ragland JD, Moberg PJ, Turner TH, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: I. Methodology and validation in healthy people. *Neuropsychopharmacology* 2001; 25(5): 766-776.

[2] Gur RC, Ragland JD, Moberg PJ, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: II. The Profile of schizophrenia. *Neuropsychopharmacology* 2001; 25(5): 777-788.

[3] Glahn DC, Cannon TD, Gur RE, Ragland JD, Gur RC. Working memory constrains abstraction in schizophrenia. *Biol Psychiat* 2000; 47:34-42.

Test Title: cjolo
Current Version: 2.03
Aliases: Judgment of Line Orientation, CJOLO, Computerized Judgment of Line Orientation
Estimated Duration:
N = 884; time units = minutes

range	**median**	10%	25%	50%	75%	90%
2.4 to 26.6	**6.5**	4.1	4.9	6.5	8.6	11.2

Cognitive Domain Tested: spatial orientation

Test Description:
The CJOLO is a measure of spatial orientation abilities based on the original paper based task developed by Benton et al. [3]. Participants are shown a pair of lines on top of the screen and asked to click with the mouse on the letter label of the matching lines arranged in a coordinate array on the mid-bottom of the screen.
During the practice trials, the lines on the top of the screen are of equal length with the lines on the bottom; during the test, the lines on the top of the screen are shorter than the ones in the array, increasing the difficulty of the matching.

Rules & Variables:
The test is scored based on the number of correct responses and the median response time for both correct and incorrect responses.

Scoring Variables List:

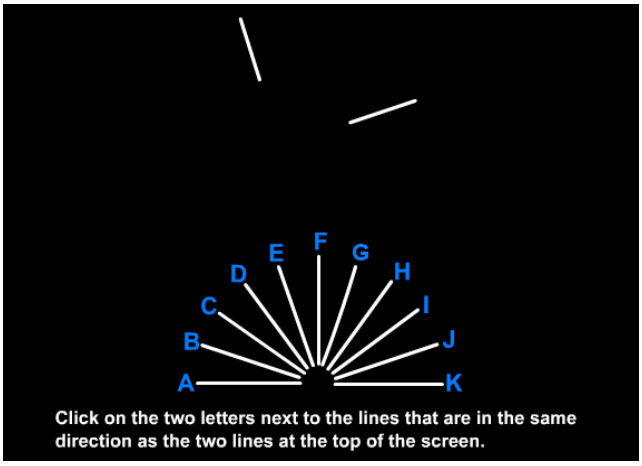
Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	-
CJOLO (CJOLO Total Correct)	0-30
CJORTCR (Median Response Time for CJOLO Correct Responses)	0-time variant
CJORTER (Median Response Time for CJOLO Incorrect Responses)	0-time variant

Variables:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above.
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.
CJOLO → both lines on the screen need to be matched correctly in order for that trial to count as a correct response.

The response time for each CJOLO test trial is the time between the presentation of the trial (as soon as the participant sees it) until the second click. Therefore, the response time lasts from beginning to the end of each trial, encompassing answers for both lines.

Test Screenshot



Correct Response: E & J

References:

[1] Gur RC, Ragland JD, Moberg PJ, Turner TH, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: I. Methodology and validation in healthy people. *Neuropsychopharmacology* 2001; 25(5): 766-776.

[2] Gur RC, Ragland JD, Moberg PJ, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: II. The Profile of schizophrenia. *Neuropsychopharmacology* 2001; 25(5): 777-788.

[3] Benton AL, Hannay JJ, Varney NR. Visual perception of line direction in patients with unilateral brain disease. *Neurology* 1975; 25:907-910.

Test Title: cpf
Current Version: 2.00
Aliases: Penn Facial Memory Test, Penn Face Memory Test, PFMT, CPF, RCPF, CPF-Targets & (R)CPF
Estimated Duration:
Presentation of 20 target faces
N = ; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
1.8 to 9.7	**2.3**	2.0	2.2	2.3	2.4	2.6

Test Trials (40 questions)
N = 884; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
0.6 to 23.1	**2.4**	1.7	2.0	2.4	3.0	3.8

The CPF has two tables for "estimated duration" time because the data collected is from a previous version of the task in which the CPF was divided in two parts: one in which the 20 target faces were presented and one in which the questions were asked. Therefore, the rough median test duration estimate for the CPF (study stimuli presentation and test trial) is ~ 4.7 min ((2.3 + 2.4)min).
Cognitive Domain Tested: facial memory

Test Description:
The CPF is a measure of facial memory. In the first part of this test, participants are shown 20 faces that they will be asked to identify later during both immediate and delayed recalls (delayed recall = CPFdelay). During the immediate recall (CPF), participants are shown a series, one at a time, of 40 faces - the 20 faces they were asked to memorize mixed with 20 novel faces. The participants' task is to decide whether they have seen the face before by clicking with the mouse on one of four buttons, presented in a 4-point scale: "definitely yes", "probably yes", "probably no" and "definitely no."

There is one alternate form of the CPF: the CPF-B.

Note: All facial stimuli are black and white photographs of faces rated as having neutral expressions, balanced for gender and age [1]. Faces are pasted on a black background with hair blending into it as to remove the hair's identifying characteristic.

Rules & Variables:
The test is scored based on the number of correct or incorrect responses, divided into true/false positives/negatives and the median response time for each category.

Scoring Variables List:

Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	1.00
CPFTP (CPF True Positives)	0-20
CPFTN (CPF True Negatives)	0-20
CPFFP (CPF False Positives)	0-20
CPFFN (CPF False Negatives)	0-20
CPFTPRT (CPF True Positives Median Response Time)	0-time variant
CPFTNRT (CPF True Negatives Median Response Time)	0-time variant

CPFFPRT (CPF False Positives Median Response Time)	0-time variant
CPFFNRT (CPF False Negatives Median Response Time)	0-time variant
IFAC_TOT (CPF Total Correct Responses)	0-40
IFAC_RTC (CPF Median Total Correct Response Time)	0-time variant

Variables and Answers:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above.
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.
CPFTP = "definitely yes" or "probably yes" answers for faces that belong to the 20 faces the participant was asked to study.
CPFTN = "definitely no" or "probably no" answers for faces that do not belong to the 20 faces the participant was asked to study.
CPFFP = "definitely yes" or "probably yes" answers for faces that do not belong to the 20 faces the participant was asked to study.
CPFFN = "definitely no" or "probably no" answers for faces that belong to the 20 faces the participant was asked to study.

Test Screenshot

Correct Responses: Definitely Yes, Probably Yes

References:
[1] Gur RC, Ragland JD, Moberg PJ, Turner TH, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: I. Methodology and validation in healthy people. *Neuropsychopharmacology* 2001; 25(5):766-776.

[2] Gur RC, Ragland JD, Moberg PJ, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: II. The Profile of schizophrenia. *Neuropsychopharmacology* 2001; 25(5):777-788.

[3] Gur RC, Jaggi JL, Ragland JD, Resnick SM, Shtasel D, Muenz L, Gur RE. Effects of memory processing on regional brain activation: cerebral blood flow in normal subjects. *Int J Neurosci*. 1993; 72:31-44.

Test Title: cpfd
Current Version: 2.00
Aliases: Penn Facial Memory Test Delayed Memory, Penn Face Memory Test - Delayed, PFMT, CPFd, CPFdelay, RCPFd
Estimated Duration:
N = 884; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
0.8 to 9.7	**2.0**	1.4	1.7	2.0	2.5	3.0

Cognitive Domain Tested: facial memory

Test Description:
The CPFd is a measure of delayed facial memory. In the first part of this test, participants were shown 20 faces that they were asked to identify for immediate recall (CPF). Now, during the delayed recall (CPFd), participants are shown a series, one at a time, of 40 faces: the 20 study stimuli/faces they were asked to memorize mixed with 20 novel faces, all different from the 20 distractors shown on the CPF. The participants' task is to decide whether they have seen each face before by clicking with the mouse on one of four buttons, presented in a 4-point scale: "definitely yes", "probably yes", "probably no" and "definitely no."

There is one alternate form of the CPFd: the CPFd-B.

Note: The CPFd takes place 15-45min after the CPF, usually with other tasks in between to control for the delay time and to avoid rehearsal. All facial stimuli are black and white photographs of faces rated as having neutral expressions, balanced for gender and age [1]. Faces are pasted on a black background with hair blending into it as to remove the hair's identifying characteristic.

Rules & Variables:
The test is scored based on the number of correct or incorrect responses, divided in true/false positives/negatives and the median response time for each category.

Scoring Variables List:

Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	1.00
CPFDTP (CPFD True Positives)	0-20
CPFDTN (CPFD True Negatives)	0-20
CPFDFP (CPFD False Positives)	0-20
CPFDFN (CPFD False Negatives)	0-20
CPFDTPRT (CPFD True Positives Median Response Time)	0-time variant
CPFDTNRT (CPFD True Negatives Median Response Time)	0-time variant
CPFDFPRT (CPFD False Positives Median Response Time)	0-time variant
CPFDFNRT (CPFD False Negatives Median Response Time)	0-time variant
DFAC_TOT (CPFD Total Correct Responses)	0-40
DFAC_RTC (CPFD Median Total Correct Response Time)	0-time variant

Variables and Answers:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above.
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.

CPFDTP = "definitely yes" or "probably yes" answers for faces that belong to the 20 faces the participant was asked to study.
CPFDTN = "definitely no" or "probably no" answers for faces that do not belong to the 20 faces the participant was asked to study.
CPFDFP = "definitely yes" or "probably yes" answers for faces that do not belong to the 20 faces the participant was asked to study.
CPFDFN = "definitely no" or "probably no" answers for faces that belong to the 20 faces the participant was asked to study.

Test Screenshot

Correct Responses: Definitely Yes, Probably Yes.

References:
[1] Gur RC, Ragland JD, Moberg PJ, Turner TH, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: I. Methodology and validation in healthy people. *Neuropsychopharmacology* 2001; 25(5):766-776.

[2] Gur RC, Ragland JD, Moberg PJ, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: II. The Profile of schizophrenia. *Neuropsychopharmacology* 2001; 25(5):777-788.

[3] Gur RC, Jaggi JL, Ragland JD, Resnick SM, Shtasel D, Muenz L, Gur RE. Effects of memory processing on regional brain activation: cerebral blood flow in normal subjects. Int J Neurosci. 1993;72:31-44.

Test Title: cpw
Current Version: 2.00
Aliases: Penn Word Memory Test, PWMT, CPW
Estimated Duration:
N = 638; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
2.4 to 8.7	**3.7**	3.0	3.3	3.7	4.3	5.0

Cognitive Domain Tested: word memory

Test Description:
The CPW is a measure of word memory. In the first part of this test, participants are shown 20 words that they will be asked to identify later during both immediate and delayed recalls (delayed recall = CPWd). During the immediate recall (CPW), participants are shown a series, one at a time, of 40 words - the 20 stimuli they were asked to memorize mixed with 20 novel stimuli. The participants' task is to decide whether they have seen the word before by clicking with the mouse on one of four buttons, presented in a 4-point scale: "definitely yes", "probably yes", "probably no" and "definitely no".

There is one alternate form of the CPW: the CPW-B.

Note: All distractor/novel stimuli are equated for frequency, length, concreteness and imageability using Pavio's norms [4].

Rules & Variables:
The test is scored based on the number of correct or incorrect responses, divided into true/false positives/negatives and the median response time for each category.

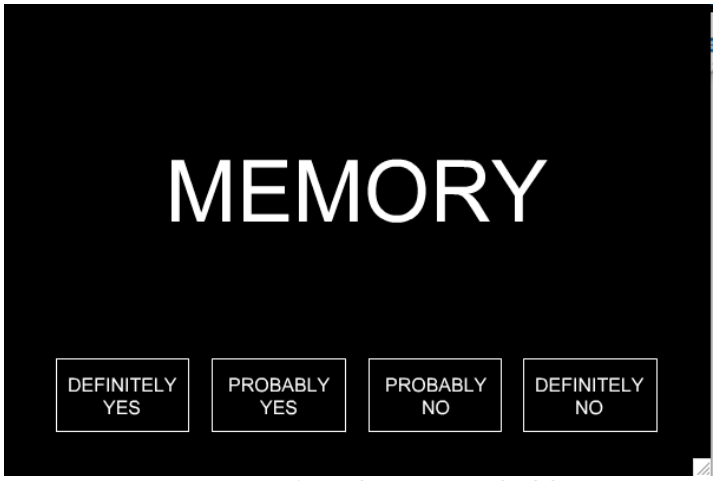
Scoring Variables List:

Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	1.00
CPWTP (CPW True Positive Responses)	0-20
CPWTN (CPW True Negative Responses)	0-20
CPWFP (CPW False Positive Responses)	0-20
CPWFN (CPW False Negative Responses)	0-20
CPWTPRT (Median Response Time for CPW True Positive Responses)	0-time variant
CPWTNRT (Median Response Time for CPW True Negative Responses)	0-time variant
CPWFPRT (Median Response Time for CPW False Positive Responses)	0-time variant
CPWFNRT (Median Response Time for CPW False Negative Responses)	0-time variant
IWRD_TOT (CPW Total Correct Responses)	0-40
IWRD_RTC (Median Response Time for CPW Total Correct Responses)	0-time variant

Variables and Answers:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above.
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.
CPWTP = "definitely yes" or "probably yes" answers for words that belong to the 20 words the participant was asked to study.
CPWTN = "definitely no" or "probably no" answers for words that do not belong to the 20 words the participant was asked to study.
CPWFP = "definitely yes" or "probably yes" answers for words that do not belong to the 20 words the participant was asked to study.
CPWFN = "definitely no" or "probably no" answers for words that belong to the 20 words the participant was asked to study.

Test Screenshot



Correct Responses: Definitely Yes, Probably Yes.

References:

[1] Gur RC, Ragland JD, Moberg PJ, Turner TH, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: I. Methodology and validation in healthy people. *Neuropsychopharmacology* 2001; 25(5):766-776.

[2] Gur RC, Ragland JD, Moberg PJ, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: II. The Profile of schizophrenia. *Neuropsychopharmacology* 2001; 25(5):777-788.

[3] Gur RC, Jaggi JL, Ragland JD, Resnick SM, Shtasel D, Muenz L, Gur RE. Effects of memory processing on regional brain activation: cerebral blood flow in normal subjects. *Int J Neurosci*. 1993; 72:31-44.

[4] Pavio A, Yuille JC, Madigan SA (1968): Concreteness, imagery, and meaningfulness values for 925 nouns. *J Exp Psychol* 1968; 76:1-25.

[5] Clark JM, Pavio A. Extensions of the Pavio, Yuille, and Madigan (1968) norms. *Behav Res Methods Instrum Comput.* 2004; 36(3): 371-83.

Test Title: cpwd
Current Version: 2.00
Aliases: Penn Word Memory Test Delayed Memory, PWMT, CPWd, CPWdelay
Estimated Duration:
N = 638; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
0.3 to 16.0	**1.6**	1.0	1.2	1.6	2.1	2.7

Cognitive Domain Tested: word memory

Test Description:
The CPWd is a measure of delayed word memory. In the first part of this test, participants are shown 20 words that they were asked to identify for immediate recall (CPW). Now, during the delayed recall (CPWd), participants are shown a series, one at a time, of 40 words: the 20 study stimuli they were asked to memorize mixed with 20 novel stimuli, completely different from the 20 distractors showed on the CPW. The participants' task is to decide whether they have seen the word before by clicking with the mouse on one of four buttons, presented in a 4-point scale: "definitely yes", "probably yes", "probably no" and "definitely no."

There is one alternate form of the CPWd: the CPWd-B.

Note: The CPWd takes place 15-45min after the CPW, usually with other tasks intervening to control for the delay time and to avoid rehearsal. All distractor/novel stimuli are equated for frequency, length, concreteness and imageability using Pavio's norms [4].

Rules & Variables:
The test is scored based on the number of correct or incorrect responses, divided into true/false positives/negatives and the median reaction time for each category.

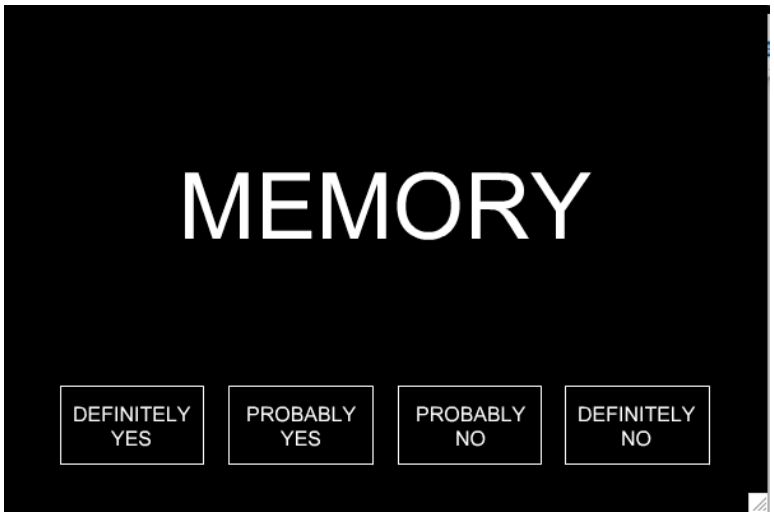
Scoring Variables List:

Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	1.00
CPWDTP (CPWD True Positive Responses)	0-20
CPWDTN (CPWD True Negative Responses)	0-20
CPWDFP (CPWD False Positive Responses)	0-20
CPWDFN (CPWD False Negative Responses)	0-20
CPWDTPRT (Median Reaction Time for CPWD True Positive Responses)	0-time variant
CPWDTNRT (Median Reaction Time for CPWD True Negative Responses)	0-time variant
CPWDFPRT (Median Reaction Time for CPWD False Positive Responses)	0-time variant
CPWDFNRT (Median Reaction Time for CPWD False Negative Responses)	0-time variant
DWRD_TOT (CPWD Total Correct Responses)	0-40
DWRD_RTC (Median Reaction Time for CPWD Total Correct Responses)	0-time variant

Variables and Answers:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above.
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.
CPWDTP = "definitely yes" or "probably yes" answers for words that belong to the 20 words the participant was asked to study.
CPWDTN = "definitely no" or "probably no" answers for words that do not belong to the 20 words the participant was asked to study.
CPWDFP = "definitely yes" or "probably yes" answers for words that do not belong to the 20 words the participant was asked to study.
CPWDFN = "definitely no" or "probably no" answers for words that belong to the 20 words the participant was asked to study.

Test Screenshot



Correct Responses: Definitely Yes, Probably Yes.

References:
[1] Gur RC, Ragland JD, Moberg PJ, Turner TH, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanni ng: I. Methodology and validation in healthy people. *Neuropsychopharmacology* 2001; 25(5):766-776.

[2] Gur RC, Ragland JD, Moberg PJ, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: II. The Profile of schizophrenia. *Neuropsychopharmacology* 2001; 25(5):777-788.

[3] Gur RC, Jaggi JL, Ragland JD, Resnick SM, Shtasel D, Muenz L, Gur RE. Effects of memory processing on regional brain activation: cerebral blood flow in normal subjects. Int J Neurosci. 1993;72:31-44.

[4] Pavio A, Yuille JC, Madigan SA (1968): Concreteness, imagery, and meaningfulness values for 925 nouns. J Exp Psychol 76:1-25.

[5] Clark JM, Pavio A. Extensions of the Pavio, Yuille, and Madigan (1968) norms. *Behav Res Methods Instrum Comput.* 2004; 36(3): 371-83.

Test Title: ctap
Current Version: 2.05
Aliases: Penn's Computerized Finger-Tapping Task, C-TAP, ctap, CTAP
Estimated Duration:
N = 796; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
5.6 to 13.7	**6.8**	6.2	6.5	6.8	7.3	7.8

Cognitive Domain Tested: manual dexterity

Test Description:
The CTAP is a measure of manual dexterity [1]. In this task, participants are asked to press the space bar with their index finger as many times as they can, on both non-dominant and dominant hands, using a special hand position shown by the administrator. The task is composed of 10 trials: 5 trials for the dominant hand and 5 trials for the non-dominant hand. The set-time interval for each test trial is 10sec. The participant practices with each hand once before starting the task on two 5sec trials.

Rules & Variables:
The test is scored based on the number of taps the participant completes in each trial for each hand and their perseverations. Perseverations are defined as the number of spacebar presses during the "STOP" prompt after each test trial. Also, the mean number of taps per dominant and non-dominant hand trials is given along with their respective standard deviations.

Scoring Variables List:

Variables and Definitions	Range
ScorVers (Current Programming Version of the Scoring Code)	1
TAP_HAND (CTAP Dominant Hand)	RIGHTdom or LEFTdom
TAP_DOM (Mean Taps for CTAP Dominant Hand)	0-number variant
TAP_NON (Mean Taps for CTAP Non-Dominant Hand)	0-number variant
TAP_DOMSD (Standard Deviation of TAP_DOM Responses)	0-number variant
TAP_NONSD (Standard Deviation of TAP_NON Responses)	0-number variant
TAP_D1 (Taps, 1st trial, Dominant Hand)	0-number variant
TAP_D2 (Taps, 2nd trial, Dominant Hand)	0-number variant
TAP_D3 (Taps, 3rd trial, Dominant Hand)	0-number variant
TAP_D4 (Taps, 4th trial, Dominant Hand)	0-number variant
TAP_D5 (Taps, 5th trial, Dominant Hand)	0-number variant
TAP_N1 (Taps, 1st trial, Non-Dominant Hand)	0-number variant
TAP_N2 (Taps, 2nd trial, Non-Dominant Hand)	0-number variant
TAP_N3 (Taps, 3rd trial, Non-Dominant Hand)	0-number variant
TAP_N4 (Taps, 4th trial, Non-Dominant Hand)	0-number variant
TAP_N5 (Taps, 5th trial, Non-Dominant Hand)	0-number variant
TAP_DP1 (Taps after STOP, 1st trial, Dominant Hand)	0-number variant
TAP_DP2 (Taps after STOP, 2nd trial, Dominant Hand)	0-number variant
TAP_DP3 (Taps after STOP, 3rd trial, Dominant Hand)	0-number variant
TAP_DP4 (Taps after STOP, 4th trial, Dominant Hand)	0-number variant
TAP_DP5 (Taps after STOP, 5th trial, Dominant Hand)	0-number variant
TAP_NP1 (Taps after STOP, 1st trial, Non-Dominant Hand)	0-number variant
TAP_NP2 (Taps after STOP, 2nd trial, Non-Dominant Hand)	0-number variant
TAP_NP3 (Taps after STOP, 3rd trial, Non-Dominant Hand)	0-number variant

TAP_NP4 (Taps after STOP, 4th trial, Non-Dominant Hand)	0-number variant
TAP_NP5 (Taps after STOP, 5th trial, Non-Dominant Hand)	0-number variant

Scoring Variables Notes:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above.

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.

Test Screenshot

References:
[1] Lezak MD. Neuropsychological Assessment. New York: Oxford University Press.1995; pg 680.

[2] Halstead WC. Brain and Intelligence. Chicago: University of Chicago Press. 1947.

[3] Reintan RM, Wolfson D. The Halstead-Reintan Neuropsychological Test Battery: theory and clinical interpretation. Tucson, AZ: Neuropsychology Press. 1993.

[4] Spreen O, Strauss E. A compendium of neuropsychological tests. New York: Oxford University Press. 1991.

Gur RC, Ragland JD, Moberg PJ, Turner TH, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: I. Methodology and validation in healthy people. *Neuropsychopharmacology* 2001; 25(5):766-776.

Gur RC, Ragland JD, Moberg PJ, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: II. The Profile of schizophrenia. *Neuropsychopharmacology* 2001; 25(5):777-788.

Test Title: edf40
Current Version: 2.00
Aliases: Penn Emotion Discrimination Task, EmoDiff40, EmoDiff, edf40.
Estimated Duration:
N = 639; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
2.0 to 19.0	**5.9**	3.7	4.5	5.9	7.5	9.5

Cognitive Domain Tested: emotion discrimination

Test Description:
The EmoDiff40 is a measure of emotion discrimination. Participants are shown 40 pairs of faces, one pair at a time. Each pair of faces consists of two pictures of the same person with or without a subtle, computer-generated difference in emotion expression, which may or may not represent a difference in the intensity of the emotion between the two faces. For each pair, the participant must decide which face expresses the given emotion more intensely or whether they are equally emotional. There are a total of 40 questions: 18 questions where one of the faces is happier; 18 where one of the faces is more sad and 4 questions where the faces are equally happy or equally sad.
Note: All facial stimuli are black and white photographs of Caucasian actors and actresses analyzed and reviewed as described in Erwin et al. [3].

Rules & Variables:
The test is scored based on the number of correct and incorrect responses for both happy and sad trials and their median response times.

Scoring Variables List:

Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	1.00
HAP_CR (Correct Responses for EDF40 Happy Trials)	0-19
SAD_CR (Correct Responses for EDF40 Sad Trials)	0-21
HAPRTCR (Median Response Time for Correct EDF40 Happy Trials)	0-time variant
HAPRTER (Median Response Time for Incorrect EDF40 Happy Trials)	0-time variant
SADRTCR (Median Response Time for Correct EDF40 Sad Trials)	0-time variant
SADRTER (Median Response Time for Incorrect EDF40 Sad Trials)	0-time variant

Variables and Answers:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above.
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.
HAP_CR or SAD_CR = reflects the correct responses in each trial, whether it be the left picture, the right picture or the option where both are equally happy or equally sad.

Test Screenshot

Correct Response: right face

References:

[1] Kohler CG, Bilker W, Hagendoorn M, Gur RE. Emotion Recognition deficit in schizophrenia: association with symptomatology and cognition. *Biol. Psychiatry* 2000; 48:127-136.

[2] Silver H, Shlomo N, Turner T, Gur RC. Perception of happy and sad facial expressions in chronic schizophrenia: Evidence for two evaluative systems. *Schizophrenia Research* 2002; 55:171-177.

[3] Erwin RJ, Gur RC, Gur RE, Smailis J, Skolnick B. Facial Emotion Discrimination: 1. Task construction and behavioral findings in normal subjects. *Psychiatry Res.* 1992; 42:231-240.

[4] Sachs, G., Steger-Wuchse, D., Kyrspin-Exner, I., Gur, R.C., Katschnig, H. (2004). Facial recognition deficits and cognition in schizophrenia. *Schizophrenia Research, 68,* 27-35.

[5] Silver H, Goodman C, Knoll G, Isakov V. Brief emotion training improves recognition of facial emotions in chronic schizophrenia. A pilot study. *Psychiatry Research* 2004; 128: 147-154.

Test Title: er40
Current Version: 2.00
Aliases: Penn Emotion Recognition Task, ER40.
Estimated Duration:
N = 791; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
1.6 to 10.6	**3.4**	2.4	2.8	3.4	4.2	5.2

Cognitive Domain Tested: emotion recognition

Test Description:
The ER40 is a measure of emotion recognition. Participants are shown a series of 40 faces, one at a time, and asked to determine what emotion the face is showing for each trial. There are 5 answer choices: happy, sad, anger, fear and no emotion. Participants respond to each trial by clicking with the mouse on the word describing the emotion each faces expresses. There are 4 female faces for each emotion (4 x 5 = 20) and 4 male faces for each emotion (4 x 5 = 20).

There is one alternate form of the ER40: the ER40-B.

Note: The faces are colored pictures taken, analyzed and rated as described in [1, 2, 3]. They derive from the University of Pennsylvania Emotion Recognition Task, 96 faces version, balanced for equality and intensity of emotion, age, gender and ethnicity [2].

Rules & Variables:
The scores are based on the number of correct responses for female versus male faces; the number of correct happy, sad, anger, fear and no emotion faces; the number of false positives for happy, sad, anger, fear and no emotion faces; and the number of mild and number of intense emotion expressions correctly identified. Median response times are given for all of these categories.

Scoring Variables List:

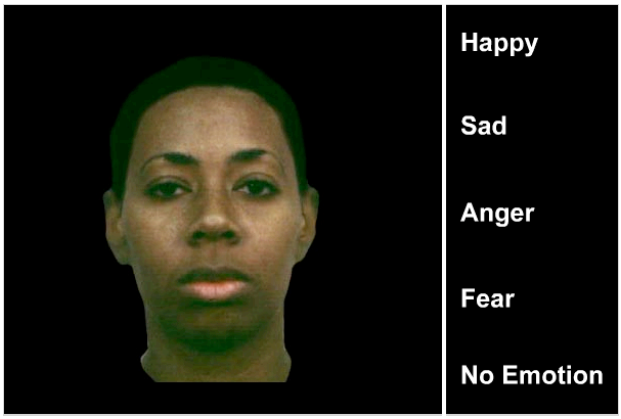
Variable Definition	Range
ScorVers = Current Programming Version of the Scoring Code	1.01
ER40_CR (ER40 Correct Responses)	0-40
ER40_CRT (ER40 Correct Responses Median Response Time)	0-time variant
ER40_FC (ER40 Correct Female Identifications)	0-20
ER40_MC (ER40 Correct Male Identifications)	0-20
ER40FCRT (ER40 Correct Female Identifications Median Response Time)	0-time variant
ER40MCRT (ER40 Correct Male Identifications Median Response Time)	0-time variant
ER40ANG (ER40 Correct Anger Identifications)	0-8
ER40FEAR (ER40 Correct Fear Identifications)	0-8
ER40HAP (ER40 Correct Happy Identifications)	0-8
ER40NOE (ER40 Correct Neutral Identifications)	0-8
ER40SAD (ER40 Correct Sad Identifications)	0-8
ER40ANGRT (Median Response Time for ER40 Correct Anger Identifications)	0-time variant
ER40FEARRT (Median Response Time for ER40 Correct Fear Identifications)	0-time variant

ER40HAPRT (Median Response Time for ER40 Correct Happy Identifications)	0-time variant
ER40NOERT (Median Response Time for ER40 Correct Neutral Identifications)	0-time variant
ER40SADRT (Median Response Time for ER40 Correct Sad Identifications)	0-time variant
ER40_FPA (ER40 False Positive Anger Responses)	0-32
ER40_FPF (ER40 False Positive Fear Responses)	0-32
ER40_FPH (ER40 False Positive Happy Responses)	0-32
ER40_FPN (ER40 False Positive Neutral Responses)	0-32
ER40_FPS (ER40 False Positive Sad Responses)	0-32
ER40_FPART (Median Response Time for ER40 False Positive Anger Responses)	0-time variant
ER40_FPFRT (Median Response Time for ER40 False Positive Fear Responses)	0-time variant
ER40_FPHRT (Median Response Time for ER40 False Positive Happy Responses)	0-time variant
ER40_FPNRT (Median Response Time for ER40 False Positive Neutral Responses)	0-time variant
ER40_FPSRT (Median Response Time for ER40 False Positive Sad Responses)	0-time variant
ER40MILD (ER40 Correct Mild Identifications)	0-20
ER40EXTR (ER40 Correct Extreme Identifications)	0-20
ER40MDRT (ER40 Correct Mild Identifications Median Response Time)	0-time variant
ER40EXRT (ER40 Correct Extreme Identifications Median Response Time)	0-time variant

Variable Notes:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above. * All time-based scores (e.g. Response Time) are given in millisecond units (ms).
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.

Test Screenshot



Correct Response: No Emotion

References:

[1] Gur RC, Sara R, Hagendoorn M, Marom O, Hughett P, Macy L, Turner T, Bajcsy R, Posner A, Gur RE. A method for obtaining 3-dimensional facial expressions and its standardization for use in neurocognitive studies. *Journal of Neuroscience Methods* 2002; 115:137-143.

[2] Kohler CG, Turner TH, Gur RE, Gur RC. Recognition of facial emotions in neuropsychiatric disorders. *CNS Spectrums* 2004; 9(4): 267-274.

[3] Kohler CG, Turner T, Stolar NM, Bilker WB, Brensinger CM, Gur RE, Gur RC. Differences in facial expressions of four universal emotions. *Psychiatry Research* 2004; 128: 235-244.

[4] Silver H, Goodman C, Knoll G, Isakov V. Brief emotion training improves recognition of facial emotions in chronic schizophrenia. A pilot study. *Psychiatry Research* 2004; 128: 147-154.

Test Title: lnb2
Current Version: 2.01
Aliases: Letter-N-Back; LNB2, N-Back test, LNB-2
Estimated Duration:
N = 659; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
9.2 to 39.5	**11.9**	10.6	11.1	11.9	13.0	14.4

Cognitive Domain Tested: attention and working memory

Test Description:
The LNB2 is a measure of attention and working memory. In this task, participants are asked to pay attention to flashing letters on the computer screen, one at a time, and to press the spacebar according to three different principles or rules: the 0-back, the 1-back and the 2-back. During the 0-back, the participant must press the spacebar whenever the letter X appears on the screen. During the 1-back, the participant must press the spacebar whenever the letter on the screen is the same as the previous letter (i.e. in the series "T", "R", "R", the participant should press the spacebar on or immediately after the second "R"). During the 2-back, the participant must press the spacebar whenever the letter on the screen is the same as the letter before the previous letter (i.e. in the series "T", "G", "T", the participant should press the spacebar on or immediately after the second "T"). In all trials, the participant has 2.5 seconds to press the spacebar. The participant practices all three principles, in which he/she is allowed to make mistakes and then, when he/she completes all practices successfully, the task will begin. During the actual test trials, the participant does three blocks of the 0-back, 1-back and 2-back in a pre-arranged order.

There is one alternate form of the LNB2: the LNB2-B.

Rules & Variables:
The LNB2 is scored based on the total number of true/false positives, median reaction time for all correct responses, and number of true/false positives and median response times for each of the three principles.

Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	1.00
LNB_TP (LNB True Positive Responses)	0-45
LNB_FP (LNB False Positive Responses)	0-90
LNB_RTC (LNB Median Response Time for All Correct Responses)	0-2500
LNB_TP0 (LNB True Positive Responses for 0-Back Trials)	0-15
LNB_FP0 (LNB False Positive Responses for 0-Back Trials)	0-30
LNB_RTC0 (LNB Median Response Time for Correct 0-Back Trials)	0-2500
LNB_TP1 (LNB True Positive Responses for 1-Back Trials)	0-15
LNB_FP1 (LNB False Positive Responses for 1-Back Trials)	0-30
LNB_RTC1 (LNB Median Response Time for Correct 1-Back Trials)	0-2500
LNB_TP2 (LNB True Positive Responses for 2-Back Trials)	0-15
LNB_FP2 (LNB False Positive Responses for 2-Back Trials)	0-30
LNB_RTC2 (LNB Median Response Time for Correct 2-Back Trials)	0-2500

Scoring Variables Notes:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above.
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.
True Positives = spacebar press following the ruling principle (a correct response).
False Positives = spacebar press not following the ruling principle.

Reference:
[1] Ragland, J.D., Turetsky, B.I., Gur, R.C., Gunning-Dixon, F., Turner, T., Schroeder, L., Chan, R., Gur, R.E. Working Memory for Complex Figures: An fMRI Comparison of Letter and Fractal N-Back Tasks. Neuropsychology, 16, 370-379, 2002.

Cohen NJ, Ryan J, Hunt C, Romine L, Wszalek T, Nash C: Hippocampal system and declarative (relational) memory: summarizing the data from functional neuroimaging studies. Hippocampus 1999; 9:83–98.

Test Title: mpraxis
Current Version: 2.00
Aliases: Motor Praxis, MPraxis, Mouse Practice (CNP), MPract (CNP)
Estimated Duration:
N = 870; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
0.8 to 29.4	**1.8**	1.2	1.5	1.8	2.7	4.0

Cognitive Domain Tested: sensory-motor ability

Test Description:
The MPraxis is a measure of sensory-motor ability. It is also designed to familiarize the participant with the computer mouse used during nearly all of the WebCNP tasks. During the MPraxis, the participant needs to move the computer mouse cursor over an ever-shrinking green box and click on it once each time it appears on a different location on the test-page. If participants can't complete the MPraxis, it is likely they won't be able to complete any other WebCNP task.

Rules & Variables:
The test is scored based on the number of correct responses for the test trials (Trial 2) and the median response times for the correct responses on the practice trial (Trial 1) and Trial 2.

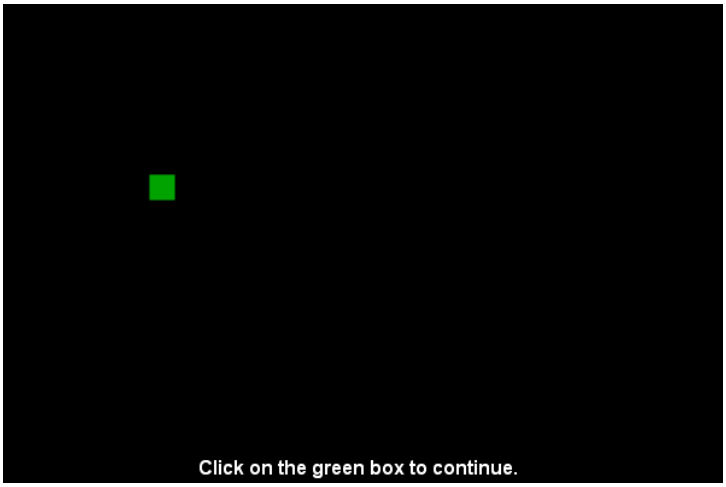
Scoring Variables List:

Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	1
MP1RT (Median Response Time for Mouse Praxis Trial 1)	0-time variant
MP2 (Mouse Praxis Correct Responses Trial 2)	0-20
MP2RT (Median Response Time for Mouse Praxis Trial 2)	0-5000

Variables and Answers:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above. * All time-based scores (e.g. Response Time) are given in millisecond units (ms).
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.
Trial 1 = forced-choice trial or practice trial. The participant can take as long as he/she needs to click on the box until the trials are over.
Trial 2 = time-limited trial. The participant has 5 seconds to click on the box before it appears, shrunk, elsewhere on the page.

Test Screenshot



Correct Response: Click once on the green box.

Reference:

Calkins ME, Ragland JD, Gur RE, Nimgaonkar LV, Pogue-Geile MF, Gur RC. Neurocognitive impairments reflect the degree of genetic predisposition to schizophrenia: evidence from a multiplex, multigenerational study. 2005; Poster Presentation.

Gur RC, Ragland JD, Moberg PJ, Turner TH, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: I. Methodology and validation in healthy people. *Neuropsychopharmacology* 2001; 25(5):766-776.

Gur RC, Ragland JD, Moberg PJ, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: II. The Profile of schizophrenia. *Neuropsychopharmacology* 2001; 25(5):777-788.

Test Title: pcet
Current Version: 2.00
Aliases: Penn Conditional Exclusion Task, PCET, Penn Conditional Exclusion Test
Estimated Duration:
N = 796; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
1.2 to 42.2	**6.8**	3.0	4.2	6.8	10.7	15.5

Cognitive Domain Tested: abstraction in executive function

Test Description:
The PCET is a measure of abstraction in executive function related to the Wisconsin Card Sorting Test [1, 2]. It is a computerized variant form of the "Odd Man Out" model [3] where participants must decide what object out of four objects does not belong with the other three [1, 2]. There are three principles/criteria for choosing an object, which change as the participant achieves 10 consecutive correct answers for each principle: line thickness, shape and size (respectively). The participant has 48 trials to get 10 consecutive answers correct in each criterion. There is only one principle for any trial, but a response may match more than one principle. The participant is not told what the ruling principle is at any moment of the task and must make his/ her decision by clicking with the mouse on the object he/she decides does not belong with the group.

There are three alternate forms of the PCET: the PCET-B, PCET-C and PCET-D.

Rules & Variables:
The test is scored based on the number of correct or incorrect responses as well as the median response times. Perseverative errors and perseverative correct responses are given in addition to the number of trials taken for each of the 3 criteria/principles.

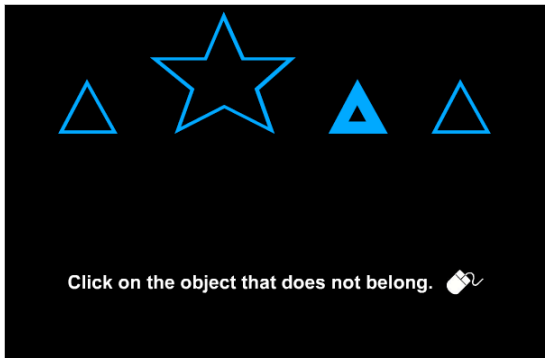
Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	1.02
PCETCR (PCET Number Correct Responses)	0-132
PCETRTCR (Median Response Time for PCET Correct Responses)	0-time variant
PCETER (PCET Number Incorrect Responses)	0-134
PCETRTER (Median Response Time for PCET Incorrect Responses)	0-time variant
PCET_NUM (Total Number of Trials)	0-144
PCET_CAT (Number of PCET Categories Achieved)	0-3
CAT1_TR (Number of Trials in PCET Using Sorting Principle 1)	10-48
CAT2_TR (Number of Trials in PCET Using Sorting Principle 2)	10-48
CAT3_TR (Number of Trials in PCET Using Sorting Principle 3)	10-48
PER_ER (PCET Number of Perseverative Errors)	0-96
PER_RES (PCET Perseverative Errors Plus Correct Perseverative Responses)	0-96

Scoring Variables Notes:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above.
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.
Sorting Principle 1 = first criterion/principle: line thickness
Sorting Principle 2 = second criterion/principle: shape

Sorting Principle 3 = third criterion/principle: size
PER_ER Perseverative Errors = errors made when the participant makes an answer based on a perseverative principle. The perseverative principle is coded whenever 3 consecutive incorrect responses based on a previous criterion are made without any intervening responses in between that match any other criterion.
PER_RES Correct Perseverative Responses = responses based on a perseverative criterion but which also match the correct sorting principle for the trial (as some responses match two criteria/principles, it is possible to make a perseverative response and yet answer the trial question correctly).

Test Screenshot



Star – Size and Shape

References:
[1] Kurtz, M.M., Ragland, J.D., Moberg, P.J., Gur, R.C., (2004). The Penn Conditional Exclusion Test: a new measure of executive-function with alternate forms for repeat administration. *Arch. Clin. Neuropsychol, 19,* 191-201.

[2] Kurtz, M.M., Wexler, B.E., Bell, M.D. (2004). The Penn Conditional Exclusion Test (PCET): relationship to the Wisconsin Card Sorting Test and work function in patients with schizophrenia. *Schizophrenia Research, 68,* 95-102.

[3] Flowers, K.A., & Robertson, C. (1985). The effect of Parkinson's disease on the ability to maintain a mental set. *Journal of Neurology, Neurosurgery, and Psychiatry*, *48*, 517–529.

Test Title: pcpt-nl
Current Version: 2.00
Aliases: Penn Continuous Performance Test-Number and Letter Version; Penn CPT, CPT-Num-Let; PCPT; PCPT-nl; Continuous Performance Test; nl-cpt, NumLet-CPT
Estimated Duration:
N = 632; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
7.3 to 36.0	**8.8**	8.2	8.4	8.8	9.2	9.8

Cognitive Domain Tested: visual attention and vigilance

Test Description:
The PCPT-nl is a measure of visual attention and vigilance based on the Penn CPT [1]. In this task, a series of red vertical and horizontal lines flash in a digital numeric frame (resembling a digital clock). The participant must press the spacebar whenever these lines form complete numbers or complete letters. The task is divided in two parts: one set of trials where the participant is looking for complete numbers lasting 3min followed by another set of trials where the participant is looking for complete letters for 3 min also. Each stimulus flashes for 300 milliseconds and a blank page is then displayed for 700 milliseconds, giving the participant 1 sec to respond to every trial. The participant practices both sets of trials before the task begins.

Rules & Variables:
The PCPT-nl is scored based on the number of true/false positives and true negative responses and their respective median response times.

Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	1.01
CPN_TP (NumLet True Positive Responses for Number Trials)	0-60
CPN_FP (NumLet False Positive Responses for Number Trials)	0-120
CPN_TN (NumLet True Negative Responses for Number Trials)	0-120
CPN_TPRT (Median Response Time for NumLet True Positive Responses for Number Trials)	0-1000ms
CPN_FPRT (Median Response Time for NumLet False Positive Responses for Number Trials)	0-1000ms
CPL_TP (NumLet True Positive Responses for Letter Trials)	0-60
CPL_FP (NumLet False Positive Responses for Letter Trials)	0-120
CPL_TN (NumLet True Negative Responses for Letter Trials)	0-120
CPL_TPRT (Median Response Time for NumLet True Positive Responses for Letter Trials)	0-1000ms
CPL_FPRT (Median Response Time for NumLet False Positive Responses of Letter Trials)	0-1000ms

Scoring Variables Notes:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above. * All time-based scores (e.g. Response Time) are given in millisecond units (ms).
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.
True Positives = spacebar press when the lines flashing form a complete number or a complete letter (a correct response).

False Positives = spacebar press when the lines flashing do not form a complete number or a complete letter (an incorrect response).
True Negatives = no spacebar press when the lines flashing do not form a complete number nor a complete letter (a correct response).
the scores presented by the variables above.

Reference:
[1] Kurtz, M.M., Ragland, J.D., Bilker, W.B., Gur, R.C., Gur, R.E. (2001): Comparison of two forms of the continuous performance test, with and without working memory demands in healthy controls and patients with schizophrenia. *Schiz Res,* 48:307–316

[2] Gur, R.C., Ragland, J.D., Moberg, P.J., Turner, T.H., Bilker, W.B., Kohler, C., Siegel, S.J., Gur, R.E. (2001): Computerized neurocognitive scanning: I. Methodology and validation in healthy people. *Neuropsychopharmacology* 25:766–776

[3] Gur, R.C., Ragland, J.D., Moberg, P.J., Bilker, W.B., Kohler, C., Siegel, S.J., Gur, R.E. (2001): Computerized neurocognitive scanning: II. The Profile of schizophrenia. *Neuropsychopharmacology,* 25(5): 777-788.

Test Title: peat40
Current Version: 2.00
Aliases: Penn Emotional Acuity Test 40, PEAT, PEAT40
Estimated Duration:
N = 92; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
1.6 to 7.5	**2.8**	1.9	2.2	2.8	3.6	4.3

Cognitive Domain Tested: emotion recognition and discrimination

Test Description:
The PEAT40 is a measurement of emotion recognition and discrimination. The task presents 40 faces, one at a time, composed of 5 happy, 5 sad and 10 neutral, male and female faces, respectively [1]. The presentation takes place in two blocks, the first of which contains sad and neutral faces (sad–neutral block); the second, happy and neutral faces (happy–neutral block). The faces are presented randomly within the blocks. Participants are asked to rate the emotional valence of the expression on each face on a seven-point scale: very sad, moderately sad, somewhat sad, neutral, somewhat happy, moderately happy, and very happy [1]. Choices are entered by clicking with the mouse on one of the seven emotion descriptions.
Stimuli: face stimuli were acquired as described in Erwin et al., 1992 [4].

Rules & Variables:
The PEAT40 uses the total correct and total within-1 correct responses and median response times for very happy, neutral-happy, neutral, neutral-sad and very sad responses.

Variable Definition	Range
ScorVers = Current Programming Version of the Scoring Code	1.00
TC (PEAT40 Total Correct)	0-40
TW1 (PEAT40 Total Within 1 Correct)	0-40
TW1RT (Median Response Time for PEAT40 Trials Within 1 Correct)	0-time variant
TRT (Median Response Time for Correct Trials)	0-time variant
VHC (PEAT40 Very Happy Correct)	0-6
VHW1 (PEAT40 Very Happy Within 1 Correct)	0-6
VHW1RT (Median Response Time for PEAT40 Very Happy Trials Within 1 Correct)	0-time variant
VHRT (Median Response Time for Correct Very Happy Trials)	0-time variant
HNC (PEAT40 Happy Neutral Correct)	0-14
HNW1 (PEAT40 Happy Neutral Within 1 Correct)	0-14
HNW1RT (Median Response Time for PEAT40 Happy Neutral Trials Within 1 Correct)	0-time variant
HNRT (Median Response Time for Correct Happy Neutral Trials)	0-time variant
NC (PEAT40 Neutral Correct)	0-20
NW1 (PEAT40 Neutral Within 1 Correct)	0-20
NW1RT (Median Response Time for PEAT40 Neutral Trials Within 1 Correct)	0-time variant
NRT (Median Response Time for Correct Neutral Trials)	0-time variant
SNC (PEAT40 Sad Neutral Correct)	0-14
SNW1 (PEAT40 Sad Neutral Within 1 Correct)	0-14

SNW1RT (Median Response Time for PEAT40 Sad Neutral Trials Within 1 Correct)	0-time variant
SNRT (Median Response Time for Correct Sad Neutral Trials)	0-time variant
VSNC (PEAT40 Very Sad Correct)	0-6
VSNW1 (PEAT40 Very Sad Within 1 Correct)	0-6
VSNW1RT (Median Response Time for PEAT40 Very Sad Trials Within 1 Correct)	0-time variant
VSNRT (Median Response Time for Correct Very Sad Trials)	0-time variant

Scoring Variables Notes:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above. * All time-based scores (e.g. Response Time) are given in millisecond units (ms).
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.

Within-1 correct = includes one level up and one level down responses, as well as the exact answer, for any of the categories computed (very happy, neutral-happy, neutral, neutral-sad and very sad responses). For example, if *moderately happy* is the correct answer, the within-1 correct answers would be *very happy* and *slightly happy* and *moderately happy*.

Test Screenshot

Within 1 Correct: Slightly Happy, Slightly Sad
Correct Response: Neutral

Reference:
[1] Sachs, G., Steger-Wuchse, D., Kyrspin-Exner, I., Gur, R.C., Katschnig, H. (2004). Facial recognition deficits and cognition in schizophrenia. *Schizophrenia Research, 68,* 27-35.

[2] Silver, H., Shlomo, N., Turner, T., Gur, R.C. (2002). Perception of happy and sad facial expressions in chronic schizophrenia: Evidence for two evaluative systems. *Schizophrenia Research, 55*, 171-177.

[3] Kohler, C.G., Bilker, W., Hagendoorn, M., Gur, R.E., Gur, R.C. (2000). Emotion recognition deficit in schizophrenia: association with symptomatology and cognition. *Society of Biological Psychiatry, 48,* 127-136.

[4] Erwin, R.J., Gur, R.C., Gur, R.E., Skolnick, B., Mawhinney-Hee, M., Smailis, J. (1992). Facial emotion discrimination 1: Task construction and behavioral findings in normal subjects. *Psychiatry Research, 42,* 231-240.

[5] Gur, R.C., Erwin, R.J., Gur, R.E., Zwil, A.S., Heimberg, C., Kraemer, H.C. (1992). Facial emotion discrimination II: Behavioral findings in depression. *Psychiatry Research, 42,* 241-251.

[6] Silver H, Goodman C, Knoll G, Isakov V. Brief emotion training improves recognition of facial emotions in chronic schizophrenia. A pilot study. *Psychiatry Research* 2004; 128: 147-154.

Test Title: pert96
Current Version: 1.01
Aliases: Penn Emotion Recognition Task, PERT96.
Estimated Duration:
N = 93; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
7.1 to 22.1	**8.8**	7.4	7.8	8.8	10.0	13.2

Cognitive Domain Tested: emotion recognition

Test Description:
The PERT96 is a measure of emotion recognition. Participants are shown a series of 96 faces, one at a time, and asked to determine what emotion the face is showing for each trial. There are 6 answer choices: happy, sad, anger, fear, disgust and no emotion. Participants choose, by clicking with the computer mouse, the emotion they believe is displayed by each face on the computer screen. There are 8 low-intensity and 8 high-intensity expressions of each emotion and 16 neutral expressions (8 x 5 x 2 = 80; 80 + 16 = 96).
Note: The faces are colored pictures taken, analyzed and rated as described in [1]. They are balanced for quality and intensity of emotion, age, gender and ethnicity [2].

Rules & Variables:
The scores are based on the total number of correct responses; the total number of correct responses for female and male expressions; and the number of correct responses (both male and female) in each of the emotion categories: happy, sad, anger, fear, disgust and no emotion/neutral. The number of false positives for happy, sad, anger, fear, disgust and no emotion/neutral faces is also given. Scores are also given for the total number of mild and intense emotion expressions correctly identified is scored and the number of correctly identified male and female mild and intense emotion expressions. Median response times are given for all scores. Finally, each of these scores are produced for a subset of 40 faces from the PERT96 that appear in the ER40, a shortened version of the PERT96 with 40 questions/faces extracted from the 96 faces of the PERT96. The other difference between the PERT96 and ER40 scores is that the ER40 does not contain the emotion "disgust". Therefore, the extracted ER40 values are the following: the total number of correct responses; the total number of correct male and female responses; correct happy, sad, fear, anger and no emotion/neutral responses; false positive responses for happy, sad, fear, anger and no emotion/neutral faces; and the number of correct mild and extreme identifications. The median response time is given for all extracted ER40 scores.

Scoring Variables List:

Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	1.02
PERT_CR (PERT Correct Responses)	0-96
PERT_CRT (Median RT for PERT Correct Responses)	0-time variant
Pert_FCR (PERT Correct Responses for Female Faces)	0-48
Pert_MCR (PERT Correct Responses for Male Faces)	0-48
PF_CRT (Median Response Time for PERT Correct Female Trials)	0-time variant
PM_CRT (Median Response Time for PERT Correct Male Trials)	0-time variant
Anger_C (PERT Correct Responses for Anger Faces)	0-16
Disgust_C (PERT Correct Responses for Disgust Faces)	0-16
Fear_C (PERT Correct Responses for Fear Faces)	0-16
Happy_C (PERT Correct Responses for Happy Faces)	0-16
NoEmo_C (PERT Correct Responses for NoE Faces)	0-16
Sad_C (PERT Correct Responses for Sad Faces)	0-16

Anger_CRT (Median Response Time for PERT Correct Responses for Anger Faces)	0-time variant
Disgust_CRT (Median Response Time for PERT Correct Responses for Disgust Faces)	0-time variant
Fear_CRT (Median Response Time for PERT Correct Responses for Fear Faces)	0-time variant
Happy_CRT (Median Response Time for PERT Correct Responses for Happy Faces)	0-time variant
NoEmo_CRT (Median Response Time for PERT Correct Responses for NoE Faces)	0-time variant
Sad_CRT (Median Response Time for PERT Correct Responses for Sad Faces)	0-time variant
FP_Anger (PERT False Positive Anger Responses)	0-80
FP_Disgust (PERT False Positive Disgust Responses)	0-80
FP_Fear (PERT False Positive Fear Responses)	0-80
FP_Happy (PERT False Positive Happy Responses)	0-80
FP_NoEmo (PERT False Positive NoEmo Responses)	0-80
FP_Sad (PERT False Positive Sad Responses)	0-80
FP_AngerRT (Median Response Time for PERT False Positive Anger Responses)	0-time variant
FP_DisgustRT (Median Response Time for PERT False Positive Disgust Responses)	0-time variant
FP_FearRT (Median Response Time for PERT False Positive Fear Responses)	0-time variant
FP_HappyRT (Median Response Time for PERT False Positive Happy Responses)	0-time variant
FP_NoEmoRT (Median Response Time for PERT False Positive NoEmo Responses)	0-time variant
FP_SadRT (Median Response Time for PERT False Positive Sad Responses)	0-time variant
FAC (PERT Correct Responses for Female Anger Faces)	0-8
FDC (PERT Correct Responses for Female Disgust Faces)	0-8
FFC (PERT Correct Responses for Female Fear Faces)	0-8
FHC (PERT Correct Responses for Female Happy Faces)	0-8
FNC (PERT Correct Responses for Female NoE Faces)	0-8
FSC (PERT Correct Responses for Female Sad Faces)	0-8
FACRT (Median Response Time for PERT Correct Responses to Female Anger Faces)	0-time variant
FDCRT (Median Response Time for PERT Correct Responses to Female Disgust Faces)	0-time variant
FFCRT (Median Response Time for PERT Correct Responses to Female Fear Faces)	0-time variant
FHCRT (Median Response Time for PERT Correct Responses to Female Happy Faces)	0-time variant
FNCRT (Median Response Time for PERT Correct Responses to Female NoE Faces)	0-time variant
FSCRT (Median Response Time for PERT Correct Responses to Female Sad Faces)	0-time variant
MAC (PERT Correct Responses for Male Anger Faces)	0-8
MDC (PERT Correct Responses for Male Disgust Faces)	0-8
MFC (PERT Correct Responses for Male Fear Faces)	0-8

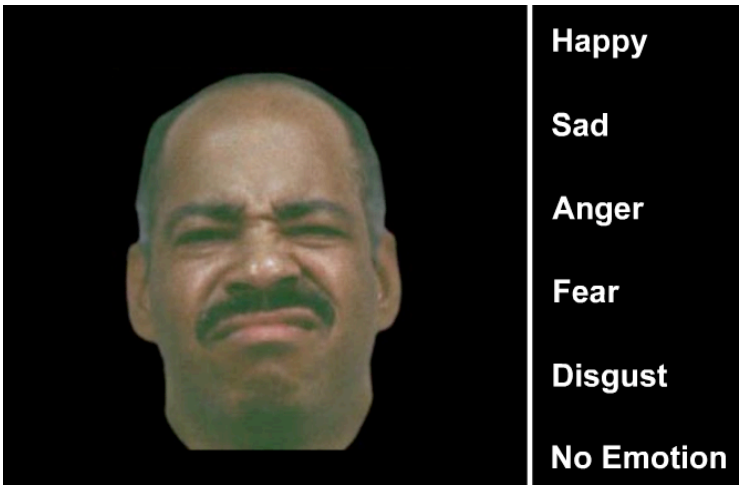
MHC (PERT Correct Responses for Male Happy Faces)	0-8
MNC (PERT Correct Responses for Male NoE Faces)	0-8
MSC (PERT Correct Responses for Male Sad Faces)	0-8
MACRT (Median Response Time for PERT Correct Responses to Male Anger Faces)	0-time variant
MDCRT (Median Response Time for PERT Correct Responses to Male Disgust Faces)	0-time variant
MFCRT (Median Response Time for PERT Correct Responses to Male Fear Faces)	0-time variant
MHCRT (Median Response Time for PERT Correct Responses to Male Happy Faces)	0-time variant
MNCRT (Median Response Time for PERT Correct Responses to Male NoE Faces)	0-time variant
MSCRT (Median Response Time for PERT Correct Responses to Male Sad Faces)	0-time variant
FXC (PERT Correct Responses for Extreme Female Faces)	0-20
FZC (PERT Correct Responses for Mild Female Faces)	0-20
MXC (PERT Correct Responses for Extreme Male Faces)	0-20
MZC (PERT Correct Responses for Mild Male Faces)	0-20
FXCRT (Median Response Time for PERT Correct Responses to Extreme Female Faces)	0-time variant
FZCRT (Median Response Time for PERT Correct Responses to Mild Female Faces)	0-time variant
MXCRT (Median Response Time for PERT Correct Responses to Extreme Male Faces)	0-time variant
MZCRT (Median Response Time for PERT Correct Responses to Mild Male Faces)	0-time variant
PER40_CR (Extracted ER40 Correct Responses)	0-40
PER40_CRT (Extracted ER40 Correct Responses Median Response Time)	0-time variant
PER40_FC (Extracted ER40 Correct Female Identifications)	0-20
PER40_MC (Extracted ER40 Correct Male Identifications)	0-20
PER40FCRT (Extracted ER40 Correct Female Identifications Median Response Time)	0-time variant
PER40MCRT (Extracted ER40 Correct Male Identifications Median Response Time)	0-time variant
PER40ANG (Extracted ER40 Correct Anger Identifications)	0-8
PER40FEAR (Extracted ER40 Correct Fear Identifications)	0-8
PER40HAP (Extracted ER40 Correct Happy Identifications)	0-8
PER40NOE (Extracted ER40 Correct Neutral Identifications)	0-8
PER40SAD (Extracted ER40 Correct Sad Identifications)	0-8
PER40ANGRT (Median Response Time for Extracted ER40 Correct Anger Identifications)	0-time variant
PER40FEARRT (Median Response Time for Extracted ER40 Correct Fear Identifications)	0-time variant
PER40HAPRT (Median Response Time for Extracted ER40 Correct Happy Identifications)	0-time variant
PER40NOERT (Median Response Time for Extracted ER40 Correct Neutral Identifications)	0-time variant
PER40SADRT (Median Response Time for Extracted ER40 Correct Sad Identifications)	0-time variant

PER40_FPA (Extracted ER40 False Positive Anger Responses)	0-32
PER40_FPF (Extracted ER40 False Positive Fear Responses)	0-32
PER40_FPH (Extracted ER40 False Positive Happy Responses)	0-32
PER40_FPN (Extracted ER40 False Positive Neutral Responses)	0-32
PER40_FPS (Extracted ER40 False Positive Sad Responses)	0-32
PER40_FPART (Median Response Time for Extracted ER40 False Positive Anger Responses)	0-time variant
PER40_FPFRT (Median Response Time for Extracted ER40 False Positive Fear Responses)	0-time variant
PER40_FPHRT (Median Response Time for Extracted ER40 False Positive Happy Responses)	0-time variant
PER40_FPNRT (Median Response Time for Extracted ER40 False Positive Neutral Responses)	0-time variant
PER40_FPSRT (Median Response Time for Extracted ER40 False Positive Sad Responses)	0-time variant
PER40MILD (Extracted ER40 Correct Mild Identifications)	0-20
PER40EXTR (Extracted ER40 Correct Extreme Identifications)	0-20
PER40MDRT (Extracted ER40 Correct Mild Identifications Median Response Time)	0-time variant
PER40EXRT (Extracted ER40 Correct Extreme Identifications Median Response Time)	0-time variant

Variable Notes:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above. * All time-based scores (e.g. Response Time) are given in millisecond units (ms).
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.
The extracted ER40 scores are based on the ER40 task (a shortened version of the PERT96, with 40 questions/faces extracted from the 96 faces of the PERT96). The other difference between the PERT96 and ER40 scores is that the ER40 does not contain the emotion "disgust".

Test Screenshot



Correct Response: Disgust

References:
[1] Gur RC, Sara R, Hagendoorn M, Marom O, Hughett P, Macy L, Turner T, Bajcsy R, Posner A, Gur RE. A method for obtaining 3-dimensional facial expressions and its standardization for use in neurocognitive studies. *Journal of Neuroscience Methods* 2002; 115:137-143.

[2] Kohler CG, Turner TH, Bilker WB, Brensinger CM, Siegel SJ, Kanes SJ, Gur RE, Gur RC. Facial emotion recognition in schizophrenia: intensity effects and error pattern. *Amercian Journal of Psychiatry 2003;* 160: 1768-1774.

[3] Kohler CG, Turner TH, Gur RE, Gur RC. Recognition of facial emotions in neuropsychiatric disorders. *CNS Spectrums* 2004; 9(4): 267-274.

Test Title: pllt
Current Version: 2.00
Aliases: Penn List Learning Test, PLLT
Estimated Duration:
N = 420; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
3.4 to 39.6	**9.3**	6.8	7.8	9.3	11.1	14.0

Cognitive Domain Tested: verbal learning and verbal memory

Test Description:
The PLLT is a measure of verbal learning and verbal memory. This test is modeled after the California Verbal Learning Test (CVLT) [1, 2, 3]. The test is composed of immediate recall, short delay recall, short delay cued recall, long delay recall and long delay cued recall sessions (long delay recall = PLLTd). First, the participant will listen to a series of 16 words read to him/her by the test administrator. Each word falls within one of four semantic categories. The administrator follows the list of words in the computer screen as each word he/she must read is highlighted for 1 second (the exact time he/she can use to read each word). The administrator is the only person looking at the screen because the participant must not see any of the words read to him/her/her. Also, it is very important that the administrator read each word using a monotone voice so that no emphasis is given to any word in particular. After the participant listens to the words, he/she is asked to repeat as many of the items as he/she can remember, in any order. This section comprises the immediate recall block and it is repeated for a total of 5 consecutive blocks (both list reading and recall).
Then, a new 16-item list is read to the participant, following the same administration rules as those of the previous 5 blocks. The participant must repeat as many items he/she can remember from the second list, in any order. Following the second-list immediate recall, the participant is asked to list all the items from the first list (without the first list being recalled) that he/she can remember (short delay recall block). Finally, the participant is asked to list the items he/she can remember from the first list according to 4 different semantic categories: professions, precious stones, four-legged animals and human dwelling. Each category comprises 4 words from the original list of words read to him/her previously (4 categories 4 words each = 16 words total). These are the short delay cued recall blocks. The long delay recall and long delay cued recall are administered through the PLLTd.

The test administrator marks the responses given by the participant by clicking with the mouse on each word the participant says on the computer. All words are displayed on the computer screen after the administrator finishes reading the prompts for each session. The administrator clicks on the words in the order the participant says. If the participant says a word that wasn't read to him/her/her or does not belong to the categories of the long delay cued recall blocks you are assessing, the administrator clicks on the "other" button.
There is a maximum of 25 total responses that may be given for the immediate and short delay recalls; and 8 answers total responses for each of the short delay cued recall blocks.

There is one alternate form of the PLLT: the PLLT-B.

Rules & Variables:
The PLLT scores are based on the number of correct responses (excluding perseverations), number of perseverations, intrusions, semantic cluster, expected semantic cluster, chance-adjusted semantic clusters, serial clusters, expected serial clusters and chance-adjusted serial clusters for each block. There are 11 blocks total. The learning slope of blocks 1-5 (the immediate recall blocks) is also given.

Scoring Variables List:

Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	-
PLLTCORn (The number of correct responses in block n, excluding perseverations; n=1 to 7)	0-16
PLLTPERn (The number of perseverations in block n; n=1 to 7)	0-24
PLLTINTn (The number of intrusions in block n; n=1 to 7)	0-25
PLLTSEMOn (The number of semantic clusters observed in block n; n=1 to 7)	0-12
PLLTSEMEn (The expected number of semantic cluster in block n; n=1 to 7)	0-3
PLLTSEMAn (The chance-adjusted number of semantic clusters in in block n; n=1 to 7)	-3-12
PLLTSEROn (The number of serial clusters observed in block n; n=1 to 7)	0-15
PLLTSEREn (The number of serial clusters expected in in block n; n=1 to 7)	0-0.9375
PLLTSERAn (The chance-adjusted number of serial clusters in in block n; n=1 to 7)	-0.9375-15
PLLTCORn (The number of correct responses in block n, excluding perseverations; n=8 to 11)	0-4
PLLTPERn (The number of perseverations in block n; n=8 to 11)	0-7
PLLTINTn (The number of intrusions in block n; n=8 to 11)	0-8
PLLTSLOPE for blocks 1-5 (The learning slope over blocks 1-5)	-8 - 8

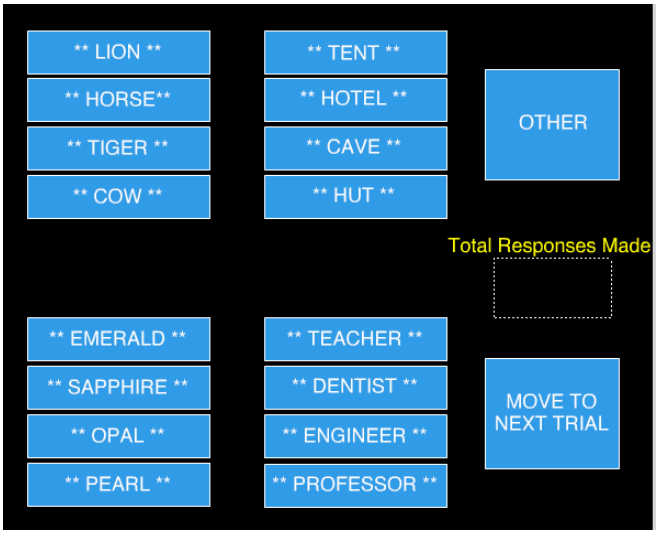
Variables and Answers:

* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above.
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.
- Perseverations = any additional correct response for a response already given. If a response is repeated the administrator must click on that word again.
- Intrusions = incorrect responses, including words not read to the participant for that specific block. Note that if the participant pluralizes a word that was read to him/her in singular or vice versa, then that answer should be marked as an intrusion (the administrator clicks on the "other" button).
- Semantic clusters = correct responses (but not perseverations) in the same semantic category as the previous response.
- Expected semantic clusters = computed as (PLLTCOR*n* – 1)/5, *n* = block number
- Chance-adjusted semantic clusters = computed as PLLTSEMO*n* – PLLTSEME*n*, *n* = block number.
- Serial clusters = correct responses (but not perseverations) with a sequence number one larger than the previous response.
- Expected serial clusters = computed as (PLLTCOR*n* - 1) / 16, *n* = block number (16 can change to 8 b/c there are a total of 8 answers which could all belong to the list in the semantic cued recall blocks)
- Chance-adjusted serial clusters = computed as (PLLTSEROn - PLLTSEREn).

- PLLTSLOPE = is the learning slope over blocks 1-5 and is computed using the standard linear regression formula for slope (-8 to 8 is the estimated range for data quality control).

Test Screenshot



References:

[1] Delis, D.C., Kramer, J.L., Kaplan, E. and Ober, B.A., 1987. California Verbal Memory Test: Manual. , Psychological Corporation, San Antonio, TX.

[2] Delis, D.C., Kramer, J.H., Kaplan, E. and Ober, B.A., 1987. California Verbal Learning Test: Research Edition—Adult Version. , The Psychological Corporation, New York, NY.

[3] Delis, D.C., Kramer, J. H., Kaplan, E., Ober, B. A., 2000. California Verbal Learning Test—2nd edition: Manual, The Psychological Corporation, San Antonio, TX.

Gur RC, Ragland JD, Moberg PJ, Turner TH, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: I. Methodology and validation in healthy people. *Neuropsychopharmacology* 2001; 25(5):766-776.

Gur RC, Ragland JD, Moberg PJ, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: II. The Profile of schizophrenia. *Neuropsychopharmacology* 2001; 25(5):777-788.

Test Title: plltd
Current Version: 2.00
Aliases: Penn List Learning Test delay, PLLTd
Estimated Duration:
N = 417; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
0.6 to 12.2	**2.3**	1.5	1.8	2.3	2.9	4.0

Cognitive Domain Tested: verbal learning and verbal memory

Test Description:
The PLLTd is a measure of verbal learning and verbal memory. This is a computerized version of the California Verbal Learning Test (CVLT) [1, 2, 3], administered 15-45 minutes after the PLLT. The participant must recall words from a list read to him/her during the PLLT; no lists are read during the PLLTd. The PLLTd is composed of long delay recall and long delay cued recall sessions of the PLLT. The administrator is the only person looking at the screen because the participant must not see any of the words displayed on the computer screen.
First, the participant is asked to list all the items from the FIRST LIST read to him/her during the PLLT that he/she can remember (long delay recall block). Then, the participant is asked to list the items he/she can remember from the FIRST LIST according to 4 different categories, each containing 4 words read to him previously (4 categories, 4 words each = 16 words total): human dwellings, four-legged animals, precious stones, and professions. These are the long delay cued recall blocks.
The test administrator marks the responses given by the participant by clicking with the mouse on each word the participant says from a list displayed on the computer screen. All words should be clicked in the order the participant says them. If the participant says a word that is not from the original list, the administrator clicks on the "other" button.
There is a maximum of 25 answers total for the long delay recall and 8 answers total for the long delay cued recall blocks.

Note: The PLLTd takes place 15-45min after the PLLT, usually with other tasks in between to control for the delay time and to avoid rehearsal.

Rules & Variables:
The PLLTd scores are based on the number of correct responses (excluding perseverations), number of perseverations, intrusions, semantic clusters, expected semantic clusters, chance-adjusted semantic clusters, serial clusters, expected serial clusters and chance-adjusted serial clusters for each block. There are 5 blocks total (12 through 16).

Scoring Variables List:

Scoring Variables List:

Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	1.00
PLLTCOR12 (The number of correct responses in the block, excluding perseverations)	0-16
PLLTPER12 (The number of perseverations in the block)	0-24
PLLTINT12 (The number of intrusions in the block)	0-25
PLLTSEMO12 (The number of semantic clusters observed in the block)	0-12

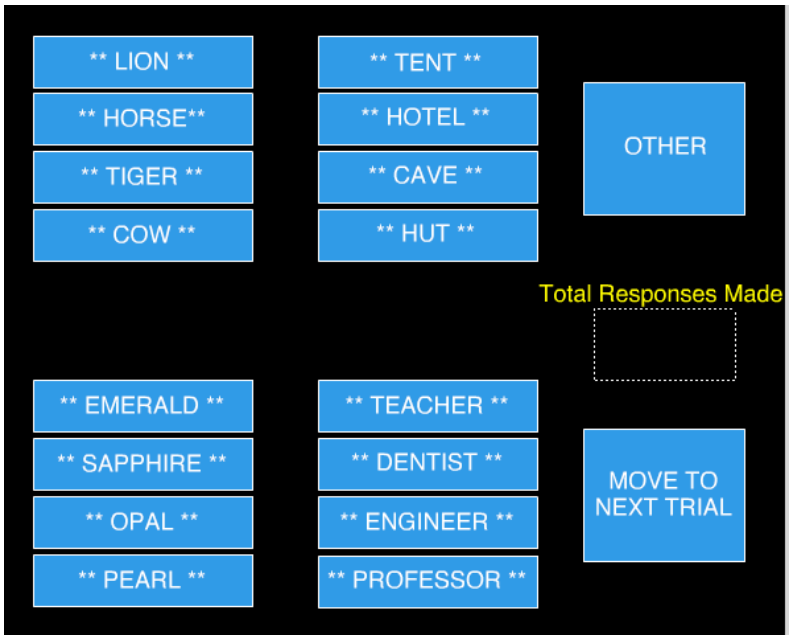
PLLTSEME12 (The expected number of semantic cluster in the block)	0-3
PLLTSEMA12 (The chance-adjusted number of semantic clusters in the block)	-3-12
PLLTSERO12 (The number of serial clusters observed in the block)	0-15
PLLTSERE12 (The number of serial clusters expected in the block)	0-0.9375
PLLTSERA12 (The chance-adjusted number of serial clusters in the block)	-0.9375-15
PLLTCORn (The number of correct responses in block n, excluding perseverations; n=13 to 16)	0-4
PLLTPERn (The number of perseverations in block n; n=13 to 16)	0-7
PLLTINTn (The number of intrusions in the block n; n=13 to 16)	0-8

Variables and Answers:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above.
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

ScorVers = scoring-code version - particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments.
- Perseverations = any additional correct response for a response already given. If a response is repeated the administrator must click on that word again.
- Intrusions = incorrect responses including words not read to the participant for that specific block. Note that if the participant pluralizes a word that was read to him/her in singular or vice versa, then that answer should be marked as an intrusion (the administrator clicks on the "other" button).
- Expected semantic clusters = computed as (PLLTCOR*n* – 1)/5, *n* = block number
- Chance-adjusted semantic clusters = computed as PLLTSEMO*n* – PLLTSEME*n*, *n* = block number.
- Serial clusters = correct responses (but not a perseveration) with a sequence number one larger than the previous response.
- Expected serial clusters = computed as (PLLTCOR*n* - 1) / 16, *n* = block number (16 can change to 8 b/c there are a total of 8 answers which could all belong to the list in the semantic cued recall blocks)
- Change-adjusted serial clusters = computed as (PLLTSEROn - PLLTSEREn).

The numbers 12-16 for all 5 blocks of the PLLTd reflect a continuation of the blocks from the PLLT (1-11).

Test Screenshot



References:

[1] Delis, D.C., Kramer, J.L., Kaplan, E. and Ober, B.A., 1987. California Verbal Memory Test: Manual. , Psychological Corporation, San Antonio, TX.

[2] Delis, D.C., Kramer, J.H., Kaplan, E. and Ober, B.A., 1987. California Verbal Learning Test: Research Edition—Adult Version. , The Psychological Corporation, New York, NY.

[3] Delis, D.C., Kramer, J. H., Kaplan, E., Ober, B. A., 2000. California Verbal Learning Test—2nd edition: Manual, The Psychological Corporation, San Antonio, TX.

Gur RC, Ragland JD, Moberg PJ, Turner TH, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: I. Methodology and validation in healthy people. *Neuropsychopharmacology* 2001; 25(5):766-776.

Gur RC, Ragland JD, Moberg PJ, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: II. The Profile of schizophrenia. *Neuropsychopharmacology* 2001; 25(5):777-788.

Test Title: spvrt
Current Version: 2.01
Aliases: Penn's Logical Reasoning Test, Short PVRT, PVRT, shortPVRT, spvrt
Estimated Duration:
N = 472; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
0.9 to 15.3	**3.2**	2.2	2.6	3.2	4.2	5.4

Cognitive Domain Tested: verbal intellectual ability

Test Description:
The shortPVRT is a measure of verbal intellectual ability. It is a short version of the Penn Verbal Reasoning Test (PVRT) [1, 2]. It is a multiple-choice task in which the participant must answer age-appropriate verbal analogy problems [2]. The shortPVRT has a total of 8 questions from the regular PVRT, which has 29 questions. The 8 questions were chosen after a statistical analysis of the PVRT, which demonstrated that these 8 questions could predict the scores of the regular 29-questions PVRT.

There is a one alternate form for the shortPVRT: the shortPVRT-B.

Note: The participant must read all verbal analogies on his/her own. The administrator cannot help the participant read any of the analogies.

Rules & Variables:
The shortPVRT is scored based on the predicted PVRT number of correct responses, percent correct responses and median reaction times for the number of correct, incorrect and all responses.

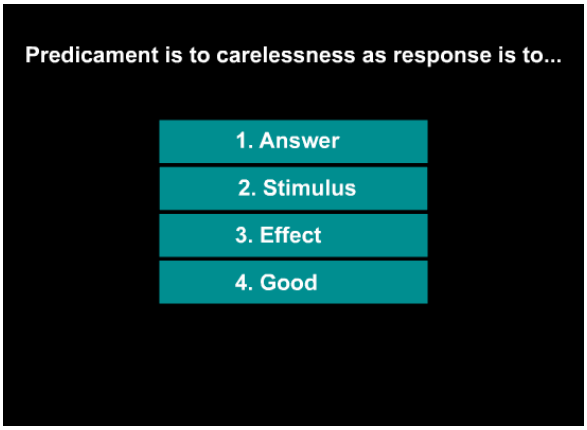
Scoring Variables List:

Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	1.01
PVRT_FORM (Form of this administration)	spvrt-1.00
PVRTCR (PVRT Total Correct)	0-29
PVRT_PC (PVRT Percent Correct)	0-100%
PVRTRTTO (Median Reaction Time for All PVRT Trials)	0-time variant
PVRTRTCR (Median Reaction Time for Correct PVRT Trials)	0-time variant
PVRTRTER (Median Reaction Time for Incorrect PVRT Trials)	0-time variant

Variables and Answers:
ScorVers = scoring-code version (particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments).
PVRT_FORM = serves to discriminate between the regular 29 question PVRT ("pvrt") and the shortPVRT ("spvrt"), which contains 8 questions.
PVRTCR = this value is an estimate from the 8 questions presented towards the total 29 questions of the long version of the PVRT (29 questions).

* The score ranges are not standardized. Normative data for your project is not accounted for in the scores presented by the variables above.

Test Screenshot



Correct Response: 2. Stimulus

Reference:

[1] Gur RC, Gur RE, Obrist WD, Skolnick BE, Reivich M. Age and regional cerebral blood flow at rest and during cognitive activity. *Arch Gen Psychiat* 1987; 44: 617-621.

[2] Gur RC, Ragland JD, Moberg PJ, Turner TH, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: I. Methodology and validation in healthy people. *Neuropsychopharmacology* 2001; 25(5): 766-776.

[3] Gur RC, Ragland JD, Moberg PJ, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: II. The Profile of schizophrenia. *Neuropsychopharmacology* 2001; 25(5): 777-788.

Test Title: plot
Current Version: 6.03
Aliases: Penn Line Orientation Test, PLOT
Estimated Duration:
N = 227; time units = minutes

range	**median**	10%	25%	50%	75%	90%
2.5 to 14.6	**4.2**	3.1	3.6	4.2	4.9	5.7

Cognitive Domain Tested: spatial orientation

Test Description:
The PLOT is a measure of spatial orientation ability. In each trial, participants are shown a pair of lines with different orientations. They are asked to rotate the moveable blue line so that it is parallel to the fixed red line. To rotate the blue line, they click repeatedly on one of two buttons that rotate the line 6 degrees clockwise or counterclockwise for each click. On each trial, the lines vary as to their relative locations on the screen; the centers are either lined up horizontally across the top half of the screen or across the bottom half of the screen, or they are lined up along a diagonal with the leftmost line on the upper left or lower left. The distance between the centers of the two lines is always the same, regardless of the relative locations of the two lines. The length of the blue line varies in each trial -- tiny, small, medium or long -- but the fixed line is always long. There are a total of 24 trials in the test.

Rules & Variables:
Scores are given for total correct trials; correct trials for each of the four possible moveable line lengths; and for correct trials for each of the four possible relative positions. The mean number of times the participant reverses direction (i.e., changes from moving clockwise to counterclockwise, or vice versa) within a trial is also scored. The mean number of clicks beyond the number required for the most efficient solution is recorded for all trials, for correct trials and for incorrect trials. (Note that this number can be negative for incorrect trials and for all trials, but not for correct trials.) Scores are also generated for the total number of positions (i.e., 6 degree angles) the participant is off of the correct solution for all trials, and for each trial individually. The maximum for each trial is 15 positions (90 degrees).

Median response times are recorded for correct and incorrect trials, as well as the median time across trials for the mean response time per click in each trial. The response time for each PLOT test trial is the time between the presentation of the trial until the "FINISHED" button is clicked.

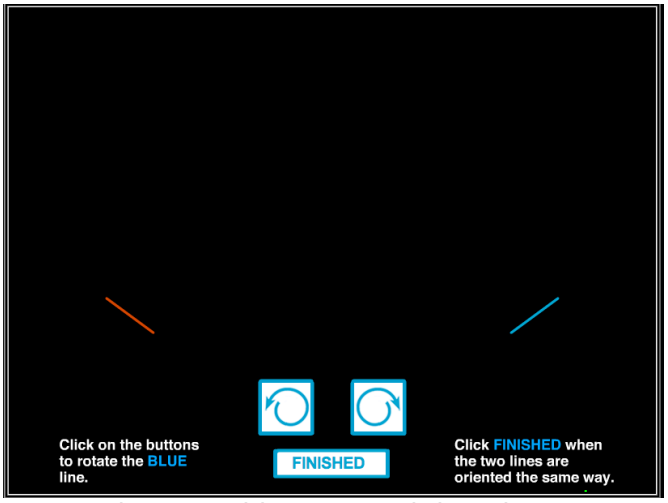
Scoring Variables List:

Variable Definition	Range
ScorVers (Current Version of the Scoring Code)	-
PLOTTC (Total Correct)	0 - 24
PLOTTCRT (Median Response Time for Correct Trials)	0-time variant
PLOTERRT (Median Response Time for Incorrect Trials)	0-time variant
PLOTPCRT (Median of Mean Response Time per Click for Each Trial)	0-time variant
PLOTREV (Mean Reversals for All Trials)	0- unlimited
PLOTCHT (Correct Responses for Horizontal Top Trials)	0 - 6
PLOTCHB (Correct Responses for Horizontal Bottom Trials)	0 - 6
PLOTCDUL (Correct Responses for Diagnonal Trials Beginning Upper Left)	0 - 6

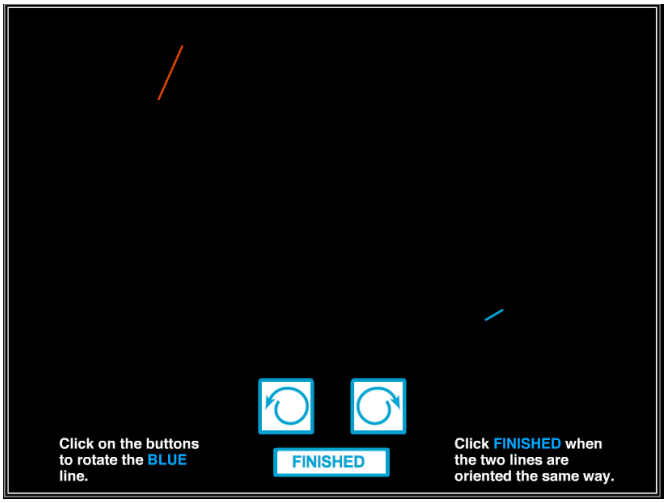
PLOTCDLL (Correct Responses for Diagnonal Trials Beginning Lower Left)	0 - 6
PLOTCTL (Correct Responses for Tiny Line Trials)	0 - 6
PLOTCSL (Correct Responses for Small Line Trials)	0 - 6
PLOTCML (Correct Responses for Medium Line Trials)	0 - 6
PLOTCLL (Correct Responses for Long Line Trials)	0 - 6
PLOTEX (Mean Excess Clicks for All Trials)	negative - unlimited
PLOTCEX (Mean Excess Clicks for Correct Trials)	0 - unlimited
PLOTEREX (Mean Excess Clicks for Incorrect Trials)	negative - unlimited
PLOTOFF (Total Positions Off for All Trials)	0 – 360 (15 * 24)
PLOTOFFn (Positions Off for Trial n, n = 1 to 24)	0 - 15

Variables:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above.
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

- Test Trail Screenshots:



horizontal bottom trial, long line



diagonal upper-left trial, tiny line

Test Title: pvoc
Current Version: 3.00
Aliases: Penn Vocabulary Test, PVOC
Estimated Duration:
N = 227; time units = minutes

range	**median**	10%	25%	50%	75%	90%
2.1 to 21.1	**8.6**	6.0	7.1	8.7	10.9	13.0

***** Note: these times are for a pilot version with 10 items per section instead of 15

Cognitive Domain Tested: verbal ability

Test Description:
The PVOC is a measure of vocabulary and verbal ability. There are five subtests, or parts. Each part contains 15 multiple-choice items with four response choices. The questions in each section are presented in order of increasing difficulty. A section is discontinued if the participant answers five questions incorrectly in that section. Each of the five test parts uses a different measure of verbal knowledge. In Part I, the participant is asked to choose a word that is "closest in meaning" to the target word. In Part II, the participant must choose the word that has a similar meaning to a bolded phrase within a sentence. In Part III, the participant must select the one word that is "not a valid English word". In Part IV, the participant selects the word that is "most nearly opposite in meaning" to the target word. And in Part V, the participant is give a target sentence with one word in bold, and four additional sentences containing the same bolded word. The participant must decide in which sentence the bolded word has a similar meaning as in the target sentence. Participants are given 60 seconds to answer each question in Parts I – IV, and 120 seconds to answer questions in Part V. Participants are given a warning when only 10 seconds remain. If the participant does not respond in the allotted time, a non-response is recorded (scored as incorrect) and the next item is presented.

Subtest	**Measures**	**Format**
PVOC1	Synonyms	Match single word with its synonym
PVOC2	Meaning in context	Replace phrase in sentence with single word having similar meaning
PVOC3	Non-words	Identify one non-word among three real words
PVOC4	Antonyms	Match single word with its antonym
PVOC5	Multiple meanings	Match meaning of common word in target sentence with its use in one of four sentences

Table 1. Five subtests of the PVOC

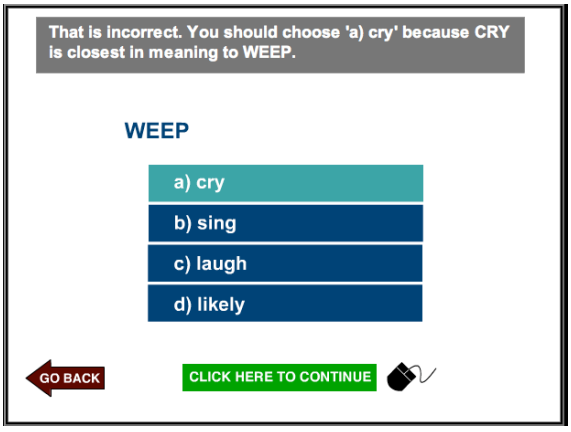
Rules & Variables:
Scores are given for number of correct trials in each of the five parts, as well as total correct responses and total non-responses.

Median response times are calculated for correct trials for each section; for incorrect trials for each section; for all correct trials; and for all incorrect trials. Response time is measured from the presentation of the question until the participant selects a response. Non-responses are not included in response time calculations.

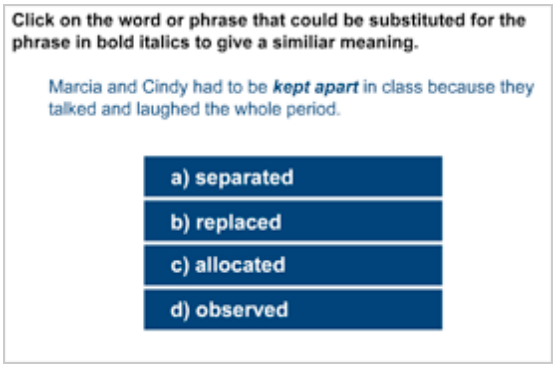
Scoring Variables List:

Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	-
PVOC1 (PVOC Correct Responses for Items 1-10)	0 - 15
PVOC2 (PVOC Correct Responses for Items 11-20)	0 - 15
PVOC3 (PVOC Correct Responses for Items 21-30)	0 - 15
PVOC4 (PVOC Correct Responses for Items 31-40)	0 - 15
PVOC5 (PVOC Correct Responses for Items 41-50)	0 - 15
PVOCCR (PVOC Total Correct Responses)	0 - 75
PVOCNR (PVOC Total Non-Responses)	0 - 25
PVOC1RTCR (Median Response Time for correct PVOC1 Trials)	0-time variant
PVOC2RTCR (Median Response Time for correct PVOC2 Trials)	0-time variant
PVOC3RTCR (Median Response Time for correct PVOC3 Trials)	0-time variant
PVOC4RTCR (Median Response Time for correct PVOC4 Trials)	0-time variant
PVOC5RTCR (Median Response Time for correct PVOC5 Trials)	0-time variant
PVOCRTCR (Median Response Time for all correct PVOC Trials)	0-time variant
PVOC1RTER (Median Response Time for incorrect PVOC1 Trials)	0-time variant
PVOC2RTER (Median Response Time for incorrect PVOC2 Trials)	0-time variant
PVOC3RTER (Median Response Time for incorrect PVOC3 Trials)	0-time variant
PVOC4RTER (Median Response Time for incorrect PVOC4 Trials)	0-time variant
PVOC5RTER (Median Response Time for incorrect PVOC5 Trials)	0-time variant
PVOCRTER (Median Response Time for all incorrect PVOC Trials)	0-time variant

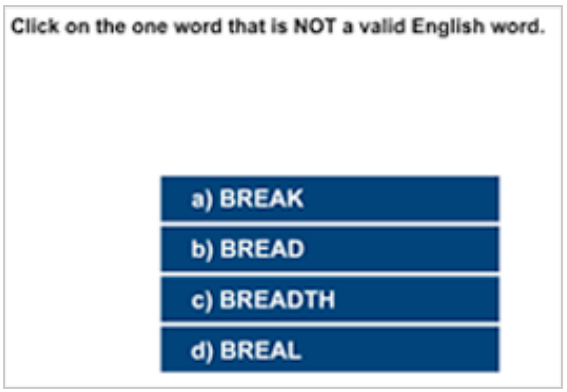
Variables:
** The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above.*
** All time-based scores (e.g. Response Time) are given in millisecond units (ms).*



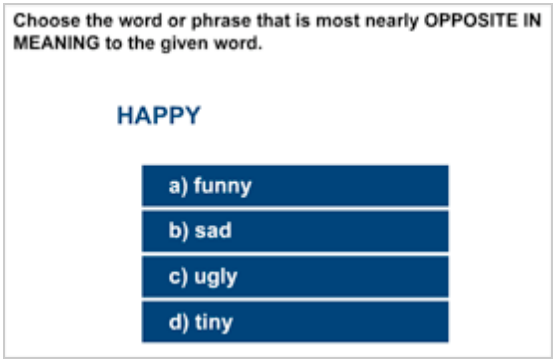
Practice Trial for Part I with Feedback, Incorrect Response



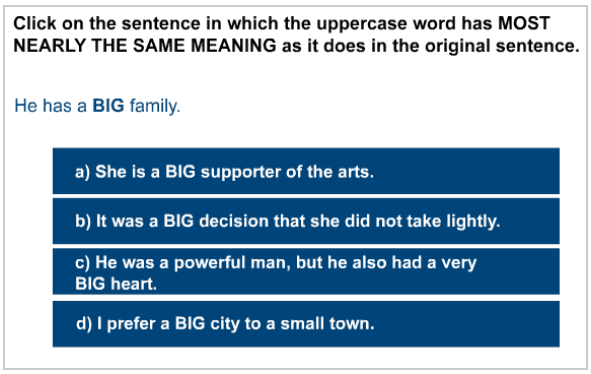
Practice Trial for Part II



Practice Trial for Part III



Practice Trial for Part IV



Practice Trial for Part V

Test Title: sraven
Current Version: 2.00
Aliases: Raven's Progressive Matrices, Short Raven, RAVEN, shortRAVEN, sraven.
Estimated Duration:
N = 472; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
1.2 to 31.7	**4.5**	2.6	3.3	4.5	6.6	9.3

Cognitive Domain Tested: abstraction and mental flexibility

Test Description:
The shortRAVEN is a measure of abstraction and mental flexibility. It is a short version of the University of Pennsylvania's RAVEN, which is a computerized version of the standard paper and pencil task published in 1960 [1-3]. It is a multiple choice task in which the participant must conceptualize spatial, design and numerical relations that range in difficulty from very easy to increasingly complex [2]. During the shortRAVEN, the participant must click with the mouse in the pattern he/she thinks best fits the visual analogy of nonrepresentational designs he/she sees on the page. The shortRAVEN has a total of 9 questions from the regular RAVEN, which has 60 questions. The 9 questions were chosen based on a statistical analysis of the University of Pennsylvania's RAVEN, which demonstrated the 9 questions could predict the scores of the regular 60-questions RAVEN.

There is one alternate form of the shortRAVEN: the shortRAVEN-B.

Note: the shortRAVEN stimuli were created by scanning and digitalizing the original stimuli cards from the paper and pencil RAVEN task [2].

Rules & Variables:
The shortRAVEN is scored based on the predicted RAVEN (60 question) number of correct responses and median reaction times for the number of correct, incorrect and all responses.

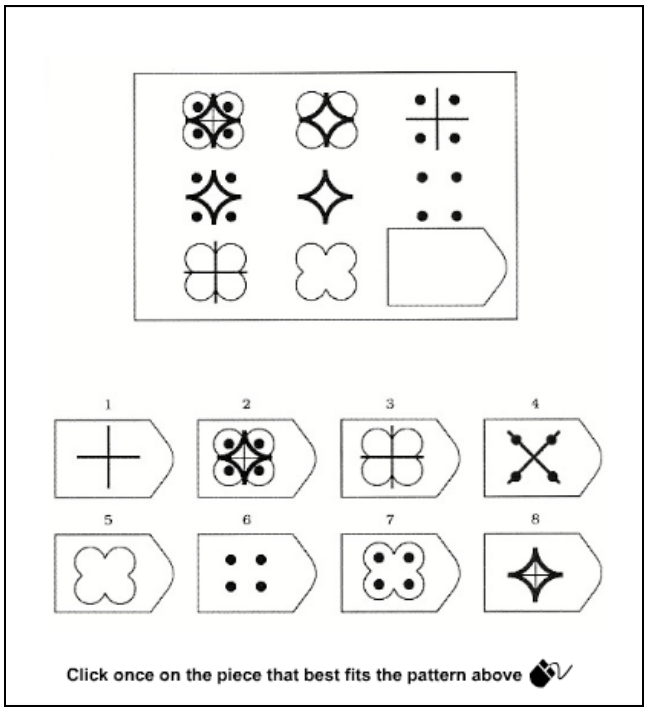
Scoring Variables List:

Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	1
RAV_FORM (Form of this administration)	sraven-1.00
RAV_CR (RAV Correct Responses)	0-60
RAVRT_CR (Median Reaction Time for RAV Correct Responses)	0-time variant
RAVRT_ER (Median Reaction Time for RAV Incorrect Responses)	0-time variant
RAVRT_TO (Median Reaction Time for All RAV Responses)	0-time variant

Variables and Answers:
ScorVers = scoring-code version (particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments).
RAV_FORM = discriminates between the regular 60 question RAVEN ("raven") and the shortRAVEN ("sraven"), which contains 9 questions.
RAV_CR = this value is an estimate from the 9 questions presented towards the total 60 questions of the long version of the RAVEN (60 questions).

* The score ranges are not standardized. Normative data for your project is not accounted for in the scores presented by the variables above.

Test Screenshot



Correct Response: #1

Reference:

[1] Raven JC. Guide to the standard progressive matrices. 1960; London, H.K. Lewis

[2] Gur RC, Ragland JD, Moberg PJ, Turner TH, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: I. Methodology and validation in healthy people. *Neuropsychopharmacology* 2001; 25(5): 766-776.

[3] Gur RC, Ragland JD, Moberg PJ, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: II. The Profile of schizophrenia. *Neuropsychopharmacology* 2001; 25(5): 777-788.

[4] Raven JC, Court JH, Raven J. Manual for Raven's Progressive Matrices. 1976; London, H.K. Lewis.

Test Title: svolt
Current Version: 2.00
Aliases: Visual Object Learning Test, Short VOLT, VOLT, sVOLT
Estimated Duration:
N = 884; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
1.3 to 16.8	**2.3**	1.8	2.0	2.3	2.6	3.1

Cognitive Domain Tested: visual object learning and memory

Test Description:
The sVOLT is a measure of visual object learning and memory. It was designed as a spatial analog of the California Verbal Learning Test. The sVOLT includes only the first set of trials of a series of 7 sets from the full version (VOLT) [1]. In the first part of this test, participants are shown 10 three-dimensional Euclidean shapes that they will be asked to identify for both immediate and delayed recalls (delayed recall = sVOLTd). During the immediate recall (sVOLT), participants are shown a series, one at a time, of 20 three-dimensional Euclidean shapes - the 10 shapes they were asked to memorize mixed with 10 novel shapes. The participant's task is to decide whether he/she has seen the shape before by clicking with the mouse on one of two buttons: "YES I have seen the shape" or "NO I have not seen the shape."

There are two alternate form of the sVOLT: the sVOLT-B and sVOLT-C.

Note: There are five classes of objects: triangles, squares, pentagons, hexagons and octagons. For each class, there are 2 figures in both study stimuli (5 x 2 = 10), and foils (5 x 2 =10) for a total of 20 shapes during the test trials [1]. All stimuli have a geometric blue two-dimension shape within the three-dimensional figure. The three dimensional shape, two dimensional blue shape and its location must be remembered in order to correctly answer test trials.

Rules & Variables:
The test is scored based on the number and median response time of true/false positive/negative responses. The total correct and median response times of total correct and total incorrect responses are given, as well as the median response time of all responses.

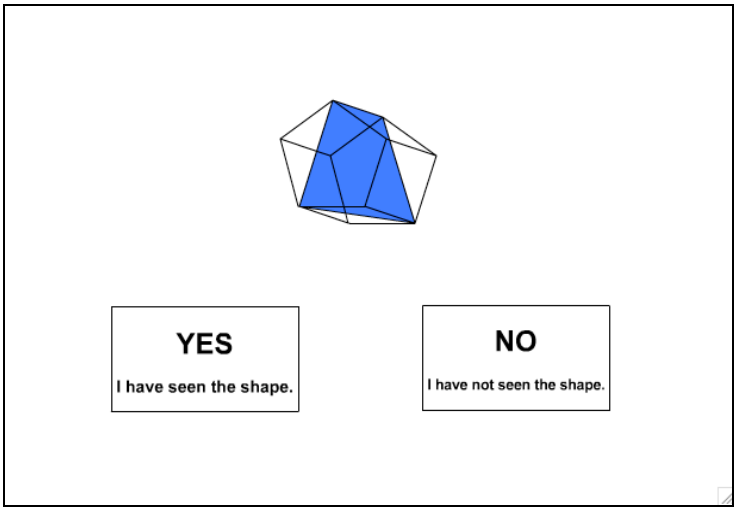
Scoring Variables List:

Variable Definition	Range
SVT (Short VOLT Total Correct)	0-20
SVTRT (Median Response Time for Short VOLT All Responses)	0-20000ms
SVTCRT (Median Response Time for Short VOLT Correct Responses)	0-20000ms
SVTIRT (Median Response Time for Short VOLT Incorrect Responses)	0-20000ms
SVTTP (Short VOLT True Positive Responses)	0-10
SVTTN (Short VOLT True Negative Responses)	0-10
SVTFP (Short VOLT False Positive Responses)	0-10
SVTFN (Short VOLT False Negative Responses)	0-10
SVTTPRT (Short VOLT True Positive Median Response Time)	0-20000ms
SVTTNRT (Short VOLT True Negative Median Response Time)	0-20000ms
SVTFPRT (Short VOLT False Positive Median Response Time)	0-20000ms
SVTFNRT (Short VOLT False Negative Median Response Time)	0-20000ms
SVT (Short VOLT Total Correct)	0-20

Variables and Answers:
ScorVers = scoring-code version (particularly important when analyzing data as we update the scoring code with corrections or necessary adjustments).
SVTTP = "YES" responses to shapes that belong to the 10 shapes the participant was asked to study (correct responses).
SVTTN = "NO" responses to shapes that do not belong to the 10 shapes the participant was asked to study (correct responses).
SVTFP = "YES" responses to shapes that do not belong to the 10 shapes the participant was asked to study (incorrect responses).
SVTFN = "NO" responses to shapes that belong to the 10 shapes the participant was asked to study (incorrect responses).

* The score ranges are not standardized. Normative data for your project is not accounted for in the scores presented by the variables above.

Test Screenshot



Correct Response: Yes, I have seen the shape.

References:
[1] Glahn DC, Gur RC, Ragland JD, Gur RE. Reliability, performance characteristics, and construct validity and initial application of the visual object learning test (VOLT). *Neuropsychology* 1997; 11:602-612.

[2] Gur RC, Ragland JD, Moberg PJ, Turner TH, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: I. Methodology and validation in healthy people. *Neuropsychopharmacology* 2001; 25(5):766-776.

[3] Gur RC, Ragland JD, Moberg PJ, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: II. The Profile of schizophrenia. *Neuropsychopharmacology* 2001; 25(5):777-788.

Test Title: svoltd
Current Version: 2.00
Aliases: Visual Object Learning Test Delayed Memory, Short VOLT delay, VOLTd, sVOLTd.
Estimated Duration:
N = 884; time unit = minutes

range	**median**	10%	25%	50%	75%	90%
0.4 to 16.8	**1.0**	0.7	0.8	1.0	1.2	1.5

Cognitive Domain Tested: visual object learning and memory

Test Description:
The sVOLTd is a measure of visual object learning and memory. It was designed as a spatial analog of the California Verbal Learning Test [1] but the sVOLTd includes only the first set of trials of a series of 7 sets. In the first part of this test, participants were shown 10 three-dimensional Euclidean shapes that they were asked to identify for immediate recall (sVOLT). Now, during the delayed recall (sVOLTd), participants are shown a series, one at a time, of 20 three-dimensional Euclidean shapes - the 10 shapes they were asked to memorize during the SVOLT mixed with 10 novel shapes. The participant's task is to decide whether he/she has seen the shape before by clicking with the mouse on one of two buttons: "YES I have seen the shape" or "NO I have not seen the shape."

There are two alternate form of the sVOLTd: the sVOLTd-B and sVOLTd-C.

Note: The SVOLTd takes place 15-30min after the sVOLT, usually with other tasks in between to control for the delay time and to avoid rehearsal. There are five classes of objects: triangles, squares, pentagons, hexagons and octagons. For each class, there are 2 figures in both study stimuli (5 x 2 = 10), and foils (5 x 2 =10) for a total of 20 shapes during the test trials [1]. All stimuli have a geometric blue two-dimension shape within the three-dimensional figure. The three dimensional shape, two dimensional blue shape and its location must be remembered in order to correctly answer test trials.

Rules & Variables:
The test is scored based on the number and median response time of true/false positive/negative responses. The total correct and median responses times of total correct and incorrect responses are also given.

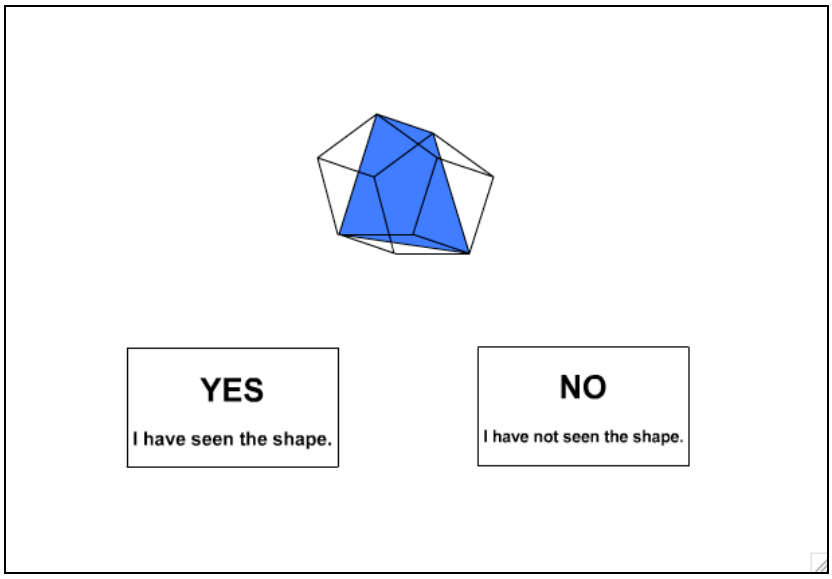
Scoring Variables List:

Variable Definition	Range
ScorVers (Current Programming Version of the Scoring Code)	1.01
SVT_LD (Short VOLT Delay Total Correct)	0-20
SVTLDRTCR (Median Response Time for Short VOLT Delay Correct Responses)	0-20000ms
SVTLDRTER (Median Response Time for Short VOLT Delay Incorrect Responses)	0-20000ms
SVTLDTP (Short VOLT Delay True Positive Responses)	0-10
SVT_LDTN (Short VOLT Delay True Negative Responses)	0-10
SVTLDFP (Short VOLT Delay False Positive Responses)	0-10
SVT_LDFN (Short VOLT Delay False Negative Responses)	0-10
SVTLDTPRT (Short VOLT Delay True Positive Median Response Time)	0-20000ms
SVT_LDTNRT (Short VOLT Delay True Negative Median Response Time)	0-20000ms
SVTLDFPRT (Short VOLT Delay False Positive Median Response Time)	0-20000ms
SVT_LDFNRT (Short VOLT Delay False Negative Median Resp. Time)	0-20000ms

Variables and Answers:
* The scores presented on WebCNP are raw scores. Normative data for your project is not accounted for in the scores presented by the variables above. * All time-based scores (e.g. Response Time) are given in millisecond units (ms).
* All time-based scores (e.g. Response Time) are given in millisecond units (ms).

SVTTP = "YES" responses to shapes that belong to the 10 shapes the participant was asked to study (correct responses).
SVTTN = "NO" responses to shapes that do not belong to the 10 shapes the participant was asked to study (correct responses).
SVTFP = "YES" responses to shapes that do not belong to the 10 shapes the participant was asked to study (incorrect responses).
SVTFN = "NO" responses to shapes that belong to the 10 shapes the participant was asked to study (incorrect responses).

Test Screenshot



Correct Response: Yes, I have seen the shape.

References:
[1] Glahn DC, Gur RC, Ragland JD, Gur RE. Reliability, performance characteristics, and construct validity and initial application of the visual object learning test (VOLT). *Neuropsychology* 1997; 11:602-612.

[2] Gur RC, Ragland JD, Moberg PJ, Turner TH, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: I. Methodology and validation in healthy people. *Neuropsychopharmacology* 2001; 25(5):766-776.

[3] Gur RC, Ragland JD, Moberg PJ, Bilker WB, Kohler C, Siegel SJ, Gur RE: Computerized neurocognitive scanning: II. The Profile of schizophrenia. *Neuropsychopharmacology* 2001; 25(5):777-788.