

**A TOOL FOR EVALUATING  
COGNITION IN CLINICAL  
PRACTICE**

# THE CHALLENGE

Cognitive deficits are the primary predictor of poor outcome, higher cost, and more comorbidity in psychiatric illness.

Cognitive deficits are relevant and potentially sensitive to change with treatment, but they are rarely quantified in clinical practice.

Quick and inexpensive methods are available to neurology (e.g. MMSE).

Can a similar tool be developed for psychiatry?

# BRIEF ASSESSMENT TOOLS

	RBANS	BACS	SCIP
Reliable	YES	YES	YES
Valid	YES	?	YES
Time	45 mins	40 mins	15 mins
Materials	Test kit	Test kit	Pencil
Translations	NO	Various	Normed: En, Jp, Sp, Fr(q). Ongoing: Ru, Ge, Be, Br, Ch, Ko, Ni,
Cost	\$400 USD + \$3 per use	\$350 USD + \$? per use	\$ 0.00 CDN
Target	Elderly	Schizophrenia	Psychiatry

# SCIP COMPONENTS

TEST	Abbev.	Domain	Origin	Time (mins)
Verbal Learning Test – Immediate	VLT_I	Declarative Memory	Rey's VLLT	4
Working Memory Test	WMT	Working Memory	Peterson's CTT	3.5
Verbal Fluency Test	VFT	Executive (speed and inhibition)	Benton's COWA	2.5
Verbal Learning Test – Delayed	VLT_D	Declarative Memory	Rey's VLLT	2.5
Visuomotor Tracking	VMT	Executive (speed and translation)	Purdon's Coding	2.5

# SCIP INSTRUCTIONS

## List Learning Test:

1. You will read the list of words 3 times, requesting recall after each presentation. For the 1<sup>st</sup> trial, say "I am going to read a list of words to you. After I am done, I want you to repeat back as many words as you can in any order".
2. Read the list of 10 words at a pace of about 3 seconds per word. Solicit and record recall.
3. For the 2<sup>nd</sup> trial say "Now I am going to read the list of words again. Once again, when I am finished, repeat back as many words as you can remember in any order, including the ones you have already told me."
4. 3<sup>rd</sup> trial say " I am going to repeat the list one last time. As before, when I am finished, repeat back as many words as you can remember in any order, including the ones you have already told me."
5. After subject has remembered all the words they can say "I want you to remember these words as best as you can because I am going to ask you to recall the list again in a few minutes".

# SCIP INSTRUCTIONS

## Consonant trigrams:

1. You will read a series of three letters and request recall after delays of varying lengths filled with a simple distraction task.
2. The form has the stimulus letters, the delay interval (0 seconds, 3 seconds, etc.) and the distraction initiation number (i.e. the number from which the subject will begin to count down).
3. Say, **"I am going to say some letters and when I am finished I want you to repeat them. Ok?"** (give first set of 2 which have a delay of 0 seconds; hence no distraction).
4. Then say, **"Now I am going to say some letters and a number. This time I want you to count backwards from the number until I ask you for the letters. For example if I say ABC, 10 – you would count backwards out loud from 10 until I ask you for the letters and then you would say ABC"**.
5. Solicit and record recall of the letters (score each letter recalled regardless of order recalled).


# SCIP INSTRUCTIONS

## Verbal Fluency:

1. You will request the subject to generate as many words as they can to a particular letter.
2. Say, "I am going to say a letter of the alphabet and I want you to tell me as many words as you can that begin with that letter."
3. There are three rules to this task. The first rule is that you cannot use words that are numbers, such as for the letter "T" saying thirty-one and thirty-two.
4. The second rule is that you cannot use any words that are commonly capitalized, such as the name of a place, a friend, or a city.
5. The third rule is that you should not provide one word and repeatedly change the ending, such as dance, dancer, and dancing.
6. Any questions?
7. The first letter is \_\_, tell me all the words you can think of that begin with \_\_\_\_.
8. Allow 30 seconds for generation.
9. Now tell me all the words you can think of that begin with the letter \_\_. Go ahead." Allow 30 seconds for generation.

# SCIP INSTRUCTIONS

## Delayed List Learning:

1. Say, "Do you remember that list that we went over the three times earlier,
  2. I want you to tell me as many words as you can from that list, in any order."
  3. Do not read the words again.
  4. Solicit and record recall.
- 



# SCIP INSTRUCTIONS

## Visuomotor Tracking:

1. You will request the subject to rapidly translate the symbols from the code listed at the top to the appropriate boxes below.
2. The test has a series of (shaded) practice items to be used for training, followed by the formal stimuli.
3. Allow 30 seconds.
4. Say, "If you look at these letters (point to code box) you will see that each letter has a code.
5. **Down here what I want you to do is fill in each box with the code that corresponds to the letter.**" Fill in three of the letters, saying "this is an \_\_\_, so I will put \_\_\_ in ". ie. This is a w, so I put dot, dash dash.
6. After filling in first three, tell subject to "Ok, now I want you to do these three in the shaded area for practice", correcting any of S's mistakes.
7. After that say "When I say start, fill these in (pointing) one after another as quickly as you can without making any mistakes.
8. Do you have any questions?

**Z-Score conversions:** Part 1.  $Z=(AVLT \text{ Immediate} - 24)/3$ . Part 2.  $Z=(CTT \text{ total} - 21)/3$ . Part 3.  $Z=(OWF \text{ total} - 18)/5$ . Part 4.  $Z=(AVLD - 8)/2$ . Part 5.  $Z=(VMT-14)/2.5$ . Global index is the average Z across the five tests.

# SCIP INSTRUCTIONS

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Part 2.  $Z = (\text{CTT total} - 21) / 3$ .

Part 3.  $Z = (\text{OWF total} - 18) / 5$ .

Part 4.  $Z = (\text{AVLD} - 8) / 2$ .

Part 5.  $Z = (\text{VMT} - 14) / 2.5$ .

Global index is the average Z across the five tests.

# SCIP PART 1:

## VERBAL LIST LEARNING TEST - IMMEDIATE

1. List learning test (Read the word list at roughly 3 seconds per word. Test recall. Repeat 2 more times). At the end of trial 3 let participant know they will be asked to recall the list again later:

	Drum	Curtain	Bell	Coffee	School	Parent	Moon	Garden	Hat	Farmer	$\Sigma/10$	
Tr. 1												
Tr. 2												
Tr. 3												$\Sigma/30 =$

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	Drum	Curtain	Bell	Coffee	School	Parent	Moon	Garden	Hat	Farmer	$\Sigma/10$	
Tr. 1	6	1	2	3	7	5		1	2	3	6	Mother (4)
Tr. 2	4	5		6	7						7	
Tr. 3	1	2	3			5		4			5	$\Sigma/30 = 18$

# SCIP: PART 2.

## WORKING MEMORY TEST

2. Consonant repetition test: Read each set of three letters. Have the subject count backwards from the start # for the seconds under delay for each item, and then recall letters. Any order is fine):

Stimulus	Start #	Delay	Response		Stimulus	Start #	Delay	Response	
Q-L-X					F-X-B	53	3		
H-J-T					J-C-N	46	9		
X-C-P	94	18			B-G-Q	117	18		
N-D-J	109	9			K-M-C	48	3		$\Sigma/24 =$

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H-J-T			H-J-T		J-C-N	46	9	---	
X-C-P	94	18	L-R-F		B-G-Q	117	18	---	
N-D-J	109	9	---		K-M-C	48	3	M-C-Q	$\Sigma/24 = 8$

# SCIP: PART 3.

## VERBAL FLUENCY TEST

3. Verbal fluency test. Allow 30 seconds to generate words beginning with each letter. There are three rules to this task. The first rule is that you cannot use words that are numbers, such as for the letter “T” saying thirty-one and thirty-two. The second rule is that you cannot use any words that are commonly capitalized, such as the name of a place, a friend, or a city. The third rule is that you should not provide one word and repeatedly change the ending, such as dance, dancer, and dancing.

Stimulus	Response	
C		
L		

# SCIP: PART 3.

## VERBAL FLUENCY TEST

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Stimulus	Response	
C	cat, common, conversation, comedy, collect, converse(I), congruency, compassion, cooperative, congruent (I), center,can	11 Hits 2 Intrusions
L	long, live, lead, look, like, learn, language, linguistic, ladder, living	10 Hits  Σ= 21 Hits, 2 Intrusions



# SCIP: PART 4.

## VERBAL LIST LEARNING TEST - DELAYED

4. Delayed list learning: Ask the subject to recall the earlier words; do not repeat the list.

	Drum	Curtain	Bell	Coffee	School	Parent	Moon	Garden	Hat	Farmer		
Tr. 4											$\Sigma/.10$	$t4/t3 * 100$

# SCIP: PART 4.

## VERBAL LIST LEARNING TEST - DELAYED

4. Delayed list learning: Ask the subject to recall the earlier words; do not repeat the list.

	Drum	Curtain	Bell	Coffee	School	Parent	Moon	Garden	Hat	Farmer		
Tr. 4	3	2	1		4	5					$\Sigma/10$ 5	$t4/t3 * 100$ $5/5*100=100\%$

# SCIP: PART 5.

## VISUOMOTOR TRACKING TEST

5. Visuomotor tracking test: After practice items, allow 30 seconds to complete left to right and top to bottom.

A	V	C	U	G	Y
. -	. . . -	- . . .	. . -	- - .	- . - -

Practice						Test			
G	U	C	Y	A	V	C	A	G	
V	Y	U	G	U	A	Y	C	V	
A	C	Y	G	U	V	C	Y	V	
U	G	A	V	C	G	A	V	Y	Σ/30

# SCIP: PART 5.

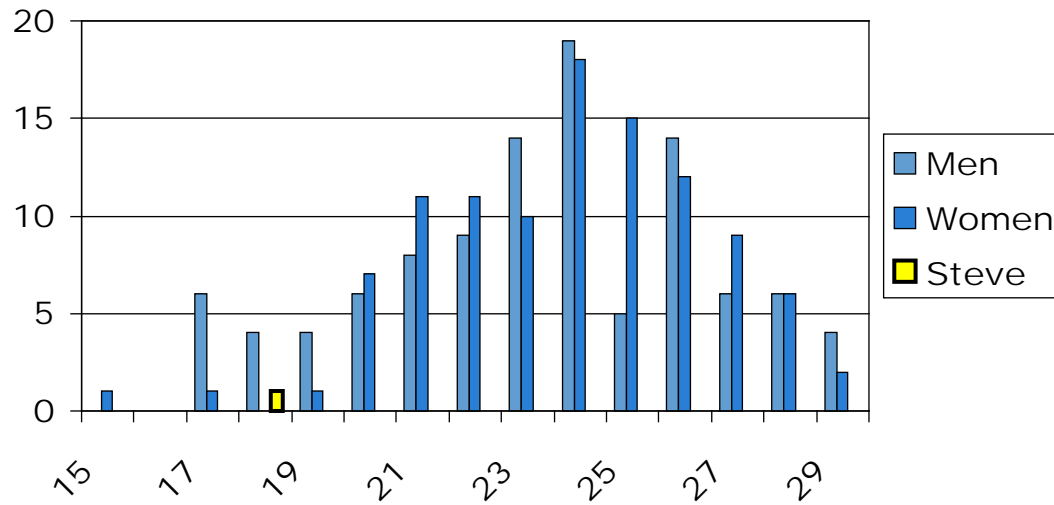
## VISUOMOTOR TRACKING TEST

5. Visuomotor tracking test: After practice items, allow 30 seconds to complete left to right and top to bottom.

A	V	C	U	G	Y
. -	. . . -	- . . .	. . -	- - .	- . - -

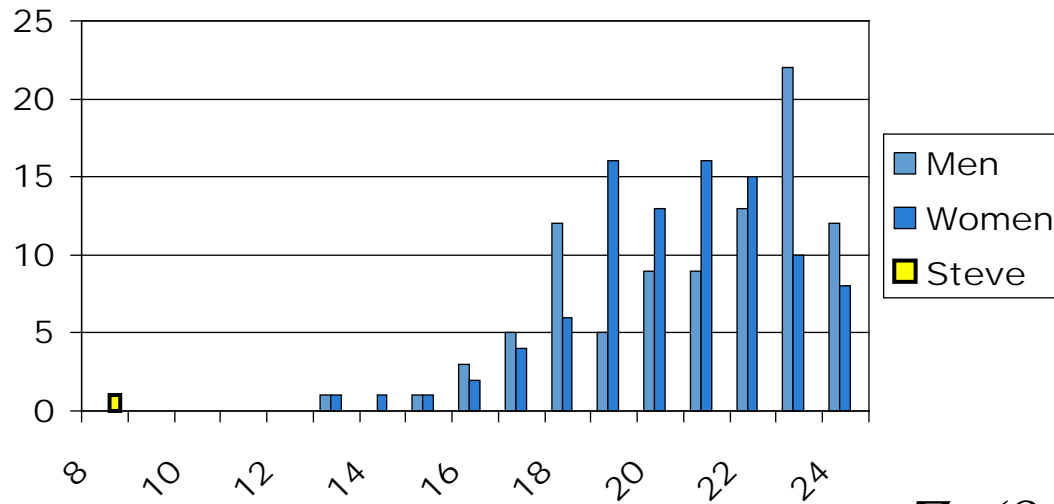
Practice						Test			
G - - .	U . . -	C - . . .	Y - . - -	A . -	V - . - -	C - . . .	A - .	G - - .	
V . . . -	Y - - - -	U . . -	G - - .	U	A	Y	C	V	
A	C	Y	G	U	V	C	Y	V	
U	G	A	V	C	G	A	V	Y	Σ/30 7

# VERBAL LEARNING TEST - IMMEDIATE



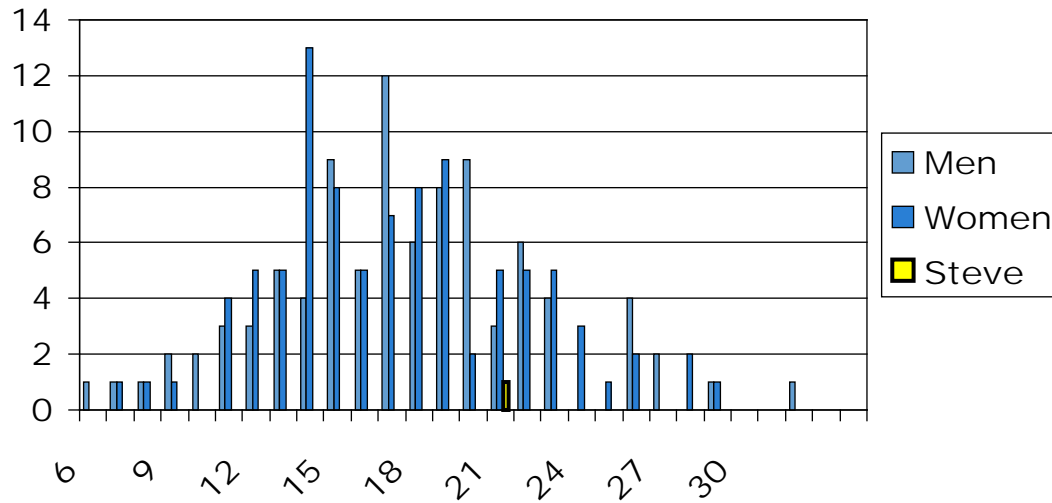
$$Z = (18 - 23.28) / 3.08 = -1.71$$

# WORKING MEMORY TEST



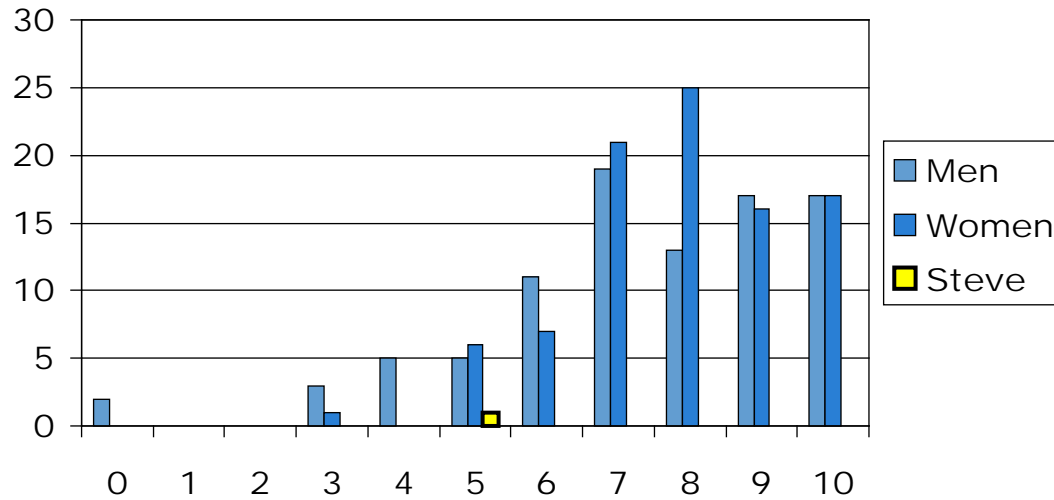
$$Z = (8 - 20.88) / 2.57 = -5.01$$

# VERBAL FLUENCY TEST



$$Z = (21 - 17.54) / 4.91 = 0.70$$

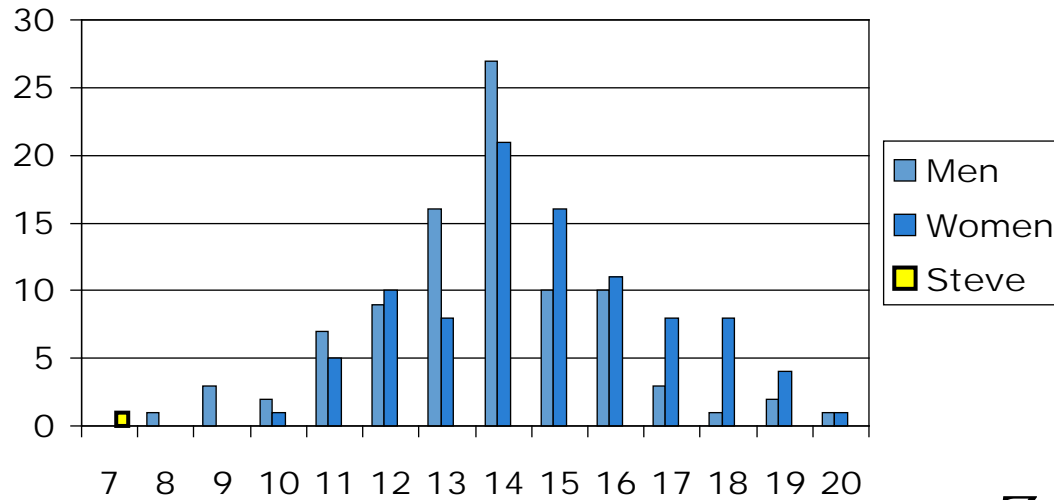
# VERBAL LEARNING TEST - DELAYED



$$Z = (5 - 7.39) / 2.20 = -1.09$$

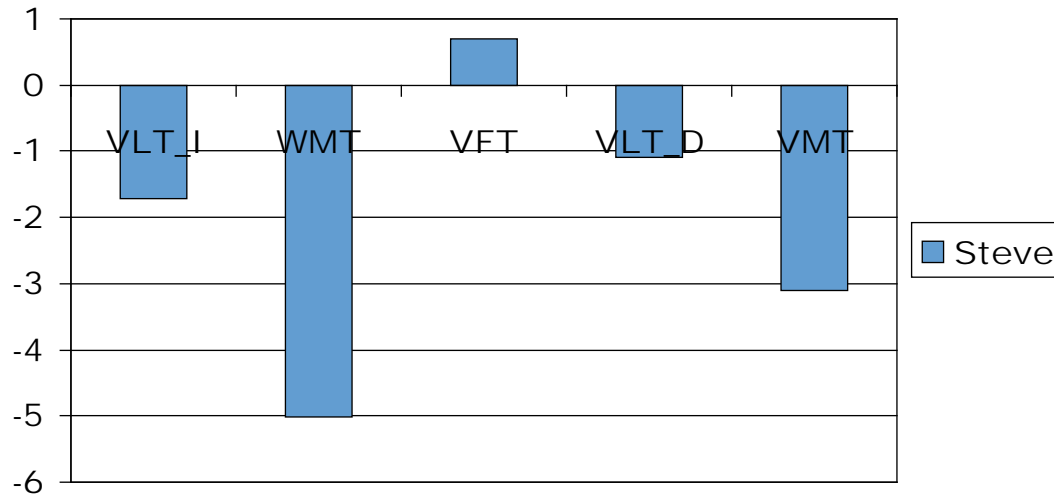


# VISUOMOTOR TRACKING



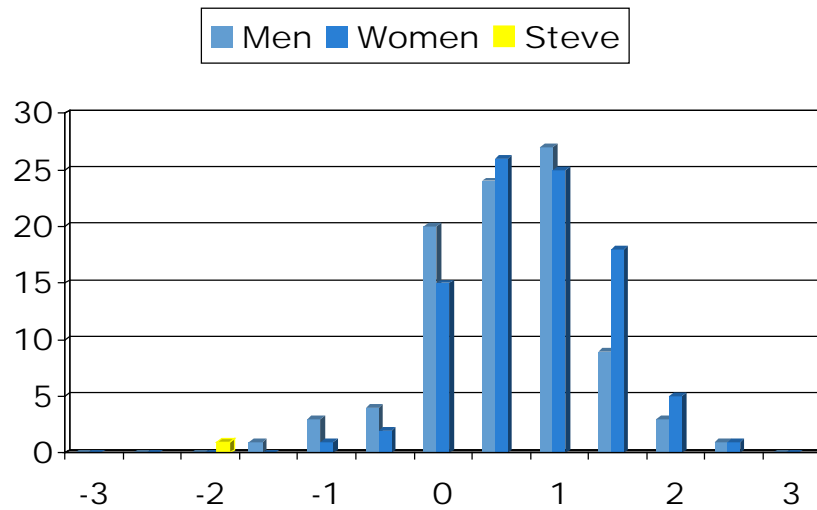
$$Z = (7 - 13.73) / 2.17 = -3.10$$

## SCIP Z-SCORES



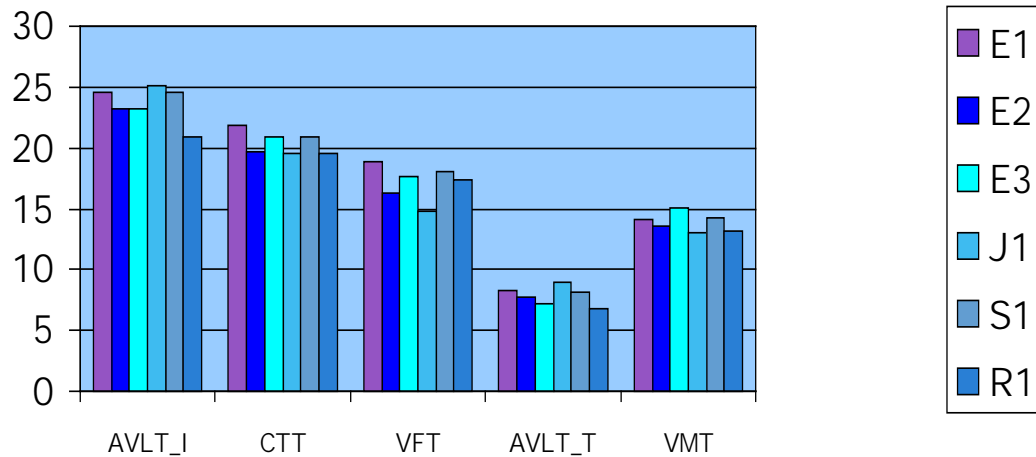
$$Z = \frac{-1.71 - 5.01 + 0.70 - 1.09 - 3.10}{5} = -2.04$$

# GLOBAL Z-SCORE



# SCIP INTERNATIONAL VALIDATION

RAW SCORES AT TIME 1 FROM CANADA (E1 TO E3), JAPAN (J1), SPAIN (S1), AND RUSSIA (R1)



E1 to E3 from Purdon SE (June of 2005). The Screen for Cognitive Impairment in Psychosis (SCIP). Three Canadian Normative Samples (n=47, 72, 66).

J1 Hirabayashi & Purdon (June of 2005). Normative data on the Japanese SCIP from Tokyo (n=24).

S1 Guilera G., Pino O., Gómez J., Rojo E.J., & Purdon SE (April of 2005). Normative data for the Spanish SCIP from Barcelona (n=72).

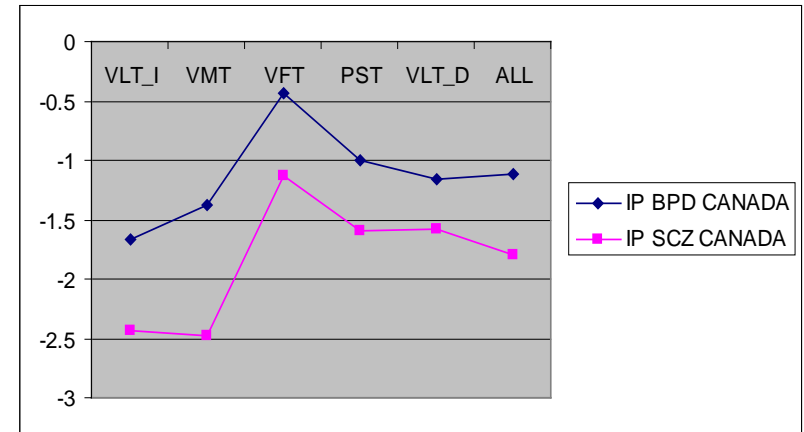
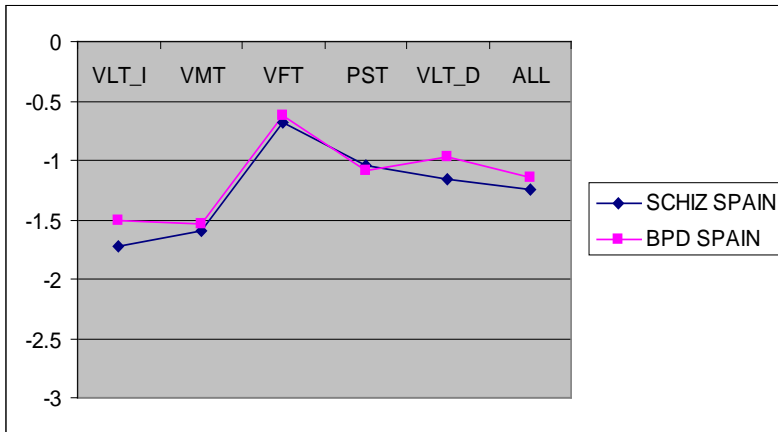
R1 Terevnikov T., Joffe G., & Purdon SE (June of 2004). Normative data for the Russian SCIP from Petrozavodsk (n=20).

# CONVERGENT VALIDITY

Subtests	Neuropsychological battery test(s)	Pearson's r
VLT-I	Word list I total score (WMS-III)	0.55*
WMT	Arithmetic total score (WMS-III) Digit total score (WMS-III) Letters and Numbers total score (WMS-III)	0.45* 0.40* 0.38*
VFT	Semantic fluency TMT-A administration time Digit Symbol-Coding total score (WAIS-III) Symbol Search total score (WAIS-III)	0.44* -0.38* 0.39* 0.47*
VLT-D	Word list II total score (WMS-III)	0.48*
PST	Digit Symbol-Coding total score (WAIS-III) Symbol Search total score (WAIS-III)	0.57* 0.60*
<p>* <math>p &lt; 0.01</math>  VLT-I=Verbal Learning Test-Immediate; WMT=Working Memory Test; VFT=Verbal Fluency Test; VLT-D= Verbal Learning Test-Delayed; PST=Processing Speed Test</p>		

# SCHIZOPHRENIA?


## 3 SCIP



- VLT\_I Verbal List Learning Test.
- VFT = Verbal Fluency Test.
- VLT\_D Delayed List Recall.

- VMT = Visuomotor Tracking Test
- PST = Psychomotor Speed Test
- All = Average

## THE SCIP IS:

- ...brief, average admin time < 16 mins.
  - ...inexpensive. A free form and a pencil.
  - ...reliable.
  - ...valid, good general measure convergence.
  - ...valid, sensitive to SC and BP I.
  - ...valid, specific to SC, not NC.
  - ...under investigation for differential Dx.
  - ...under investigation for sensitivity to Rx.
- 

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