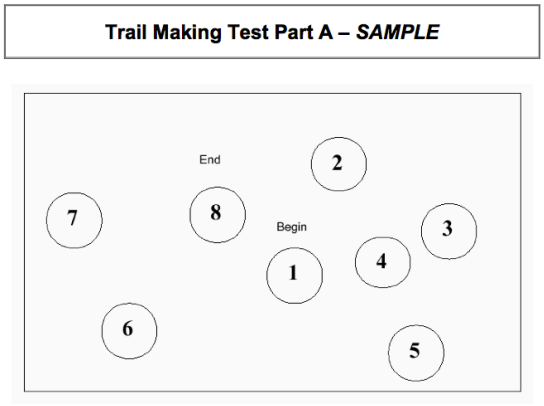
NP Test Practice

- In which we practice giving two common neuropsychological tests
- And we practice scoring the tests, converting to standardized scores, and interpreting the results

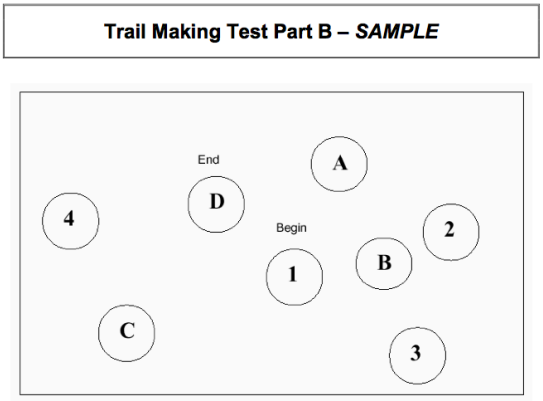
Trail-Making Test A and B ("Trails A and B")

- History
  - Originally part of Army Individual Test of General Ability (1944)
  - Incorporated into Halstead-Reitan Battery
- Procedure
  - Part A: subject connects the dots in order
    - 1,2,3,4,5...
  - Part B: subject connects the dots in order, alternating numbers with letters
    - 1,A,2,B,3,C...

Trails A



Trails B



Trails - Practice

- Break into teams of 2 or 3
- Administer Trails A, and Trails B to each other
- Use your non-dominant hand!
  - (why? privacy, embarrassment, ethical issues, test scores will be more interesting)

Trails A and B - Abilities

- Trails A
  - visual perception
  - motor control
  - number sequencing
  - load on Working Memory: Low
- Trails B
  - same as trails A, plus…
  - working memory - letter/number sequencing
  - executive control : inhibition of over-learned responses
    - (temptation to go from 1 to 2, rather than 1 to A, or from A to B, rather than A to 2)

Trails A&B - Demographic Effects

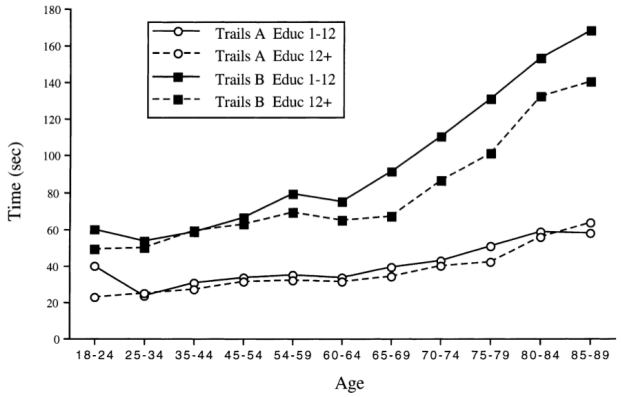
- Age: r=0.58 to 0.62
- Education : r=0.17 to 0.25
- Gender : 0.05 (NS)
- Trails A vs. B: 0.74

Table 1
Correlations of age, education, gender with time (s) to complete Trails A and B

	Age	Education	Gender	Trail A
Age				
Education	−.17**			
Gender	−.08*	−.03		
Trail A	.58**	−.17**	−.05	
Trail B	.62**	−.25**	−.05	.74**

* $p < .05$.
** $p < .01$.

Trails A&B - Demographic Effects



Trails A - Scoring Example

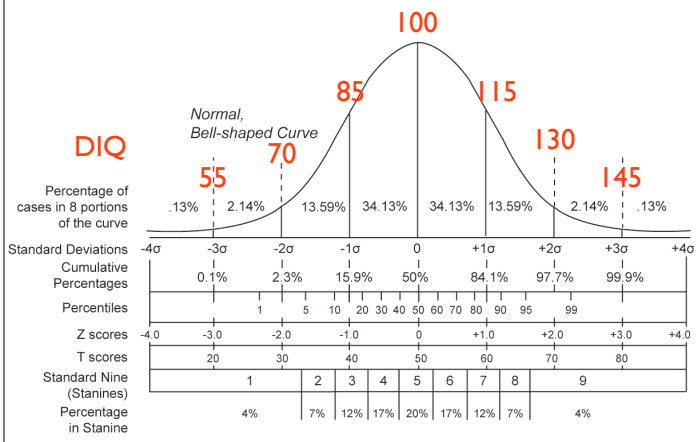
- First, determine your Raw score
  - X = _____
- Next, determine demographic variables (age, education, gender…)
- For given demographics, determine normative score
  - mean (M) = _____
  - standard deviation (SD) = _____
- Next, convert raw score to a standard score using formula:
  - Z score = (X-M) / SD
  - the Z score is simply the distance from the mean, expressed in units of 1.0 SD
  - if your score is 1 SD below the mean, then Z = -1.0, etc.
  - convert standard score to description “High average” etc.

Trails A,B Norms

Table 2
Statistical properties for age, education, gender, Trails A and B (s) for each normati

	Statistics		
Age groups	Mean (S.D.)	Median	Minimum–maximum
Age group 18–24 ($n = 155$)			
Age	20.17 (1.48)	20.00	18–24
Education	12.92 (1.01)	13.00	10–15
Gender	1.59 (0.49)		
Trail A (s)	22.93 (6.87)	21.70	12–57
Trail B (s)	48.97 (12.69)	47.00	29–95
Age group 25–34 ($n = 33$)			
Age	29.42 (2.87)	30.00	25–34
Education	14.18 (1.61)	14.00	11–18
Gender	1.58 (0.50)		
Trail A (s)	24.40 (8.71)	23.00	10–45
Trail B (s)	50.68 (12.36)	50.00	29–78
Age group 35–44 ($n = 39$)			
Age	39.74 (2.94)	41.00	35–44
Education	13.59 (2.06)	14.00	10–20
Gender	1.59 (0.50)		
Trail A (s)	28.54 (10.09)	26.00	12–50
Trail B (s)	58.46 (16.41)	58.00	29–95

Standard Scores



COWAT - Verbal Fluency

- Controlled Oral Word Association Test
  - aka Verbal Fluency
  - aka “FAS, Animals”
- History
  - Incorporated into Halstead-Reitan Battery
- Procedure
  - FAS - phonemic
    - name as many words as possible starting with F, A, S
  - Animals - semantic
    - name as many animals as possible

COWAT - Abilities

- FAS
  - verbal fluency / processing speed
  - short term verbal memory
  - semantic memory
  - word associations by phonemic lookup
  - mediated by Frontal Lobe?
- Animals
  - word association by semantic lookup
  - mediated by Temporal lobe?

COWAT - Demographic Effects

- Age: r=.02 to .07
- Education : r=.08
- Race : r=.10
- Gender : NS

COWAT - Administration - Practice

Appendix A

Instructions for Letter (FAS) and Category (Animals) Fluency Tasks

Verbatim Instructions for the Controlled Oral Word Association Test (FAS)

"I am going to say a letter of the alphabet to you, and I want you to tell me as many words as you can think of that begin with that letter. But none of the words can be proper names of people or places. For instance, if I gave you the letter "B," you could say "brook, bottle, black," and so forth, but you could not say "Barbara" since that is a person's name, nor could you say "Boston," since that is the proper name of a place. Also, do not give me the same word with different endings, such as sit, sits, and sitting."

"The first letter we will use is "F." Go ahead and tell me as many words as you can think of that begin with "F."

(Begin timing. Record all responses verbatim. Do not interrupt the respondent or ask him or her to slow down. It is permissible to repeat instructions if the respondent loses set or forgets what he or she is supposed to be doing. Stop the respondent after 60 seconds. "A" and "S" trial are introduced in the same manner as above.)

Verbatim Instructions for Category Fluency

"Now we are going to do something a little different. This time I want you to tell me all of the animal names that you can think of. It doesn't matter what letter they start with. Just tell me all of the animal names that you can think of."

(Record the animal names in the same manner as above.)

COWAT - Scoring Example

- First, determine your Raw score
  - X = _____ (for FAS, total across all letters)
- Next, convert Raw score to Scaled score (see table)
  - Scaled = _____
- Next, determine demographic variables (age, education, gender, ethnicity)
- Use formula to convert Scaled score to T score
  - T-score = _____
- Now, double-check by comparing computed T score with T-score from lookup table

COWAT - Raw to Scaled Conversion

Table 4
Scaled Score Equivalents to Raw Scores for Letter (FAS) and Category (Animal) Fluency

	Raw score	
Scaled score	FAS	Animal
19	78+	37+
18	73 - 77	33 - 36
17	67 - 72	31 - 32
16	63 - 66	30
15	58 - 62	29
14	54 - 57	27 - 28
13	50 - 53	25 - 26
12	46 - 49	23 - 24
11	42 - 45	21 - 22
10	37 - 41	19 - 20
9	33 - 36	17 - 18
8	29 - 32	15 - 16
7	26 - 28	14
6	21 - 25	13
5	18 - 20	12
4	15 - 17	11
3	13 - 14	10
2	0 - 12	8 - 9
1		0 - 7

COWAT - Formula

Appendix B

Letter (FAS) and Category (Animal) Norms Formulas

Demographically corrected *T* scores for fluency can be calculated as follows:

Letter (FAS) *T* score = 14.796 + (3.584 x FAS Scaled Score) – (0.914 x Education) + (0.177 x Age) + (5.470 x Race)

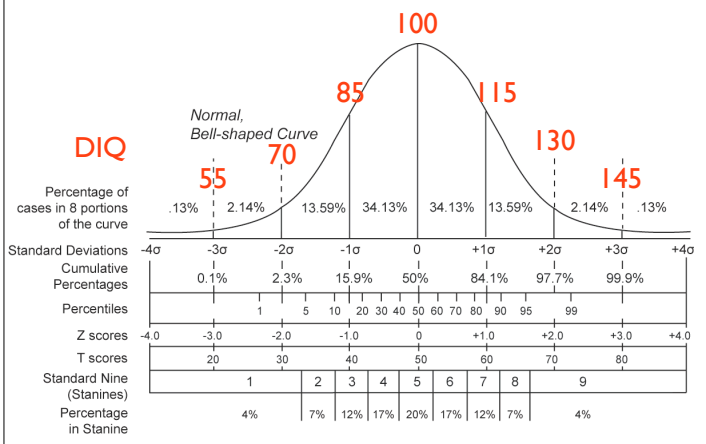
Category (Animal) *T* score = 10.450 + (3.558 x Animal Scaled Score) – (1.048 x Education) + (0.301 x Age) + (8.476 x Race)

Education = years of education successfully completed.

Age = actual age (if age is 20-34 years, age is coded as 34 years).

Race: Caucasian = 0, African American = 1.

Standard Scores



Describing Performance (WAIS-4)

Classification	IQ Score	Z Score	T-Score	% of people
Very superior	above 130	above 2.0	70 and above	2.2
Superior	120-129	1.3 to 2.0	63-39	6.7
High average	110-119	0.6 to 1.3	56-62	16.1
Average	90-109	-0.6 to +0.6	44-55	50.0
Low average	80-89	-0.6 to -1.3	43-37	16.1
Borderline	70-79	-1.3 to -2.0	36-30	6.7
Extremely low	69 and below	below -2.0	29 and below	2.2