APPENDIX C

SAMPLE REPORTS - CLASSIC STYLE USED 1986-1998

INCLUDES INTERPRETATION GUIDE AND SAMPLE REPORTS

INTERPRETATION OF REACTION TIME RESULTS

The CALCAP program provides three types of printed output, one displaying the individual's range of scores and median values [Standard Printout], one displaying normative ranges [Alternate Printout], and one showing these data in a graph [Graphical Printout]. You can toggle between these screens by pressing the letter 'T'. This feature is always available when viewing results.

Sample output from the CALCAP program is shown below [Standard Printout] and on the following pages [Alternate Printout], [Graphical Printout].

The headings at the top of the printouts are described in greater detail on the following page.

Outcome Codes, *z*-Scores and Percentile Ranks

In the right-hand margin the program will display either *z*-scores (the default), percentile ranks, or outcome codes. You can toggle between these three options by pressing `'Z'` while viewing the results. The *z*-scores and percentile ranks refer only to the mean reaction time scores. The outcome codes (shown below in Figures 2 and 3) indicate abnormal performance (below 2 SDs) on reaction time, number of correct responses, and signal detection parameters. A complete description of the outcome codes is detailed in 'Interpretation of Outcome Codes.'

Figure 1. Standard Printout (Press 'T' to toggle between the Standard, Alternate and Graphical printouts; press 'Z' to toggle between *z*-scores [the default], Percentile Ranks, and Outcome Codes [shown below]).

```
Subject #40000     Age 47   Educ 16  Vision C  CLERICAL

Date of testing: 25 AUG 1990      Site ID: 64

                                   True   False         RT Scores
## Description                      Pos     Pos    Range  Median Mean
-- ------------------------------  ------ -------  -------- ------ ----
 1 Simple RT - Dominant Hand                      283- 352    333  332
 2 Simple RT - Nondominant Hand                   295- 428    343  351
 3 Choice Reaction Time - Digits  15/15    0/85   375- 502    427  426

 4 Sequential Reaction Time 1      9/20    1/80   437- 853    853  712  CT A
 5 Language Discrimination        24/24    0/96   382- 552    482  488
 6 Simple RT - Dominant Hand                      338- 868    354  385 R

 7 Degraded Words with Distract   15/15    1/85   431- 669    515  503
 8 Response Reversal - Words      15/15    1/85   407- 757    613  601
 9 Form Discrimination            19/20    7/80   435-1133    607  613    F

10 Simple RT - Dominant Hand                      298- 458    328  335

-----> RECOMMEND FOLLOW-UP                                          8 8
                                                                  Outcome
                                                                   Codes
```

Figure 2. Alternate Printout (Press 'T' to toggle between the Standard, Alternate and Graphical printouts; press 'Z' to toggle between *z*-scores, Percentile Ranks, and Outcome Codes [shown below]).

```
Subject #40000     Age 47   Educ 16  Vision C  CLERICAL

Date of testing: 25 AUG 1990      Site ID: 64

                                    TP  True False  Lower Upper Computed
## Description                    Bound   Pos   Pos  Bound Bound       RT
-- ------------------------------ ----- ----- -----  ----- ----- --------
 1 Simple RT - Dominant Hand                          211   666   332.00
 2 Simple RT - Nondominant Hand                       201   485   350.75
 3 Choice Reaction Time - Digits  15-15   15     0     360   484   425.91

 4 Sequential Reaction Time 1     14-20 <  9>    1     414   687   712.44  CT A
 5 Language Discrimination        22-24   24     0     482   590   487.50
 6 Simple RT - Dominant Hand                          217   626   385.00 R

 7 Degraded Words with Distract   10-15   15     1     415   682   503.18
 8 Response Reversal - Words       7-15   15     1     509   831   601.00
 9 Form Discrimination             5-20   19  <  7>    589  1049   613.00    F

10 Simple RT - Dominant Hand                          234   514   334.75

----> RECOMMEND FOLLOW-UP                                                 8 8
                                                                        Outcome
                                                                          Codes
```

Understanding the Column Headings

The headings from the Alternate and Standard Printouts are described in greater detail below:

##	Code number for the task
Description	A brief description of the task
True Pos	The actual number of true positive responses made by the subject. On the Alternate Printout the maximum number of possible true positive responses also is shown. (Choice reaction time measures only.)
False Pos	The actual number of false positive responses made by the subject. On the Alternate Printout the maximum number of possible false positive responses also is shown. (Choice reaction time measures only.)
Range	The range of reaction times recorded for this subject [Standard Printout only].
Median	Median reaction time (including all trials) [Standard Printout only].
Mean	The mean reaction time obtained by the subject (excluding the two best and two worst performances) [Standard Printout only; identical to Computed RT on the Alternate Printout].
TP Bound	Normative range for true positive responses (lower and upper bounds defined as 2 SDs below/above the age- and education-matched mean for the normative sample†). (Choice reaction time measures only.)
Lower Bound	Normative lower bound for mean reaction time (2 SDs below the age- and education-matched mean for the

normative sample†) [Alternate Printout only].

Upper Bound — Normative upper bound for mean reaction time (2 SDs above the age- and education-matched mean for the normative sample†) [Alternate Printout only].

Computed RT — The mean reaction time obtained by the subject (excluding the two best and two worst performances) [Alternate Printout only; identical to Mean on the Standard Printout].

†Subjects who are not within the age groupings of the normative sample are evaluated based on means and standard deviations for all subjects within their educational stratum. If years of education are missing, subjects are evaluated using means and standard deviations for all subjects within their age stratum. If age and education data are missing or out of range, subjects are evaluated using means and standard deviations for all subjects within the normative sample.

Interpretation of Outcome Codes

The CALCAP program compares each subject's responses with normative data matched (when possible) by age and education. The normative sample consisted of over 600 men between the ages of 21 to 59, with a mean educational level of a college degree. Normative data are stratified by both age (20-34, 35-44, 45+) and education (< 16 years, 16 years, > 16 years). Reaction time correlates most highly with age, and, to a lesser extent, with years of education.

Results that are outside of normal limits (> 2 SDs below the mean for the control sample) are tagged as described below. The code '-SKIP' appears when the subject did not complete the full subtest.

R – Range between fastest and slowest reaction times is abnormal. In other words, the subject is responding extremely quickly to some items, but extremely slowly to others. The response inconsistency may be due to fluctuating attention or environmental distractors.

C – Computed reaction time is abnormal. Mean reaction time (after dropping the two best and two worst performances) is excessively slow.

T – Number of true positive responses is low. The subject is performing poorly on the task of identifying target stimuli.

F – Number of false positive responses is high. The subject is showing a bias where s/he is incorrectly responding to distractor stimuli.

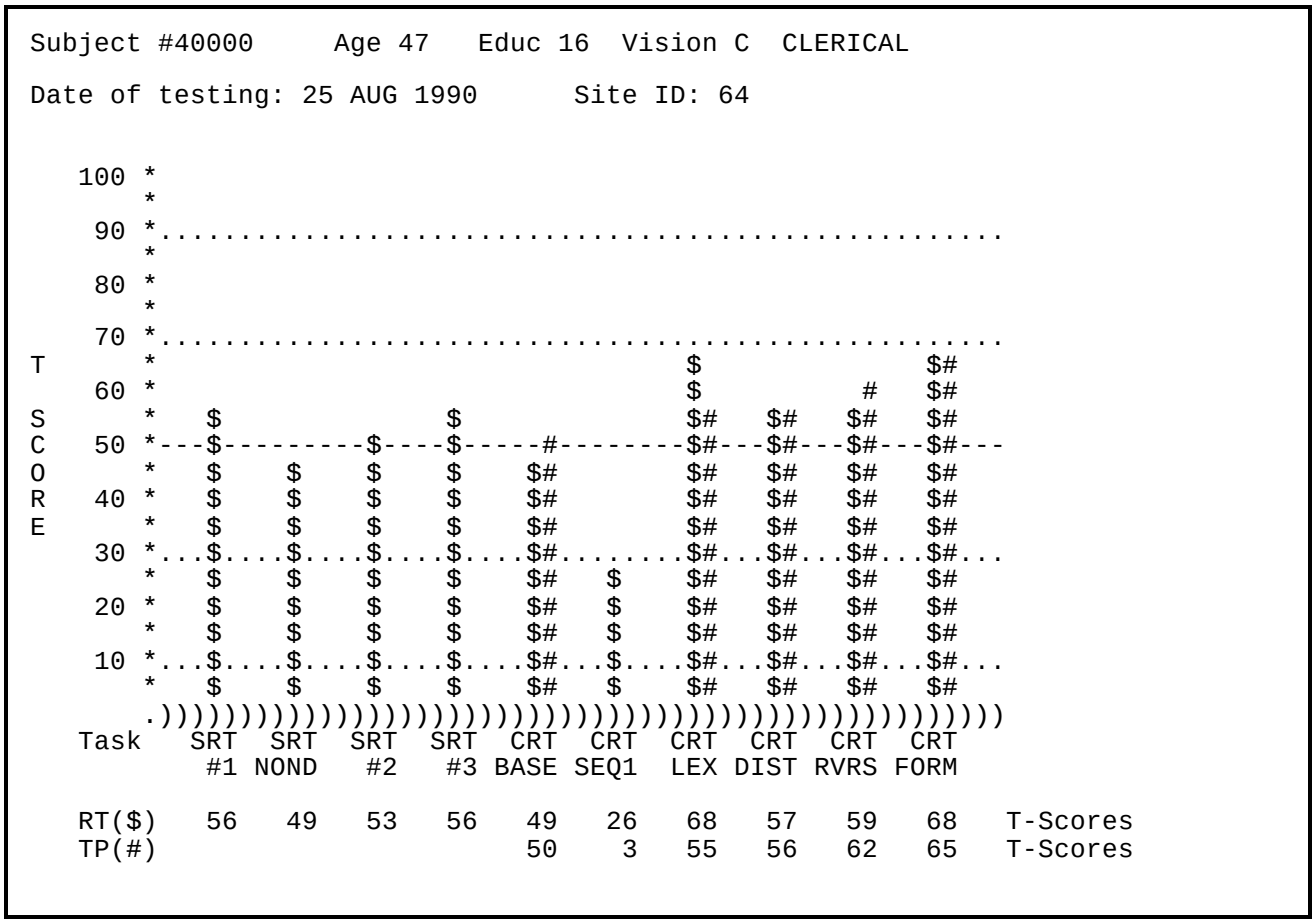
A – Signal detection parameters are outside of normal limits. The subject is having difficulty correctly discriminating the target stimuli from the distractor stimuli.

Summary Evaluations

At the end of the Standard Version of the CALCAP program you will be informed whether the individual fell 'Within Normal Limits.' If not, the message 'Recommend Follow-Up' will be displayed.

The outcome of 'Recommend Follow-Up' occurs approximately 10-15% of the time in unselected populations. 'Recommend Follow-Up' is displayed if the subject scores 2 or more SDs below the mean for age- and education-matched controls on 2 or more tasks. This message is also displayed if the subject scores 3 or more SDs below the mean on any one task. Only tasks 4 through 10 (standard version of the CALCAP program) are considered in making this judgment. Although performance on individual tasks is measured in many ways, the judgment of 'Recommend Follow-Up' is based solely on reaction time.

Figure 3. Graphical Printout (Press 'T' to toggle between the Standard, Alternate and Graphical printouts)



Understanding the Graphical Printout

The graphical representation of exam results is presented using T-score (standard score) values where a score of 50 is average. The standard deviation for a T-score is 10. Higher T-scores correspond to better performance, lower T-scores correspond to poorer performance.

The CALCAP program displays the age- and education-adjusted reaction time T-scores for all of the simple and choice measures. In addition, the program displays the age- and education-adjusted T-scores for the number of true positive responses on each choice reaction time measure.

The following codes are used:

- RT = Age & education adjusted T-score for Mean Computed Reaction Time
- TP = Age & education adjusted T-score for # of True Positive responses

Task Codes:

- SRT #1 = Simple RT, Dominant Hand (1st iteration)
- SRT NOND= Simple RT, Nondominant Hand
- SRT #2 = Simple RT, Dominant Hand (2nd iteration)
- SRT #3 = Simple RT, Dominant Hand (3rd iteration)
- CRT BASE = Choice RT, Basic Go-No Go Paradigm
- CRT SEQ1 = Choice RT, Serial Pattern Matching (Repetition of Numbers)
- CRT LEX = Choice RT, Word Discrimination
- CRT DIST = Choice RT, Go-No Go Paradigm with Distraction
- CRT RVRS = Choice RT, Rapid Visual Scanning/Response Reversal
- CRT FORM= Choice RT, Form Discrimination
- CRT SEQ2 = Choice RT, Serial Pattern Matching (Numbers in Sequence)
- MEMORY = Recognition Memory

General Tips for Interpretation

In general, you should consider the first simple and choice reaction time tasks to be practice trials. Even though each individual task has a practice component, many subject's scores do not stabilize until after the first tasks.

The reaction time tasks measure cognitive functioning that is not ordinarily assessed using standard neuropsychological procedures. Although the tasks correlate modestly (.2 - .4) with other neuropsychological measures (especially Symbol Digit Substitution and Trails B), based on factor analyses the reaction time measures form two factors (Simple reaction time and Choice reaction time) that are different from standard NP tasks.

The cognitive functions assessed by the CALCAP program are best described as timed psychomotor skills requiring focused or sustained attention. Impaired reaction time across multiple measures is usually indicative of generalized motor slowing. Impaired reaction time on specific measures, particularly when coupled with scores outside of normal bounds on true positive responding, is suggestive of a more specific functional deficit, usually in the area of fluctuating attention.

In general, poor performance on a single measure is not indicative of a specific type of cognitive impairment. Certain tasks, however, do seem to be related to specific skills.

Serial Pattern Matching (Sequential Reaction Time) is largely a measure of divided attention skills (similar to Trails B, Consonant Trigrams, etc.)

Lexical Discrimination is frequently impaired in non-native English speakers.

A large discrepancy in reaction time between tasks 1 (simple reaction time–dominant hand) and 2 (simple reaction time–non-dominant hand) may be suggestive of a lateralizing finding.

An isolated finding of impaired performance on Form Discrimination may be suggestive of focal impairment in visuoperceptual skills.

Sample Output - Standard Stimulus Materials

Standard Printout

CALIFORNIA COMPUTERIZED ASSESSMENT PACKAGE (Report prepared on 08-12-1993)

Subject #40000 14 Age 40 Educ 16 Vision N WRITER

Date of testing: 10-14-1990 Site ID: 63

##	Description	True Pos	False Pos	RT Scores Range	Median	Mean	z-score
1	Simple RT - Dominant Hand			328- 452	343	346	0.23
2	Simple RT - Nondominant Hand			244- 281	263	265	0.96
3	Choice Reaction Time - Digits	15/15	0/85	313- 450	396	403	0.05
4	Sequential Reaction Time 1	20/20	0/80	386- 760	559	552	-0.10
5	Language Discrimination	23/24	1/96	396- 863	521	517	0.23
6	Simple RT - Dominant Hand			268- 394	309	306	0.90
7	Degraded Words with Distract	15/15	0/85	475- 593	524	516	0.21
8	Response Reversal - Words	12/15	2/85	436- 967	616	650	-0.07
9	Form Discrimination	20/20	2/80	471-1021	604	605	1.22
10	Simple RT - Dominant Hand			282- 398	320	322	0.57

----> WITHIN NORMAL LIMITS
----> NOTE: BEST AND WORST PERFORMANCES ON A' DIFFER BY MORE THAN 2 SDs

Explanation of Codes: (Normal range = +/- 2 SDs from normative sample mean)

R = Range between best and worst RTs is outside of normal limits
C = Mean Reaction Time (RT) is below normal limits
T = Number of True Positive (TP) responses is below normal limits
F = Number of False Positive (FP) responses is above normal limits
A = Signal detection estimate of d' [sensitivity] is below normal limits

Selection criteria # 5 developed on 04/27/87

Means are based on 47 males aged 35- 44 with education level = 16 years
(Normative Group = SERONEG/509)

Sample Output - Standard Stimulus Materials
Alternate Printout

CALIFORNIA COMPUTERIZED ASSESSMENT PACKAGE (Report prepared on 08-12-1993)

Subject #40000 14 Age 40 Educ 16 Vision N WRITER

Date of testing: 10-14-1990 Site ID: 63

##	Description	TP Bound	True Pos	False Pos	Lower Bound	Upper Bound	Computed RT	z
1	Simple RT - Dominant Hand				211	577	345.50	0.23
2	Simple RT - Nondominant Hand				207	456	265.25	0.96
3	Choice Reaction Time - Digits	15-15	15	0	325	489	402.82	0.05
4	Sequential Reaction Time 1	12-20	20	0	358	739	551.69	-0.10
5	Language Discrimination	21-24	23	1	427	665	517.25	0.23
6	Simple RT - Dominant Hand				217	580	306.00	0.90
7	Degraded Words with Distract	11-15	15	0	393	693	515.82	0.21
8	Response Reversal - Words	8-15	12	2	494	837	649.64	-0.07
9	Form Discrimination	6-20	20	2	519	1045	604.63	1.22
10	Simple RT - Dominant Hand				234	481	321.50	0.57

----> WITHIN NORMAL LIMITS
----> NOTE: BEST AND WORST PERFORMANCES ON A' DIFFER BY MORE THAN 2 SDs

Explanation of Codes: (Normal range = +/- 2 SDs from normative sample mean)

R = Range between best and worst RTs is outside of normal limits
C = Mean Reaction Time (RT) is below normal limits
T = Number of True Positive (TP) responses is below normal limits
F = Number of False Positive (FP) responses is above normal limits
A = Signal detection estimate of d' [sensitivity] is below normal limits

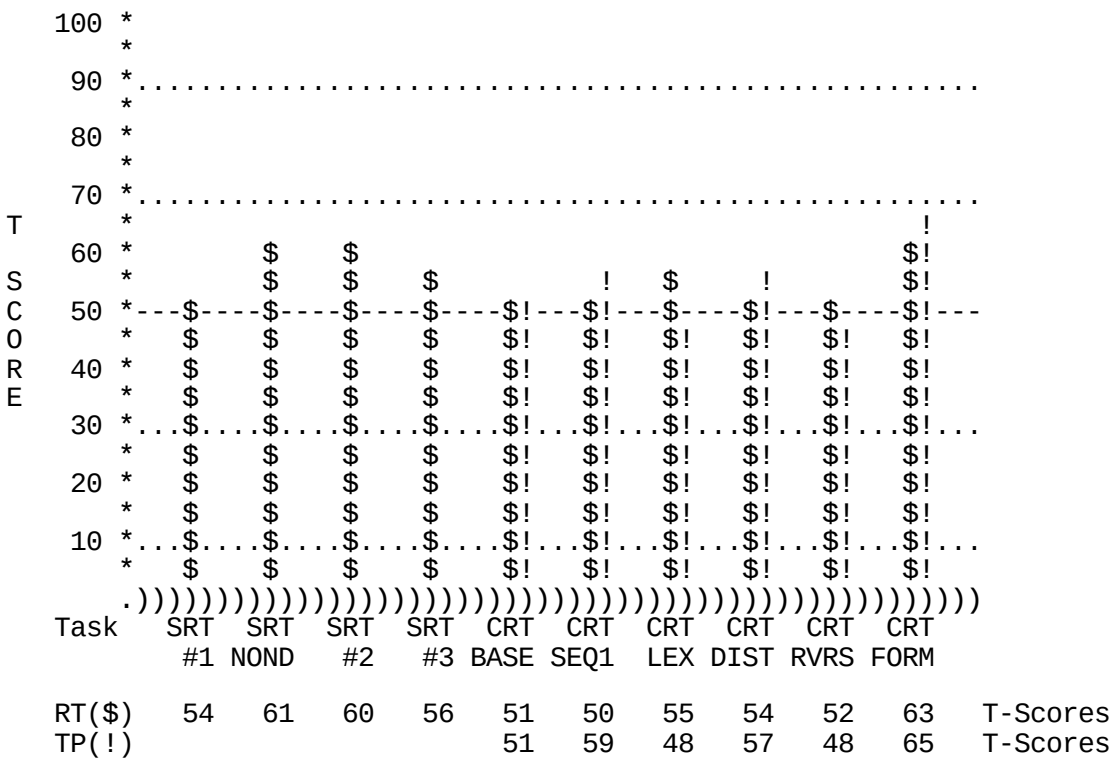
Selection criteria # 5 developed on 04/27/87

Means are based on 47 males aged 35- 44 with education level = 16 years
(Normative Group = SERONEG/509)

Sample Output - Standard Stimulus Materials
Graphical Printout

Subject #40000   Age 40   Educ 16 Vision N WRITER

Date of testing: 10-14-1990   Site ID: 63



Explanation of Codes:

RT = Age & education adjusted T-score for Mean Computed Reaction Time
TP = Age & education adjusted T-score for # of True Positive responses

SRT #1   = Simple RT, Dominant Hand (1st iteration)
SRT NOND = Simple RT, Nondominant Hand
SRT #2   = Simple RT, Dominant Hand (2nd iteration)
SRT #3   = Simple RT, Dominant Hand (3rd iteration)

CRT BASE = Choice RT, Basic Go-No Go Paradigm
CRT SEQ1 = Choice RT, Serial Pattern Matching (Repetition of Numbers)
CRT LEX = Choice RT, Word Discrimination
CRT DIST = Choice RT, Go-No Go Paradigm with Distraction
CRT RVRS = Choice RT, Rapid Visual Scanning/Response Reversal
CRT FORM = Choice RT, Form Discrimination

Norms are based on   47 males aged 35- 44 with education level = 16 years
(Normative Group = SERONEG/509)

Sample Output - Abbreviated Stimulus Materials
Standard Printout

CALIFORNIA COMPUTERIZED ASSESSMENT PACKAGE (Report prepared on 08-12-1993)

Subject #40000 150 Age 35 Educ 20 Vision C NEUROPSYCHOLOGIST

Date of testing: 03-05-1991 Site ID: 80

##	Description	True Pos	False Pos	RT Scores Range	Median	Mean	z-score
1	Simple RT - Dominant Hand			186- 347	256	247	0.82
2	Choice Reaction Time - Digits	15/15	0/85	319- 416	388	371	0.77
3	Sequential Reaction Time 1	20/20	0/80	305- 524	354	369	1.77
4	Sequential Reaction Time 2	19/20	2/80	309- 884	399	454	1.22

Explanation of Codes: (Normal range = +/- 2 SDs from normative sample mean)

R = Range between best and worst RTs is outside of normal limits
C = Mean Reaction Time (RT) is below normal limits
T = Number of True Positive (TP) responses is below normal limits
F = Number of False Positive (FP) responses is above normal limits
A = Signal detection estimate of d' [sensitivity] is below normal limits

Selection criteria # 5 developed on 04/27/87

Means are based on 82 males aged 35- 44 with education level > 16 years
(Normative Group = SERONEG/509)

Sample Output - Abbreviated Stimulus Materials
Alternate Printout

CALIFORNIA COMPUTERIZED ASSESSMENT PACKAGE (Report prepared on 08-12-1993)

Subject #40000 150 Age 35 Educ 20 Vision C NEUROPSYCHOLOGIST

Date of testing: 03-05-1991 Site ID: 80

##	Description	TP Bound	True Pos	False Pos	Lower Bound	Upper Bound	Computed RT	z
1	Simple RT - Dominant Hand				211	485	246.55	0.82
2	Choice Reaction Time - Digits	14-15	15	0	315	496	371.00	0.77
3	Sequential Reaction Time 1	14-20	20	0	341	717	368.50	1.77
4	Sequential Reaction Time 2	14-20	19	2	341	717	454.25	1.21

Explanation of Codes: (Normal range = +/- 2 SDs from normative sample mean)

R = Range between best and worst RTs is outside of normal limits
C = Mean Reaction Time (RT) is below normal limits
T = Number of True Positive (TP) responses is below normal limits
F = Number of False Positive (FP) responses is above normal limits
A = Signal detection estimate of d' [sensitivity] is below normal limits

Selection criteria # 5 developed on 04/27/87

Means are based on 82 males aged 35- 44 with education level > 16 years
(Normative Group = SERONEG/509)