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TITLE: A Model for Predicting Cognitive and Emotional Health from Structural and Functional Neurocircuitry Following Traumatic Brain Injury

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| 13. SUPPLEMENTARY NOTES                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |              |                                 |                            |                                                |                                           |
| 14. ABSTRACT<br>Mild traumatic brain injury (mTBI) is one of the major health problems facing military servicemembers returning from deployments. White matter axonal damage, as measured by neuroimaging techniques like Diffusion Weighted Imaging (DWI), is one of the hypothesized mechanisms contributing to the cognitive and affective sequelae of mTBI. Presently, many of the findings in the literature examining the association between DWI and neuropsychological outcome are contradictory, possibly due to differences in stage of recovery at the time of assessment. This study will address this problem by collecting measures of white matter integrity and concomitant neuropsychological status at five time points in the first year following an mTBI. During the first year, study preparations, including ethical approval, hiring and training of new staff, purchasing of equipment and materials, and validation of neuroimaging protocols, were completed ahead of schedule. During the past year, we have collected usable data from a total of 52 participants. These data have been cleaned and preliminary analyses suggest that we are able to identify meaningful trends in the data. |              |                                 |                            |                                                |                                           |
| 15. SUBJECT TERMS<br>TBI, traumatic brain injury, concussion, DWI, Diffusion Weighted Imaging, white matter, brain imaging, neuropsychological performance, neurocognitive performance, structural connectivity                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |              |                                 |                            |                                                |                                           |
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## 1. INTRODUCTION:

Since the year 2000, military personnel have sustained over 413,000 traumatic brain injuries (TBIs) (DVBIC Report, November 8, 2019). Of these injuries, the vast majority, exceeding 82% of all TBIs, are in the mild category. In addition to the impact on military readiness, mild traumatic brain injury (mTBI) represents a major health concern and economic burden in the United States (Humphreys, Wood, Phillips, & Macey, 2013). While most individuals who sustain an mTBI will recover fully within a matter of days (McCrea et al., 2003), a significant proportion of individuals with mild TBI will experience a prolonged recovery with persistent post-concussive symptoms, and it is yet unclear why some individuals will show a good injury outcome, whereas others will not (Bogdanova & Verfaellie, 2012; Lange et al., 2012; Lange, Brickell, Ivins, Vanderploeg, & French, 2013; Leong, Mazlan, Abd Rahim, & Ganesan, 2013). Structural damage to white matter axonal tracts has been suggested to underlie many of these persistent behavioral changes (Arenth, Russell, Scanlon, Kessler, & Ricker, 2013; Jorge et al., 2012; Morey et al., 2012; Spitz, Maller, O'Sullivan, & Ponsford, 2013; Yeh et al., 2013). Yet due to differences in brain imaging methods, neuropsychological testing approaches, and sample characteristics, this has not been consistently demonstrated at different recovery stages.

Furthermore, the relationship between structural connectivity, functional connectivity and neuropsychological performance remains unclear. The present study aims to systematically assess structural connectivity, functional connectivity and neuropsychological functioning at five recovery stages (i.e., two weeks, one month, three months, six months and 12 months) following mild TBI relative to healthy controls. We hypothesize that structural white matter tract disintegrity will underlie abnormalities in functional connectivity, neurocognitive performance and post-concussion symptom severity, but that these metrics will vary with time since injury. The primary aim of the proposed study is therefore to investigate whether measures of white matter disintegrity following mild TBI would explain abnormalities in functional connectivity of the brain, cognition and emotional disturbance, and whether white matter integrity (or lack thereof) could serve as a reliable biomarker of mild TBI. This will allow conclusions on the utility of measures of white matter integrity in the diagnosis of mild TBI. As the study incorporates five time points of measurement to represent different recovery stages of mild TBI, this will allow conclusions on the natural recovery course of mild TBI and the utility of white matter integrity measures in the prediction of injury outcome. In brief, we aim to collect data from 180 participants, including 30 healthy controls and five separate samples of 30 participants at various time points following injury, ranging from 2 weeks to one-year post-concussion (see Figure below). During, participants will attend a single assessment session comprising a series of neuroimaging scans, including diffusion tensor imaging (DTI), structural volumetric scan, and resting state functional connectivity (rsFC). Additionally, participants will also undergo a comprehensive neuropsychological assessment battery. We will analyze differences in structural and functional connectivity across these various stages of recovery and associated differences in neurocognitive performance and symptom expression.



**Basic Study Design.** A total of 180 participants will be assessed. Six (6) groups of 30 participants with mTBI will be scanned at various time points ranging from 2-weeks to 12-months post-injury. We will also collect diffusion weighted scans from 30 healthy controls (HC).

## **2. KEYWORDS:**

TBI, traumatic brain injury, mTBI, mild traumatic brain injury, concussion, DWI, Diffusion Weighted Imaging, white matter, brain imaging, neuropsychological performance, neurocognitive performance, structural connectivity, brain injury, head injury

## **3. ACCOMPLISHMENTS:**

### **Major Task 1: Study Preparation, Staff Hiring, and Materials Acquisition - Complete**

- Data collection is complete. No new staff hiring or materials acquisition are planned.

### **Major Task 2: Human Subjects Approval – Complete**

- The project protocol was approved by the University of Arizona Institutional Review Board and the U.S. Army Human Research Protections Office (HRPO) and continues to remain open. Amendments are submitted on an as needed basis. All annual continuing review reports continue to be submitted to the UA IRB Office and HRPO prior to their annual due dates. The most recent continue annual review for the UA IRB was submitted on 6/4/2019 and approved on 7/12/19.

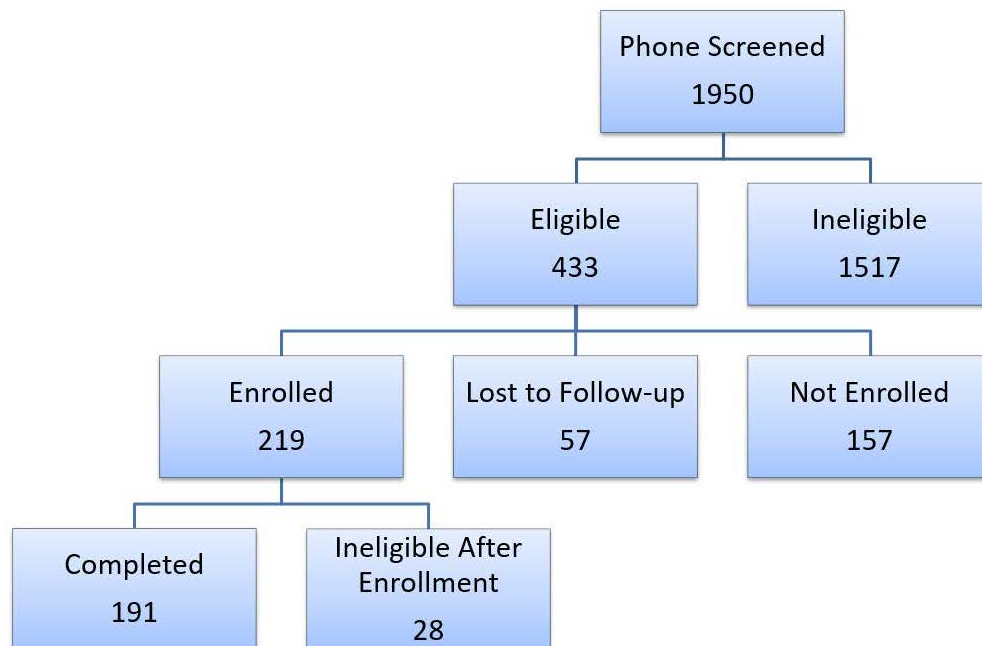
### **Major Task 3: Advertisement and Subject Recruitment – Complete**

- During this past year we have hit our enrollment goal of 190 participants.
- Use of paid advertisements over this past year (Y8) included local newspapers, such as the Tucson Weekly.
- During the past year we placed online advertisements on Facebook and Instagram. These advertisements led to greater visibility of the study online.
- On September 6<sup>th</sup>, 2019, a minor change was made, increasing the age range from 18-45 to 18-50. This change was approved by the IRB and by HRPO.

### **Major Task 4: Data Collection – Complete**

- Data collection for the mTBI and healthy control groups is now complete. During this reporting year, we enrolled a total of 39 participants. Of those enrolled, 38 completed the study and 1 was deemed ineligible upon further evaluation.
- MTBI Sample: Of the (66) participants deemed eligible after phone screenings during this past year:
  - 35 were enrolled (34 completed the study, and 1 was ineligible after enrollment).
  - 2 were lost to follow-up.
- Healthy Control Sample: Of the 4 healthy control individuals that were deemed eligible after phone screenings during this past year:
  - 4 were enrolled and completed the study
  - 0 were lost to follow-up.
- In total, 162 people completed the study since data collection started at the **University of Arizona** on April 15<sup>th</sup>, 2017. At present these groups include:
  - 37 healthy controls
  - 12 mTBI at 2-weeks post-injury
  - 24 mTBI at 1-month post-injury
  - 29 mTBI at 3-month post-injury
  - 21 mTBI at 6-month post-injury

- 39 mTBI at 1-year post-injury
- Before data collection started at the University of Arizona on April 15<sup>th</sup>, 2017, 31 participants completed data collection at **McLean Hospital**. These participants were grouped in the following way:
  - 3 healthy controls
  - 2 mTBI at 2-weeks post-injury
  - 6 mTBI at 1-month post-injury
  - 5 mTBI at 3-month post-injury
  - 10 mTBI at 6-month post-injury
  - 3 mTBI at 1-year post-injury
  - 2 mTBI were deemed ineligible after enrollment
- Thus, the **total** breakdown of participants (N = 191) recruited across both sites upon conclusion of data collection is:
  - 40 healthy controls
  - 14 mTBI at 2-weeks post-injury
  - 30 mTBI at 1-month post-injury
  - 34 mTBI at 3-month post-injury
  - 31 mTBI at 6-month post-injury
  - 42 mTBI at 1-year post-injury
- The participant flow diagram below outlines cumulative recruitment and enrollment for the study, combining participants that were run at the University of Arizona and McLean.



*Participant flow diagram of cumulative participant numbers for this study. Lost to follow-up refers to individuals who could not be reached or who were no longer interested in participating.*

- As of the date of this report, no negative outcomes from activities related to the study have been reported

by any of the study participants.

- Behavioral data were entered into the REDCap database by two independent research assistants. Data were cross-checked for inconsistent entries and screening for outliers was conducted.
- Neuroimaging data are uploaded to laboratory computers, and all identifying information was removed (de-identified) the same day of scanning. Diffusion tensor imaging (DTI) data were pre-processed within 4 business days.

### **Major Task 5: Quality Control Checks – Complete**

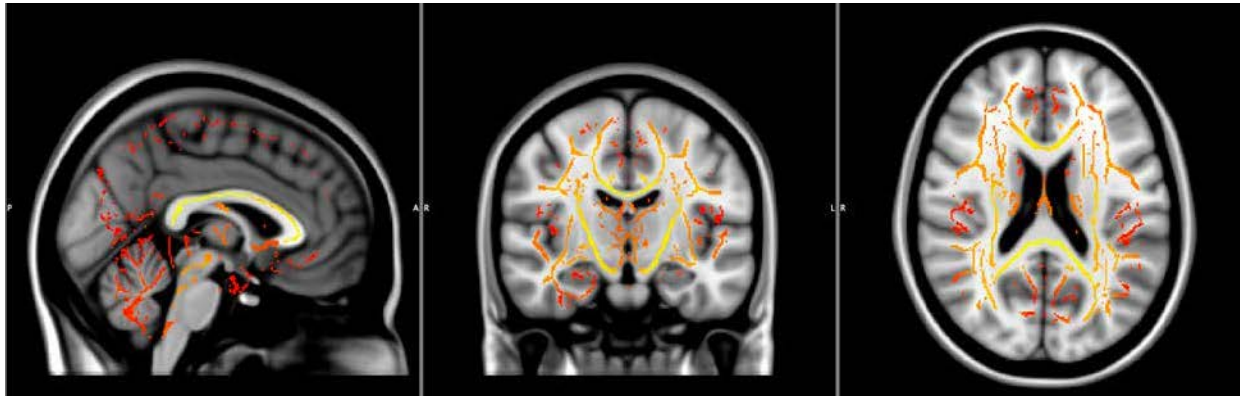
- Throughout all data collection, we maintained a high level of quality control checks to ensure that the data were being collected correctly and that scoring occurred with high fidelity.
- Every neuroimaging scan was visually checked for movement and artifacts during data acquisition and throughout the pre-processing pipeline. This ensured proper scan sequences were selected and allowed us to track corrections. Neuroimaging data were also checked for correct parameters during acquisition and during the pre-processing pipeline. Any deviations from standard protocol were noted in writing. Data collected with parameters that deviated from standard were labeled and segregated for further processing.
- Each participant was required to provide head injury documentation prior to undergoing study procedures.
- All behavioral data were quality checked upon entry. One research technician checks all behavioral data for completeness and correctness before entry into the database. After scoring was validated, data were entered twice into REDCap by independent research assistants and then cross-validated for correctness in order to minimize error. Each month 20% of completed subject files were double scored as an additional check.
- Maintaining high inter-rater reliability for our test administrators was of paramount importance. Regular focused staff training was provided by doctoral level clinically licensed Speech-Language Pathologist to ensure reliability and validity of data collection.

### **Major Task 6: Preliminary Analysis – Complete**

- Data collection is fully complete, and a final dataset was compiled for analysis. Some of these data were analyzed for submission to conferences and scientific publications, as appropriate, and presented in prior Quarterly Reports. Behavioral data from neuropsychological assessments and self-report questionnaires includes over 1400 variables.
  - Behavioral data were scored and z-transformed. Study staff are in the process of sorting variables by cognitive domain (attention and speed of information processing, memory and learning, executive function, language). Composite scores will be generated for each domain and used in subsequent analyses.
  - Self-report measures were scored and assessed for clinical severity.
  - Demographic data have been compiled and assessed for outliers.
  - All behavioral data were tested for normality. For data with normal distributions, parametric statistic test will be applied (see Extensive Data Analysis). Given non-normal distributions, data transformation will be applied as appropriate (log transformation for positive skew and unequal variances; reverse score transformation for negative skew). If normal distributions are achieved, parametric statistical tests on the transformed data will be applied. Alternatively, if normal distribution is not achieved, robust statistical tests will be conducted.
  - Neuroimaging data for all 191 completed subjects was QC during the last year and we have continued with our preprocessing pipeline. For DTI data, QSIPrep (<https://qsiprep>) was

completed resulting in DTI metrics that will be used for the extensive data analyses outlined below.

- As more extensive data analysis is now planned, we only report here some of the recent preliminary findings that were presented at conferences in recent months. The final report will contain full data analyses.



Output measure from QSIPrep of mean fractional anisotropy (FA) for all healthy control participants overlaid on a standard brain (MNI52 T1 1mm). Yellow indicated higher FA values.

### Compounding Impact of Daytime Sleepiness and Brain Injury

It is well known that daytime sleepiness is among the most frequent self-reported sleep complaint following a mTBI. It has yet to be determined, however, whether the symptom of daytime sleepiness increases the severity of cognitive deficits above and beyond the direct effect of the brain injury itself. The goal of this preliminary analysis was to determine the association between vigilance, daytime sleepiness, and the presence or absence of mTBI. A sub-set of 135 participants ( $M_{age} = 24.89 \pm 7.2$ ; 83 females) were entered into the analysis, including 34 healthy controls and 101 individuals with mTBI. Participants with a history of mTBI were further divided based on time-since-injury to include acute ( $n = 29$ ; 2-weeks and 1-month post-injury), 3-months ( $n = 23$ ), 6-months ( $n = 20$ ), and chronic ( $n = 29$ ; 1-year post-injury). To assess the effect of mTBI and daytime sleepiness on vigilance, a Poisson regression was fit to the number of lapses on the Psychomotor Vigilance Task (PVT), with group and Epworth Sleepiness Scale (ESS) as predictors.

ESS scores were significantly higher ( $p < .001$ ) and there were significantly more PVT lapses ( $p = .03$ ) among those with a recent mTBI, compared to HCs. For those with mTBI, the rate of lapses increased by 7.5% for every 1-point increase in ESS score ( $p < .001$ ; see **Figure 2**). Furthermore, when compared to HCs, the PVT lapse rate was 1.5x higher for the acute group ( $p = .001$ ), 1.7x higher for the 3-month group ( $p < .001$ ), 1.8x higher for the 6-month group ( $p < .001$ ), and 1.4x higher for the chronic group ( $p = 0.002$ ), after controlling for ESS scores. These findings provide evidence of a significant compounding effect of daytime sleepiness and brain injury on sustained vigilant attention. Clinical evaluation of mTBI would benefit from routine assessment of daytime sleepiness.

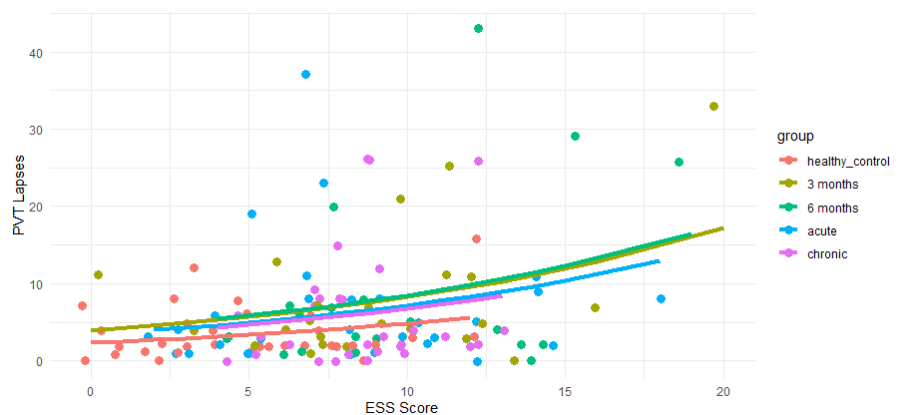


**Figure 2.** The association between daytime sleepiness (ESS) and vigilance (PVT).



### **Major Task 7: Extensive Data Analysis – Pending**

- The analyses for the final report were on track to be completed during the summer of 2020. However, due to the unanticipated emergence of the COVID-19 pandemic, our research staff have been prevented from returning to the laboratory. Most of our neuroimaging analysis systems require processing of large volumes of data that do not function effectively when operated via remote connections. Thus, we have not been able to undertake the extensive data analysis required for completion of the final report. Therefore, we requested a 6-month no-cost extension, with the hope that the viral spread levels will reduce enough to allow a return of research staff to the lab in the coming months.

### **Major Task 8: Manuscript Preparation and Submission for Publication – Ongoing**

- Manuscript preparation is ongoing for the preliminary findings regarding learning and memory in acute and chronic stages of mTBI recovery. As mentioned above, data analyses and publication of data from this study have been severely hampered by the current closure of the university and mandatory stay-at-home restrictions. This process will be re-initiated once the COVID-19 crisis abates and we are permitted to return to the lab.

### **What opportunities for training and professional development have the project provided?**

While the primary goal of this project is not to provide training and professional development, many such experiences have occurred for our team members. We continue to write papers on available data while working remotely, but full data analysis and publication will require research investigators to be able to return to the laboratory. The following activities occurred as a part of this project:

6 members of our lab presented research findings and lectures at the International Neuropsychological Society, Denver, CO, February 5-8, 2020

4 members of our lab presented research findings and lectures at the American Speech-Language Hearing Association Convention, Orlando, FL, November 21-23, 2019

3 members of our lab presented research findings and attended lectures at the Military Health Systems Research Symposium, Orlando, FL, August 18-22, 2019

4 members of our lab presented research findings and attended lectures at the Annual Meeting of The Associated Professional Sleep Societies, San Antonio, TX, June 9-12, 2019.

1 postdoc attended the DIPY Workshop, Bloomington, IN, March 8-12, 2019

2 members of our lab presented research findings and lectures at the International Neuropsychological Society, New York, NY, February 14-17, 2018.

2 members of our lab presented research findings and attended lectures at the Military Health Systems Research Symposium, Orlando, FL, August 20-23, 2018.

1 member of our lab presented research findings and attended lectures at the Organization for Human Brain Mapping, Singapore, Malaysia, June, 17-21, 2018

2 members of our lab presented research findings and attended lectures at the Annual Meeting of The Associated Professional Sleep Societies, Baltimore, MD, June 3-6, 2018.

1 member of our lab presented research findings and attended lectures at the Society for Biological Psychiatry, New York, NY, May 10-12, 2018.

1 member of our lab attended a grant writing workshop for early-career researchers at the 16<sup>th</sup> Annual Lessons for Success, Rockville, MD, April 23-25, 2018.

1 member of our lab presented research findings and attended lectures at the Anxiety and Depression Association of America, Washington DC, April 5-8, 2018.

2 members of our lab presented research findings and attended lectures at International Neuropsychological Society, Washington, DC, February 14-17, 2018.

1 member of our lab presented research findings and attended lectures at the Big Sky Athletic Training and Sports Medicine Conference, Big Sky, MT, February 4-7, 2018.

1 postdoc attended the Applied Workshop on the New SCID-5, Mastering the Diagnostic Interview, University of Michigan.

1 postdoc attended the Computational Psychiatry Course, University of Zurich, Zurich Switzerland, August 28-September 2, 2017.

1 postdoc attended the Neurometrika SPM Workshop, Philadelphia, PA, July 13-24, 2017.

1 postdoc attended the BrainSuite Workshop, Vancouver, CA, June 24, 2017.

1 postdoc attended the FSL Workshop, Vancouver, CA, June 19-23, 2017.

1 member of our lab attended lectures and presented research findings at the Organization for Human Brain Mapping, Vancouver, CA, June 25-29, 2017.

2 members of our lab attended lectures and presented research findings at the Military Health Systems Research Symposium, Orlando, FL, August 26-30, 2017.

3 members of our lab attended lectures and presented research findings at the Associated Professional Sleep Societies Meeting, Boston, MA, June 3-7, 2017

1 member of our lab attended lectures and presented research findings at the Society of Biological Psychiatry Meeting, San Diego, CA, May 18-20, 2017

1 member of our lab attended lectures and presented research findings at the International Neuropsychological Society Meeting, New Orleans, LA, February 1-4, 2017

1 member of our lab attended lectures and presented research findings at the meeting of the Society for Psychophysiological Research, Minneapolis, MN, September 21-25, 2016.

1 member of our lab attended lectures and presented research findings at the Military Health Systems Research Symposium, Orlando, FL, August 15-18, 2016.

2 postdocs attended the NIH Grant Writing Workshop at the University of Arizona (August 2016), Tucson, AZ.

4 members of our lab attended lectures and presented research findings at the Associated Professional Sleep Societies Meeting, Denver, CO, June 11-15, 2016

1 member of our lab attended a workshop entitled: Actigraphy and Figness/Sleep trackers in Adults and Children: Fundamentals and applications, at the Associated Professional Sleep Societies Meeting, Denver, CO, June 11-15, 2016

3 members of our lab attended lectures and presented research findings at the Society of Biological Psychiatry Meeting, Atlanta, GA, May 12-14, 2016

1 postdoc and 1 graduate student attended the CONN Functional Connectivity Workshop (April 2016), in Boston, MA.

4 members of our lab attended lectures and presented research findings at the International Neuropsychological Society Meeting, Boston, MA, February 3-6, 2016

1 postdoc attended the Mind Research Network Functional MRI Training Workshop (Jan 2016) in Albuquerque, NM.

15 college undergraduate students obtained training in research methods during a summer training program in our lab this year, 4 who were sponsored by the University of Arizona and the other by the National Institutes of Health MARC Undergraduate Student Training in Academic Research (U-STAR) Award.

7 undergraduate students were supervised for their Senior Honors Thesis' in our lab.

1 graduate student was supervised for his doctoral dissertation in our lab

1 graduate student was completed his Master's Thesis in our lab.

Multiple members of our lab have attended regular training in MRI analysis methods and safety as part of an ongoing training series offered at the University of Arizona.

All members of our lab receive regular one-on-one instruction and supervision in the administration and scoring of neuro-psychological assessments, psycho-diagnostic testing, electrode placement, and patient interviewing to ensure best data collection practices.

Over 20 members of our lab have undergone regular in-house training in the use of various brain-imaging software, including SPM12, Matlab, FSL, Freesurfer, TracVis, MRICron and others.

Over 25 members of our lab have undergone basic training modules in ethical conduct, statistical analysis, and neuroanatomy. All lab members have been certified in CPR and basic life support and first aid.

### **How were the results disseminated to communities of interest?**

Consistent with prior years, results were disseminated to communities of interest through presentations at research meetings, journal articles, community forums and tabling events, and poster presentations. In

particular, we have given poster presentations on data from this study at the International Neuropsychological Society Annual Meeting, the SLEEP meeting, the American Speech-Language Hearing Association (ASHA) meeting, the Annual Biomedical Research Conference for Minority Students, and the Military Health Systems Research Symposium in recent years.

**What do you plan to do during the next reporting period to accomplish the goals and objectives?**

Since data collection for the study is complete, we will focus our efforts on extensive data analysis during the next few months. We will continue to work on the data dictionary for the study and run extensive analysis to complete the primary study objectives. As mentioned above, the situation is currently in flux, as we are awaiting additional guidance from state and local authorities and the administration of the University of Arizona before being allowed to return to normal research activities in the laboratory. While the viral transmission level is currently at its highest point so far, we are optimistic that the State of Arizona will reach its peak levels in the coming weeks and will begin to decline, as seen in other areas of the country. We have developed an extensive mitigation and return to work plan that will be initiated once the University permits a return to research operations.

**4. IMPACT:**

**What was the impact on the development of the principal discipline(s) of the project?**

We have continued to present our findings at scientific and military conferences. These findings have advanced our understanding of the effects of mTBI on various outcomes, including daytime sleepiness and vigilance, language processing, reading fluency, and memory capacity, and how these are associated with concussion-related changes in brain organization. Thus, the field of concussion research, in and out of the military, has been advanced by the preliminary knowledge that has already been disseminated this year.

**What was the impact on other disciplines?**

While the findings have been primarily disseminated within the concussion and neuropsychology community, we have also presented this work at conferences focused on sleep and on speech-language-hearing. Thus, the findings are having widespread reach beyond the primary discipline of neuropsychology.

**What was the impact on technology transfer?**

Nothing to report.

**What was the impact on society beyond science and technology?**

Our team has given small tabletop presentations in the local Tucson community to expand awareness of concussion to the non-professional and lay audiences. This has helped to communicate concussion awareness to athletes and the general student population. We have also given presentations at local Veteran's groups over the past few years, which has further enhanced awareness of the impact of concussion on mood, sleep, and cognitive functioning within military Veterans.

**5. CHANGES/PROBLEMS:**

**Changes in approach and reasons for change**

Due to the COVID-19 pandemic, we have had to discontinue all on-campus research activities. Lab personnel continue to work from home and are engaged in data cleaning and quality assurance checks as we wait to return to the laboratory. We had anticipated completing all data collection during the summer of 2020, but this was not possible due to restrictions on lab operations imposed during the pandemic crisis.

**Actual or anticipated problems or delays and actions or plans to resolve them**

The major problem encountered this quarter as the rapid development and progression of the COVID-19 pandemic. As a result of the pandemic, a statewide shutdown was implemented and consequently, no laboratory staff could be at the University laboratory location. This substantially impaired our ability to conduct the primary neuroimaging analyses and made working on study projects more challenging. Consequently, we requested a no-cost extension on June 15, 2020. This request was approved on June 30, 2020.

**Changes that had a significant impact on expenditures**

Nothing to report.

**Significant changes in use or care of human subjects, vertebrate animals, biohazards, and/or select agents**

Nothing to report.

**6. PRODUCTS:****Publications, conference papers, and presentations****Journal publications this year.**

Dailey, N.S., & Killgore, W.D.S. (in prep). *Lexical-Semantic Processing in Acute and Chronic Stages of Mild Traumatic Brain Injury*.

Meinhausen, C., Dailey, N.S., Esbit, S., Raikes, A., Miller, M. & Killgore, W.D.S. (in prep). *Self-Initiated Verbal Recall Strategies following Mild Traumatic Brain Injury*.

**Other publications, conference papers, and presentations this year.**

Dailey, N.S., Raikes, A., Bajaj, S., Alkozei, Sanasac, S., & Killgore, W.D.S. (2020, February). *Frontal and Temporal Cortical Surface Area is Associated with Lexical-Semantic Knowledge in Adults with Mild Traumatic Brain Injury*. Talk presented at the 48th meeting of the International Neuropsychological Society 2020, Denver, CO.

Esbit, S., Raygoza, D., Meinhausen, C., Dailey, N.S., & Killgore, W.D.S. (2020, February). *Discrepancies Between Working Memory and Clustering Strategies in Total Recall Performance for Mild Traumatic Brain Injury*. Poster presented at the 48th annual meeting of the International Neuropsychological Society 2020, Denver, CO.

Meinhausen, C., Esbit, S., Dailey, N.S., & Killgore, W.D.S. (2020, February). *Self-Initiated Verbal Recall Strategies Following Mild Traumatic Brain Injury*. Poster presented at the 48th annual meeting of the International Neuropsychological Society 2020, Denver, CO.

Dailey, N.S., Raikes, A.C., Wager, M.E., Grandner, M.A., Alkozei, A., & Killgore, W.D.S. (2019, December). *The Compounding Impact of Daytime Sleepiness and Brain Injury on Sustained Vigilance*. Submitted to SLEEP 2020, Philadelphia, PA.

Dailey, N.S., Raikes, A.C., Alkozei, A., Grandner, M.A., & Killgore, W.D.S. (2019, December). Reduced

Cortical Thickness as a Biomarker of Daytime Sleepiness in Mild Traumatic Brain Injury. Submitted to SLEEP 2020, Philadelphia, PA.

Dailey, N.S. & Killgore, W.D.S. (2019, November). *Disrupted Thalamocortical Connectivity following Mild Traumatic Brain Injury: Associations with Daytime Sleepiness*. Oral Presentation at the American Speech-Language Hearing Association Conference, Orlando, FL.

Dailey, N.S. & Killgore, W.D.S. (2019, November). *Reading Fluency in Mild Traumatic Brain Injury*. Poster presented at the American Speech-Language Hearing Association Conference, Orlando FL.

**Website(s) or other Internet site(s)**

Nothing to report

**Technologies or techniques**

Nothing to report.

**Inventions, patent applications, and/or licenses**

Nothing to report.

**Other Products**

Nothing to report.

**7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS**

**What individuals have worked on the project?**

Name: William D. "Scott" Killgore, Ph.D.

Project Role: PI

Nearest person month worked: 1

Contribution to Project: Dr. Killgore oversees all aspects of project progress and orchestrates data analysis and publication efforts.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062  
USAMRAA W81XWH-12-1-0386

Name: Ted Trouard, Ph.D.

Project Role: Co-PI

Nearest person month worked: 0

Contribution to Project: Dr. Trouard provides support on brain imaging aspects of the study, including scanner parameters and data analysis.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062  
USAMRAA W81XWH-12-1-0386

Name: Emily Taylor, M. S.

Project Role: Lab Manager

Nearest person month worked: 1

Contribution to Project: Ms. Taylor assists with the management aspects of the study and study

staff, in addition to providing support, and performing periodic quality control checks.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Natalie Dailey, Ph.D., CCC-SLP

Project Role: Postdoctoral Fellow

Nearest person month worked: 6

Contribution to Project: Dr. Dailey performs data analysis and processing for the project.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Sahil Bajaj, Ph.D.

Project Role: Postdoctoral Fellow

Nearest person month worked: 0

Contribution to Project: Dr. Bajaj performs data analysis and processing for the project.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Adam C. Raikes, Ph.D.

Project Role: Postdoctoral Fellow

Nearest person month worked: 1

Contribution to Project: Dr. Raikes performs data analysis and oversees brain imaging processing for the project.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062  
USAMRAA W81XWH-12-1-0386

Name: Matthew Allbright

Project Role: Research Technician

Nearest person month worked: 1

Contribution to Project: Mr. Allbright oversees the technical aspects of the project and assists in database export, storage, and management.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Briann Satterfield, Ph.D.

Project Role: Postdoctoral Fellow

Nearest person month worked: 1

Contribution to Project: Dr. Satterfield performs data analysis and oversees brain imaging processing for the project.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Cameron Akira Barnes

Project Role: Research Technician

Nearest person month worked: 0

Contribution to Project: Ms. Barnes provides supports with data collection, data entry, and recruitment activities.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Anna Burns

Project Role: Research Technician

Nearest person month worked: 0

Contribution to Project: Ms. Burns provides support with recruitment activities.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Brittany Forbeck

Project Role: Research Technician

Nearest person month worked: 5

Contribution to Project: Ms. Forbeck provides support with data collection and recruitment activities and manages the day-to-day needs of the project.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Ian Anlap

Project Role: Research Technician

Nearest person month worked: 0

Contribution to Project: Mr. Anlap assists in database storage and management.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Ayla Bullock

Project Role: Research Technician

Nearest person month worked: 0

Contribution to Project: Mr. Bullock assists in database storage and management.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Sara Cloonan

Project Role: Research Technician

Nearest person month worked: 0



Contribution to Project: Ms. Cloonan assists in database storage and management.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Simon Esbit

Project Role: Research Technician

Nearest person month worked: 1

Contribution to Project: Mr. Esbit provides support with recruitment activities.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Michael Miller

Project Role: Research Specialist, Assistant Lab Manager

Nearest person month worked: 0

Contribution to Project: Mr. Miller assists with the administrative aspects of the study and study staff, in addition to providing support, and performing periodic quality control checks.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Yinya Huang

Project Role: Research Technician

Nearest person month worked: 0

Contribution to Project: Ms. Huang assists in database storage and management.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Rebecca Woods-Lubbert

Project Role: Research Technician

Nearest person month worked: 0

Contribution to Project: Ms. Woods-Lubbert provides support with data collection and recruitment activities.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Michael Strong

Project Role: Research Technician

Nearest person month worked: 2

Contribution to Project: Mr. Strong provides support with data collection recruitment activities and manages the day-to-day needs of the project.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Meltem Ozcan

Project Role: Research Technician

Nearest person month worked: 0

Contribution to Project: Ms. Ozcan provides support with data collection and recruitment activities.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Kristin Caleigh Shepard

Project Role: Research Technician

Nearest person month worked: 0

Contribution to Project: Ms. Shepard provides support with data collection and recruitment activities.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Jeffrey Skalamera

Project Role: Research Technician

Nearest person month worked: 0

Contribution to Project: Mr. Skalamera provides support with data collection and recruitment activities.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

Name: Molly Richards

Project Role: Research Technician

Nearest person month worked: 1

Contribution to Project: Ms. Richards provides support with data collection and recruitment activities.

Funding support: USAMRAA W81XWH-14-1-0570  
USAMRAA W81XWH-14-1-0571 USAMRAA W81XWH-16-1-0062 USAMRAA  
W81XWH-12-1-0386

**Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?**

Nothing to report.

**What other organizations were involved as partners?**

Nothing to report.

## **8. SPECIAL REPORTING REQUIREMENTS**

Please see updated Quad Chart attached in Appendix.

## **CONCLUSION**

Data collection for this project is complete and we have exceeded our overall planned recruitment numbers. The preliminary data are already showing important findings regarding the effects of mTBI on sleep, language, and cognitive performance. We had anticipated completing the final report as of the summer of 2020, but the lab was shut down due to the emergence of the COVID-19 pandemic. Research investigators have not been able to fully access and analyze the neuroimaging data due to the mandated restrictions on laboratory operations imposed by the University of Arizona, as well as state and local authorities during the pandemic crisis. Consequently, we requested and were granted a 6-month no-cost extension to allow greater latitude to complete data analysis as the situation allows. While there is considerable uncertainty regarding the actual timeline to return to normal lab operations, we are optimistic that we will be able to complete full data analysis for the project during the coming months.

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## **APPENDICES**

### **Table of Contents**

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**A Model for Predicting Cognitive and Emotional Health from Structural and Functional  
Neurocircuitry Following Traumatic Brain Injury  
Study Tasks and Assessments**

Day of Scan Questionnaire

Epworth Sleepiness Scale (ESS)

OSU TBI Interview

Glasgow Outcome Scale – Extended (GOS-E)

MINI International Psychiatric Interview (MINI)

California Verbal Learning Test (CVLT)

Repeatable Battery for the Assessment of Neuropsychological Status (RBANS)

Delis-Kaplan Executive Function System (D-KEFS)

Go/No Go

Brief Visual Memory Test-Revised (BVM-T-R)

Buss Perry Aggression Questionnaire (BPAQ)

Psychomotor Vigilance Test (PVT)

Pittsburgh Sleep Quality Index (PSQI)

State Trait Anxiety Inventory (STAI)

Automated Neuropsychological Assessment Metrics (ANAM)

Beck Depression Inventory (BDI-II)

Wechsler Abbreviated Scale of Intelligence (WASI II)

Connor- Davidson Resilience Scale (CD-RISC)

Craig Handicap Assessment and Reporting Technique Short Form (CHART-SF)

Personality Assessment Inventory (PAI)

Alcohol Use Disorder Identification Test (AUDIT)

Rivermead Post Concussion Symptoms Questionnaire (RPCSQ)

Snaith Hamilton Pleasure Scale (SHAPS)

Satisfaction With Life Scale (SWLS)

Edinburgh Handedness Survey (EHS)

Marijuana Use Questionnaire (MUSE)

Woodcock Johnson Sentence Reading Fluency (WJ IV)

# A Model for Predicting Cognitive and Emotional Health from Structural and Functional Neurocircuitry following Traumatic Brain Injury

PT110814

W81XWH-12-1-0386

PI: William D. Killgore, Ph.D.

Org: University of Arizona

Award Amount: \$2,272,098



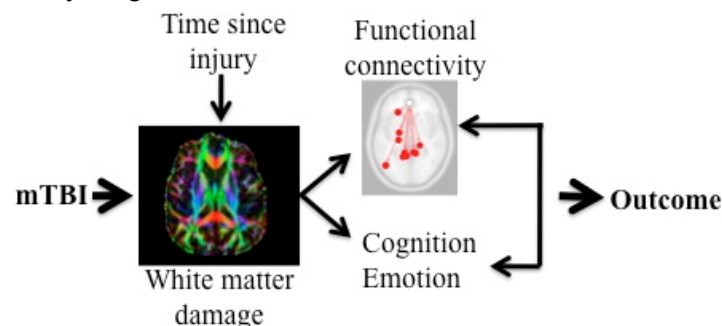
## Study/Product Aim(s)

- Demonstrate the extent to which structural white matter damage explains abnormalities in cognition and emotion at different recovery stages following mild traumatic brain injury (TBI).
- Demonstrate the extent to which structural white matter damage explains abnormalities in functional connectivity at different recovery stages following mild TBI.
- Determine whether white matter disintegrity could serve as an objective marker for mild TBI.

## Approach

Cross-sectional study involves comprehensive neuropsychiatric and neuropsychological assessment of 30 healthy controls and 150 individuals with mild TBI, of which 30 each will be assessed at 2 weeks, 1 month, 3 months, 6 months, and 12 month post-TBI. All participants undergo diffusion-weighted imaging, resting-state functional connectivity imaging, and neurocognitive assessment.

The study investigates whether and how white matter damage at 5 different natural recovery stages contributes to functional connectivity, cognition and emotion.



**Accomplishments:** Data collection is complete. We have collected 191 datasets. Data analysis is delayed due to COVID-19 shutdown of lab. 6-month no-cost extension received.

## Timeline and Cost

| Activities                  | CY | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|-----------------------------|----|----|----|----|----|----|----|----|----|----|
| Study preparations          |    |    |    |    |    |    |    |    |    |    |
| Data collection             |    |    |    |    |    |    |    |    |    |    |
| Lab Relocation/Grant Move   |    |    |    |    |    |    |    |    |    |    |
| Data quality check          |    |    |    |    |    |    |    |    |    |    |
| Data analysis/dissemination |    |    |    |    |    |    |    |    |    |    |
| Estimated Budget (\$2,272K) |    |    |    |    |    |    |    |    |    |    |

## Goals/Milestones

**CY14 Goal** – Close study to enrolment and move lab to U of Arizona

☑ Completed move successfully. Funding transferred successfully

**CY15 Goals** – Complete preparations & launch study at UA

☑ Preparations, training, and MRI protocols successfully completed

☑ Study re-initiated in Arizona successfully!

☑ Preliminary findings published; several presentations submitted

**CY16-20 Goal** – Data collection, quality checks

☑ 153 participants have completed in total (85%). ~6 month delay occurred last year due to MRI scanner shutdown and relocation.

**CY20 Goal** – Complete data collection, analysis, and dissemination

☑ Complete data collection

☐ Conduct final data analyses and prepare data for publication

## Comments/Challenges/Issues/Concerns

COVID-19 pandemic has necessitated remote/telework lab operations  
Six-Month No-Cost Extension received due to COVID-19<sub>23</sub>

## Budget Expenditure to Date

Cumulative Expenditure: \$2,272,098

Updated: 13 Jul 2020

AGE \_\_\_\_\_ years

HEIGHT \_\_\_\_\_ ft/inches

WEIGHT \_\_\_\_\_ lbs

SEX ☐ **MALE** ☐ **FEMALE**

For females only:

When was the start of your last menstrual period?

Be as precise as possible.

Date of period: \_\_\_\_\_

or about \_\_\_\_\_ days ago.

RIGHT or LEFT-HANDED?

☐ **RIGHT**

☐ **LEFT**

☐ **BOTH/NEITHER**

Do you have any problems with reading? ☐ **NO** ☐ **YES**



**EDUCATION:** What is the highest grade or level of school you have completed or the highest degree you have obtained? *Please choose one:*

- ☐ 9th Grade
- ☐ 10th Grade
- ☐ 11th Grade
- ☐ 12th Grade, no diploma
- ☐ High school graduate
- ☐ GED or equivalent
- ☐ Some college, no degree
- ☐ Associate degree: occupational, technical, or vocational program
- ☐ Associate degree: academic program
- ☐ Bachelor's degree (e.g., BA, AB, BS, BBA)
- ☐ Master's degree (e.g., MA, MS, MEng, MEd, MBA)
- ☐ Professional school degree (e.g., MD, DDS, DVM, JD)
- ☐ Doctoral degree (e.g., PhD, EdD)
- ☐ Unknown

**RACE:** With what ethnicity do you identify?

- ☐ White
- ☐ Hispanic/Latino
- ☐ Black/African American
- ☐ Native American/ American Indian
- ☐ Asian/Pacific Islander
- ☐ Other

Are you currently doing shift work (e.g., working early morning, evening, or night shifts)?

- ☐ **NO**      ☐ **YES**

Do you engage in regular exercise?

- ☐ **NO**      ☐ **YES**

Which sport? \_\_\_\_\_

How many days per week? \_\_\_\_\_

How many minutes per exercise session (on average)? \_\_\_\_\_



## **CAFFEINE USE**

Did you have any caffeine containing products today?

☐ **NO** ☐ **YES**      How much? \_\_\_\_\_

On average, how many cups (=8oz) of caffeinated coffee do you drink per day? \_\_\_\_\_

On average, how many cups (=8oz) of caffeinated tea do you drink per day? \_\_\_\_\_

On average, how many cans of caffeinated soda do you drink per day? \_\_\_\_\_

On average, how many caffeinated sports drinks do you drink per day? \_\_\_\_\_ (brand)

Do you use any other caffeinated products (e.g. Vivarin)?

☐ **NO** ☐ **YES**      Brand? \_\_\_\_\_

How much? \_\_\_\_\_

How often? \_\_\_\_\_

## **NICOTINE AND OTHER SUBSTANCE USE**

Do you currently smoke cigarettes?

☐ **NO**      ☐ **YES**

How many? \_\_\_\_\_ daily / weekly / monthly / yearly (*circle one*)

For how long? \_\_\_\_\_ years \_\_\_\_\_ months

Have you tried to quit?      ☐ **NO**      ☐ **YES**

How many times? \_\_\_\_\_

Have you ever smoked cigarettes in the past?

☐ **NO**      ☐ **YES**

How many? \_\_\_\_\_ daily / weekly / monthly / yearly (*circle one*)

For how long? \_\_\_\_\_ years \_\_\_\_\_ months

When did you quit? \_\_\_\_\_ (approximate date)

Do you currently smoke large cigars?

☐ **NO**      ☐ **YES**

How many? \_\_\_\_\_ daily / weekly / monthly / yearly (*circle one*)

For how long? \_\_\_\_\_ years \_\_\_\_\_ months

Have you tried to quit?      ☐ **NO**      ☐ **YES**

How many times? \_\_\_\_\_

Have you ever smoked large cigars in the past?

☐ **NO**      ☐ **YES**

How many? \_\_\_\_\_ daily / weekly / monthly / yearly (*circle one*)

For how long? \_\_\_\_\_ years \_\_\_\_\_ months

When did you quit? \_\_\_\_\_ (approximate date)

Do you currently smoke small cigars?

☐ **NO**      ☐ **YES**

How many? \_\_\_\_\_ daily / weekly / monthly/ yearly (*circle one*)

For how long? \_\_\_\_\_ years \_\_\_\_\_ months

Have you tried to quit?      ☐ **NO**      ☐ **YES**

How many times? \_\_\_\_\_

Have you ever smoked small cigars in the past?

☐ **NO**      ☐ **YES**

How many? \_\_\_\_\_ daily / weekly / monthly / yearly (*circle one*)

For how long? \_\_\_\_\_ years \_\_\_\_\_ months

When did you quit? \_\_\_\_\_ (approximate date)

Do you currently smoke cigarillos?

☐ **NO**      ☐ **YES**

How many? \_\_\_\_\_ daily / weekly / monthly/ yearly (*circle one*)

For how long? \_\_\_\_\_ years \_\_\_\_\_ months

Have you tried to quit?      ☐ **NO**      ☐ **YES**

How many times? \_\_\_\_\_

Have you ever smoked cigarillos in the past?

☐ **NO**      ☐ **YES**

How many? \_\_\_\_\_ daily / weekly / monthly / yearly (*circle one*)

For how long? \_\_\_\_\_ years \_\_\_\_\_ months

When did you quit? \_\_\_\_\_ (approximate date)

Do you currently use smokeless tobacco, such as dip or chew?

☐ **NO**

☐ **YES**

About how much/ many? \_\_\_\_\_ daily / weekly / monthly / yearly (*circle one*)

For how long? \_\_\_\_\_ years \_\_\_\_\_ months

Have you tried to quit? ☐ **NO** ☐ **YES**

How many times? \_\_\_\_\_

Have you ever used smokeless tobacco in the past?

☐ **NO**

☐ **YES**

About how much/ many? \_\_\_\_\_ daily / weekly / monthly / yearly (*circle one*)

For how long? \_\_\_\_\_ years \_\_\_\_\_ months

When did you quit? \_\_\_\_\_ (approximate date)

Do you currently use any other nicotine-containing products?

☐ **NO**

☐ **YES**

Which kind? \_\_\_\_\_

For how long? \_\_\_\_\_ years \_\_\_\_\_ months

How often? \_\_\_\_\_ daily/ weekly/ monthly/ yearly (*circle one*)

Have you tried to quit? ☐ **NO** ☐ **YES**

How many times? \_\_\_\_\_

Have you ever used any other kind of nicotine containing products?

☐ **NO**

☐ **YES**

Which kind? \_\_\_\_\_

For how long? \_\_\_\_\_ years \_\_\_\_\_ months

How often? \_\_\_\_\_ daily/ weekly/ monthly/ yearly (*circle one*)

Have you tried to quit? ☐ **NO** ☐ **YES**

How many times? \_\_\_\_\_

Are you currently taking diet pills?

☐ **NO**

☐ **YES**

What brand? \_\_\_\_\_

For how long? \_\_\_\_\_ years \_\_\_\_\_ months \_\_\_\_\_ days

How much? \_\_\_\_\_

How often? \_\_\_\_\_ daily / weekly / monthly / yearly (*circle one*)

Are you currently taking any medications, vitamins, or supplements?

☐ **NO**

☐ **YES**

Please list:

Name: \_\_\_\_\_

Dosage: \_\_\_\_\_

Name: \_\_\_\_\_

Dosage: \_\_\_\_\_

Name: \_\_\_\_\_

Dosage: \_\_\_\_\_

Name: \_\_\_\_\_

Dosage: \_\_\_\_\_

Have you ever used any street drugs?

☐ **NO**

☐ **YES**

What? \_\_\_\_\_

How much? \_\_\_\_\_

How often? \_\_\_\_\_ daily/ weekly/ monthly/ yearly (*circle one*)

In the past year, did you use any other street drugs?

☐ **NO** ☐ **YES**

What? \_\_\_\_\_

How much? \_\_\_\_\_

How often? \_\_\_\_\_ daily/ weekly/ monthly/ yearly (*circle one*)

Do you currently use any other street drugs?

☐ **NO**

☐ **YES**

What? \_\_\_\_\_

How much? \_\_\_\_\_

How often? \_\_\_\_\_ daily/ weekly/ monthly/ yearly (*circle one*)

Do you drink alcohol?

☐ **NO**

☐ **YES**

How many times per month? \_\_\_\_\_

Using the below chart, what is the average number of drinks you consume on these occasions? \_\_\_\_\_

Using the chart, what is the largest number of drinks you consume? \_\_\_\_\_

One drink equals:

12 fl oz of **regular beer** = 8-9 fl oz of **malt liquor** (shown in a 12-oz glass) = 5 fl oz of **table wine** = 3-4 oz of **fortified wine** (such as sherry or port 3.5 oz shown) = 2-3 oz of **cordial, liqueur, or aperitif** (2.5 oz shown) = 1.5 oz of **brandy** (a single jigger or shot) = 1.5 fl oz shot of **80-proof spirits** ("hard liquor")



about 5% alcohol



about 7% alcohol



about 12% alcohol



about 17% alcohol



about 24% alcohol



about 40% alcohol



about 40% alcohol

### INFORMATION ON THE MOST RECENT DOCUMENTED INJURY

Injury date and time:      \_\_\_\_ / \_\_\_\_ / \_\_\_\_        \_\_ : \_\_ (24 hour clock)  
                                        (day / month / year)

What happened? \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Did you experience any symptoms or changes after the injury?

- ☐ NO      ☐ YES, IMMEDIATELY AFTER THE INJURY  
☐ YES, NOT IMMEDIATELY AFTER THE INJURY

Which symptoms or changes did you experience?

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At the time of the injury, were you under the influence of alcohol, medication or drugs at that time?

- ☐ **NO**
- ☐ **YES, ALCOHOL**
- ☐ **YES, MEDICATION** (which?) \_\_\_\_\_
- ☐ **YES, DRUGS** (which?) \_\_\_\_\_

Were medical services received after injury?

- ☐
- NO
- ☐
- DO NOT KNOW
- ☐
- YES

Did you “see stars” during your last concussion?

- ☐
- NO
- ☐
- DO NOT KNOW
- ☐
- YES



Did you experience loss of consciousness?

☐ **NO**      ☐ **DO NOT KNOW**      ☐ **YES**

Duration of loss of consciousness:

- ☐ <1 minute
- ☐ 1-29 minutes
- ☐ 30-59 minutes
- ☐ 1-24 hours
- ☐ 1-7 days
- ☐ > 7 days
- ☐ Unknown

How was the loss of consciousness verified?

☐ **Self-report**      ☐ **Witness**      ☐ **Medical chart**

Do you have a PERSONAL memory of the event/ incident itself?

☐ **YES, I FULLY REMEMBER**      ☐ **YES, BUT THERE ARE GAPS IN MY MEMORY**  
☐ **NO, I DO NOT REMEMBER AT ALL**

How much do you NOT remember after the injury?

- ☐ <1 minute
- ☐ 1-29 minutes
- ☐ 30-59 minutes
- ☐ 1-24 hours
- ☐ 1-7 days
- ☐ > 7 days
- ☐ Unknown

How was the memory loss verified?

☐ **Self-report**      ☐ **Witness**      ☐ **Medical chart**

After the injury, when did you feel back to yourself or 100%? Please state the approximate number of days. \_\_\_\_\_

How many separate injuries do you think have you sustained in total? \_\_\_\_\_

How many of these were documented by a health professional, athletic trainer, coach, etc.? \_\_\_\_\_

## **SLEEP HABITS**

How much sleep did you get last night? \_\_\_\_\_ HRS

**Before** your injury, what time did you typically awaken on:

Weekdays (Mon-Fri)? \_\_\_\_\_ AM PM (midnight = 12 AM; noon = 12 PM)

Weekends (Sat-Sun)? \_\_\_\_\_ AM PM

**Before** your injury, how long did it typically take you to fall asleep at night?

Week nights (Sun-Thur) \_\_\_\_\_ MIN HRS (midnight = 12 AM; noon = 12 PM)

Weekends (Fri-Sat) \_\_\_\_\_ MIN HRS

**Before** your injury, at what time did you normally go to bed at night on:

Week nights (Sun-Thur)? \_\_\_\_\_ AM PM (midnight = 12 AM; noon = 12 PM)

Weekends (Fri-Sat)? \_\_\_\_\_ AM PM

**Before** the injury, did you experience sleep problems?

☐ NO ☐ **YES, I had trouble falling asleep.**

How often? \_\_\_\_\_ times per WEEK MONTH YEAR

☐ **YES, I had trouble staying asleep.**

How often? \_\_\_\_\_ times per WEEK MONTH YEAR

**Since the injury**, did you notice that your sleep became worse?

☐ NO ☐ YES

What sleep problems became more noticeable to you? (check all that apply)

☐ I get sleepier during the day.

☐ I get drowsier than I used to when trying to concentrate or work.

☐ I fall asleep when I should not.

☐ It is harder to stay alert during the day.

☐ It is harder to fall asleep at night.

How often? \_\_\_\_\_ times per WEEK MONTH YEAR (circle one)

☐ I fall asleep much later than I used to.

- ☐ I fall asleep much earlier than I used to.
- ☐ I sleep later in the morning than I used to.
- ☐ I have trouble staying asleep.

How often? \_\_\_\_\_ times per WEEK MONTH YEAR (circle one)

- ☐ I wake up much earlier in the morning than I used to.
- ☐ When I do sleep, it is fitful or less restful than it used to be.
- ☐ I wake up off and on throughout the night more than I used to.
- ☐ I have more nightmares than I used to.

**Since your injury,** how much do you typically sleep on weeknights (Sun-Thur)? \_\_\_\_\_ HRS

**Since your injury,** how much do you typically sleep on weekend nights (Fri-Sat)? \_\_\_\_\_ HRS

**Since your injury,** at what time do you normally go to bed at night on:

Week nights (Sun-Thur)? \_\_\_\_\_ AM PM (midnight = 12 AM; noon = 12 PM)

Weekends (Fri-Sat)? \_\_\_\_\_ AM PM

**Since your injury,** what time do you typically awaken on:

Weekdays (Mon-Fri)? \_\_\_\_\_ AM PM

Weekends (Sat-Sun)? \_\_\_\_\_ AM PM

**Since your injury,** how long does it typically take you to fall asleep at night?

Week nights (Sun-Thur)? \_\_\_\_\_ MIN HRS

Weekends (Fri-Sat)? \_\_\_\_\_ MIN HRS

**Since your injury,**

at what time of day do you feel sleepiest? \_\_\_\_\_ AM PM

at what time of day do you feel most alert? \_\_\_\_\_ AM PM

how many hours do you need to sleep to feel your best? \_\_\_\_\_

if you get less than \_\_\_\_\_ hours of sleep, you notice impairment in your ability to function at work.

if you get more than \_\_\_\_\_ hours of sleep, you notice impairment in your ability to function at work.

**Since your injury**, do you take more than two daytime naps per month?

☐ **NO**      ☐ **YES**

How many times per week do you nap? \_\_\_\_\_

At what time? \_\_\_\_:\_\_\_\_ AM/PM to \_\_\_\_:\_\_\_\_ AM/PM

Do you consider yourself a light, normal, or heavy sleeper?

☐ **LIGHT**      ☐ **NORMAL**      ☐ **HEAVY**

Have you been told or do you think that you snore excessively?

☐ **NO**      ☐ **YES**

Have you ever been diagnosed or treated for sleep apnea or sleep disordered breathing?

☐ **NO**      ☐ **YES**

Is daytime sleepiness currently a problem for you?

☐ **NO**      ☐ **YES**

## **Epworth Sleepiness Scale**

How likely are you to doze off or fall asleep in the following situations, in contrast to feeling just tired? This refers to your **usual way of life in recent times**. Even if you have not done some of these things recently try to work out how they would have affected you. Use the following scale to choose the most appropriate number for each situation:

0 = would never doze

1 = slight chance of dozing

2 = moderate chance of dozing

3 = high chance of dozing

| SITUATION                                                       | CHANCE OF DOZING |   |   |   |
|-----------------------------------------------------------------|------------------|---|---|---|
| Sitting and reading                                             | 0                | 1 | 2 | 3 |
| Watching TV                                                     | 0                | 1 | 2 | 3 |
| Sitting, inactive in a public place (e.g. a theater or meeting) | 0                | 1 | 2 | 3 |
| As a passenger in a car for an hour without a break             | 0                | 1 | 2 | 3 |
| Lying down to rest in the afternoon when circumstances permit   | 0                | 1 | 2 | 3 |
| Sitting and talking to someone                                  | 0                | 1 | 2 | 3 |
| Sitting quietly after a lunch without alcohol                   | 0                | 1 | 2 | 3 |
| In a car, while stopped for a few minutes in the traffic        | 0                | 1 | 2 | 3 |

# Ohio State University TBI Identification Method Short Form\*

**I would like to ask you about injuries to your head or neck that you may have had at anytime in your life.**

**Interviewer instruction:** Record cause and any details provided spontaneously in the box at the bottom of the page. DO NOT query further about LOC or other details at this stage.

1. Have you ever been hospitalized or treated in an emergency room following an injury to your head or neck? Think about any childhood injuries you remember or were told about.  
☐ Yes—Record cause(s) in table below  
☐ No
2. Have you ever injured your head or neck in a car accident or from some other moving vehicle accident (e.g. motorcycle, ATV)?  
☐ Yes—Record cause(s) in table below  
☐ No
3. Have you ever injured your head or neck in a fall or from being hit by something (e.g. falling from a bike, horse, or rollerblades, falling on ice, being hit by a rock)? Have you ever injured your head or neck playing sports or on the playground?  
☐ Yes—Record cause(s) in table below  
☐ No
4. Have you ever injured your head or neck in a fight, from being hit by someone, or from being shaken violently? Have you ever been shot in the head?  
☐ Yes—Record cause(s) in table below  
☐ No
5. Have you ever been nearby when an explosion or a blast occurred? If you served in the military, think about any combat- or training-related incidents.  
☐ Yes—Record cause(s) in table below  
☐ No
6. If all above are “no” then proceed to question 7. If answered “yes” to *any* of the questions above, ask the following for each injury: **Were you knocked or did you lose consciousness (LOC)? If yes, how long? If no, were you dazed or did you have a gap in your memory from the injury? How old were you? (age is only needed if there was LOC)**

[illegible]

\* adapted with permission from the Ohio State University TBI Identification Method (Corrigan, J.D., Bogner, J.A. (2007). Initial reliability and validity of the OSU TBI Identification Method. *J Head Trauma Rehabil*, 22(6):318-329,

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|  |  |  |  |  |  |  |  |

If more injuries with LOC: How many more? \_\_\_\_ Longest knocked out? \_\_\_\_ How many  $\geq 30$  mins.? \_\_\_\_ Youngest age? \_\_\_\_

7. Have you ever lost consciousness from a drug overdose or being choked? \_\_\_\_ # overdose \_\_\_\_ # choked

### **SCORING**

\_\_\_\_\_ # **TBI-LOC** (number of TBI's with loss of consciousness from #6a)

\_\_\_\_\_ # **TBI-LOC  $\geq 30$**  (number of TBI's with loss of consciousness  $\geq 30$  minutes from #6a)

\_\_\_\_\_ **age at first TBI-LOC** (youngest age from #6a)

\_\_\_\_\_ **TBI-LOC before age 15** (if youngest age from #7B  $< 15$  then =1, if  $\geq 15$  then = 0)

\_\_\_\_\_ **Worst Injury** (1-5):

If responses to #1-5 are "no" classify as 1 "improbable TBI".

If in response to #6a and 6b reports never having LOC, being dazed or having memory lapses classify as 1 "improbable TBI".

If in response to #6b reports being dazed or having a memory lapse classify as 2 "possible TBI".

If in response to #6a loss of consciousness (LOC) does not exceed 30 minutes for any injury classify as 3 "mild TBI".

If in response to #6a LOC for any one injury is between 30 minutes and 24 hours classify as 4 "moderate TBI".

If in response to #6a LOC for any one injury exceeds 24 hours classify as 5 "severe TBI".

\_\_\_\_\_ # **anoxic injuries** (sum of incidents reported in #7)

Subject ID: \_\_\_\_\_

Date: \_\_\_\_\_

## Glasgow Outcome Scale – Extended

| <b>CONSCIOUSNESS</b>                |                                                                                                  |                         |                          |
|-------------------------------------|--------------------------------------------------------------------------------------------------|-------------------------|--------------------------|
| 1.                                  | Is the subject able to obey simple commands, or say words?                                       | NO                      | YES                      |
| <b>INDEPENDENCE IN THE HOME</b>     |                                                                                                  |                         |                          |
| 2.a                                 | Is assistance of another person at home essential every day for some activities of daily living? | NO                      | YES                      |
|                                     | Notes.                                                                                           |                         |                          |
| 2.b                                 | Do you need frequent help or someone to be around at home most of the time?                      | NO<br><i>(UPPER SD)</i> | YES<br><i>(LOWER SD)</i> |
| 2.c                                 | Was assistance at home essential before the injury?                                              | NO                      | YES                      |
|                                     | Notes.                                                                                           |                         |                          |
| <b>INDEPENDENCE OUTSIDE OF HOME</b> |                                                                                                  |                         |                          |
| 3.a                                 | Do you shop without assistance?                                                                  | NO<br><i>(UPPER SD)</i> | YES                      |
| 3.b                                 | Did you need assistance before the injury?                                                       | NO                      | YES                      |
|                                     | Notes.                                                                                           |                         |                          |
| 4.a                                 | Do you travel without assistance?                                                                | NO<br><i>(UPPER SD)</i> | YES                      |
| 4.b                                 | Did you need assistance before the injury?                                                       | NO                      | YES                      |
|                                     | Notes.                                                                                           |                         |                          |



| <b>WORK</b>                            |                                                                                                                          |                                                                                   |                                                                  |                                                                                                |
|----------------------------------------|--------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| 5.a                                    | Are you currently working to your previous capacity?                                                                     | NO                                                                                |                                                                  | YES                                                                                            |
| 5.b                                    | How restricted are you?                                                                                                  | Reduced work capacity.<br><br>(UPPER MD)                                          |                                                                  | Able to work in sheltered workshop or non-competitive job, or unable to work<br><br>(LOWER MD) |
| 5.c                                    | Have you been working or seeking employment before the injury?                                                           | NO                                                                                |                                                                  | YES                                                                                            |
|                                        | Notes.                                                                                                                   |                                                                                   |                                                                  |                                                                                                |
| <b>SOCIAL &amp; LEISURE ACTIVITIES</b> |                                                                                                                          |                                                                                   |                                                                  |                                                                                                |
| 6.a                                    | Are you able to resume regular social and leisure activities outside home?                                               | NO                                                                                |                                                                  | YES                                                                                            |
| 6.b                                    | What is the extent of the restriction?                                                                                   | Participate a bit less: at least half as often as before injury<br><br>(LOWER GR) | Participate much less: less than half as often<br><br>(UPPER MD) | Unable to participate: rarely, if ever<br><br>(LOWER MD)                                       |
| 6.c                                    | Did you engage in regular social and leisure activities before the injury?                                               | NO                                                                                |                                                                  | YES                                                                                            |
|                                        | Notes.                                                                                                                   |                                                                                   |                                                                  |                                                                                                |
| <b>FAMILY &amp; FRIENDSHIPS</b>        |                                                                                                                          |                                                                                   |                                                                  |                                                                                                |
| 7.a                                    | Have there been any psychological problems which have resulted in ongoing family disruption or disruption of friendship? | NO                                                                                |                                                                  | YES                                                                                            |

Subject ID: \_\_\_\_\_

Date: \_\_\_\_\_

|                              |                                                                                      |                                 |                                                 |                                    |
|------------------------------|--------------------------------------------------------------------------------------|---------------------------------|-------------------------------------------------|------------------------------------|
| 7.b                          | What is the extent of disruption or strain?                                          | Occasional:<br>less than weekly | Frequent:<br>once a week or more, but tolerable | Constant:<br>daily and intolerable |
| 7.c                          | Were there problems with family or friends before the injury?                        | NO                              |                                                 | YES                                |
|                              | Notes.                                                                               |                                 |                                                 |                                    |
| <b>RETURN TO NORMAL LIFE</b> |                                                                                      |                                 |                                                 |                                    |
| 8.a                          | Are there any other current problems relating to the injury which affect daily life? | NO<br>(UPPER GR)                |                                                 | YES<br>(LOWER GR)                  |
| 8.b                          | Were similar problems present before injury?                                         | NO                              |                                                 | YES                                |
|                              | Notes.                                                                               |                                 |                                                 |                                    |

| SCORING |                           |          |
|---------|---------------------------|----------|
| 1       | Dead                      |          |
| 2       | Vegetative State          | VS       |
| 3       | Lower Severe Disability   | Lower SD |
| 4       | Upper Severe Disability   | Upper SD |
| 5       | Lower Moderate Disability | Lower MD |
| 6       | Upper Moderate Disability | Upper MD |
| 7       | Lower Good Recovery       | Lower GR |
| 8       | Upper Good Recovery       | Upper GR |

# M.I.N.I.

## MINI INTERNATIONAL NEUROPSYCHIATRIC INTERVIEW

English Version 6.0.0

DSM-IV

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### DISCLAIMER

Our aim is to assist in the assessment and tracking of patients with greater efficiency and accuracy. Before action is taken on any data collected and processed by this program, it should be reviewed and interpreted by a licensed clinician.

This program is not designed or intended to be used in the place of a full medical and psychiatric evaluation by a qualified licensed physician – psychiatrist. It is intended only as a tool to facilitate accurate data collection and processing of symptoms elicited by trained personnel.

|                            |                              |
|----------------------------|------------------------------|
|                            | <b>Patient Number:</b>       |
|                            | <b>Time Interview Began:</b> |
| <b>Interviewer's Name:</b> | <b>Time Interview Ended:</b> |
| <b>Date of Interview:</b>  | <b>Total Time:</b>           |

| MODULES                                     | TIME FRAME                                                                                                           | MEETS CRITERIA                                                                              | DSM-IV-TR               | ICD-10            | PRIMARY DIAGNOSIS        |
|---------------------------------------------|----------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------|-------------------------|-------------------|--------------------------|
| A MAJOR DEPRESSIVE EPISODE                  | Current (2 weeks)                                                                                                    | <input type="checkbox"/>                                                                    | 296.20-296.26 Single    | F32.x             | <input type="checkbox"/> |
|                                             | Past                                                                                                                 | <input type="checkbox"/>                                                                    | 296.20-296.26 Single    | F32.x             | <input type="checkbox"/> |
|                                             | Recurrent                                                                                                            | <input type="checkbox"/>                                                                    | 296.30-296.36 Recurrent | F33.x             | <input type="checkbox"/> |
| B SUICIDALITY                               | Current (Past Month)<br><input type="checkbox"/> Low <input type="checkbox"/> Moderate <input type="checkbox"/> High | <input type="checkbox"/>                                                                    |                         |                   |                          |
| C MANIC EPISODE                             | Current                                                                                                              | <input type="checkbox"/>                                                                    | 296.00-296.06           | F30.x-F31.9       | <input type="checkbox"/> |
|                                             | Past                                                                                                                 | <input type="checkbox"/>                                                                    |                         |                   |                          |
| HYPOMANIC EPISODE                           | Current                                                                                                              | <input type="checkbox"/>                                                                    | 296.80-296.89           | F31.8-F31.9/F34.0 | <input type="checkbox"/> |
|                                             | Past                                                                                                                 | <input type="checkbox"/>                                                                    |                         |                   |                          |
| BIPOLAR I DISORDER                          | Current                                                                                                              | <input type="checkbox"/>                                                                    | 296.0x-296.6x           | F30.x-F31.9       | <input type="checkbox"/> |
|                                             | Past                                                                                                                 | <input type="checkbox"/>                                                                    | 296.0x-296.6x           | F30.x-F31.9       | <input type="checkbox"/> |
| BIPOLAR II DISORDER                         | Current                                                                                                              | <input type="checkbox"/>                                                                    | 296.89                  | F31.8             | <input type="checkbox"/> |
|                                             | Past                                                                                                                 | <input type="checkbox"/>                                                                    | 296.89                  | F31.8             | <input type="checkbox"/> |
| BIPOLAR DISORDER NOS                        | Current                                                                                                              | <input type="checkbox"/>                                                                    | 296.80                  | F31.9             | <input type="checkbox"/> |
|                                             | Past                                                                                                                 | <input type="checkbox"/>                                                                    | 296.80                  | F31.9             | <input type="checkbox"/> |
| D PANIC DISORDER                            | Current (Past Month)                                                                                                 | <input type="checkbox"/>                                                                    | 300.01/300.21           | F40.01-F41.0      | <input type="checkbox"/> |
|                                             | Lifetime                                                                                                             | <input type="checkbox"/>                                                                    |                         |                   |                          |
| E AGORAPHOBIA                               | Current                                                                                                              | <input type="checkbox"/>                                                                    | 300.22                  | F40.00            | <input type="checkbox"/> |
| F SOCIAL PHOBIA (Social Anxiety Disorder)   | Current (Past Month)                                                                                                 |                                                                                             |                         |                   |                          |
|                                             | Generalized                                                                                                          | <input type="checkbox"/>                                                                    | 300.23                  | F40.1             | <input type="checkbox"/> |
|                                             | Non-Generalized                                                                                                      | <input type="checkbox"/>                                                                    | 300.23                  | F40.1             | <input type="checkbox"/> |
| G OBSESSIVE-COMPULSIVE DISORDER             | Current (Past Month)                                                                                                 | <input type="checkbox"/>                                                                    | 300.3                   | F42.8             | <input type="checkbox"/> |
| H POSTTRAUMATIC STRESS DISORDER             | Current (Past Month)                                                                                                 | <input type="checkbox"/>                                                                    | 309.81                  | F43.1             | <input type="checkbox"/> |
| I ALCOHOL DEPENDENCE                        | Past 12 Months                                                                                                       | <input type="checkbox"/>                                                                    | 303.9                   | F10.2x            | <input type="checkbox"/> |
| ALCOHOL ABUSE                               | Past 12 Months                                                                                                       | <input type="checkbox"/>                                                                    | 305.00                  | F10.1             | <input type="checkbox"/> |
| J SUBSTANCE DEPENDENCE (Non-alcohol)        | Past 12 Months                                                                                                       | <input type="checkbox"/>                                                                    | 304.00-.90/305.20-.90   | F11.1-F19.1       | <input type="checkbox"/> |
| SUBSTANCE ABUSE (Non-alcohol)               | Past 12 Months                                                                                                       | <input type="checkbox"/>                                                                    | 304.00-.90/305.20-.90   | F11.1-F19.1       | <input type="checkbox"/> |
| K PSYCHOTIC DISORDERS                       | Lifetime                                                                                                             | <input type="checkbox"/>                                                                    | 295.10-295.90/297.1/    | F20.xx-F29        | <input type="checkbox"/> |
|                                             | Current                                                                                                              | <input type="checkbox"/>                                                                    | 297.3/293.81/293.82/    |                   |                          |
|                                             |                                                                                                                      |                                                                                             | 293.89/298.8/298.9      |                   |                          |
| MOOD DISORDER WITH                          | Lifetime                                                                                                             | <input type="checkbox"/>                                                                    | 296.24/296.34/296.44    | F32.3/F33.3/      | <input type="checkbox"/> |
| PSYCHOTIC FEATURES                          | Current                                                                                                              | <input type="checkbox"/>                                                                    | 296.24/296.34/296.44    | F30.2/F31.2/F31.5 | <input type="checkbox"/> |
|                                             |                                                                                                                      |                                                                                             |                         | F31.8/F31.9/F39   | <input type="checkbox"/> |
| L ANOREXIA NERVOSA                          | Current (Past 3 Months)                                                                                              | <input type="checkbox"/>                                                                    | 307.1                   | F50.0             | <input type="checkbox"/> |
| M BULIMIA NERVOSA                           | Current (Past 3 Months)                                                                                              | <input type="checkbox"/>                                                                    | 307.51                  | F50.2             | <input type="checkbox"/> |
|                                             |                                                                                                                      |                                                                                             |                         |                   |                          |
| ANOREXIA NERVOSA, BINGE EATING/PURGING TYPE | Current                                                                                                              | <input type="checkbox"/>                                                                    | 307.1                   | F50.0             | <input type="checkbox"/> |
| N GENERALIZED ANXIETY DISORDER              | Current (Past 6 Months)                                                                                              | <input type="checkbox"/>                                                                    | 300.02                  | F41.1             | <input type="checkbox"/> |
| O MEDICAL, ORGANIC, DRUG CAUSE RULED OUT    |                                                                                                                      | <input type="checkbox"/> No <input type="checkbox"/> Yes <input type="checkbox"/> Uncertain |                         |                   |                          |
| P ANTISOCIAL PERSONALITY DISORDER           | Lifetime                                                                                                             | <input type="checkbox"/>                                                                    | 301.7                   | F60.2             | <input type="checkbox"/> |

IDENTIFY THE PRIMARY DIAGNOSIS BY CHECKING THE APPROPRIATE CHECK BOX.

(Which problem troubles you the most or dominates the others or came first in the natural history?)



The translation from DSM-IV-TR to ICD-10 coding is not always exact. For more information on this topic see Schulte-Markwort. Crosswalks ICD-10/DSM-IV-TR. Hogrefe & Huber Publishers 2006.

## GENERAL INSTRUCTIONS

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The M.I.N.I. was designed as a brief structured interview for the major Axis I psychiatric disorders in DSM-IV and ICD-10. Validation and reliability studies have been done comparing the M.I.N.I. to the SCID-P for DSM-III-R and the CIDI (a structured interview developed by the World Health Organization). The results of these studies show that the M.I.N.I. has similar reliability and validity properties, but can be administered in a much shorter period of time (mean  $18.7 \pm 11.6$  minutes, median 15 minutes) than the above referenced instruments. It can be used by clinicians, after a brief training session. Lay interviewers require more extensive training.

### INTERVIEW:

In order to keep the interview as brief as possible, inform the patient that you will conduct a clinical interview that is more structured than usual, with very precise questions about psychological problems which require a yes or no answer.

### GENERAL FORMAT:

The M.I.N.I. is divided into **modules** identified by letters, each corresponding to a diagnostic category.

- At the beginning of each diagnostic module (except for psychotic disorders module), screening question(s) corresponding to the main criteria of the disorder are presented in a **gray box**.
- At the end of each module, diagnostic box(es) permit the clinician to indicate whether diagnostic criteria are met.

### CONVENTIONS:

*Sentences written in « normal font »* should be read exactly as written to the patient in order to standardize the assessment of diagnostic criteria.

*Sentences written in « CAPITALS »* should not be read to the patient. They are instructions for the interviewer to assist in the scoring of the diagnostic algorithms.

*Sentences written in « bold »* indicate the time frame being investigated. The interviewer should read them as often as necessary. Only symptoms occurring during the time frame indicated should be considered in scoring the responses.

*Answers with an arrow above them (➡)* indicate that one of the criteria necessary for the diagnosis(es) is not met. In this case, the interviewer should go to the end of the module, circle « **NO** » in all the diagnostic boxes and move to the next module.

When terms are separated by a *slash (/)* the interviewer should read only those symptoms known to be present in the patient (for example, question G6).

*Phrases in (parentheses)* are clinical examples of the symptom. These may be read to the patient to clarify the question.

### RATING INSTRUCTIONS:

All questions must be rated. The rating is done at the right of each question by circling either Yes or No. Clinical judgment by the rater should be used in coding the responses. Interviewers need to be sensitive to the diversity of cultural beliefs in their administration of questions and rating of responses. The rater should ask for examples when necessary, to ensure accurate coding. The patient should be encouraged to ask for clarification on any question that is not absolutely clear.

The clinician should be sure that each dimension of the question is taken into account by the patient (for example, time frame, frequency, severity, and/or alternatives).

Symptoms better accounted for by an organic cause or by the use of alcohol or drugs should not be coded positive in the M.I.N.I. The M.I.N.I. Plus has questions that investigate these issues.

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For any questions, suggestions, need for a training session or information about updates of the M.I.N.I., please contact:

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## A. MAJOR DEPRESSIVE EPISODE

(➡ MEANS : GO TO THE DIAGNOSTIC BOXES, CIRCLE **NO** IN ALL DIAGNOSTIC BOXES, AND MOVE TO THE NEXT MODULE)

|                                                   |   |                                                                                                                                                        |         |     |
|---------------------------------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|
| A1                                                | a | Were you <u>ever</u> depressed or down, most of the day, nearly every day, for two weeks?                                                              | NO      | YES |
| IF NO, CODE NO TO <b>A1b</b> : IF <b>YES</b> ASK: |   |                                                                                                                                                        |         |     |
|                                                   | b | For the <u>past two weeks</u> , were you depressed or down, most of the day, nearly every day?                                                         | NO      | YES |
| A2                                                | a | Were you <u>ever</u> much less interested in most things or much less able to enjoy the things you used to enjoy most of the time, for two weeks?      | NO      | YES |
| IF NO, CODE NO TO <b>A2b</b> : IF <b>YES</b> ASK: |   |                                                                                                                                                        |         |     |
|                                                   | b | In the <u>past two weeks</u> , were you much less interested in most things or much less able to enjoy the things you used to enjoy, most of the time? | NO      | YES |
| IS <b>A1a</b> OR <b>A2a</b> CODED <b>YES</b> ?    |   |                                                                                                                                                        | ➡<br>NO | YES |

A3 IF **A1b** OR **A2b** = **YES**: EXPLORE THE **CURRENT** AND THE MOST SYMPTOMATIC **PAST** EPISODE, OTHERWISE  
IF **A1b** AND **A2b** = **NO**: EXPLORE ONLY THE MOST SYMPTOMATIC **PAST** EPISODE

**Over that two week period, when you felt depressed or uninterested:**

|    |                                                                                                                                                                                                                                                                                                               | Past 2 Weeks |     | Past Episode |     |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------|-----|--------------|-----|
| a  | Was your appetite decreased or increased nearly every day? Did your weight decrease or increase without trying intentionally (i.e., by $\pm 5\%$ of body weight or $\pm 8$ lbs. or $\pm 3.5$ kgs., for a 160 lb./70 kg. person in a month)?<br><small>IF YES TO EITHER, CODE YES.</small>                     | NO           | YES | NO           | YES |
| b  | Did you have trouble sleeping nearly every night (difficulty falling asleep, waking up in the middle of the night, early morning wakening or sleeping excessively)?                                                                                                                                           | NO           | YES | NO           | YES |
| c  | Did you talk or move more slowly than normal or were you fidgety, restless or having trouble sitting still almost every day?                                                                                                                                                                                  | NO           | YES | NO           | YES |
| d  | Did you feel tired or without energy almost every day?                                                                                                                                                                                                                                                        | NO           | YES | NO           | YES |
| e  | Did you feel worthless or guilty almost every day?<br><br><small>IF YES, ASK FOR EXAMPLES.<br/>THE EXAMPLES ARE CONSISTENT WITH A DELUSIONAL IDEA. Current Episode <input type="checkbox"/> No <input type="checkbox"/> Yes<br/>Past Episode <input type="checkbox"/> No <input type="checkbox"/> Yes</small> | NO           | YES | NO           | YES |
| f  | Did you have difficulty concentrating or making decisions almost every day?                                                                                                                                                                                                                                   | NO           | YES | NO           | YES |
| g  | Did you repeatedly consider hurting yourself, feel suicidal, or wish that you were dead? Did you attempt suicide or plan a suicide?<br><small>IF YES TO EITHER, CODE YES.</small>                                                                                                                             | NO           | YES | NO           | YES |
| A4 | Did these symptoms cause significant problems at home, at work, socially, at school or in some other important way?                                                                                                                                                                                           | NO           | YES | NO           | YES |
| A5 | In between 2 episodes of depression, did you ever have an interval of at least 2 months, without any significant depression or any significant loss of interest?                                                                                                                                              |              |     | NO           | YES |

ARE **5** OR MORE ANSWERS (**A1-A3**) CODED **YES** AND IS **A4** CODED YES FOR THAT TIME FRAME?

SPECIFY IF THE EPISODE IS CURRENT AND / OR PAST.

IF **A5** IS CODED **YES**, CODE **YES** FOR RECURRENT.

| NO                                  | YES                      |
|-------------------------------------|--------------------------|
| <b>MAJOR DEPRESSIVE<br/>EPISODE</b> |                          |
| CURRENT                             | <input type="checkbox"/> |
| PAST                                | <input type="checkbox"/> |
| RECURRENT                           | <input type="checkbox"/> |

A6 a How many episodes of depression did you have in your lifetime? \_\_\_\_\_

Between each episode there must be at least 2 months without any significant depression.

## B. SUICIDALITY

Points

**In the past month did you:**

|     |                                                                                                                                                            |    |     |   |
|-----|------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|---|
| B1  | Suffer any accident?<br>IF NO TO B1, SKIP TO B2; IF YES, ASK B1a:                                                                                          | NO | YES | 0 |
| B1a | Plan or intend to hurt yourself in that accident either actively or passively<br>(e.g. not avoiding a risk)?<br>IF NO TO B1a, SKIP TO B2: IF YES, ASK B1b: | NO | YES | 0 |
| B1b | Intend to die as a result of this accident?                                                                                                                | NO | YES | 0 |
| B2  | Feel hopeless?                                                                                                                                             | NO | YES | 1 |
| B3  | Think that you would be better off dead or wish you were dead?                                                                                             | NO | YES | 1 |
| B4  | Want to harm yourself or to hurt or to injure yourself or<br>have mental images of harming yourself?                                                       | NO | YES | 2 |
| B5  | Think about suicide?<br>IF NO TO B5, SKIP TO B7. OTHERWISE ASK:                                                                                            | NO | YES | 6 |

Frequency

Intensity

|              |                          |          |                          |
|--------------|--------------------------|----------|--------------------------|
| Occasionally | <input type="checkbox"/> | Mild     | <input type="checkbox"/> |
| Often        | <input type="checkbox"/> | Moderate | <input type="checkbox"/> |
| Very often   | <input type="checkbox"/> | Severe   | <input type="checkbox"/> |

|     |                                                                                                                                                        |    |     |   |
|-----|--------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|---|
|     | Can you state that you will not act on these impulses during this treatment program?                                                                   | NO | YES |   |
| B6  | Feel unable to control these impulses?                                                                                                                 | NO | YES | 8 |
| B7  | Have a suicide plan?                                                                                                                                   | NO | YES | 8 |
| B8  | Take any active steps to prepare to injure yourself or to prepare for a suicide attempt<br>in which you expected or intended to die?                   | NO | YES | 9 |
| B9  | Deliberately injure yourself without intending to kill yourself?                                                                                       | NO | YES | 4 |
| B10 | Attempt suicide?<br>IF NO SKIP TO B11:<br>Hope to be rescued / survive <input type="checkbox"/><br>Expected / intended to die <input type="checkbox"/> | NO | YES | 9 |

**In your lifetime:**

|     |                                      |    |     |   |
|-----|--------------------------------------|----|-----|---|
| B11 | Did you ever make a suicide attempt? | NO | YES | 4 |
|-----|--------------------------------------|----|-----|---|



IS AT LEAST **1** OF THE ABOVE (EXCEPT B1) CODED **YES**?

IF YES, ADD THE TOTAL POINTS FOR THE ANSWERS (B1-B11)  
CHECKED ‘YES’ AND SPECIFY THE SUICIDALITY SCORE AS  
INDICATED IN THE DIAGNOSTIC BOX:

MAKE ANY ADDITIONAL COMMENTS ABOUT YOUR ASSESSMENT  
OF THIS PATIENT’S CURRENT AND NEAR FUTURE SUICIDALITY IN  
THE SPACE BELOW:

| NO                 |          | YES |                          |
|--------------------|----------|-----|--------------------------|
| <b>SUICIDALITY</b> |          |     |                          |
| <b>CURRENT</b>     |          |     |                          |
| 1-8 points         | Low      |     | <input type="checkbox"/> |
| 9-16 points        | Moderate |     | <input type="checkbox"/> |
| ≥ 17 points        | High     |     | <input type="checkbox"/> |

## C. MANIC AND HYPOMANIC EPISODES

(➡ MEANS : GO TO THE DIAGNOSTIC BOXES, CIRCLE NO IN MANIC AND HYPOMANIC DIAGNOSTIC BOXES, AND MOVE TO NEXT MODULE)

Do you have any family history of manic depressive illness or bipolar disorder, or any family member who had mood swings treated with a medication like lithium, sodium valproate (Depakote) or lamotrigine (Lamictal)?

NO

YES

THIS QUESTION IS NOT A CRITERION FOR BIPOLAR DISORDER, BUT IS ASKED TO INCREASE THE CLINICIAN'S VIGILANCE ABOUT THE RISK FOR BIPOLAR DISORDER .

IF YES, PLEASE SPECIFY WHO: \_\_\_\_\_

- C1 a Have you **ever** had a period of time when you were feeling 'up' or 'high' or 'hyper' or so full of energy or full of yourself that you got into trouble, - or that other people thought you were not your usual self? (Do not consider times when you were intoxicated on drugs or alcohol.)

NO

YES

IF PATIENT IS PUZZLED OR UNCLEAR ABOUT WHAT YOU MEAN

BY 'UP' OR 'HIGH' OR 'HYPER', CLARIFY AS FOLLOWS: By 'up' or 'high' or 'hyper'

I mean: having elated mood; increased energy; needing less sleep; having rapid thoughts; being full of ideas; having an increase in productivity, motivation, creativity, or impulsive behavior; phoning or working excessively or spending more money.

IF NO, CODE NO TO **C1b**: IF YES ASK:

- b Are you currently feeling 'up' or 'high' or 'hyper' or full of energy?

NO

YES

- C2 a Have you **ever** been persistently irritable, for several days, so that you had arguments or verbal or physical fights, or shouted at people outside your family? Have you or others noticed that you have been more irritable or over reacted, compared to other people, even in situations that you felt were justified?

NO

YES

IF NO, CODE NO TO **C2b**: IF YES ASK:

- b Are you currently feeling persistently irritable?

NO

YES

IS **C1a** OR **C2a** CODED YES?

➡

NO

YES

- C3 IF **C1b** OR **C2b** = YES: EXPLORE THE **CURRENT** AND THE MOST SYMPTOMATIC **PAST** EPISODE, OTHERWISE  
IF **C1b** AND **C2b** = NO: EXPLORE ONLY THE MOST SYMPTOMATIC **PAST** EPISODE

**During the times when you felt high, full of energy, or irritable did you:**

|                                                                                                                                                                                                                                                                                                                                         | <u>Current Episode</u> |     | <u>Past Episode</u> |     |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------|-----|---------------------|-----|
| a Feel that you could do things others couldn't do, or that you were an especially important person? If YES, ASK FOR EXAMPLES.<br>THE EXAMPLES ARE CONSISTENT WITH A DELUSIONAL IDEA. Current Episode <input type="checkbox"/> No <input type="checkbox"/> Yes<br>Past Episode <input type="checkbox"/> No <input type="checkbox"/> Yes | NO                     | YES | NO                  | YES |
| b Need less sleep (for example, feel rested after only a few hours sleep)?                                                                                                                                                                                                                                                              | NO                     | YES | NO                  | YES |
| c Talk too much without stopping, or so fast that people had difficulty understanding?                                                                                                                                                                                                                                                  | NO                     | YES | NO                  | YES |
| d Have racing thoughts?                                                                                                                                                                                                                                                                                                                 | NO                     | YES | NO                  | YES |

|                                                                                                                                                                                                                                                                                                                                                            | Current Episode |                          | Past Episode |                          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------|--------------------------|--------------|--------------------------|
| e Become easily distracted so that any little interruption could distract you?                                                                                                                                                                                                                                                                             | NO              | YES                      | NO           | YES                      |
| f Have a significant increase in your activity or drive, at work, at school, socially or sexually or did you become physically or mentally restless?                                                                                                                                                                                                       | NO              | YES                      | NO           | YES                      |
| g Want so much to engage in pleasurable activities that you ignored the risks or consequences (for example, spending sprees, reckless driving, or sexual indiscretions)?                                                                                                                                                                                   | NO              | YES                      | NO           | YES                      |
| <b>C3 SUMMARY: WHEN RATING CURRENT EPISODE:</b><br>IF C1b IS NO, ARE 4 OR MORE C3 ANSWERS CODED YES?<br>IF C1b IS YES, ARE 3 OR MORE C3 ANSWERS CODED YES?                                                                                                                                                                                                 | NO              | YES                      | NO           | YES                      |
| WHEN RATING PAST EPISODE:<br>IF C1a IS NO, ARE 4 OR MORE C3 ANSWERS CODED YES?<br>IF C1a IS YES, ARE 3 OR MORE C3 ANSWERS CODED YES?<br><br>CODE YES ONLY IF THE ABOVE 3 OR 4 SYMPTOMS OCCURRED DURING THE SAME TIME PERIOD.<br><br>RULE: ELATION/EXPANSIVENESS REQUIRES ONLY THREE C3 SYMPTOMS, WHILE IRRITABLE MOOD ALONE REQUIRES 4 OF THE C3 SYMPTOMS. |                 |                          |              |                          |
| <b>C4</b> What is the longest time these symptoms lasted?                                                                                                                                                                                                                                                                                                  |                 |                          |              |                          |
| a) 3 days or less                                                                                                                                                                                                                                                                                                                                          |                 | <input type="checkbox"/> |              | <input type="checkbox"/> |
| b) 4 to 6 days                                                                                                                                                                                                                                                                                                                                             |                 | <input type="checkbox"/> |              | <input type="checkbox"/> |
| c) 7 days or more                                                                                                                                                                                                                                                                                                                                          |                 | <input type="checkbox"/> |              | <input type="checkbox"/> |
| <b>C5</b> Were you hospitalized for these problems?                                                                                                                                                                                                                                                                                                        | NO              | YES                      | NO           | YES                      |
| IF YES, STOP HERE AND CIRCLE YES IN MANIC EPISODE FOR THAT TIME FRAME.                                                                                                                                                                                                                                                                                     |                 |                          |              |                          |
| <b>C6</b> Did these symptoms cause significant problems at home, at work, socially in your relationships with others, at school or in some other important way?                                                                                                                                                                                            | NO              | YES                      | NO           | YES                      |

ARE **C3 SUMMARY** AND **C5** AND **C6** CODED **YES** AND EITHER **C4a** or **b** or **c** CODED **YES**?

OR

ARE **C3 SUMMARY** AND **C4c** AND **C6** CODED **YES** AND IS **C5** CODED **NO**?

SPECIFY IF THE EPISODE IS CURRENT AND / OR PAST.

| NO                   | YES                      |
|----------------------|--------------------------|
| <b>MANIC EPISODE</b> |                          |
| CURRENT              | <input type="checkbox"/> |
| PAST                 | <input type="checkbox"/> |

ARE **C3 SUMMARY** AND **C5** AND **C6** CODED **NO** AND EITHER **C4b** OR **C4c** CODED **YES**?

OR

ARE **C3 SUMMARY** AND **C4b** AND **C6** CODED **YES** AND IS **C5** CODED **NO**?

SPECIFY IF THE EPISODE IS CURRENT AND / OR PAST.

| NO                       | YES                      |
|--------------------------|--------------------------|
| <b>HYPOMANIC EPISODE</b> |                          |
| CURRENT                  | <input type="checkbox"/> |
| PAST                     | <input type="checkbox"/> |

ARE **C3** SUMMARY AND **C4a** CODED **YES** AND IS **C5** CODED **NO**?

**NO**

**YES**

***HYPOMANIC SYMPTOMS***

SPECIFY IF THE EPISODE IS CURRENT AND / OR PAST.

CURRENT

☐

PAST

☐

C7

a) IF MANIC EPISODE IS POSITIVE FOR EITHER CURRENT OR PAST ASK:

Did you have 2 or more manic episodes (**C4c**) in your lifetime (including the current episode if present)? NO YES

b) IF HYPOMANIC EPISODE IS POSITIVE FOR EITHER CURRENT OR PAST ASK:

Did you have 2 or more hypomanic EPISODES (**C4b**) in your lifetime (including the current episode)? NO YES

c) IF PAST "HYPOMANIC SYMPTOMS" IS CODED POSITIVE ASK:

Did you have 2 or more episodes of hypomanic SYMPTOMS (**C4a**) in your lifetime (including the current episode if present)? NO YES

## D. PANIC DISORDER

(➡ MEANS : CIRCLE NO IN D5, D6 AND D7 AND SKIP TO E1)

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                 |         |                                             |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------------------------------------|
| D1 | a Have you, on more than one occasion, had spells or attacks when you <b>suddenly</b> felt anxious, frightened, uncomfortable or uneasy, even in situations where most people would not feel that way?                                                                                                                                                                                                                          | ➡<br>NO | YES                                         |
|    | b Did the spells surge to a peak within 10 minutes of starting?                                                                                                                                                                                                                                                                                                                                                                 | ➡<br>NO | YES                                         |
| D2 | At any time in the past, did any of those spells or attacks come on unexpectedly or occur in an unpredictable or unprovoked manner?                                                                                                                                                                                                                                                                                             | ➡<br>NO | YES                                         |
| D3 | Have you ever had one such attack followed by a month or more of persistent concern about having another attack, or worries about the consequences of the attack - or did you make a significant change in your behavior because of the attacks (e.g., shopping only with a companion, not wanting to leave your house, visiting the emergency room repeatedly, or seeing your doctor more frequently because of the symptoms)? | NO      | YES                                         |
| D4 | <b>During the worst attack that you can remember:</b>                                                                                                                                                                                                                                                                                                                                                                           |         |                                             |
|    | a Did you have skipping, racing or pounding of your heart?                                                                                                                                                                                                                                                                                                                                                                      | NO      | YES                                         |
|    | b Did you have sweating or clammy hands?                                                                                                                                                                                                                                                                                                                                                                                        | NO      | YES                                         |
|    | c Were you trembling or shaking?                                                                                                                                                                                                                                                                                                                                                                                                | NO      | YES                                         |
|    | d Did you have shortness of breath or difficulty breathing?                                                                                                                                                                                                                                                                                                                                                                     | NO      | YES                                         |
|    | e Did you have a choking sensation or a lump in your throat?                                                                                                                                                                                                                                                                                                                                                                    | NO      | YES                                         |
|    | f Did you have chest pain, pressure or discomfort?                                                                                                                                                                                                                                                                                                                                                                              | NO      | YES                                         |
|    | g Did you have nausea, stomach problems or sudden diarrhea?                                                                                                                                                                                                                                                                                                                                                                     | NO      | YES                                         |
|    | h Did you feel dizzy, unsteady, lightheaded or faint?                                                                                                                                                                                                                                                                                                                                                                           | NO      | YES                                         |
|    | i Did things around you feel strange, unreal, detached or unfamiliar, or did you feel outside of or detached from part or all of your body?                                                                                                                                                                                                                                                                                     | NO      | YES                                         |
|    | j Did you fear that you were losing control or going crazy?                                                                                                                                                                                                                                                                                                                                                                     | NO      | YES                                         |
|    | k Did you fear that you were dying?                                                                                                                                                                                                                                                                                                                                                                                             | NO      | YES                                         |
|    | l Did you have tingling or numbness in parts of your body?                                                                                                                                                                                                                                                                                                                                                                      | NO      | YES                                         |
|    | m Did you have hot flushes or chills?                                                                                                                                                                                                                                                                                                                                                                                           | NO      | YES                                         |
| D5 | ARE BOTH <b>D3</b> , AND <b>4</b> OR MORE <b>D4</b> ANSWERS, CODED <b>YES</b> ?<br>IF YES TO D5, SKIP TO D7.                                                                                                                                                                                                                                                                                                                    | NO      | YES                                         |
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                 |         | <i>PANIC DISORDER<br/>LIFETIME</i>          |
| D6 | IF <b>D5</b> = <b>NO</b> , ARE ANY D4 ANSWERS CODED <b>YES</b> ?<br>THEN SKIP TO <b>E1</b> .                                                                                                                                                                                                                                                                                                                                    | NO      | YES                                         |
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                 |         | <i>LIMITED SYMPTOM<br/>ATTACKS LIFETIME</i> |

|    |                                                                                                                                                                                                                                                          |    |                                          |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|------------------------------------------|
| D7 | In the past month, did you have such attacks repeatedly (2 or more), and did you have persistent concern about having another attack, or worry about the consequences of the attacks, or did you change your behavior in any way because of the attacks? | NO | YES<br><i>PANIC DISORDER<br/>CURRENT</i> |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|------------------------------------------|

E. AGORAPHOBIA

|    |                                                                                                                                                                                                                                                                                                                                                                                    |    |     |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|
| E1 | Do you feel anxious or uneasy in places or situations where help might not be available or escape might be difficult, like being in a crowd, standing in a line (queue), when you are alone away from home or alone at home, or when crossing a bridge, or traveling in a bus, train or car or where you might have a panic attack or the panic-like symptoms we just spoke about? | NO | YES |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|

IF E1 = NO, CIRCLE NO IN E2.

|    |                                                                                                                     |    |                                       |
|----|---------------------------------------------------------------------------------------------------------------------|----|---------------------------------------|
| E2 | Do you fear these situations so much that you avoid them, or suffer through them, or need a companion to face them? | NO | YES<br><i>AGORAPHOBIA<br/>CURRENT</i> |
|----|---------------------------------------------------------------------------------------------------------------------|----|---------------------------------------|

IS E2 (CURRENT AGORAPHOBIA) CODED YES  
  
and  
  
IS D7 (CURRENT PANIC DISORDER) CODED YES?

NO
YES

PANIC DISORDER  
with Agoraphobia  
CURRENT

IS E2 (CURRENT AGORAPHOBIA) CODED NO  
  
and  
  
IS D7 (CURRENT PANIC DISORDER) CODED YES?

NO
YES

PANIC DISORDER  
without Agoraphobia  
CURRENT

IS E2 (CURRENT AGORAPHOBIA) CODED YES  
  
and  
  
IS D5 (PANIC DISORDER LIFETIME) CODED NO?

NO
YES

AGORAPHOBIA, CURRENT  
without history of  
Panic Disorder

## F. SOCIAL PHOBIA (Social Anxiety Disorder)

(➡ MEANS : GO TO THE DIAGNOSTIC BOX, CIRCLE NO AND MOVE TO THE NEXT MODULE)

|    |                                                                                                                                                                                                                                                                                                             |         |     |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|
| F1 | In the past month, did you have persistent fear and significant anxiety at being watched, being the focus of attention, or of being humiliated or embarrassed? This includes things like speaking in public, eating in public or with others, writing while someone watches, or being in social situations. | ➡<br>NO | YES |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|

|    |                                                                                           |         |     |
|----|-------------------------------------------------------------------------------------------|---------|-----|
| F2 | Is this social fear excessive or unreasonable and does it almost always make you anxious? | ➡<br>NO | YES |
|----|-------------------------------------------------------------------------------------------|---------|-----|

|    |                                                                                                          |         |     |
|----|----------------------------------------------------------------------------------------------------------|---------|-----|
| F3 | Do you fear these social situations so much that you avoid them or suffer through them most of the time? | ➡<br>NO | YES |
|----|----------------------------------------------------------------------------------------------------------|---------|-----|

|    |                                                                                                                 |    |     |
|----|-----------------------------------------------------------------------------------------------------------------|----|-----|
| F4 | Do these social fears disrupt your normal work, school or social functioning or cause you significant distress? | NO | YES |
|----|-----------------------------------------------------------------------------------------------------------------|----|-----|

**SOCIAL PHOBIA**  
(*Social Anxiety Disorder*)  
**CURRENT**

GENERALIZED ☐

NON-GENERALIZED ☐

SUBTYPES

Do you fear and avoid 4 or more social situations?

If YES            Generalized social phobia (social anxiety disorder)

If NO            Non-generalized social phobia (social anxiety disorder)

EXAMPLES OF SUCH SOCIAL SITUATIONS TYPICALLY INCLUDE

- INITIATING OR MAINTAINING A CONVERSATION,
- PARTICIPATING IN SMALL GROUPS,
- DATING,
- SPEAKING TO AUTHORITY FIGURES,
- ATTENDING PARTIES,
- PUBLIC SPEAKING,
- EATING IN FRONT OF OTHERS,
- URINATING IN A PUBLIC WASHROOM, ETC.

NOTE TO INTERVIEWER: PLEASE ASSESS WHETHER THE SUBJECT'S FEARS ARE RESTRICTED TO NON-GENERALIZED ("ONLY 1 OR SEVERAL") SOCIAL SITUATIONS OR EXTEND TO GENERALIZED ("MOST") SOCIAL SITUATIONS. "MOST" SOCIAL SITUATIONS IS USUALLY OPERATIONALIZED TO MEAN 4 OR MORE SOCIAL SITUATIONS, ALTHOUGH THE DSM-IV DOES NOT EXPLICITLY STATE THIS.

## G. OBSESSIVE-COMPULSIVE DISORDER

(➡ MEANS: GO TO THE DIAGNOSTIC BOX, CIRCLE NO AND MOVE TO THE NEXT MODULE)

|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |            |     |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----|
| G1 | In the past month, have you been bothered by recurrent thoughts, impulses, or images that were unwanted, distasteful, inappropriate, intrusive, or distressing? - (For example, the idea that you were dirty, contaminated or had germs, <b>or</b> fear of contaminating others, <b>or</b> fear of harming someone even though it disturbs or distresses you, or fear you would act on some impulse, <b>or</b> fear or superstitions that you would be responsible for things going wrong, <b>or</b> obsessions with sexual thoughts, images or impulses, <b>or</b> hoarding, collecting, <b>or</b> religious obsessions.) | NO         | YES |
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | ↓          |     |
|    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | SKIP TO G4 |     |

(DO NOT INCLUDE SIMPLY EXCESSIVE WORRIES ABOUT REAL LIFE PROBLEMS. DO NOT INCLUDE OBSESSIONS DIRECTLY RELATED TO EATING DISORDERS, SEXUAL DEVIATIONS, PATHOLOGICAL GAMBLING, OR ALCOHOL OR DRUG ABUSE BECAUSE THE PATIENT MAY DERIVE PLEASURE FROM THE ACTIVITY AND MAY WANT TO RESIST IT ONLY BECAUSE OF ITS NEGATIVE CONSEQUENCES.)

|    |                                                                                            |            |     |
|----|--------------------------------------------------------------------------------------------|------------|-----|
| G2 | Did they keep coming back into your mind even when you tried to ignore or get rid of them? | NO         | YES |
|    |                                                                                            | ↓          |     |
|    |                                                                                            | SKIP TO G4 |     |

|    |                                                                                                                     |    |            |
|----|---------------------------------------------------------------------------------------------------------------------|----|------------|
| G3 | Do you think that these obsessions are the product of your own mind and that they are not imposed from the outside? | NO | YES        |
|    |                                                                                                                     |    | obsessions |

|    |                                                                                                                                                                                                                                                        |    |             |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-------------|
| G4 | In the past month, did you do something repeatedly without being able to resist doing it, like washing or cleaning excessively, counting or checking things over and over, or repeating, collecting, arranging things, or other superstitious rituals? | NO | YES         |
|    |                                                                                                                                                                                                                                                        |    | compulsions |

IS G3 OR G4 CODED YES?

|   |    |     |
|---|----|-----|
| ➡ | NO | YES |
|---|----|-----|

|    |                                                                                                                                    |    |     |
|----|------------------------------------------------------------------------------------------------------------------------------------|----|-----|
| G5 | At any point, did you recognize that either these obsessive thoughts or these compulsive behaviors were excessive or unreasonable? | NO | YES |
|    |                                                                                                                                    | ➡  |     |

|    |                                                                                                                                                                                                                                               |  |  |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|
| G6 | In the past month, did these obsessive thoughts and/or compulsive behaviors significantly interfere with your normal routine, your work or school, your usual social activities, or relationships, or did they take more than one hour a day? |  |  |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--|--|

|    |     |
|----|-----|
| NO | YES |
|----|-----|

***O.C.D.  
CURRENT***



## H. POSTTRAUMATIC STRESS DISORDER

(➔ MEANS : GO TO THE DIAGNOSTIC BOX, CIRCLE NO, AND MOVE TO THE NEXT MODULE)

|    |                                                                                                                                                                            |         |     |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|
| H1 | Have you ever experienced or witnessed or had to deal with an extremely traumatic event that included actual or threatened death or serious injury to you or someone else? | ➔<br>NO | YES |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|

EXAMPLES OF TRAUMATIC EVENTS INCLUDE: SERIOUS ACCIDENTS, SEXUAL OR PHYSICAL ASSAULT, A TERRORIST ATTACK, BEING HELD HOSTAGE, KIDNAPPING, FIRE, DISCOVERING A BODY, WAR, OR NATURAL DISASTER, WITNESSING THE VIOLENT OR SUDDEN DEATH OF SOMEONE CLOSE TO YOU, OR A LIFE THREATENING ILLNESS.

|    |                                                            |         |     |
|----|------------------------------------------------------------|---------|-----|
| H2 | Did you respond with intense fear, helplessness or horror? | ➔<br>NO | YES |
|----|------------------------------------------------------------|---------|-----|

|    |                                                                                                                                                                                                                                                                   |         |     |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|
| H3 | During the past month, have you re-experienced the event in a distressing way (such as in dreams, intense recollections, flashbacks or physical reactions) or did you have intense distress when you were reminded about the event or exposed to a similar event? | ➔<br>NO | YES |
|----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|

### H4 In the past month:

|   |                                                                                               |         |     |
|---|-----------------------------------------------------------------------------------------------|---------|-----|
| a | Have you avoided thinking about or talking about the event ?                                  | NO      | YES |
| b | Have you avoided activities, places or people that remind you of the event?                   | NO      | YES |
| c | Have you had trouble recalling some important part of what happened?                          | NO      | YES |
| d | Have you become much less interested in hobbies or social activities?                         | NO      | YES |
| e | Have you felt detached or estranged from others?                                              | NO      | YES |
| f | Have you noticed that your feelings are numbed?                                               | NO      | YES |
| g | Have you felt that your life will be shortened or that you will die sooner than other people? | NO      | YES |
|   | ARE <b>3</b> OR MORE <b>H4</b> ANSWERS CODED <b>YES</b> ?                                     | ➔<br>NO | YES |

### H5 In the past month:

|   |                                                                   |         |     |
|---|-------------------------------------------------------------------|---------|-----|
| a | Have you had difficulty sleeping?                                 | NO      | YES |
| b | Were you especially irritable or did you have outbursts of anger? | NO      | YES |
| c | Have you had difficulty concentrating?                            | NO      | YES |
| d | Were you nervous or constantly on your guard?                     | NO      | YES |
| e | Were you easily startled?                                         | NO      | YES |
|   | ARE <b>2</b> OR MORE <b>H5</b> ANSWERS CODED <b>YES</b> ?         | ➔<br>NO | YES |

|    |                                                                                                                                                  |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------|
| H6 | During the past month, have these problems significantly interfered with your work, school or social activities, or caused significant distress? |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------|

|    |     |
|----|-----|
| NO | YES |
|----|-----|

|                                                      |
|------------------------------------------------------|
| <b>POSTTRAUMATIC<br/>STRESS DISORDER<br/>CURRENT</b> |
|------------------------------------------------------|

## I. ALCOHOL DEPENDENCE / ABUSE

(➡ MEANS: GO TO DIAGNOSTIC BOXES, CIRCLE NO IN BOTH AND MOVE TO THE NEXT MODULE)

|    |                                                                                                                     |         |     |
|----|---------------------------------------------------------------------------------------------------------------------|---------|-----|
| I1 | In the past 12 months, have you had 3 or more alcoholic drinks, - within a 3 hour period, - on 3 or more occasions? | ➡<br>NO | YES |
|----|---------------------------------------------------------------------------------------------------------------------|---------|-----|

|    |                                                                                                                                                                                                                                      |    |     |
|----|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|
| I2 | In the past 12 months:                                                                                                                                                                                                               |    |     |
| a  | Did you need to drink a lot more in order to get the same effect that you got when you first started drinking or did you get much less effect with continued use of the same amount?                                                 | NO | YES |
| b  | When you cut down on drinking did your hands shake, did you sweat or feel agitated? Did you drink to avoid these symptoms (for example, "the shakes", sweating or agitation) or to avoid being hungover?<br>IF YES TO ANY, CODE YES. | NO | YES |
| c  | During the times when you drank alcohol, did you end up drinking more than you planned when you started?                                                                                                                             | NO | YES |
| d  | Have you tried to reduce or stop drinking alcohol but failed?                                                                                                                                                                        | NO | YES |
| e  | On the days that you drank, did you spend substantial time in obtaining alcohol, drinking, or in recovering from the effects of alcohol?                                                                                             | NO | YES |
| f  | Did you spend less time working, enjoying hobbies, or being with others because of your drinking?                                                                                                                                    | NO | YES |
| g  | If your drinking caused you health or mental problems, did you still keep on drinking?                                                                                                                                               | NO | YES |

ARE 3 OR MORE I2 ANSWERS CODED YES?

\* IF YES, SKIP I3 QUESTIONS AND GO TO NEXT MODULE. "DEPENDENCE PREEMPTS ABUSE" IN DSM IV TR.

|                               |      |
|-------------------------------|------|
| NO                            | YES* |
| ALCOHOL DEPENDENCE<br>CURRENT |      |

|    |                                                                                                                                                                                                          |    |     |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|
| I3 | In the past 12 months:                                                                                                                                                                                   |    |     |
| a  | Have you been intoxicated, high, or hungover more than once when you had other responsibilities at school, at work, or at home? Did this cause any problems?<br>(CODE YES ONLY IF THIS CAUSED PROBLEMS.) | NO | YES |
| b  | Were you intoxicated more than once in any situation where you were physically at risk, for example, driving a car, riding a motorbike, using machinery, boating, etc.?                                  | NO | YES |
| c  | Did you have legal problems more than once because of your drinking, for example, an arrest or disorderly conduct?                                                                                       | NO | YES |
| d  | If your drinking caused problems with your family or other people, did you still keep on drinking?                                                                                                       | NO | YES |

ARE 1 OR MORE I3 ANSWERS CODED YES?

|                      |     |
|----------------------|-----|
| NO                   | YES |
| <i>ALCOHOL ABUSE</i> |     |
| CURRENT              |     |

## J. SUBSTANCE DEPENDENCE / ABUSE (NON-ALCOHOL)

(➡ MEANS : GO TO THE DIAGNOSTIC BOXES, CIRCLE NO IN ALL DIAGNOSTIC BOXES, AND MOVE TO THE NEXT MODULE)

Now I am going to show you / read to you a list of street drugs or medicines.

- |    |   |                                                                                                                                             |         |     |
|----|---|---------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|
| J1 | a | In the past 12 months, did you take any of these drugs more than once, to get high, to feel elated, to get “a buzz” or to change your mood? | ➡<br>NO | YES |
|----|---|---------------------------------------------------------------------------------------------------------------------------------------------|---------|-----|

CIRCLE EACH DRUG TAKEN:

**Stimulants:** amphetamines, "speed", crystal meth, "crank", "rush", Dexedrine, Ritalin, diet pills.

**Cocaine:** snorting, IV, freebase, crack, "speedball".

**Narcotics:** heroin, morphine, Dilaudid, opium, Demerol, methadone, Darvon, codeine, Percodan, Vicoden, OxyContin.

**Hallucinogens:** LSD ("acid"), mescaline, peyote, psilocybin, STP, "mushrooms", "ecstasy", MDA, MDMA.

**Phencyclidine:** PCP ("Angel Dust", "PeaCe Pill", "Tranq", "Hog"), or ketamine ("special K").

**Inhalants:** "glue", ethyl chloride, "rush", nitrous oxide ("laughing gas"), amyl or butyl nitrate ("poppers").

**Cannabis:** marijuana, hashish ("hash"), THC, "pot", "grass", "weed", "reefer".

**Tranquilizers:** Quaalude, Seconal ("reds"), Valium, Xanax, Librium, Ativan, Dalmane, Halcion, barbiturates, Miltown, GHB, Roofinol, "Roofies".

**Miscellaneous:** steroids, nonprescription sleep or diet pills. Cough Medicine? Any others?

SPECIFY THE MOST USED DRUG(S): \_\_\_\_\_

WHICH DRUG(S) CAUSE THE BIGGEST PROBLEMS?: \_\_\_\_\_

FIRST EXPLORE THE DRUG CAUSING THE BIGGEST PROBLEMS AND MOST LIKELY TO MEET DEPENDENCE / ABUSE CRITERIA.

IF MEETS CRITERIA FOR ABUSE OR DEPENDENCE, SKIP TO THE NEXT MODULE. OTHERWISE, EXPLORE THE NEXT MOST PROBLEMATIC DRUG.

J2 **Considering your use of (NAME THE DRUG / DRUG CLASS SELECTED), in the past 12 months:**

- |                             |                                                                                                                                                                                                                                                                                                                                                                                        |    |     |
|-----------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|
| a                           | Have you found that you needed to use much more (NAME OF DRUG / DRUG CLASS SELECTED) to get the same effect that you did when you first started taking it?                                                                                                                                                                                                                             | NO | YES |
| b                           | When you reduced or stopped using (NAME OF DRUG / DRUG CLASS SELECTED), did you have withdrawal symptoms (aches, shaking, fever, weakness, diarrhea, nausea, sweating, heart pounding, difficulty sleeping, or feeling agitated, anxious, irritable, or depressed)? Did you use any drug(s) to keep yourself from getting sick (withdrawal symptoms) or so that you would feel better? | NO | YES |
| IF YES TO EITHER, CODE YES. |                                                                                                                                                                                                                                                                                                                                                                                        |    |     |
| c                           | Have you often found that when you used (NAME OF DRUG / DRUG CLASS SELECTED), you ended up taking more than you thought you would?                                                                                                                                                                                                                                                     | NO | YES |
| d                           | Have you tried to reduce or stop taking (NAME OF DRUG / DRUG CLASS SELECTED) but failed?                                                                                                                                                                                                                                                                                               | NO | YES |
| e                           | On the days that you used (NAME OF DRUG / DRUG CLASS SELECTED), did you spend substantial time (>2 HOURS), obtaining, using or in recovering from the drug, or thinking about the drug?                                                                                                                                                                                                | NO | YES |
| f                           | Did you spend less time working, enjoying hobbies, or being with family or friends because of your drug use?                                                                                                                                                                                                                                                                           | NO | YES |
| g                           | If (NAME OF DRUG / DRUG CLASS SELECTED) caused you health or mental problems, did you still keep on using it?                                                                                                                                                                                                                                                                          | NO | YES |

ARE **3** OR MORE **J2** ANSWERS CODED **YES**?

SPECIFY DRUG(S): \_\_\_\_\_

**\*** IF YES, SKIP J3 QUESTIONS, MOVE TO NEXT DISORDER.  
“DEPENDENCE PREEMPTS ABUSE” IN DSM IV TR.

**NO**

**YES \***

***SUBSTANCE DEPENDENCE  
CURRENT***

**Considering your use of (NAME THE DRUG CLASS SELECTED), in the past 12 months:**

- J3 a Have you been intoxicated, high, or hungover from (NAME OF DRUG / DRUG CLASS SELECTED) more than once, when you had other responsibilities at school, at work, or at home? Did this cause any problem?

**NO**

**YES**

(CODE **YES** ONLY IF THIS CAUSED PROBLEMS.)

- b Have you been high or intoxicated from (NAME OF DRUG / DRUG CLASS SELECTED) more than once in any situation where you were physically at risk (for example, driving a car, riding a motorbike, using machinery, boating, etc.)?

**NO**

**YES**

- c Did you have legal problems more than once because of your drug use, for example, an arrest or disorderly conduct?

**NO**

**YES**

- d If (NAME OF DRUG / DRUG CLASS SELECTED) caused problems with your family or other people, did you still keep on using it?

**NO**

**YES**

ARE **1** OR MORE **J3** ANSWERS CODED **YES**?

SPECIFY DRUG(S): \_\_\_\_\_

**NO**

**YES**

***SUBSTANCE ABUSE  
CURRENT***

## K. PSYCHOTIC DISORDERS AND MOOD DISORDER WITH PSYCHOTIC FEATURES

ASK FOR AN EXAMPLE OF EACH QUESTION ANSWERED POSITIVELY. CODE **YES** ONLY IF THE EXAMPLES CLEARLY SHOW A DISTORTION OF THOUGHT OR OF PERCEPTION OR IF THEY ARE NOT CULTURALLY APPROPRIATE. BEFORE CODING, INVESTIGATE WHETHER DELUSIONS QUALIFY AS "BIZARRE".

DELUSIONS ARE "BIZARRE" IF: CLEARLY IMPLAUSIBLE, ABSURD, NOT UNDERSTANDABLE, AND CANNOT DERIVE FROM ORDINARY LIFE EXPERIENCE.

HALLUCINATIONS ARE SCORED "BIZARRE" IF: A VOICE COMMENTS ON THE PERSON'S THOUGHTS OR BEHAVIOR, OR WHEN TWO OR MORE VOICES ARE CONVERSING WITH EACH OTHER.

THE PURPOSE OF THIS MODULE IS TO EXCLUDE PATIENTS WITH PSYCHOTIC DISORDERS. THIS MODULE NEEDS EXPERIENCE.

| Now I am going to ask you about unusual experiences that some people have. |   |                                                                                                                                                                                                                                                                                                                                                              | BIZARRE                  |
|----------------------------------------------------------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| K1                                                                         | a | Have you ever believed that people were spying on you, or that someone was plotting against you, or trying to hurt you?<br><b>NOTE:</b> ASK FOR EXAMPLES TO RULE OUT ACTUAL STALKING.                                                                                                                                                                        | NO YES YES               |
|                                                                            | b | <b>IF YES OR YES BIZARRE:</b> do you currently believe these things?                                                                                                                                                                                                                                                                                         | NO YES YES<br>↳K6        |
| K2                                                                         | a | Have you ever believed that someone was reading your mind or could hear your thoughts, or that you could actually read someone's mind or hear what another person was thinking?                                                                                                                                                                              | NO YES YES               |
|                                                                            | b | <b>IF YES OR YES BIZARRE:</b> do you currently believe these things?                                                                                                                                                                                                                                                                                         | NO YES YES<br>↳K6        |
| K3                                                                         | a | Have you ever believed that someone or some force outside of yourself put thoughts in your mind that were not your own, or made you act in a way that was not your usual self? Have you ever felt that you were possessed?<br><b>CLINICIAN:</b> ASK FOR EXAMPLES AND DISCOUNT ANY THAT ARE NOT PSYCHOTIC.                                                    | NO YES YES               |
|                                                                            | b | <b>IF YES OR YES BIZARRE:</b> do you currently believe these things?                                                                                                                                                                                                                                                                                         | NO YES YES<br>↳K6        |
| K4                                                                         | a | Have you ever believed that you were being sent special messages through the TV, radio, newspapers, books or magazines or that a person you did not personally know was particularly interested in you?                                                                                                                                                      | NO YES YES               |
|                                                                            | b | <b>IF YES OR YES BIZARRE:</b> do you currently believe these things?                                                                                                                                                                                                                                                                                         | NO YES YES<br>↳K6        |
| K5                                                                         | a | Have your relatives or friends ever considered any of your beliefs odd or unusual?<br><b>INTERVIEWER:</b> ASK FOR EXAMPLES. ONLY CODE <b>YES</b> IF THE EXAMPLES ARE <b>CLEARLY</b> DELUSIONAL IDEAS NOT EXPLORED IN QUESTIONS K1 TO K4, FOR EXAMPLE, SOMATIC OR RELIGIOUS DELUSIONS OR DELUSIONS OF GRANDIOSITY, JEALOUSY, GUILT, RUIN OR DESTITUTION, ETC. | NO YES YES               |
|                                                                            | b | <b>IF YES OR YES BIZARRE:</b> do they currently consider your beliefs strange?                                                                                                                                                                                                                                                                               | NO YES YES               |
| K6                                                                         | a | Have you ever heard things other people couldn't hear, such as voices?<br><br><b>IF YES TO VOICE HALLUCINATION:</b> Was the voice commenting on your thoughts or behavior or did you hear two or more voices talking to each other?                                                                                                                          | NO YES<br>NO YES         |
|                                                                            | b | <b>IF YES OR YES BIZARRE TO K6a:</b> have you heard sounds / voices in the past month?<br><br><b>IF YES TO VOICE HALLUCINATION:</b> Was the voice commenting on your thoughts or behavior or did you hear two or more voices talking to each other?                                                                                                          | NO YES<br>NO YES<br>↳K8b |

K7 a Have you ever had visions when you were awake or have you ever seen things other people couldn't see? NO YES

CLINICIAN: CHECK TO SEE IF THESE ARE CULTURALLY INAPPROPRIATE.

b IF YES: have you seen these things in the past month? NO YES

### CLINICIAN'S JUDGMENT

K8 b IS THE PATIENT CURRENTLY EXHIBITING INCOHERENCE, DISORGANIZED SPEECH, OR MARKED LOOSENING OF ASSOCIATIONS? NO YES

K9 b IS THE PATIENT CURRENTLY EXHIBITING DISORGANIZED OR CATATONIC BEHAVIOR? NO YES

K10 b ARE NEGATIVE SYMPTOMS OF SCHIZOPHRENIA, E.G. SIGNIFICANT AFFECTIVE FLATTENING, POVERTY OF SPEECH (ALOGIA) OR AN INABILITY TO INITIATE OR PERSIST IN GOAL-DIRECTED ACTIVITIES (AVOLITION), PROMINENT DURING THE INTERVIEW? NO YES

K11 a ARE 1 OR MORE « a » QUESTIONS FROM K1a TO K7a CODED YES OR YES BIZARRE AND IS EITHER:

MAJOR DEPRESSIVE EPISODE, (CURRENT, RECURRENT OR PAST)

OR

MANIC OR HYPOMANIC EPISODE, (CURRENT OR PAST) CODED YES?

NO YES  
↳ K13

IF NO TO K11 a, CIRCLE NO IN BOTH 'MOOD DISORDER WITH PSYCHOTIC FEATURES' DIAGNOSTIC BOXES AND MOVE TO K13.

b You told me earlier that you had period(s) when you felt (depressed/high/persistently irritable).

Were the beliefs and experiences you just described (SYMPTOMS CODED YES FROM K1a TO K7a) restricted exclusively to times when you were feeling depressed/high/irritable?

IF THE PATIENT EVER HAD A PERIOD OF AT LEAST 2 WEEKS OF HAVING THESE BELIEFS OR EXPERIENCES (PSYCHOTIC SYMPTOMS) WHEN THEY WERE NOT DEPRESSED/HIGH/IRRITABLE, CODE NO TO THIS DISORDER.

IF THE ANSWER IS NO TO THIS DISORDER, ALSO CIRCLE NO TO K12 AND MOVE TO K13

NO YES

**MOOD DISORDER WITH  
PSYCHOTIC FEATURES**

**LIFETIME**

K12 a ARE 1 OR MORE « b » QUESTIONS FROM K1b TO K7b CODED YES OR YES BIZARRE AND IS EITHER:

MAJOR DEPRESSIVE EPISODE, (CURRENT)

OR

MANIC OR HYPOMANIC EPISODE, (CURRENT) CODED YES?

NO YES

**MOOD DISORDER WITH  
PSYCHOTIC FEATURES**

**CURRENT**

IF THE ANSWER IS YES TO THIS DISORDER (LIFETIME OR CURRENT), CIRCLE NO TO K13 AND K14 AND MOVE TO THE NEXT MODULE.

K13 ARE 1 OR MORE « b » QUESTIONS FROM K1b TO K6b, CODED **YES BIZARRE**?

OR

ARE 2 OR MORE « b » QUESTIONS FROM K1b TO K10b, CODED **YES** (RATHER THAN **YES BIZARRE**)?

AND DID AT LEAST TWO OF THE PSYCHOTIC SYMPTOMS OCCUR DURING THE SAME 1 MONTH PERIOD?

**NO**

**YES**

***PSYCHOTIC DISORDER  
CURRENT***

K14 IS **K13** CODED **YES**

OR

ARE 1 OR MORE « a » QUESTIONS FROM K1a TO K6a, CODED **YES BIZARRE**?

OR

ARE 2 OR MORE « a » QUESTIONS FROM K1a TO K7a, CODED **YES** (RATHER THAN **YES BIZARRE**)

AND DID AT LEAST TWO OF THE PSYCHOTIC SYMPTOMS OCCUR DURING THE SAME 1 MONTH PERIOD?

**NO**

**YES**

***PSYCHOTIC DISORDER  
LIFETIME***



## L. ANOREXIA NERVOSA

(➔ MEANS : GO TO THE DIAGNOSTIC BOX, CIRCLE NO, AND MOVE TO THE NEXT MODULE)

|    |    |                                                                                                          |                                                  |
|----|----|----------------------------------------------------------------------------------------------------------|--------------------------------------------------|
| L1 | a  | How tall are you?                                                                                        | <input type="text"/> ft <input type="text"/> in. |
|    |    |                                                                                                          | <input type="text"/> cm.                         |
|    | b. | What was your lowest weight in the past 3 months?                                                        | <input type="text"/> lbs.                        |
|    |    |                                                                                                          | <input type="text"/> kgs.                        |
| c  |    | IS PATIENT'S WEIGHT EQUAL TO OR BELOW THE THRESHOLD CORRESPONDING TO HIS / HER HEIGHT? (SEE TABLE BELOW) | ➔<br>NO YES                                      |

**In the past 3 months:**

|    |   |                                                                                                                                                  |             |
|----|---|--------------------------------------------------------------------------------------------------------------------------------------------------|-------------|
| L2 |   | In spite of this low weight, have you tried not to gain weight?                                                                                  | ➔<br>NO YES |
| L3 |   | Have you intensely feared gaining weight or becoming fat, even though you were underweight?                                                      | ➔<br>NO YES |
| L4 | a | Have you considered yourself too big / fat or that part of your body was too big / fat?                                                          | NO YES      |
|    | b | Has your body weight or shape greatly influenced how you felt about yourself?                                                                    | NO YES      |
|    | c | Have you thought that your current low body weight was normal or excessive?                                                                      | NO YES      |
| L5 |   | ARE 1 OR MORE ITEMS FROM L4 CODED YES?                                                                                                           | ➔<br>NO YES |
| L6 |   | FOR WOMEN ONLY: During the last 3 months, did you miss all your menstrual periods when they were expected to occur (when you were not pregnant)? | ➔<br>NO YES |

FOR WOMEN: ARE L5 AND L6 CODED YES?

FOR MEN: IS L5 CODED YES?

NO YES

**ANOREXIA NERVOSA  
CURRENT**

**HEIGHT / WEIGHT TABLE CORRESPONDING TO A BMI THRESHOLD OF 17.5 kg/m<sup>2</sup>**

| Height/Weight |     |      |      |     |     |     |     |     |     |     |     |     |     |      |
|---------------|-----|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|------|
| ft/in         | 4'9 | 4'10 | 4'11 | 5'0 | 5'1 | 5'2 | 5'3 | 5'4 | 5'5 | 5'6 | 5'7 | 5'8 | 5'9 | 5'10 |
| lbs.          | 81  | 84   | 87   | 89  | 92  | 96  | 99  | 102 | 105 | 108 | 112 | 115 | 118 | 122  |
| cm            | 145 | 147  | 150  | 152 | 155 | 158 | 160 | 163 | 165 | 168 | 170 | 173 | 175 | 178  |
| kgs           | 37  | 38   | 39   | 41  | 42  | 43  | 45  | 46  | 48  | 49  | 51  | 52  | 54  | 55   |

| Height/Weight |      |     |     |     |     |
|---------------|------|-----|-----|-----|-----|
| ft/in         | 5'11 | 6'0 | 6'1 | 6'2 | 6'3 |
| lbs.          | 125  | 129 | 132 | 136 | 140 |
| cm            | 180  | 183 | 185 | 188 | 191 |
| kgs           | 57   | 59  | 60  | 62  | 64  |

The weight thresholds above are calculated using a body mass index (BMI) equal to or below 17.5 kg/m<sup>2</sup> for the patient's height. This is the threshold guideline below which a person is deemed underweight by the DSM-IV and the ICD-10 Diagnostic Criteria for Research for Anorexia Nervosa.

## M. BULIMIA NERVOSA

(➔ MEANS : GO TO THE DIAGNOSTIC BOXES, CIRCLE NO IN ALL DIAGNOSTIC BOXES, AND MOVE TO THE NEXT MODULE)

|    |                                                                                                                                                                                                                                             |                       |     |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----|
| M1 | In the past three months, did you have eating binges or times when you ate a very large amount of food within a 2-hour period?                                                                                                              | ➔<br>NO               | YES |
| M2 | In the last 3 months, did you have eating binges as often as twice a week?                                                                                                                                                                  | ➔<br>NO               | YES |
| M3 | During these binges, did you feel that your eating was out of control?                                                                                                                                                                      | ➔<br>NO               | YES |
| M4 | Did you do anything to compensate for, or to prevent a weight gain from these binges, like vomiting, fasting, exercising or taking laxatives, enemas, diuretics (fluid pills), or other medications?                                        | ➔<br>NO               | YES |
| M5 | Does your body weight or shape greatly influence how you feel about yourself?                                                                                                                                                               | ➔<br>NO               | YES |
| M6 | DO THE PATIENT'S SYMPTOMS MEET CRITERIA FOR ANOREXIA NERVOSA?                                                                                                                                                                               | NO<br>↓<br>Skip to M8 | YES |
| M7 | Do these binges occur only when you are under ( ____lbs./kgs.)?<br><small>INTERVIEWER: WRITE IN THE ABOVE PARENTHESIS THE THRESHOLD WEIGHT FOR THIS PATIENT'S HEIGHT FROM THE HEIGHT / WEIGHT TABLE IN THE ANOREXIA NERVOSA MODULE.</small> | NO                    | YES |

M8 IS **M5** CODED **YES** AND IS EITHER **M6** OR **M7** CODED **NO**?

IS **M7** CODED **YES**?

**NO** **YES**

**BULIMIA NERVOSA**  
**CURRENT**

**NO** **YES**

**ANOREXIA NERVOSA**  
*Binge Eating/Purging Type*  
**CURRENT**

## N. GENERALIZED ANXIETY DISORDER

(➔ MEANS : GO TO THE DIAGNOSTIC BOX, CIRCLE NO, AND MOVE TO THE NEXT MODULE)

|    |   |                                                                                                                                                                                                                                             |         |          |
|----|---|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|----------|
| N1 | a | Were you excessively anxious or worried about several routine things, over the past 6 months?<br>IN ENGLISH, IF THE PATIENT IS UNCLEAR ABOUT WHAT YOU MEAN, PROBE BY ASKING (Do others think that you are a “worry wart”) AND GET EXAMPLES. | ➔<br>NO | YES      |
|    | b | Are these anxieties and worries present most days?                                                                                                                                                                                          | ➔<br>NO | YES      |
|    |   | ARE THE PATIENT’S ANXIETY AND WORRIES RESTRICTED EXCLUSIVELY TO, OR BETTER EXPLAINED BY, ANY DISORDER PRIOR TO THIS POINT?                                                                                                                  | NO      | ➔<br>YES |
| N2 |   | Do you find it difficult to control the worries?                                                                                                                                                                                            | ➔<br>NO | YES      |
| N3 |   | FOR THE FOLLOWING, CODE <b>NO</b> IF THE SYMPTOMS ARE CONFINED TO FEATURES OF ANY DISORDER EXPLORED PRIOR TO THIS POINT.                                                                                                                    |         |          |
|    |   | <b>When you were anxious over the past 6 months, did you, most of the time:</b>                                                                                                                                                             |         |          |
|    | a | Feel restless, keyed up or on edge?                                                                                                                                                                                                         | NO      | YES      |
|    | b | Have muscle tension?                                                                                                                                                                                                                        | NO      | YES      |
|    | c | Feel tired, weak or exhausted easily?                                                                                                                                                                                                       | NO      | YES      |
|    | d | Have difficulty concentrating or find your mind going blank?                                                                                                                                                                                | NO      | YES      |
|    | e | Feel irritable?                                                                                                                                                                                                                             | NO      | YES      |
|    | f | Have difficulty sleeping (difficulty falling asleep, waking up in the middle of the night, early morning waking or sleeping excessively)?                                                                                                   | NO      | YES      |
|    |   | ARE <b>3</b> OR MORE <b>N3</b> ANSWERS CODED <b>YES</b> ?                                                                                                                                                                                   | ➔<br>NO | YES      |
| N4 |   | Do these anxieties and worries disrupt your normal work, school or social functioning or cause you significant distress?                                                                                                                    |         |          |

**NO** **YES**

**GENERALIZED ANXIETY  
DISORDER  
CURRENT**

## O. RULE OUT MEDICAL, ORGANIC OR DRUG CAUSES FOR ALL DISORDERS

IF THE PATIENT CODES POSITIVE FOR ANY CURRENT DISORDER ASK:

**Just before these symptoms began:**

- O1a Were you taking any drugs or medicines? ☐ No ☐ Yes ☐ Uncertain
- O1b Did you have any medical illness? ☐ No ☐ Yes ☐ Uncertain

IN THE CLINICIAN’S JUDGMENT: ARE EITHER OF THESE LIKELY TO BE DIRECT CAUSES OF THE PATIENT’S DISORDER?  
IF NECESSARY ASK ADDITIONAL OPEN-ENDED QUESTIONS.

- O2 SUMMARY:** HAS AN ORGANIC CAUSE BEEN RULED OUT? ☐ No ☐ Yes ☐ Uncertain

## P. ANTISOCIAL PERSONALITY DISORDER

(➡ MEANS : GO TO THE DIAGNOSTIC BOX AND CIRCLE NO)

### P1 Before you were 15 years old, did you:

- |   |                                                         |    |     |
|---|---------------------------------------------------------|----|-----|
| a | repeatedly skip school or run away from home overnight? | NO | YES |
| b | repeatedly lie, cheat, "con" others, or steal?          | NO | YES |
| c | start fights or bully, threaten, or intimidate others?  | NO | YES |
| d | deliberately destroy things or start fires?             | NO | YES |
| e | deliberately hurt animals or people?                    | NO | YES |
| f | force someone to have sex with you?                     | NO | YES |
|   | ➡                                                       |    |     |
|   | ARE 2 OR MORE P1 ANSWERS CODED YES?                     | NO | YES |

DO NOT CODE YES TO THE BEHAVIORS BELOW IF THEY ARE EXCLUSIVELY POLITICALLY OR RELIGIOUSLY MOTIVATED.

### P2 Since you were 15 years old, have you:

- |   |                                                                                                                                                                                              |    |     |
|---|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----|-----|
| a | repeatedly behaved in a way that others would consider irresponsible, like failing to pay for things you owed, deliberately being impulsive or deliberately not working to support yourself? | NO | YES |
| b | done things that are illegal even if you didn't get caught (for example, destroying property, shoplifting, stealing, selling drugs, or committing a felony)?                                 | NO | YES |
| c | been in physical fights repeatedly (including physical fights with your spouse or children)?                                                                                                 | NO | YES |
| d | often lied or "conned" other people to get money or pleasure, or lied just for fun?                                                                                                          | NO | YES |
| e | exposed others to danger without caring?                                                                                                                                                     | NO | YES |
| f | felt no guilt after hurting, mistreating, lying to, or stealing from others, or after damaging property?                                                                                     | NO | YES |

ARE 3 OR MORE P2 QUESTIONS CODED YES?

NO

YES

**ANTISOCIAL PERSONALITY  
DISORDER  
LIFETIME**

THIS CONCLUDES THE INTERVIEW

## REFERENCES

Sheehan DV, Lecrubier Y, Harnett-Sheehan K, Janavs J, Weiller E, Bonara LI, Keskiner A, Schinka J, Knapp E, Sheehan MF, Dunbar GC. Reliability and Validity of the MINI International Neuropsychiatric Interview (M.I.N.I.): According to the SCID-P. *European Psychiatry*. 1997; 12:232-241.

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### Translations

|                      |                                                                                                 |
|----------------------|-------------------------------------------------------------------------------------------------|
| Afrikaans            | R. Emsley, W. Maartens                                                                          |
| Arabic               |                                                                                                 |
| Bengali              |                                                                                                 |
| Braille (English)    |                                                                                                 |
| Brazilian Portuguese | P. Amorim                                                                                       |
| Bulgarian            | L.G. Hranov                                                                                     |
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| Czech                |                                                                                                 |
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| Dutch/Flemish        | E. Griez, K. Shruers, T. Overbeek, K. Demyttenaere                                              |
| English              | D. Sheehan, J. Janavs, R. Baker, K. Harnett-Sheehan, E. Knapp, M. Sheehan                       |
| Estonian             |                                                                                                 |
| Farsi/Persian        |                                                                                                 |
| Finnish              | M. Heikkinen, M. Lijeström, O. Tuominen                                                         |
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| Gujarati             |                                                                                                 |
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| Hindi                |                                                                                                 |
| Hungarian            | I. Bitter, J. Balazs                                                                            |
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| Japanese             |                                                                                                 |

### M.I.N.I. 4.6/5.0, M.I.N.I. Plus 4.6/5.0 and M.I.N.I. Screen 5.0:

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T. Calligas, S. Beratis, GN Papadimitriou, T Matsoukas  
CR Soldatos  
M. Patel, B. Patel, Organon  
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C. Mittal, K. Batra, S. Gambhir, Organon  
I. Bitter, J. Balazs  
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|            |                                                               |                                                                                                                 |
|------------|---------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------|
| Kannada    |                                                               | Organon                                                                                                         |
| Korean     |                                                               | K.S. Oh and Korean Academy of Anxiety Disorders                                                                 |
| Latvian    | V. Janavs, J. Janavs, I. Nagobads                             | V. Janavs, J. Janavs                                                                                            |
| Lithuanian |                                                               | A. Bacevicius                                                                                                   |
| Luganda    |                                                               | WW. Muhweziosal, H. Agren                                                                                       |
| Malayalam  |                                                               | Organon                                                                                                         |
| Marathi    |                                                               | Organon                                                                                                         |
| Norwegian  | G. Pedersen, S. Blomhoff                                      | K.A. Leiknes , U. Malt, E. Malt, S. Leganger                                                                    |
| Polish     | M. Masiak, E. Jasiak                                          | M. Masiak, E. Jasiak                                                                                            |
| Portuguese | P. Amorim                                                     | P. Amorim, T. Guterres                                                                                          |
| Punjabi    |                                                               | A. Gahunia, S. Gambhir                                                                                          |
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| Russian    |                                                               | A. Bystritsky, E. Selivra, M. Bystritsky, L. Shumyak, M. Klisinska.                                             |
| Serbian    | I. Timotijevic                                                | I. Timotijevic                                                                                                  |
| Setswana   | K. Ketlogetswe                                                |                                                                                                                 |
| Slovenian  | M. Kocmur                                                     |                                                                                                                 |
| Spanish    | L. Ferrando, J. Bobes-Garcia, J. Gilbert-Rahola, Y. Lecrubier | L. Ferrando, L. Franco-Alfonso, M. Soto, J. Bobes-Garcia, O. Soto, L. Franco, G. Heinze, C. Santana, R. Hidalgo |
| Swedish    | M. Waern, S. Andersch, M. Humble                              | C. Allgulander, H. Agren M. Waern, A. Brimse, M. Humble.                                                        |
| Tamil      |                                                               | Organon                                                                                                         |
| Telugu     |                                                               | Organon                                                                                                         |
| Thai       |                                                               | P. Kittirattanapaiboon, S. Mahatnirunkul, P. Udomrat, P. Silpakit,, M. Khamwongpin, S. Srikosai.                |
| Turkish    | T. Örnek, A. Keskiner, I. Vahip                               | T. Örnek, A. Keskiner, A.Engeler                                                                                |
| Urdu       |                                                               | S. Gambhir                                                                                                      |
| Yiddish    |                                                               | J. Goldman, Chana Pollack, Myrna Mniewski                                                                       |

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## MOOD DISORDERS: DIAGNOSTIC ALGORITHM

Consult Modules:

|   |                          |
|---|--------------------------|
| A | Major Depressive Episode |
| C | (Hypo) manic Episode     |
| K | Psychotic Disorders      |

### MODULE K:

|    |                           |    |     |
|----|---------------------------|----|-----|
| 1a | IS <b>K11b</b> CODED YES? | NO | YES |
| 1b | IS <b>K12a</b> CODED YES? | NO | YES |

### MODULES A and C:

|   |                                                                 | Current | Past |
|---|-----------------------------------------------------------------|---------|------|
| 2 | a CIRCLE YES IF A DELUSIONAL IDEA IS IDENTIFIED IN <b>A3e</b> ? | YES     | YES  |
|   | b CIRCLE YES IF A DELUSIONAL IDEA IS IDENTIFIED IN <b>C3a</b> ? | YES     | YES  |

- c Is a Major Depressive Episode coded YES (current or past)?  
**and**  
 is Manic Episode coded NO (current and past)?  
**and**  
 is Hypomanic Episode coded NO (current and past)?  
**and**  
 is "Hypomanic Symptoms" coded NO (current and past)?

**Specify:**

- If the depressive episode is **current** or **past** or both
- **With Psychotic Features** Current: If 1b or 2a (current) = YES  
 With Psychotic Features Past: If 1a or 2a (past) = YES

**MAJOR DEPRESSIVE DISORDER**

|                                |                          |                          |
|--------------------------------|--------------------------|--------------------------|
|                                | current                  | past                     |
| <b>MDD</b>                     | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>With Psychotic Features</b> |                          |                          |
| Current                        | <input type="checkbox"/> |                          |
| Past                           | <input type="checkbox"/> |                          |

- d Is a Manic Episode coded YES (current or past)?

**Specify:**

- If the Bipolar I Disorder is **current** or **past** or both
- With **Single Manic Episode**: If Manic episode (current or past) = YES  
 and MDE (current and past) = NO
- **With Psychotic Features** Current: If 1b or 2a (current) or 2b (current) = YES  
 With Psychotic Features Past: If 1a or 2a (past) or 2b (past) = YES
- If the **most recent episode** is manic, depressed,  
 mixed or hypomanic or unspecified (all mutually exclusive)
- **Unspecified** if the Past Manic Episode is coded YES AND  
 Current (C3 Summary AND C4a AND C6 AND O2) are coded YES

**BIPOLAR I DISORDER**

|                                |                          |                          |
|--------------------------------|--------------------------|--------------------------|
|                                | current                  | past                     |
| <b>Bipolar I Disorder</b>      | <input type="checkbox"/> | <input type="checkbox"/> |
| Single Manic Episode           | <input type="checkbox"/> | <input type="checkbox"/> |
| <b>With Psychotic Features</b> |                          |                          |
| Current                        | <input type="checkbox"/> |                          |
| Past                           | <input type="checkbox"/> |                          |
| <b>Most Recent Episode</b>     |                          |                          |
| Manic                          | <input type="checkbox"/> |                          |
| Depressed                      | <input type="checkbox"/> |                          |
| Mixed                          | <input type="checkbox"/> |                          |
| Hypomanic                      | <input type="checkbox"/> |                          |
| Unspecified                    | <input type="checkbox"/> |                          |

- e Is Major Depressive Episode coded YES (current or past)?  
**and**  
 Is Hypomanic Episode coded YES (current or past)?  
**and**  
 Is Manic Episode coded NO (current and past)?

**Specify:**

- If the Bipolar Disorder is **current** or **past** or both
- If the most recent mood episode is **hypomanic** or **depressed** (mutually exclusive)

|                                       |                          |                          |
|---------------------------------------|--------------------------|--------------------------|
| <b><i>BIPOLAR II<br/>DISORDER</i></b> |                          |                          |
|                                       | current                  | past                     |
| Bipolar II Disorder                   | <input type="checkbox"/> | <input type="checkbox"/> |
| <b><i>Most Recent Episode</i></b>     |                          |                          |
| Hypomanic                             | <input type="checkbox"/> |                          |
| Depressed                             | <input type="checkbox"/> |                          |

- f Is MDE coded NO (current and past)  
**and**  
 Is Manic Episode coded NO (current and past)?  
**and is either:**

1) C7b coded YES for the appropriate time frame?

**or**

2) C3 Summary coded YES for the appropriate time frame?

**and**

C4a coded YES for the appropriate time frame?

**and**

C7c coded YES for the appropriate time frame?

Specify if the Bipolar Disorder NOS is **current** or **past** or both

|                                        |                          |                          |
|----------------------------------------|--------------------------|--------------------------|
| <b><i>BIPOLAR<br/>DISORDER NOS</i></b> |                          |                          |
|                                        | current                  | past                     |
| Bipolar Disorder NOS                   | <input type="checkbox"/> | <input type="checkbox"/> |



## M.I.N.I. PLUS

The shaded modules below are additional modules available in the MINI PLUS beyond what is available in the standard MINI. The un-shaded modules below are in the standard MINI.

These MINI PLUS modules can be inserted into or used in place of the standard MINI modules, as dictated by the specific needs of any study.

|   | MODULES                                                                | TIME FRAME                                                                                                               |
|---|------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|
| A | MAJOR DEPRESSIVE EPISODE                                               | Current (2 weeks)<br>Past<br>Recurrent                                                                                   |
|   | MOOD DISORDER DUE TO A GENERAL MEDICAL CONDITION                       | Current<br>Past                                                                                                          |
|   | SUBSTANCE INDUCED MOOD DISORDER                                        | Current<br>Past                                                                                                          |
|   | MDE WITH MELANCHOLIC FEATURES                                          | Current (2 weeks)                                                                                                        |
|   | MDE WITH ATYPICAL FEATURES                                             | Current (2 weeks)                                                                                                        |
|   | MDE WITH CATATONIC FEATURES                                            | Current (2 weeks)                                                                                                        |
| B | DYSTHYMIA                                                              | Current (Past 2 years)<br>Past                                                                                           |
| C | SUICIDALITY                                                            | Current (Past Month)<br>Risk: <input type="checkbox"/> Low <input type="checkbox"/> Medium <input type="checkbox"/> High |
| D | MANIC EPISODE                                                          | Current<br>Past                                                                                                          |
|   | HYPOMANIC EPISODE                                                      | Current<br>Past                                                                                                          |
|   | BIPOLAR I DISORDER                                                     | Current<br>Past                                                                                                          |
|   | BIPOLAR II DISORDER                                                    | Current<br>Past                                                                                                          |
|   | BIPOLAR DISORDER NOS                                                   | Current<br>Past                                                                                                          |
|   | MANIC EPISODE DUE TO A GENERAL MEDICAL CONDITION                       | Current<br>Past                                                                                                          |
|   | HYPOMANIC EPISODE DUE TO A GENERAL MEDICAL CONDITION                   | Current<br>Past                                                                                                          |
|   | SUBSTANCE INDUCED MANIC EPISODE                                        | Current<br>Past                                                                                                          |
|   | SUBSTANCE INDUCED HYPOMANIC EPISODE                                    | Current<br>Past                                                                                                          |
| E | PANIC DISORDER                                                         | Current (Past Month)<br>Lifetime                                                                                         |
|   | ANXIETY DISORDER WITH PANIC ATTACKS DUE TO A GENERAL MEDICAL CONDITION | Current                                                                                                                  |
|   | SUBSTANCE INDUCED ANXIETY DISORDER WITH PANIC ATTACKS                  | Current                                                                                                                  |
| F | AGORAPHOBIA                                                            | Current                                                                                                                  |
| G | SOCIAL PHOBIA (Social Anxiety Disorder)                                | Current (Past Month)                                                                                                     |
| H | SPECIFIC PHOBIA                                                        | Current                                                                                                                  |
| I | OBSESSIVE-COMPULSIVE DISORDER                                          | Current (Past Month)                                                                                                     |
|   | OCD DUE TO A GENERAL MEDICAL CONDITION                                 | Current                                                                                                                  |
|   | SUBSTANCE INDUCED OCD                                                  | Current                                                                                                                  |
| J | POSTTRAUMATIC STRESS DISORDER                                          | Current (Past Month)                                                                                                     |
| K | ALCOHOL DEPENDENCE                                                     | Past 12 Months                                                                                                           |
|   | ALCOHOL DEPENDENCE                                                     | Lifetime                                                                                                                 |
|   | ALCOHOL ABUSE                                                          | Past 12 Months                                                                                                           |
|   | ALCOHOL ABUSE                                                          | Lifetime                                                                                                                 |
| L | SUBSTANCE DEPENDENCE (Non-alcohol)                                     | Past 12 Months                                                                                                           |
|   | SUBSTANCE DEPENDENCE (Non-alcohol)                                     | Lifetime                                                                                                                 |
|   | SUBSTANCE ABUSE (Non-alcohol)                                          | Past 12 Months                                                                                                           |

|   |                                                                 |                         |
|---|-----------------------------------------------------------------|-------------------------|
| M | PSYCHOTIC DISORDERS                                             | Lifetime                |
|   |                                                                 | Current                 |
|   | MOOD DISORDER WITH PSYCHOTIC FEATURES                           | Current                 |
|   | SCHIZOPHRENIA                                                   | Current                 |
|   |                                                                 | Lifetime                |
|   | SCHIZOAFFECTIVE DISORDER                                        | Current                 |
|   |                                                                 | Lifetime                |
|   | SCHIZOPHRENIFORM DISORDER                                       | Current                 |
|   |                                                                 | Lifetime                |
|   | BRIEF PSYCHOTIC DISORDER                                        | Current                 |
|   |                                                                 | Lifetime                |
|   | DELUSIONAL DISORDER                                             | Current                 |
|   |                                                                 | Lifetime                |
|   | PSYCHOTIC DISORDER DUE TO A GENERAL MEDICAL CONDITION           | Current                 |
|   |                                                                 | Lifetime                |
|   | SUBSTANCE INDUCED PSYCHOTIC DISORDER                            | Current                 |
|   |                                                                 | Lifetime                |
|   | PSYCHOTIC DISORDER NOS                                          | Current                 |
|   |                                                                 | Lifetime                |
|   | MOOD DISORDER WITH PSYCHOTIC FEATURES                           | Lifetime                |
|   | MOOD DISORDER NOS                                               | Lifetime                |
|   | MAJOR DEPRESSIVE DISORDER WITH PSYCHOTIC FEATURES               | Current                 |
|   |                                                                 | Past                    |
|   | BIPOLAR I DISORDER WITH PSYCHOTIC FEATURES                      | Current                 |
|   |                                                                 | Past                    |
| N | ANOREXIA NERVOSA                                                | Current (Past 3 Months) |
| O | BULIMIA NERVOSA                                                 | Current (Past 3 Months) |
|   | BULIMIA NERVOSA PURGING TYPE                                    | Current                 |
|   | BULIMIA NERVOSA NONPURGING TYPE                                 | Current                 |
|   | ANOREXIA NERVOSA, BINGE EATING/PURGING TYPE                     | Current                 |
|   | ANOREXIA NERVOSA, RESTRICTING TYPE                              | Current                 |
| P | GENERALIZED ANXIETY DISORDER                                    | Current (Past 6 Months) |
|   | GENERALIZED ANXIETY DISORDER DUE TO A GENERAL MEDICAL CONDITION | Current                 |
|   | SUBSTANCE INDUCED GAD                                           | Current                 |
| Q | ANTISOCIAL PERSONALITY DISORDER                                 | Lifetime                |
| R | SOMATIZATION DISORDER                                           | Lifetime                |
|   |                                                                 | Current                 |
| S | HYPOCHONDRIASIS                                                 | Current                 |
| T | BODY DYSMORPHIC DISORDER                                        | Current                 |
| U | PAIN DISORDER                                                   | Current                 |
| V | CONDUCT DISORDER                                                | Past 12 Months          |
| W | ATTENTION DEFICIT/HYPERACTIVITY DISORDER (Children/Adolescents) | Past 6 Months           |
|   | ATTENTION DEFICIT/HYPERACTIVITY DISORDER (Adults)               | Lifetime                |
|   |                                                                 | Current                 |
| X | ADJUSTMENT DISORDERS                                            | Current                 |
| Y | PREMENSTRUAL DYSPHORIC DISORDER                                 | Current                 |
| Z | MIXED ANXIETY-DEPRESSIVE DISORDER                               | Current                 |

ID#: \_\_\_\_\_ Examiner: \_\_\_\_\_

Sex: ☐ F ☐ M

Race/Ethnicity: \_\_\_\_\_ Education (years): \_\_\_\_\_

Handedness: ☐ R ☐ L ☐ Ambidextrous

Hearing adequate? ☐ Y ☐ N

Hearing aid? ☐ Y ☐ N

First language: \_\_\_\_\_ Preferred language: \_\_\_\_\_ Effort appear adequate? ☐ Y ☐ ? ☐ N

Affect and mood: \_\_\_\_\_ Physical appearance: \_\_\_\_\_

Other behaviors: \_\_\_\_\_

Major complaints: \_\_\_\_\_

Diagnostic history: \_\_\_\_\_

Current medications: \_\_\_\_\_

|             | Year | Month | Day |
|-------------|------|-------|-----|
| Date Tested |      |       |     |

|                |  |  |  |
|----------------|--|--|--|
| Age at Testing |  |  |  |
|----------------|--|--|--|

|                                             | Raw Score | Standard Score |                                                                           | Raw Score | Standard Score |
|---------------------------------------------|-----------|----------------|---------------------------------------------------------------------------|-----------|----------------|
| Trial 1 Free Recall <b>Correct</b>          |           |                | Long-Delay Free Recall <b>Correct</b>                                     |           |                |
| Trial 2 Free Recall <b>Correct</b>          |           |                | Long-Delay Cued Recall <b>Correct</b>                                     |           |                |
| Trial 3 Free Recall <b>Correct</b>          |           |                | Free-Recall Intrusions (Immediate & Delayed, All Types)                   |           |                |
| Trial 4 Free Recall <b>Correct</b>          |           |                | Cued-Recall Intrusions (All Types)                                        |           |                |
| Trial 5 Free Recall <b>Correct</b>          |           |                | Total Intrusions (All Recall Trials, All Types)                           |           |                |
| Trials 1–5 Free Recall Total <b>Correct</b> |           | (T score)      | Total Repetitions (All Recall Trials)                                     |           |                |
| List B Free Recall <b>Correct</b>           |           |                | Long-Delay Yes/No Recognition Hits                                        |           |                |
| Short-Delay Free Recall <b>Correct</b>      |           |                | Long-Delay Yes/No Recognition False-Positives                             |           |                |
| Short-Delay Cued Recall <b>Correct</b>      |           |                | Long-Delay Forced-Choice Recognition Accuracy<br>(# hits _____ /16) × 100 | %         |                |

**List A Immediate Free Recall Trial 1**

I'm going to read a list of words to you. Listen carefully, because when I'm through, I want you to tell me as many of the words as you can. You can say them in any order, just say as many of them as you can. Are you ready?

Read List A at an even pace, taking slightly longer than one second per word, so the entire list takes 18 to 20 seconds. Then say: Go ahead.

**List A**  
truck  
spinach  
giraffe  
bookcase  
onion  
motorcycle  
cabinet  
zebra  
subway  
lamp  
celery  
cow  
desk  
boat  
squirrel  
cabbage

**Trial 2**

I'm going to read the same list again. Like before, tell me as many of the words as you can, in any order. Be sure to also say words from the list that you told me the first time.

**Trials 3 and 4**

I'm going to read the same list again. Like before, tell me as many of the words as you can, in any order, including words from the list you've said before.

**Trial 5**

I'm going to read the same list one more time. Like before, tell me as many of the words as you can, in any order, including words from the list you've said before.

Record all responses verbatim, in the order recalled. Prompt only once (e.g., Anything else?) at the end of each free and cued recall trial (i.e., after 15 seconds with no response or when the examinee says he/she cannot remember more words).

|                   | Trial 1 |                      | Trial 2           |           | Trial 3              |                   | Trial 4 |                      | Trial 5           |           |                      |
|-------------------|---------|----------------------|-------------------|-----------|----------------------|-------------------|---------|----------------------|-------------------|-----------|----------------------|
|                   |         | Resp Type            |                   | Resp Type |                      | Resp Type         |         | Resp Type            |                   | Resp Type |                      |
| 1                 |         |                      | 1                 |           | 1                    |                   | 1       |                      | 1                 |           |                      |
| 2                 |         |                      | 2                 |           | 2                    |                   | 2       |                      | 2                 |           |                      |
| 3                 |         |                      | 3                 |           | 3                    |                   | 3       |                      | 3                 |           |                      |
| 4                 |         |                      | 4                 |           | 4                    |                   | 4       |                      | 4                 |           |                      |
| 5                 |         |                      | 5                 |           | 5                    |                   | 5       |                      | 5                 |           |                      |
| 6                 |         |                      | 6                 |           | 6                    |                   | 6       |                      | 6                 |           |                      |
| 7                 |         |                      | 7                 |           | 7                    |                   | 7       |                      | 7                 |           |                      |
| 8                 |         |                      | 8                 |           | 8                    |                   | 8       |                      | 8                 |           |                      |
| 9                 |         |                      | 9                 |           | 9                    |                   | 9       |                      | 9                 |           |                      |
| 10                |         |                      | 10                |           | 10                   |                   | 10      |                      | 10                |           |                      |
| 11                |         |                      | 11                |           | 11                   |                   | 11      |                      | 11                |           |                      |
| 12                |         |                      | 12                |           | 12                   |                   | 12      |                      | 12                |           |                      |
| 13                |         |                      | 13                |           | 13                   |                   | 13      |                      | 13                |           |                      |
| 14                |         |                      | 14                |           | 14                   |                   | 14      |                      | 14                |           |                      |
| 15                |         |                      | 15                |           | 15                   |                   | 15      |                      | 15                |           |                      |
| 16                |         |                      | 16                |           | 16                   |                   | 16      |                      | 16                |           |                      |
| 17                |         |                      | 17                |           | 17                   |                   | 17      |                      | 17                |           |                      |
| 18                |         |                      | 18                |           | 18                   |                   | 18      |                      | 18                |           |                      |
| 19                |         |                      | 19                |           | 19                   |                   | 19      |                      | 19                |           |                      |
| 20                |         |                      | 20                |           | 20                   |                   | 20      |                      | 20                |           |                      |
| Total Correct     | C       | <input type="text"/> | Total Correct     | C         | <input type="text"/> | Total Correct     | C       | <input type="text"/> | Total Correct     | C         | <input type="text"/> |
| Total Repetitions | R       | <input type="text"/> | Total Repetitions | R         | <input type="text"/> | Total Repetitions | R       | <input type="text"/> | Total Repetitions | R         | <input type="text"/> |
| Total Intrusions  | I       | <input type="text"/> | Total Intrusions  | I         | <input type="text"/> | Total Intrusions  | I       | <input type="text"/> | Total Intrusions  | I         | <input type="text"/> |

**List B Immediate Free Recall**

Now I'm going to read a second list of words to you. When I'm through, I want you to tell me as many words from this second list as you can, in any order. Don't tell me words from the first list, just this second list.

Read List B at an even pace, taking slightly longer than one second per word, so the entire list takes 18 to 20 seconds. Then say: Go ahead.

**List B**

violin  
cucumber  
elephant  
closet  
turnip  
guitar  
basement  
sheep  
clarinet  
garage  
corn  
rabbit  
patio  
saxophone  
tiger  
radishes

**Trial B**

|    |  |
|----|--|
| 1  |  |
| 2  |  |
| 3  |  |
| 4  |  |
| 5  |  |
| 6  |  |
| 7  |  |
| 8  |  |
| 9  |  |
| 10 |  |
| 11 |  |
| 12 |  |
| 13 |  |
| 14 |  |
| 15 |  |
| 16 |  |
| 17 |  |
| 18 |  |
| 19 |  |
| 20 |  |

Total Correct C Total Repetitions R Total Intrusions I **List A Short-Delay Free Recall**

Now I want you to tell me all the words you can from the first list, the one I read to you several times. Don't tell me words from the second list, just the first list. Go ahead.

Record all responses verbatim, in the order recalled. Prompt only once (e.g., Anything else?) at the end of each free and cued recall trial (i.e., after 15 seconds with no response or when the examinee says he/she cannot remember more words).

**List A**

|    |  |
|----|--|
| 1  |  |
| 2  |  |
| 3  |  |
| 4  |  |
| 5  |  |
| 6  |  |
| 7  |  |
| 8  |  |
| 9  |  |
| 10 |  |
| 11 |  |
| 12 |  |
| 13 |  |
| 14 |  |
| 15 |  |
| 16 |  |
| 17 |  |
| 18 |  |
| 19 |  |
| 20 |  |

Total Correct C Total Repetitions R Total Intrusions I **List A Short-Delay Cued Recall**

Tell me all the words from the first list that are furniture.  
Tell me all the words from the first list that are vegetables.  
Tell me all the words from the first list that are ways of traveling.  
Tell me all the words from the first list that are animals.

**Furniture**

|   |  |
|---|--|
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |

**Ways of Traveling**

|   |  |
|---|--|
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |

Total Correct C Total Intrusions I **Vegetables**

|   |  |
|---|--|
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |

**Animals**

|   |  |
|---|--|
| 1 |  |
| 2 |  |
| 3 |  |
| 4 |  |
| 5 |  |
| 6 |  |
| 7 |  |
| 8 |  |

Total Repetitions R 

There should be approximately a 20-minute delay between the completion of Short-Delay Cued Recall and the start of Long-Delay Free Recall. Do not inform the examinee that there will be later CVLT-II trials.

### List A Long-Delay Free Recall

I read two different lists of words to you earlier: a first list that I read to you several times, and a second list that I read to you once. Tell me all the words you can that were from the first list. Don't tell me words from the second list, just the first list. Go ahead.

#### List A

|    |  |
|----|--|
| 1  |  |
| 2  |  |
| 3  |  |
| 4  |  |
| 5  |  |
| 6  |  |
| 7  |  |
| 8  |  |
| 9  |  |
| 10 |  |
| 11 |  |
| 12 |  |
| 13 |  |
| 14 |  |
| 15 |  |
| 16 |  |
| 17 |  |
| 18 |  |
| 19 |  |
| 20 |  |

Total Correct C

Total Repetitions R

Total Intrusions I

### List A Long-Delay Cued Recall

Tell me all the words from the first list that are furniture.

Tell me all the words from the first list that are vegetables.

Tell me all the words from the first list that are ways of traveling.

Tell me all the words from the first list that are animals.

| Furniture     | Resp Type              | Vegetables        | Resp Type              | Ways of Traveling | Resp Type              | Animals | Resp Type |
|---------------|------------------------|-------------------|------------------------|-------------------|------------------------|---------|-----------|
| 1             |                        | 1                 |                        | 1                 |                        | 1       |           |
| 2             |                        | 2                 |                        | 2                 |                        | 2       |           |
| 3             |                        | 3                 |                        | 3                 |                        | 3       |           |
| 4             |                        | 4                 |                        | 4                 |                        | 4       |           |
| 5             |                        | 5                 |                        | 5                 |                        | 5       |           |
| 6             |                        | 6                 |                        | 6                 |                        | 6       |           |
| 7             |                        | 7                 |                        | 7                 |                        | 7       |           |
| 8             |                        | 8                 |                        | 8                 |                        | 8       |           |
| Total Correct | C <input type="text"/> | Total Repetitions | R <input type="text"/> | Total Intrusions  | I <input type="text"/> |         |           |

### List A Long-Delay Yes/No Recognition

Now I'm going to read more words to you. After I read each one, say "Yes" if that word was from the first list, or say "No" if it was not from the first list.

If the examinee responds "I don't know" during Yes/No Recognition, say, "Tell me whether you think \_\_\_\_\_ was on the first list."

|           | Response | Item Type |            | Response | Item Type |          | Response | Item Type |         | Response | Item Type |
|-----------|----------|-----------|------------|----------|-----------|----------|----------|-----------|---------|----------|-----------|
| wallet    | Y N      | UN        | violin     | Y N      | BN        | dog      | Y N      | PR        | turnip  | Y N      | BS        |
| boat      | Y N      | T         | cow        | Y N      | T         | bookcase | Y N      | T         | cabinet | Y N      | T         |
| saxophone | Y N      | BN        | fork       | Y N      | UN        | matches  | Y N      | UN        | onion   | Y N      | T         |
| cucumber  | Y N      | BS        | bus        | Y N      | PR        | spinach  | Y N      | T         | lion    | Y N      | PR        |
| giraffe   | Y N      | T         | celery     | Y N      | T         | clarinet | Y N      | BN        | camera  | Y N      | UN        |
| carrot    | Y N      | PR        | lamp       | Y N      | T         | truck    | Y N      | T         | guitar  | Y N      | BN        |
| patio     | Y N      | BN        | radishes   | Y N      | BS        | rabbit   | Y N      | BS        | subway  | Y N      | T         |
| cabbage   | Y N      | T         | table      | Y N      | PR        | chair    | Y N      | PR        | tiger   | Y N      | BS        |
| desk      | Y N      | T         | rose       | Y N      | UN        | com      | Y N      | BS        | coffee  | Y N      | UN        |
| bracelet  | Y N      | UN        | motorcycle | Y N      | T         | seashell | Y N      | UN        | zebra   | Y N      | T         |
| car       | Y N      | PR        | sheep      | Y N      | BS        | garage   | Y N      | BN        | lettuce | Y N      | PR        |
| elephant  | Y N      | BS        | basement   | Y N      | BN        | squirrel | Y N      | T         | closet  | Y N      | BN        |

T = Target

Distractor Types: BS = Just 5 Shared; BN = Just 5 Non-Shared; PR = Prototypical; UN = Unrelated

There should be approximately a 10-minute delay between the completion of Yes/No Recognition and the start of Forced-Choice Recognition. Do not inform the examinee that there will be a later CVLT-II trial.

Total Hits

Total False-Positives



**PEARSON**

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Subject# \_\_\_\_\_ Age \_\_\_\_\_ Sex \_\_\_\_\_ Education Level \_\_\_\_\_

Examiner \_\_\_\_\_ Date of Testing \_\_\_\_\_ Ethnicity \_\_\_\_\_

Observations: \_\_\_\_\_

|                       | Immediate<br>Memory | Visuospatial/<br>Construction | Language | Attention | Delayed<br>Memory |                 | Total<br>Scale          |
|-----------------------|---------------------|-------------------------------|----------|-----------|-------------------|-----------------|-------------------------|
| Index Score           |                     |                               |          |           |                   |                 |                         |
| Confidence Interval % |                     |                               |          |           |                   |                 |                         |
| Percentile            |                     |                               |          |           |                   |                 |                         |
| Index Score           |                     |                               |          |           |                   | Percentile Rank | Total Scale Index Score |
| 160                   |                     |                               |          |           |                   | >99.9           | 160                     |
| 155                   |                     |                               |          |           |                   | >99.9           | 155                     |
| 150                   |                     |                               |          |           |                   | >99.9           | 150                     |
| 145                   |                     |                               |          |           |                   | 99.9            | 145                     |
| 140                   |                     |                               |          |           |                   | 99.6            | 140                     |
| 135                   |                     |                               |          |           |                   | 99              | 135                     |
| 130                   |                     |                               |          |           |                   | 98              | 130                     |
| 125                   |                     |                               |          |           |                   | 95              | 125                     |
| 120                   |                     |                               |          |           |                   | 91              | 120                     |
| 115                   |                     |                               |          |           |                   | 84              | 115                     |
| 110                   |                     |                               |          |           |                   | 75              | 110                     |
| 105                   |                     |                               |          |           |                   | 63              | 105                     |
| 100                   |                     |                               |          |           |                   | 50              | 100                     |
| 95                    |                     |                               |          |           |                   | 37              | 95                      |
| 90                    |                     |                               |          |           |                   | 25              | 90                      |
| 85                    |                     |                               |          |           |                   | 16              | 85                      |
| 80                    |                     |                               |          |           |                   | 9               | 80                      |
| 75                    |                     |                               |          |           |                   | 5               | 75                      |
| 70                    |                     |                               |          |           |                   | 2               | 70                      |
| 65                    |                     |                               |          |           |                   | 1               | 65                      |
| 60                    |                     |                               |          |           |                   | 0.4             | 60                      |
| 55                    |                     |                               |          |           |                   | 0.1             | 55                      |
| 50                    |                     |                               |          |           |                   | <0.1            | 50                      |
| 45                    |                     |                               |          |           |                   | <0.1            | 45                      |
| 40                    |                     |                               |          |           |                   | <0.1            | 40                      |

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# 1 List Learning

## Trial 1

Say *I am going to read you a list of words. I want you to listen carefully and, when I finish, repeat back as many words as you can. You don't have to say them in the same order that I do—just repeat back as many words as you can remember, in any order. Okay?*

## Trials 2–4

Say *I am going to read the list again. When I finish, repeat back as many words as you can, even if you have already said them before. Okay?*

Record responses in order.

Scoring: 1 point for each word correctly recalled on each trial.

| List    | Trial 1 | Trial 2 | Trial 3 | Trial 4 |
|---------|---------|---------|---------|---------|
| Market  |         |         |         |         |
| Package |         |         |         |         |
| Elbow   |         |         |         |         |
| Apple   |         |         |         |         |
| Story   |         |         |         |         |
| Carpet  |         |         |         |         |
| Bubble  |         |         |         |         |
| Highway |         |         |         |         |
| Saddle  |         |         |         |         |
| Powder  |         |         |         |         |

|                |               |   |               |   |               |   |               |   |                           |
|----------------|---------------|---|---------------|---|---------------|---|---------------|---|---------------------------|
| Number Correct |               | + |               | + |               | + |               | = |                           |
|                | Total Trial 1 |   | Total Trial 2 |   | Total Trial 3 |   | Total Trial 4 |   | Total Score<br>Range=0–40 |

## 2 Story Memory

### Trial 1

Say *I am going to read you a short story. I'd like you to listen carefully and, when I finish, repeat back as much of the story as you can remember. Try and use the same wording, if you can. Okay?*

Read the story below, then say *Now repeat back as much of that story as you can.*

### Trial 2

Say *I am going to read that same story again. When I finish, I want you to again repeat back as much of the story as you can remember. Try to repeat it as exactly as you can.*

Read the story below, then say *Now repeat back as much of that story as you can.*

Scoring: 1 point for verbatim recall of bold, italic words or alternatives, shown below in color within parentheses. Record intrusions or variations in the Responses column.

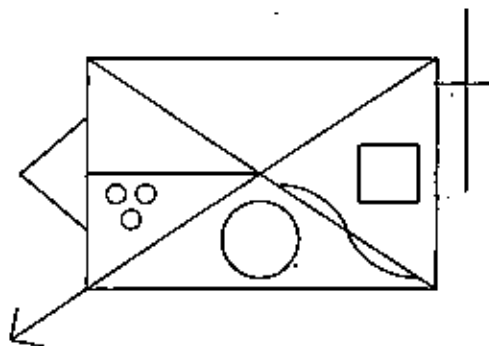
| Story                                               | Responses | Trial 1 Score<br>(0 or 1) | Trial 2 Score<br>(0 or 1) | Item Score<br>(0-2) |
|-----------------------------------------------------|-----------|---------------------------|---------------------------|---------------------|
| 1. On <b>Tuesday</b> ,                              |           |                           |                           |                     |
| 2. <b>May</b>                                       |           |                           |                           |                     |
| 3. <b>Fourth</b> ,                                  |           |                           |                           |                     |
| 4. in <b>Cleveland</b> , Ohio,                      |           |                           |                           |                     |
| 5. a <b>3 alarm</b>                                 |           |                           |                           |                     |
| 6. <b>fire</b> broke out.                           |           |                           |                           |                     |
| 7. <b>Two</b>                                       |           |                           |                           |                     |
| 8. <b>hotels</b>                                    |           |                           |                           |                     |
| 9. and a <b>restaurant</b>                          |           |                           |                           |                     |
| 10. were <b>destroyed</b>                           |           |                           |                           |                     |
| 11. before the <b>firefighters</b> (firemen)        |           |                           |                           |                     |
| 12. were able to <b>extinguish it</b> (put it out). |           |                           |                           |                     |
| Total Score<br>(Trial 1 + Trial 2)<br>Range=0-24    |           |                           |                           |                     |

### 3 Figure Copy

 Time Limit: 4 minutes

Fold this page back and present the Figure Copy Drawing Page along with the stimulus. Ask the examinee to make an exact copy of the figure. Tell the examinee that he or she is being timed, but that the score is based *only* on the exactness of his or her copy.

Scoring: 1 point for correctness and completeness (drawing), and 1 point for proper placement. See Appendix 1 in Stimulus Booklet A for complete scoring criteria and scoring examples.



### Figure Copy Criteria

(Fold back for use.)

| Item               | Drawing<br>(0 or 1) | Placement<br>(0 or 1) | Score<br>(0, 1, or 2) | Scoring Criteria                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|---------------------|-----------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. rectangle       |                     |                       |                       | Drawing: lines are unbroken and straight; angles 90 degrees; top/bottom lines 25% longer than sides<br>Placement: not rotated more than 15 degrees                                                                                                                                                                                                                         |
| 2. diagonal cross  |                     |                       |                       | Drawing: lines are unbroken and straight and should approximately bisect each other<br>Placement: ends of lines should meet corners of the rectangle without significant overlap or measurable distance between the ends of the lines and the corners                                                                                                                      |
| 3. horizontal line |                     |                       |                       | Drawing: line is unbroken and straight; should not exceed 1/2 the length of the rectangle<br>Placement: should bisect left side of the rectangle at approximately a right angle and intersect the diagonal cross                                                                                                                                                           |
| 4. circle          |                     |                       |                       | Drawing: round, unbroken and closed; diameter should be approximately 1/4–1/3 height of rectangle<br>Placement: placed in appropriate segment; not touching any other part of figure                                                                                                                                                                                       |
| 5. 3 small circles |                     |                       |                       | Drawing: round, unbroken and closed; equal size; triangular arrangement; not touching each other<br>Placement: in appropriate segment; not touching figure; triangle formed not rotated more than 15 degrees                                                                                                                                                               |
| 6. square          |                     |                       |                       | Drawing: must be closed; 90 degree angles; lines straight and unbroken; height is 1/4–1/3 height of rectangle<br>Placement: in appropriate segment; not touching any other part of figure; not rotated more than 15 degrees                                                                                                                                                |
| 7. curving line    |                     |                       |                       | Drawing: 2 curved segments are approximately equal in length and symmetrical; correct direction of curves<br>Placement: ends of line touch diagonal; do not touch corner of rectangle or intersection of diagonal lines                                                                                                                                                    |
| 8. outside cross   |                     |                       |                       | Drawing: vertical line of the outside cross is parallel to side of rectangle; >1/2 the height of rectangle; horizontal line crosses vertical at 90 degree angle and is between 20–50% of length of vertical line<br>Placement: horizontal line of outside cross touches rectangle higher than 2/3 the height of rectangle, but below top; does not penetrate the rectangle |
| 9. triangle        |                     |                       |                       | Drawing: angle formed by 2 sides of triangle is between 60–100 degrees; sides are straight, unbroken and meet in a point; distance on vertical side of rectangle subsumed by triangle is approximately 50% of the height of vertical side<br>Placement: roughly centered on the left vertical side of the rectangle                                                        |
| 10. arrow          |                     |                       |                       | Drawing: straight and unbroken; lines forming arrow are approximately equal in length and not more than 1/3 length of staff<br>Placement: must protrude from appropriate corner of rectangle such that staff appears to be continuation of diagonal cross                                                                                                                  |

Total Score  
Range=0–20

# Figure Copy Drawing Page

(Fold back for use.)

## 4 Line Orientation



Time Limit: 20 seconds/item

Present the sample item, and say **These two lines down here (indicate) match two of the lines on top. Can you tell me the numbers, or point to the lines that they match?** Correct any errors and make sure the examinee understands the task. Continue with Items 1–10.

Scoring: 1 point for each line correctly identified.

| Item   | Responses | Correct Responses | Score (0, 1, or 2) |
|--------|-----------|-------------------|--------------------|
| Sample |           | 1, 7              |                    |
| 1.     |           | 10, 12            |                    |
| 2.     |           | 4, 11             |                    |
| 3.     |           | 6, 9              |                    |
| 4.     |           | 8, 13             |                    |
| 5.     |           | 2, 4              |                    |

| Item                      | Responses | Correct Responses | Score (0, 1, or 2) |
|---------------------------|-----------|-------------------|--------------------|
| 6.                        |           | 1, 6              |                    |
| 7.                        |           | 3, 10             |                    |
| 8.                        |           | 5, 8              |                    |
| 9.                        |           | 1, 3              |                    |
| 10.                       |           | 11, 13            |                    |
| Total Score<br>Range=0–20 |           |                   |                    |

## 5 Picture Naming



Time Limit: 20 seconds/item

Ask the examinee to name each picture. Give the semantic cue only if the picture is obviously misperceived.

Scoring: 1 point for each item that is correctly named spontaneously or following semantic cue.

| Item                      | Semantic Cue                                     | Responses | Score (0 or 1) |
|---------------------------|--------------------------------------------------|-----------|----------------|
| 1. chair                  | a piece of furniture                             |           |                |
| 2. pencil                 | used for writing                                 |           |                |
| 3. well                   | you get water from it                            |           |                |
| 4. giraffe                | an animal                                        |           |                |
| 5. sailboat               | used on the water (if "boat," query "what kind") |           |                |
| 6. cannon                 | a weapon, used in war                            |           |                |
| 7. pliers                 | a tool                                           |           |                |
| 8. trumpet                | a musical instrument ("cornet" okay)             |           |                |
| 9. clothespin             | used to hold laundry on a line                   |           |                |
| 10. kite                  | it's flown in the air                            |           |                |
| Total Score<br>Range=0–10 |                                                  |           |                |

## 6 Semantic Fluency

 Time Limit: 60 seconds

Say *Now I'd like you to tell me the names of all of the different kinds of fruits and vegetables that you can think of. I'll give you one minute to come up with as many as you can. Ready?*

Scoring: 1 point for each correct response.

|           |           |           |           |
|-----------|-----------|-----------|-----------|
| 1. _____  | 11. _____ | 21. _____ | 31. _____ |
| 2. _____  | 12. _____ | 22. _____ | 32. _____ |
| 3. _____  | 13. _____ | 23. _____ | 33. _____ |
| 4. _____  | 14. _____ | 24. _____ | 34. _____ |
| 5. _____  | 15. _____ | 25. _____ | 35. _____ |
| 6. _____  | 16. _____ | 26. _____ | 36. _____ |
| 7. _____  | 17. _____ | 27. _____ | 37. _____ |
| 8. _____  | 18. _____ | 28. _____ | 38. _____ |
| 9. _____  | 19. _____ | 29. _____ | 39. _____ |
| 10. _____ | 20. _____ | 30. _____ | 40. _____ |

Total Score  
Range=0-40

## 7 Digit Span

Say *I am going to say some numbers, and I want you to repeat them after me. Okay?*

Read the numbers at the rate of 1 per second. Only read the second string in each set if the first string was failed. Discontinue after failure of both strings in any set.

Scoring: 2 points for the first string correct, 1 point for the second string correct, and 0 points for both strings failed.

| Item | First String      | String Score<br>(0 or 2) | Second String     | String Score<br>(0 or 1) | Item Score<br>(0-2) |
|------|-------------------|--------------------------|-------------------|--------------------------|---------------------|
| 1.   | 4-9               |                          | 5-3               |                          |                     |
| 2.   | 8-3-5             |                          | 2-4-1             |                          |                     |
| 3.   | 7-2-4-6           |                          | 1-6-3-8           |                          |                     |
| 4.   | 5-3-9-2-4         |                          | 3-8-4-9-1         |                          |                     |
| 5.   | 6-4-2-9-3-5       |                          | 9-1-5-3-7-6       |                          |                     |
| 6.   | 2-8-5-1-9-3-7     |                          | 5-3-1-7-4-9-2     |                          |                     |
| 7.   | 8-3-7-9-5-2-4-1   |                          | 9-5-1-4-2-7-3-8   |                          |                     |
| 8.   | 1-5-9-2-3-8-7-4-6 |                          | 5-1-9-7-6-2-3-6-5 |                          |                     |

Total Score  
Range=0-16

## 8 Coding



Time Limit: 90 seconds

Say **Look at these boxes** (indicate key). **For each one of these marks there is a number that goes with it. Down here there are marks, but no numbers. I want you to fill in the number that goes with each mark.**

Demonstrate the first three. Say **Now I would like you to fill in the rest of these boxes up to the double lines** (indicate) **for practice.** Correct any errors as they are made. Make sure that the examinee understands the task and has correctly completed the sample items before you begin timing.

Say **Now I would like you to continue to fill in the numbers that match the marks. Go as quickly as you can without skipping any. When you reach the end of the line, go on to the next one. Ready? Go ahead.**

Redirect the examinee to the task if he or she becomes distracted. If the examinee is unable to comprehend the task, the subtest score is 0.

Scoring: 1 point for each item correctly coded within 90 seconds (*do not* score the sample items).

Note: Familiarize yourself with these instructions before administering this subtest.

Total Score  
Range=0–89

|  |
|--|
|  |
|--|



## 9 List Recall

Say *Do you remember the list of words that I read to you in the beginning? Tell me as many of those words as you can remember now.*

Scoring: 1 point for each word correctly recalled.

| List<br>(Do not read.)    | Response | Score<br>(0 or 1) |
|---------------------------|----------|-------------------|
| Market                    |          |                   |
| Package                   |          |                   |
| Elbow                     |          |                   |
| Apple                     |          |                   |
| Story                     |          |                   |
| Carpet                    |          |                   |
| Bubble                    |          |                   |
| Highway                   |          |                   |
| Saddle                    |          |                   |
| Powder                    |          |                   |
| Total Score<br>Range=0-10 |          |                   |

## 10 List Recognition

Say *I'm going to read you some words. Some of these words were on that list, and some of them weren't. I want you to tell me which words were on the list.* For each word, ask *Was \_\_\_\_\_ on the list?*

Scoring: 1 point for each word correctly identified. Circle the letter corresponding to examinee's response (y = yes, n = no); bold, capitalized (Y, N) letter indicates correct response.

| List      | Circle One | List      | Circle One | List        | Circle One | List        | Circle One |
|-----------|------------|-----------|------------|-------------|------------|-------------|------------|
| 1. Apple  | Y n        | 6. sailor | y N        | 11. Bubble  | Y n        | 16. Saddle  | Y n        |
| 2. honey  | y N        | 7. velvet | y N        | 12. prairie | y N        | 17. Powder  | Y n        |
| 3. Market | Y n        | 8. Carpet | Y n        | 13. Highway | Y n        | 18. angel   | y N        |
| 4. Story  | Y n        | 9. valley | y N        | 14. oyster  | y N        | 19. Package | Y n        |
| 5. fabric | y N        | 10. Elbow | Y n        | 15. student | y N        | 20. meadow  | y N        |

Total Score  
Range=0-20

## 11 Story Recall

Say: *Do you remember that story about a fire that I read to you earlier? Tell me as many details from the story as you can remember now.*

Scoring: 1 point for each verbatim recall of bold, italic words or alternatives, shown below in color within parentheses. Record intrusions or variations in the Responses column.

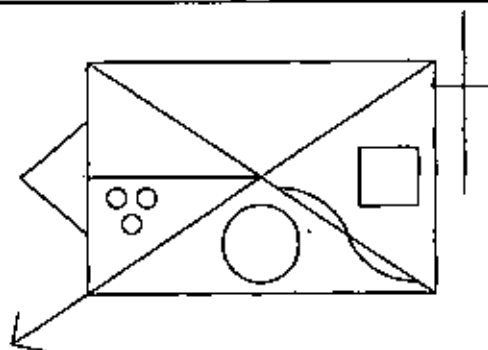
| Story (Do not read.)                                 | Responses | Item Score<br>(0 or 1) |
|------------------------------------------------------|-----------|------------------------|
| 1. On <b>Tuesday</b> ,                               |           |                        |
| 2. <i>May</i>                                        |           |                        |
| 3. <b>Fourth</b> ,                                   |           |                        |
| 4. in <b>Cleveland</b> , Ohio,                       |           |                        |
| 5. a <b>3 alarm</b>                                  |           |                        |
| 6. <i>fire</i> broke out.                            |           |                        |
| 7. <b>Two</b>                                        |           |                        |
| 8. <i>hotels</i>                                     |           |                        |
| 9. and a <b>restaurant</b>                           |           |                        |
| 10. were <b>destroyed</b>                            |           |                        |
| 11. before the <b>firefighters (firemen)</b>         |           |                        |
| 12. were able to <b>extinguish it (put it out)</b> . |           |                        |
| Total Score<br>Range=0-12                            |           |                        |

## 12 Figure Recall

Say *Do you remember that figure that I had you copy? I want you to draw as much of it as you can remember now. If you remember a part, but you're not sure where it goes, put it anywhere. Try to draw as much of it as you can.*

Now, present the Figure Recall Drawing Page.

Scoring: 1 point for correctness and completeness (drawing), and 1 point for proper placement. See Appendix 1 in Stimulus Booklet A for complete scoring criteria and scoring examples.



### Figure Recall Criteria

(Fold back for use.)

| Item               | Drawing<br>(0 or 1) | Placement<br>(0 or 1) | Score<br>(0, 1, or 2) | Scoring Criteria                                                                                                                                                                                                                                                                                                                                                           |
|--------------------|---------------------|-----------------------|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. rectangle       |                     |                       |                       | Drawing: lines are unbroken and straight; angles 90 degrees; top/bottom lines 25% longer than sides<br>Placement: not rotated more than 15 degrees                                                                                                                                                                                                                         |
| 2. diagonal cross  |                     |                       |                       | Drawing: lines are unbroken and straight and should approximately bisect each other<br>Placement: ends of lines should meet corners of the rectangle without significant overlap or measurable distance between the ends of the lines and the corners                                                                                                                      |
| 3. horizontal line |                     |                       |                       | Drawing: line is unbroken and straight; should not exceed 1/2 the length of the rectangle<br>Placement: should bisect left side of the rectangle at approximately a right angle and intersect the diagonal cross                                                                                                                                                           |
| 4. circle          |                     |                       |                       | Drawing: round, unbroken and closed; diameter should be approximately 1/4–1/3 height of rectangle<br>Placement: placed in appropriate segment; not touching any other part of figure                                                                                                                                                                                       |
| 5. 3 small circles |                     |                       |                       | Drawing: round, unbroken and closed; equal size; triangular arrangement; not touching each other<br>Placement: in appropriate segment; not touching figure; triangle formed not rotated more than 15 degrees                                                                                                                                                               |
| 6. square          |                     |                       |                       | Drawing: must be closed; 90 degree angles; lines straight and unbroken; height is 1/4–1/3 height of rectangle<br>Placement: in appropriate segment; not touching any other part of figure; not rotated more than 15 degrees                                                                                                                                                |
| 7. curving line    |                     |                       |                       | Drawing: 2 curved segments are approximately equal in length and symmetrical; correct direction of curves<br>Placement: ends of line touch diagonal; do not touch corner of rectangle or intersection of diagonal lines                                                                                                                                                    |
| 8. outside cross   |                     |                       |                       | Drawing: vertical line of the outside cross is parallel to side of rectangle; >1/2 the height of rectangle; horizontal line crosses vertical at 90 degree angle and is between 20–50% of length of vertical line<br>Placement: horizontal line of outside cross touches rectangle higher than 2/3 the height of rectangle, but below top; does not penetrate the rectangle |
| 9. triangle        |                     |                       |                       | Drawing: angle formed by 2 sides of triangle is between 60–100 degrees; sides are straight, unbroken and meet in a point; distance on vertical side of rectangle subsumed by triangle is approximately 50% of the height of vertical side<br>Placement: roughly centered on the left vertical side of the rectangle                                                        |
| 10. arrow          |                     |                       |                       | Drawing: straight and unbroken; lines forming arrow are approximately equal in length and not more than 1/3 length of staff<br>Placement: must protrude from appropriate corner of rectangle such that staff appears to be continuation of diagonal cross                                                                                                                  |

Total Score  
Range=0–20

# Figure Recall Drawing Page

(Fold back for use.)



# Delis-Kaplan Executive Function System

Dean C. Delis Edith Kaplan Joel H. Kramer

## Standard Record Form

ID: \_\_\_\_\_ Examiner: \_\_\_\_\_

Sex: ☐ F ☐ M Handedness: ☐ R ☐ L ☐ Ambidextrous

Highest Level of Education (years): \_\_\_\_\_

Current Grade (if applicable): \_\_\_\_\_

School (if applicable): \_\_\_\_\_

|                | Year | Month | Day |
|----------------|------|-------|-----|
| Date Tested    |      |       |     |
| Age at Testing |      |       |     |

Referral Source/Reason for Referral/Presenting Complaints: \_\_\_\_\_

Attitude Toward Testing: \_\_\_\_\_

Affect and Mood: \_\_\_\_\_

Unusual Behaviors and Comments: \_\_\_\_\_

Physical Appearance: \_\_\_\_\_

Visual/Auditory/Motor Problems: \_\_\_\_\_

Language Background: \_\_\_\_\_

Diagnostic History: \_\_\_\_\_

Current Medications: \_\_\_\_\_

**PEARSON**

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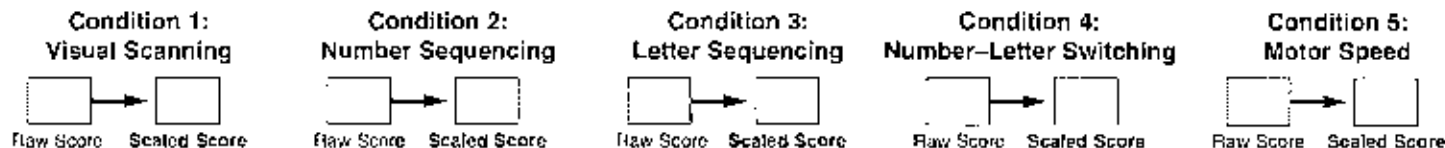
**PsychCorp**

Product Number 0154091154

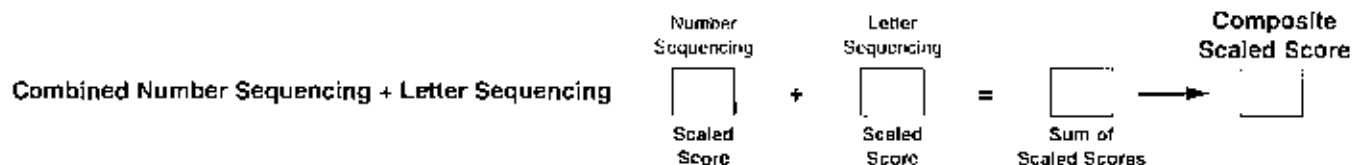
Trails Verbal Design Color Sorting Twenty Word Tower Proverbs

# D-KEFS Trail Making Test: Summary of Scores

## Primary Measures: Completion Times



## Primary Combined Measure: Completion Times



## Primary Contrast Measures: Completion Times

|                                                                                   | Switching:<br>Scaled Score |   | Scaled<br>Score |   | Scaled Score<br>Difference |   | Contrast<br>Scaled Score* |
|-----------------------------------------------------------------------------------|----------------------------|---|-----------------|---|----------------------------|---|---------------------------|
| Number–Letter Switching vs.<br>Visual Scanning*                                   |                            | – |                 | = |                            | → |                           |
| Number–Letter Switching vs.<br>Number Sequencing*                                 |                            | – |                 | = |                            | → |                           |
| Number–Letter Switching vs.<br>Letter Sequencing*                                 |                            | – |                 | = |                            | → |                           |
| Number–Letter Switching vs.<br>Combined Number Sequencing +<br>Letter Sequencing* |                            | – |                 | = |                            | → |                           |
| Number–Letter Switching vs.<br>Motor Speed*                                       |                            | – |                 | = |                            | → |                           |

\* A low or high contrast scaled score may reflect different cognitive problems; see examiner's manual.

## Optional Measures: Error Analysis

|                                                                                                                                                 |                                                                                        |                                                                                          |                                                                                          |                                                                                                |                                                                                    |
|-------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|
|                                                                                                                                                 | <b>Condition 1:<br/>Visual Scanning</b><br><br>Raw Score    Cumulative Percentile Rank | <b>Condition 2:<br/>Number Sequencing</b><br><br>Raw Score    Cumulative Percentile Rank | <b>Condition 3:<br/>Letter Sequencing</b><br><br>Raw Score    Cumulative Percentile Rank | <b>Condition 4:<br/>Number–Letter Switching</b><br><br>Raw Score    Cumulative Percentile Rank | <b>Condition 5:<br/>Motor Speed</b><br><br>Raw Score    Cumulative Percentile Rank |
| <b>Omission Errors</b><br><br>Raw Score    Cumulative Percentile Rank                                                                           | <b>Sequencing Errors</b><br><br>Raw Score    Cumulative Percentile Rank                | <br>Raw Score    Cumulative Percentile Rank                                              | <br>Raw Score    Cumulative Percentile Rank                                              | <br>Raw Score    Cumulative Percentile Rank                                                    | <br>Raw Score    Cumulative Percentile Rank                                        |
| <b>Commission Errors</b><br><br>Raw Score    Cumulative Percentile Rank                                                                         | <b>Set-Loss Errors</b><br><br>Raw Score    Cumulative Percentile Rank                  | <br>Raw Score    Cumulative Percentile Rank                                              | <br>Raw Score    Cumulative Percentile Rank                                              | <br>Raw Score    Cumulative Percentile Rank                                                    | <br>Raw Score    Cumulative Percentile Rank                                        |
|                                                                                                                                                 | <b>Time-Discontinue Errors</b><br><br>Raw Score    Cumulative Percentile Rank          | <br>Raw Score    Cumulative Percentile Rank                                              | <br>Raw Score    Cumulative Percentile Rank                                              | <br>Raw Score    Cumulative Percentile Rank                                                    | <br>Raw Score    Cumulative Percentile Rank                                        |
| <div style="text-align: center;"> <br/> <b>Condition 4:<br/>All Error Types</b><br/> <br/>         Total Raw Score    Scaled Score       </div> |                                                                                        |                                                                                          |                                                                                          |                                                                                                |                                                                                    |

Note: Cumulative percentile ranks for the D-KEFS were scaled to reflect the percentage of the normative sample that obtained raw scores equal to or worse than the raw score obtained by the examinee.

# D-KEFS Verbal Fluency Test

## Condition 1: Letter Fluency

**F**

**A**

**S**

First  
Interval:  
1-15  
Seconds

1"-15"

1"-15"

1"-15"

1"-15"  
**F + A + S**  
Correct  
Responses

Second  
Interval:  
16-30  
Seconds

16"-30"

16"-30"

16"-30"

16"-30"  
**F + A + S**  
Correct  
Responses

Third  
Interval:  
31-45  
Seconds

31"-45"

31"-45"

31"-45"

31"-45"  
**F + A + S**  
Correct  
Responses

Fourth  
Interval:  
46-60  
Seconds

46"-60"

46"-60"

46"-60"

46"-60"  
**F + A + S**  
Correct  
Responses

**F**  
Total  
Correct Responses   
Total  
Set-Loss Errors   
Total  
Repetition Errors

**A**  
Total  
Correct Responses   
Total  
Set-Loss Errors   
Total  
Repetition Errors

**S**  
Total  
Correct Responses   
Total  
Set-Loss Errors   
Total  
Repetition Errors

1"-60"  
**F + A + S**  
Letter  
Fluency:  
Total  
Correct  
Raw Score

Letter Fluency: Total Responses\*  
(Correct + Incorrect)

\* Note: Some repetition errors are coded also as set-loss errors; each double-coded error counts as only one response for the total responses measure.

# D-KEFS Verbal Fluency Test (continued)

## Condition 2: Category Fluency

### Animals

|                                      |                                 |
|--------------------------------------|---------------------------------|
| First Interval:<br>1-15<br>Seconds   | 1"-15"<br><input type="text"/>  |
| Second Interval:<br>16-30<br>Seconds | 16"-30"<br><input type="text"/> |
| Third Interval:<br>31-45<br>Seconds  | 31"-45"<br><input type="text"/> |
| Fourth Interval:<br>46-60<br>Seconds | 46"-60"<br><input type="text"/> |

**Animals**  
Total Correct Responses   
Total Set-Loss Errors   
Total Repetition Errors

Category Fluency: Total Responses  
(Correct + Incorrect)\*

### Boys' Names

|                                 |                                 |                                                                                      |
|---------------------------------|---------------------------------|--------------------------------------------------------------------------------------|
| 1"-15"<br><input type="text"/>  | 1"-15"<br><input type="text"/>  | 1"-15"<br><b>Animals + Boys' Names</b><br>Correct Responses<br><input type="text"/>  |
| 16"-30"<br><input type="text"/> | 16"-30"<br><input type="text"/> | 16"-30"<br><b>Animals + Boys' Names</b><br>Correct Responses<br><input type="text"/> |
| 31"-45"<br><input type="text"/> | 31"-45"<br><input type="text"/> | 31"-45"<br><b>Animals + Boys' Names</b><br>Correct Responses<br><input type="text"/> |
| 46"-60"<br><input type="text"/> | 46"-60"<br><input type="text"/> | 46"-60"<br><b>Animals + Boys' Names</b><br>Correct Responses<br><input type="text"/> |

**Boys' Names**  
Total Correct Responses   
Total Set-Loss Errors   
Total Repetition Errors   
1"-60"  
  
Category Fluency: Total Correct Raw Score



# D-KEFS Verbal Fluency Test (continued)

## Condition 3: Category Switching

### Fruits / Furniture

First  
Interval:  
1-15  
Seconds

1'-15"  
**Fruits**  
+  
**Furniture**  
Correct  
Responses\*

Second  
Interval:  
16-30  
Seconds

16'-30"  
**Fruits**  
+  
**Furniture**  
Correct  
Responses\*

Third  
Interval:  
31-45  
Seconds

31'-45"  
**Fruits**  
+  
**Furniture**  
Correct  
Responses\*

Fourth  
Interval:  
46-60  
Seconds

46'-60"  
**Fruits**  
+  
**Furniture**  
Correct  
Responses\*

Category Switching:  
Total Switching  
Accuracy

**Fruits**  
Total Correct  
Responses\*

+

**Furniture**  
Total Correct  
Responses\*

=

1'-60"  
**Fruits**  
+  
**Furniture**  
Correct  
Responses\*

Category Switching:  
Total Correct Responses\*

Raw  
Score

\* Correct responses are summed  
independent of switching accuracy.

Total Set-Loss Errors

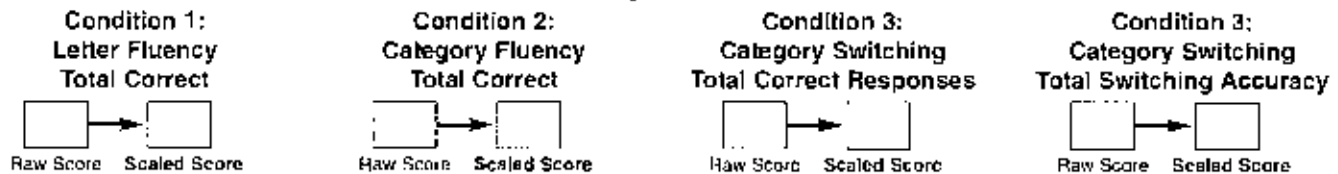
Total Repetition Errors

Category Switching:  
Total Responses (Correct + Incorrect)\*\*

\*\* Note: Some repetition errors are coded also as set-loss errors; each double-coded error counts as only one response for the total responses measure.

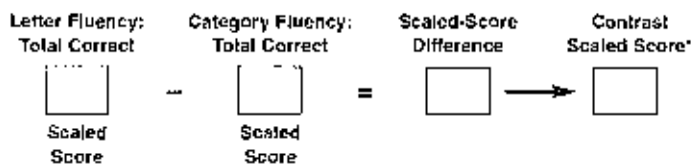
# D-KEFS Verbal Fluency Test: Summary of Scores

## Primary Measures

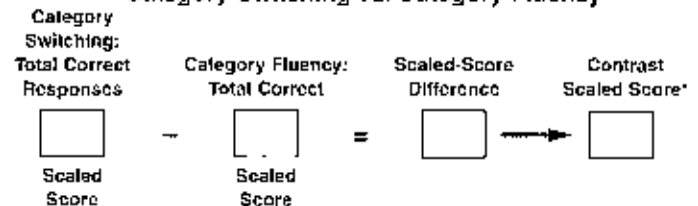


## Primary Contrast Measures

### Letter Fluency vs. Category Fluency\*



### Category Switching vs. Category Fluency\*



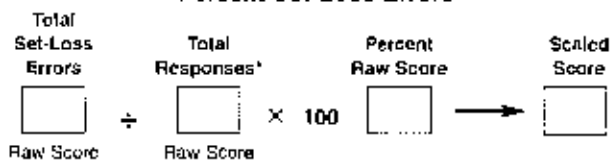
\* A low or high contrast scaled score may reflect different cognitive problems; see examiner's manual.

## Optional Measures: Conditions 1–3 Combined

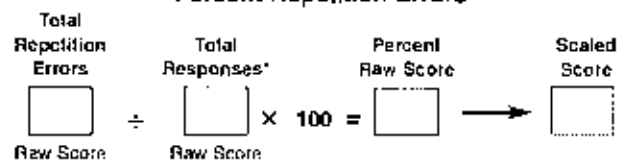
|                                           | Condition 1:<br>Letter<br>Fluency<br>Raw Score |   | Condition 2:<br>Category<br>Fluency<br>Raw Score |   | Condition 3:<br>Category<br>Switching<br>Raw Score |   | Total<br>Raw Score   | Scaled Score         |
|-------------------------------------------|------------------------------------------------|---|--------------------------------------------------|---|----------------------------------------------------|---|----------------------|----------------------|
| First Interval (1"–15"): Total Correct    | <input type="text"/>                           | + | <input type="text"/>                             | + | <input type="text"/>                               | = | <input type="text"/> | <input type="text"/> |
| Second Interval (16"–30"): Total Correct  | <input type="text"/>                           | + | <input type="text"/>                             | + | <input type="text"/>                               | = | <input type="text"/> | <input type="text"/> |
| Third Interval (31"–45"): Total Correct   | <input type="text"/>                           | + | <input type="text"/>                             | + | <input type="text"/>                               | = | <input type="text"/> | <input type="text"/> |
| Fourth Interval (46"–60"): Total Correct  | <input type="text"/>                           | + | <input type="text"/>                             | + | <input type="text"/>                               | = | <input type="text"/> | <input type="text"/> |
| Set-Loss Errors                           | <input type="text"/>                           | + | <input type="text"/>                             | + | <input type="text"/>                               | = | <input type="text"/> | <input type="text"/> |
| Repetition Errors                         | <input type="text"/>                           | + | <input type="text"/>                             | + | <input type="text"/>                               | = | <input type="text"/> | <input type="text"/> |
| Total Responses<br>(Correct + Incorrect)* | <input type="text"/>                           | + | <input type="text"/>                             | + | <input type="text"/>                               | = | <input type="text"/> |                      |

\* Note: Some repetition errors are coded also as set-loss errors; each double-coded error counts as only one response for the total responses measure.

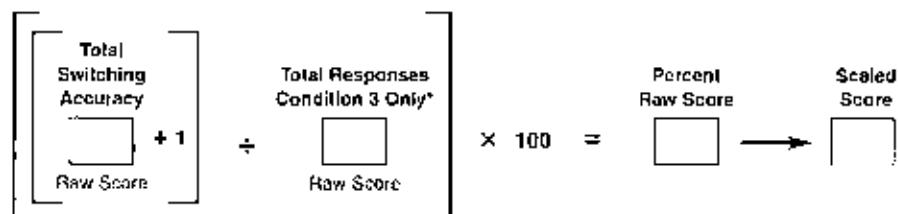
### Percent Set-Loss Errors



### Percent Repetition Errors



### Category Switching: Percent Switching Accuracy (Condition 3 Only)



\* Note: Some repetition errors are coded also as set-loss errors; each double-coded error counts as only one response for the total responses measure.

13. **What is the purpose of the study?**

Condition 1  
Filled Dots:  
Total Correct

Condition 2  
Empty Dots Only:  
Total Correct

Condition 3  
Switching:  
Total Correct

Design Fluency  
Total Correct

Design Fluency: Total Correct

Sum of  
Scaled Scores

Composite  
Scaled Score

**Combined Filled Dots + Empty Dots: Total Correct**

| Condition 1 Filled Dots                                                           | Condition 2 Empty Dots Only                                                       | Sum of Scaled Scores                                                               | Composite Scaled Score                                                              |
|-----------------------------------------------------------------------------------|-----------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
|  |  |  |  |
| Scaled Score                                                                      | Scaled Score                                                                      |                                                                                    |                                                                                     |

**Switching vs. Combined Filled Dots + Empty Dots\***

|                                                                                   |   |                                                                                   |   |                                                                                    |   |                                                                                     |
|-----------------------------------------------------------------------------------|---|-----------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------|---|-------------------------------------------------------------------------------------|
| Condition 3<br>Switching:<br>Total Correct                                        |   | Conditions 1 + 2<br>Combined                                                      |   | Scaled<br>Score<br>Difference                                                      |   | Contrast<br>Scaled<br>Score*                                                        |
|  | - |  | = |  | → |  |
| Scaled Score                                                                      |   | Composite<br>Scaled Score                                                         |   |                                                                                    |   |                                                                                     |

### Optional Measures

### Optional Measures

|                                 | Condition 1<br>Filled Dots                                                                                               | Condition 2<br>Empty Dots Only                                                                                           | Condition 3<br>Switching                                                                                                  |   | Total Set-Loss<br>Designs                                                                          | Total Set-Loss<br>Designs                                                                             |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|---|----------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------|
| <b>Total Set-Loss Designs</b>   | Set-Loss<br>Designs<br><br>Raw Score  | Set-Loss<br>Designs<br><br>Raw Score  | Set-Loss<br>Designs<br><br>Raw Score  | = | <br>Raw Score | <br>Scaled Score |
| <b>Total Repeated Designs</b>   | Repeated<br>Designs<br><br>Raw Score  | Repeated<br>Designs<br><br>Raw Score  | Repeated<br>Designs<br><br>Raw Score  | = | <br>Raw Score | <br>Scaled Score |
| <b>Total Attempted Designs*</b> | Attempted<br>Designs<br><br>Raw Score | Attempted<br>Designs<br><br>Raw Score | Attempted<br>Designs<br><br>Raw Score | = | <br>Raw Score | <br>Scaled Score |

\* Note: Some replication errors are coded also as set-loss errors; each double-coded error counts as only one response for the total attempted designs measure.

**Percent Design Accuracy**

$$\frac{\left[ \begin{array}{c} \text{Design} \\ \text{Fluency:} \\ \text{Total Correct} \\ \hline \text{Raw Score} \end{array} \right]}{\left[ \begin{array}{c} \text{Total} \\ \text{Attempted} \\ \text{Designs*} \\ \hline \text{Raw Score} \end{array} \right]} \times 100 = \begin{array}{c} \text{Percent} \\ \text{Raw Score} \\ \hline \end{array} \longrightarrow \begin{array}{c} \text{Scaled} \\ \text{Score} \\ \hline \end{array}$$

# D-KEFS Color-Word Interference Test

**Ages 8–89**

**Materials:** Record Form, Stimulus Booklet (Flat Position), Stopwatch

## Condition 1: Color Naming

### Discontinue

Discontinue if the examinee has marked difficulty or makes four uncorrected errors on the practice lines. Otherwise, discontinue the scored task after 90 seconds.

### Administration and Recording

Place the stimulus booklet flat on the table in a horizontal (landscape) position directly in front of the examinee so that the two practice lines of Condition 1 are positioned at the top of the page from the examinee's perspective. Say,

**This page has patches of color on it. I'd like you to say the colors as quickly as you can without skipping any or making mistakes. When you finish this line (sweep across the first practice line of five squares with your finger), go on to this one (point to the first square of the second row). Now try these first two lines for practice.**

If the examinee is able to complete the two practice lines, say, **Good. Now, when I say begin, I want you to say the rest of the colors. Begin here (point to the first square on the first line of 10 squares below the practice lines) and say each color, one after the other, without skipping any. When you finish this line (sweep across the first row with your finger), go on to this one (point to the first square of the second row). Keep saying the colors until you reach the end of the last line (point). Say the colors as quickly as you can without making mistakes. Ready? Begin.**

Start timing. Follow the examinee's progress item by item. Record errors by writing the first letter of the incorrect color name beneath the correct response and record any nonsense words (e.g., "bleen") verbatim. Indicate self-corrections by drawing a slash mark through the letter or word. Record total completion time in seconds.

Allow the examinee to use a finger to maintain his or her place on the stimulus page. If the examinee skips a line accidentally, point out the error immediately and redirect the examinee to the correct line. Keep the stopwatch running while pointing out line-skipping errors.

If the examinee does not complete the task at the end of 90 seconds, say, **Stop.** Indicate the last item attempted and record 90 seconds as the total completion time. Items to which the examinee did not respond because the time limit was reached are not counted as errors. Turn the page in the stimulus booklet to Condition 2: Word Reading.

|      |       |       |       |       |       |       |       |       |       |
|------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
|      |       |       | green | red   | blue  | green | blue  |       |       |
|      |       |       | red   | blue  | green | blue  | green |       |       |
| red  | blue  | red   | green | red   | blue  | green | blue  | red   | green |
| blue | green | red   | green | red   | green | blue  | red   | blue  | green |
| red  | green | blue  | red   | green | red   | green | blue  | green | red   |
| blue | red   | green | blue  | red   | green | blue  | red   | blue  | green |
| red  | blue  | red   | green | blue  | green | blue  | red   | blue  | green |

## Condition 1: Color Naming

Total  
Uncorrected  
Errors

Total  
Self-Corrected  
Errors

Total  
Time To  
Complete

# D-KEFS Color-Word Interference Test (continued)

## Condition 2: Word Reading

### Discontinue

Discontinue if the examinee has marked difficulty or makes four uncorrected errors on the two practice lines. Otherwise, discontinue the scored task after 90 seconds.

### Administration and Recording

Place the stimulus booklet flat on the table in a horizontal (landscape) position directly in front of the examinee, with the rows of words printed in black ink facing the examinee. Say,

**Now look at this page with words printed on it. I'd like you to read the words aloud as quickly as you can without skipping any or making mistakes. When you finish this line (sweep across the first practice line of five words with your finger), go on to this one (point to the first word of the second row). Now try reading these first two lines for practice.**

If the examinee is able to complete the two practice lines, say,

**Good. Now, when I say begin, I want you to read the rest of the words. Begin here (point to the first word on the first line of 10 words below the practice lines) and read each word, one after the other, without skipping any. Keep reading the words until you reach the end (point to the last word on the last line). Read the words as quickly as you can without making mistakes. Ready? Begin.**

Start timing. Follow the examinee's progress item by item. Record errors by writing the first letter of the incorrect word beneath the correct response and record any nonsense words (e.g., "bleen") verbatim. Indicate self-corrections by drawing a slash mark through the letter or word. Record total completion time in seconds.

Allow the examinee to use a finger to maintain his or her place on the stimulus page. If the examinee skips a line accidentally, point out the error immediately and redirect the examinee to the correct line. Keep the stopwatch running while pointing out line-skipping errors.

If the examinee does not complete the task at the end of 90 seconds, say, **Stop**. Indicate the last item attempted and record 90 seconds as the total completion time. Items to which the examinee did not respond because the time limit was reached are not counted as errors. Turn the page in the stimulus booklet to Condition 3: Inhibition.

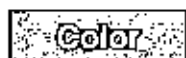
|       |       |      |       |       |       |       |       |      |       |
|-------|-------|------|-------|-------|-------|-------|-------|------|-------|
|       |       |      | red   | blue  | green | red   | blue  |      |       |
|       |       |      | green | blue  | green | red   | green |      |       |
| green | red   | blue | green | blue  | red   | blue  | green | blue | green |
| red   | green | blue | green | blue  | green | red   | blue  | red  | green |
| red   | green | blue | green | red   | blue  | green | red   | blue | red   |
| blue  | green | red  | blue  | green | red   | blue  | green | blue | red   |
| green | red   | blue | red   | blue  | green | red   | blue  | red  | green |

## Condition 2: Word Reading

Total  
Uncorrected  
Errors

Total  
Self-Corrected  
Errors

Total  
Time To  
Complete



# D-KEFS Color-Word Interference Test (continued)

## Condition 3: Inhibition

### Discontinue

Discontinue if the examinee has marked difficulty or requires four corrections on the two practice lines. Otherwise, discontinue the scored task after 180 seconds.

### Administration and Recording

Place the stimulus booklet flat on the table in a horizontal (landscape) position directly in front of the examinee, with the rows of words printed in dissonant ink colors facing the examinee. Say,

Now look at this page. It's going to be a little harder than the other pages because the color names are printed in a different-colored ink. For example (point to the first word on the first practice line of five words), do you see how the word *red* is printed in *green* ink here? This time, you are to name *the color of the ink* that the letters are printed in and *not read the word*. So, what would you say for this one? (Point again to the first word on the first practice line and allow the examinee to respond. Correct any errors.) Good. And this one? (Point to the next two practice items. Correct any errors.) Good. Now try these first two lines for practice.

If the examinee has difficulty understanding the task, you may demonstrate it by naming the ink colors on the first practice line, then inviting the examinee to respond to the second line. If the examinee requires four corrections on the two practice lines, discontinue this condition and do not administer Condition 4: Inhibition/Switching.

If the examinee is able to complete the two practice lines, say,

Good. Now, when I say begin, I want you to do the same thing for the rest of them. Say the color of the ink the letters are printed in; do not read the words. Begin here (point to the first word on the first line of 10 words below the practice lines) and say each ink color, one after the other, without skipping any. Keep saying the ink colors until you reach the end (point to the last word of the last line). Say the ink colors as quickly as you can without making mistakes. Ready? Begin.

Start timing. Follow the examinee's progress item by item. The single letter (*r* for red, *b* for blue, *g* for green) printed in parentheses next to each correct response represents the error response if the examinee reads the word rather than naming the ink color. Record errors by circling the letter or by writing the initial letter of other incorrect colors beneath the correct response. Also record any nonsense words (e.g., "bleen") verbatim. Indicate self-corrections by drawing a slash through the letter or word. Record total completion time in seconds.

Allow the examinee to use a finger to maintain his or her place on the stimulus page. If the examinee skips a line accidentally, point out the error immediately and redirect the examinee to the correct line. Keep the stopwatch running while pointing out line-skipping errors.

If the examinee makes three consecutive errors of reading the words, prompt him or her to name the ink color. Provide this prompt only once during this condition and keep the stopwatch running.

If the examinee does not complete the task at the end of 180 seconds, say, **Stop**. Indicate the last item attempted and record 180 seconds as the total completion time. Items to which the examinee did not respond because the time limit was reached are not counted as errors. Turn the page in the stimulus booklet to Condition 4: Inhibition/Switching.

green(r) red(b) blue(g) green(b) red(g)

blue(r) red(b) green(r) red(g) green(r)

red(b) blue(g) red(b) green(r) red(b) blue(r) green(b) blue(r) red(b) green(r)

red(b) blue(g) green(b) blue(g) green(r) blue(g) red(b) green(r) red(b) blue(g)

green(r) blue(g) green(r) red(b) blue(g) green(r) red(g) blue(r) green(b) red(g)

green(b) blue(g) red(b) green(r) blue(g) red(b) green(r) blue(g) green(r) red(g)

blue(g) green(b) blue(r) red(b) blue(g) green(r) red(b) blue(g) green(r) red(b)

## Condition 3: Inhibition

Total  
Uncorrected  
Errors

Total  
Self-Corrected  
Errors

Total  
Time To  
Complete

# D-KEFS Color-Word Interference Test (continued)

## Condition 4: Inhibition/Switching

### Discontinue

Do not administer Condition 4 if the examinee had marked difficulty or did not finish before the time limit was reached on Condition 3: Inhibition. Discontinue if the examinee has marked difficulty or requires four corrections on the practice lines of Condition 4. Otherwise, discontinue the scored task after 180 seconds.

### Administration and Recording

Place the stimulus booklet flat on the table in a horizontal (landscape) position directly in front of the examinee, with the rows of words printed in dissonant ink colors, half of which are contained in rectangles, facing the examinee. Say,

**This is the fourth and last page. This time, for many of the words, you are to do the same thing you just did: Name the color of the ink and do not read the words. But if a word is inside a little box, you should read the word and not name the ink color. (Point to the first three items in the first practice line of five words.) For example, what would you say for these first three words? (Allow the examinee to respond and provide corrections if necessary.) Good. Now try these first two lines for practice.**

If the examinee has difficulty understanding the task, you may demonstrate it by responding to the items on the first practice line, then inviting the examinee to respond to the second line. If the examinee requires four corrections on the two practice lines, discontinue this condition. If the examinee is able to complete the practice lines, say,

**Very good. Now, when I say begin, I want you to do the same thing for the rest of them. Say the color of the ink the letters are printed in or read the word if it is in a box. Begin here (point to the first word on the first line of 10 words below the practice lines) and keep going until you reach the end (point to the last word of the last line). Say the ink colors or words as quickly as you can without making mistakes. Ready? Begin.**

Start timing. Follow the examinee's progress item by item. The single letter (r for red, b for blue, g for green) printed in parentheses next to each correct response represents the error response if the examinee either (a) reads the word rather than naming the ink color for an item not contained in a rectangle or (b) names the ink color rather than reading the word for an item contained in a rectangle. Record errors by circling the letter or by writing the initial letter of other incorrect colors beneath the correct response. Also record any nonsense words (e.g., "bleen") verbatim. Indicate self-corrections by drawing a slash through the letter or word. Record total completion time in seconds.

Allow the examinee to use a finger to maintain his or her place on the stimulus page. If the examinee skips a line accidentally, point out the error immediately and redirect the examinee to the correct line. Keep the stopwatch running while pointing out line-skipping errors.

If the examinee makes three consecutive errors, prompt him or her either to name the ink color or to read the word in the rectangle. Provide this prompt only once during this condition and keep the stopwatch running.

If the examinee does not complete the task at the end of 180 seconds, say, **Stop**. Indicate the last item attempted and record 180 seconds as the total completion time. Items to which the examinee did not respond because the time limit was reached are not counted as errors.

|          |          |          |          |          |          |          |          |          |         |  |
|----------|----------|----------|----------|----------|----------|----------|----------|----------|---------|--|
|          |          |          |          | red(b)   | blue(r)  | green(r) | blue(r)  | green(b) |         |  |
|          |          |          |          | blue(g)  | red(g)   | blue(g)  | green(r) | blue(r)  |         |  |
| red(g)   | blue(g)  | red(g)   | green(b) | red(b)   | green(r) | blue(r)  | green(r) | green(r) | blue(r) |  |
| red(b)   | blue(r)  | green(r) | red(g)   | blue(g)  | red(g)   | green(b) | red(b)   | green(r) | blue(r) |  |
| green(b) | blue(r)  | green(r) | red(g)   | blue(r)  | green(r) | green(b) | red(b)   | green(b) | red(b)  |  |
| red(b)   | green(b) | red(b)   | green(b) | red(g)   | blue(r)  | green(r) | blue(r)  | blue(g)  | red(g)  |  |
| green(r) | red(g)   | blue(r)  | red(b)   | green(b) | red(b)   | blue(r)  | green(r) | blue(g)  | red(g)  |  |

## Condition 4: Inhibition/Switching

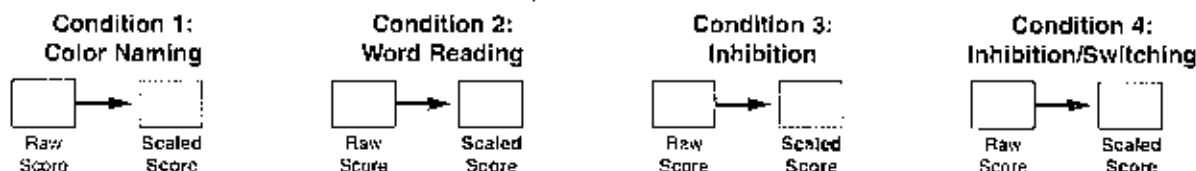
Total  
Uncorrected  
Errors

Total  
Self-Corrected  
Errors

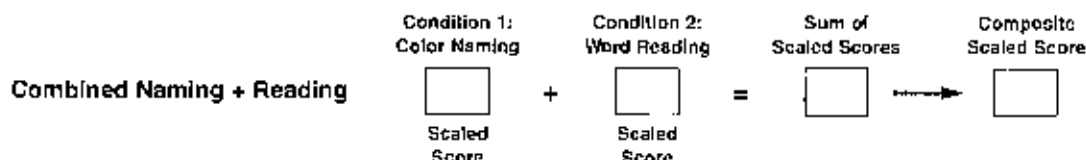
Total  
Time To  
Complete

# D-KEFS Color-Word Interference Test: Summary of Scores

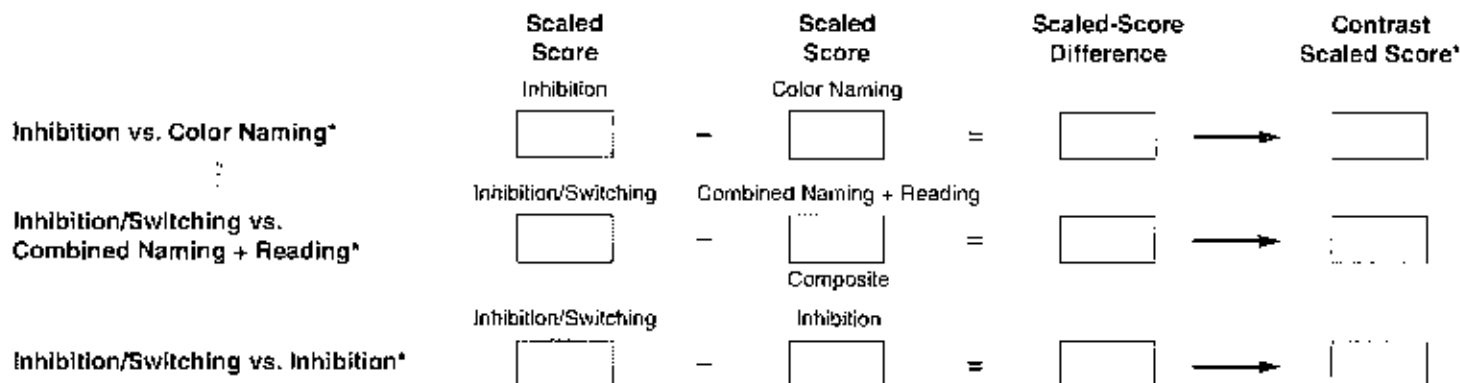
## Primary Measures: Completion Times



## Primary Combined Measure: Completion Times

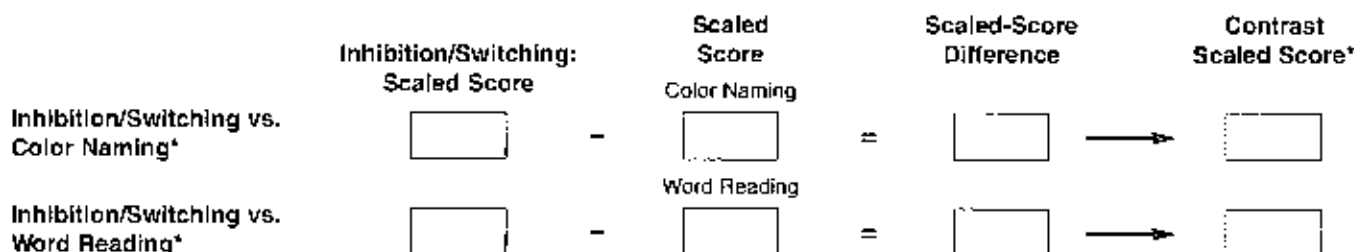


## Primary Contrast Measures: Completion Times



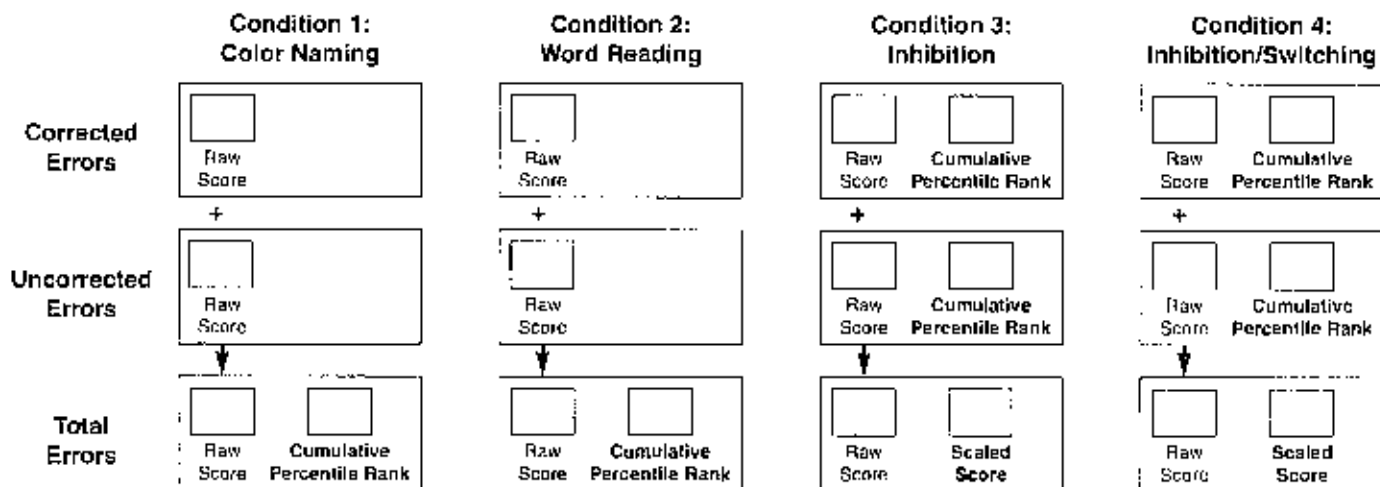
\* A low or high contrast scaled score may reflect different cognitive problems; see examiner's manual.

## Optional Contrast Measures: Completion Times



\* A low or high contrast scaled score may reflect different cognitive problems; see examiner's manual.

## Optional Measures: Error Analysis



Note: Cumulative percentile ranks for the D-KEFS were scaled to reflect the percentage of the normative sample that obtained raw scores equal to or worse than the raw score obtained by the examinee.



# D-KEFS Sorting Test

## Screening Pretest

Words Incorrectly Read: \_\_\_\_\_

Raw Score: \_\_\_\_\_

Words Not Understood: \_\_\_\_\_

Raw Score: \_\_\_\_\_

### Condition 1—Free Sorting: Card Set 1

Discontinue administration of Card Set 1 after either (a) the examinee indicates that he or she cannot identify any more sorts, even after receiving the single prompt to keep trying; (b) 240 seconds (4 minutes) of cumulative *sorting* time have elapsed; or (c) the examinee has completed 10 attempted sorts.

#### First Sort

Description:

Sorting Time  
(Seconds)

Sort:

|                |      |             |
|----------------|------|-------------|
| Animals        | Air  | 1 Syllable  |
| Transportation | Land | 2 Syllables |

Verbal Sorts

|       |          |           |        |       |
|-------|----------|-----------|--------|-------|
| Large | Curved   | Uppercase | Blue   | White |
| Small | Straight | Lowercase | Yellow | Red   |

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Airplane Bus Car Duck Eagle Tiger

#### PRIMARY DESCRIPTION MEASURES

|                             |   |   |   |
|-----------------------------|---|---|---|
| 1st Group Description Score | 0 | 1 | 2 |
| 2nd Group Description Score | 0 | 1 | 2 |

#### OPTIONAL DESCRIPTION MEASURES

|                             |     |
|-----------------------------|-----|
| Incorrect Description       | Y   |
| Repeated Description        | Y   |
| No/Don't Know Response      | Y   |
| Noncredit Description       | Y   |
| Overly Abstract Description | Y   |
| Description Type            | V P |

#### PRIMARY SORTING MEASURE

|                        |   |
|------------------------|---|
| Confirmed Correct Sort | Y |
|------------------------|---|

#### OPTIONAL SORTING MEASURES

|                         |     |
|-------------------------|-----|
| Repeated Sort           | Y   |
| Unconfirmed Target Sort | Y   |
| Set-Loss Sort           | Y   |
| Non-target Even Sort    | Y   |
| Sort Type               | V P |

#### Second Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|                |      |             |
|----------------|------|-------------|
| Animals        | Air  | 1 Syllable  |
| Transportation | Land | 2 Syllables |

Verbal Sorts

|       |          |           |        |       |
|-------|----------|-----------|--------|-------|
| Large | Curved   | Uppercase | Blue   | White |
| Small | Straight | Lowercase | Yellow | Red   |

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Airplane Bus Car Duck Eagle Tiger

#### PRIMARY DESCRIPTION MEASURES

|                             |   |   |   |
|-----------------------------|---|---|---|
| 1st Group Description Score | 0 | 1 | 2 |
| 2nd Group Description Score | 0 | 1 | 2 |

#### OPTIONAL DESCRIPTION MEASURES

|                             |     |
|-----------------------------|-----|
| Incorrect Description       | Y   |
| Repeated Description        | Y   |
| No/Don't Know Response      | Y   |
| Noncredit Description       | Y   |
| Overly Abstract Description | Y   |
| Description Type            | V P |

#### PRIMARY SORTING MEASURE

|                        |   |
|------------------------|---|
| Confirmed Correct Sort | Y |
|------------------------|---|

#### OPTIONAL SORTING MEASURES

|                         |     |
|-------------------------|-----|
| Repeated Sort           | Y   |
| Unconfirmed Target Sort | Y   |
| Set-Loss Sort           | Y   |
| Non-target Even Sort    | Y   |
| Sort Type               | V P |

#### Third Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|                |      |             |
|----------------|------|-------------|
| Animals        | Air  | 1 Syllable  |
| Transportation | Land | 2 Syllables |

Verbal Sorts

|       |          |           |        |       |
|-------|----------|-----------|--------|-------|
| Large | Curved   | Uppercase | Blue   | White |
| Small | Straight | Lowercase | Yellow | Red   |

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Airplane Bus Car Duck Eagle Tiger

#### PRIMARY DESCRIPTION MEASURES

|                             |   |   |   |
|-----------------------------|---|---|---|
| 1st Group Description Score | 0 | 1 | 2 |
| 2nd Group Description Score | 0 | 1 | 2 |

#### OPTIONAL DESCRIPTION MEASURES

|                             |     |
|-----------------------------|-----|
| Incorrect Description       | Y   |
| Repeated Description        | Y   |
| No/Don't Know Response      | Y   |
| Noncredit Description       | Y   |
| Overly Abstract Description | Y   |
| Description Type            | V P |

#### PRIMARY SORTING MEASURE

|                        |   |
|------------------------|---|
| Confirmed Correct Sort | Y |
|------------------------|---|

#### OPTIONAL SORTING MEASURES

|                         |     |
|-------------------------|-----|
| Repeated Sort           | Y   |
| Unconfirmed Target Sort | Y   |
| Set-Loss Sort           | Y   |
| Non-target Even Sort    | Y   |
| Sort Type               | V P |

## Free Sorting: Card Set 1 (continued)

### Fourth Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|                |      |             |
|----------------|------|-------------|
| Animals        | Air  | 1 Syllable  |
| Transportation | Land | 2 Syllables |

Verbal Sorts

|       |          |           |        |       |
|-------|----------|-----------|--------|-------|
| Large | Curved   | Uppercase | Blue   | White |
| Small | Straight | Lowercase | Yellow | Red   |

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Airplane Bus Car Duck Eagle Tiger

| PRIMARY DESCRIPTION MEASURES  |   |     |
|-------------------------------|---|-----|
| 1st Group Description Score   | 0 | 1 2 |
| 2nd Group Description Score   | 0 | 1 2 |
| OPTIONAL DESCRIPTION MEASURES |   |     |
| Incorrect Description         | Y |     |
| Repeated Description          | Y |     |
| No/Don't Know Response        | Y |     |
| Nonredundant Description      | Y |     |
| Overly Abstract Description   | Y |     |
| Description Type              | V | P   |

| PRIMARY SORTING MEASURE   |     |
|---------------------------|-----|
| Confirmed Correct Sort    | Y   |
| OPTIONAL SORTING MEASURES |     |
| Repeated Sort             | Y   |
| Unconfirmed Target Sort   | Y   |
| Set-Loss Sort             | Y   |
| Non-target Even Sort      | Y   |
| Sort Type                 | V P |

### Fifth Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|                |      |             |
|----------------|------|-------------|
| Animals        | Air  | 1 Syllable  |
| Transportation | Land | 2 Syllables |

Verbal Sorts

|       |          |           |        |       |
|-------|----------|-----------|--------|-------|
| Large | Curved   | Uppercase | Blue   | White |
| Small | Straight | Lowercase | Yellow | Red   |

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Airplane Bus Car Duck Eagle Tiger

| PRIMARY DESCRIPTION MEASURES  |   |     |
|-------------------------------|---|-----|
| 1st Group Description Score   | 0 | 1 2 |
| 2nd Group Description Score   | 0 | 1 2 |
| OPTIONAL DESCRIPTION MEASURES |   |     |
| Incorrect Description         | Y |     |
| Repeated Description          | Y |     |
| No/Don't Know Response        | Y |     |
| Nonredundant Description      | Y |     |
| Overly Abstract Description   | Y |     |
| Description Type              | V | P   |

| PRIMARY SORTING MEASURE   |     |
|---------------------------|-----|
| Confirmed Correct Sort    | Y   |
| OPTIONAL SORTING MEASURES |     |
| Repeated Sort             | Y   |
| Unconfirmed Target Sort   | Y   |
| Set-Loss Sort             | Y   |
| Non-target Even Sort      | Y   |
| Sort Type                 | V P |

### Sixth Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|                |      |             |
|----------------|------|-------------|
| Animals        | Air  | 1 Syllable  |
| Transportation | Land | 2 Syllables |

Verbal Sorts

|       |          |           |        |       |
|-------|----------|-----------|--------|-------|
| Large | Curved   | Uppercase | Blue   | White |
| Small | Straight | Lowercase | Yellow | Red   |

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Airplane Bus Car Duck Eagle Tiger

| PRIMARY DESCRIPTION MEASURES  |   |     |
|-------------------------------|---|-----|
| 1st Group Description Score   | 0 | 1 2 |
| 2nd Group Description Score   | 0 | 1 2 |
| OPTIONAL DESCRIPTION MEASURES |   |     |
| Incorrect Description         | Y |     |
| Repeated Description          | Y |     |
| No/Don't Know Response        | Y |     |
| Nonredundant Description      | Y |     |
| Overly Abstract Description   | Y |     |
| Description Type              | V | P   |

| PRIMARY SORTING MEASURE   |     |
|---------------------------|-----|
| Confirmed Correct Sort    | Y   |
| OPTIONAL SORTING MEASURES |     |
| Repeated Sort             | Y   |
| Unconfirmed Target Sort   | Y   |
| Set-Loss Sort             | Y   |
| Non-target Even Sort      | Y   |
| Sort Type                 | V P |

### Seventh Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|                |      |             |
|----------------|------|-------------|
| Animals        | Air  | 1 Syllable  |
| Transportation | Land | 2 Syllables |

Verbal Sorts

|       |          |           |        |       |
|-------|----------|-----------|--------|-------|
| Large | Curved   | Uppercase | Blue   | White |
| Small | Straight | Lowercase | Yellow | Red   |

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Airplane Bus Car Duck Eagle Tiger

| PRIMARY DESCRIPTION MEASURES  |   |     |
|-------------------------------|---|-----|
| 1st Group Description Score   | 0 | 1 2 |
| 2nd Group Description Score   | 0 | 1 2 |
| OPTIONAL DESCRIPTION MEASURES |   |     |
| Incorrect Description         | Y |     |
| Repeated Description          | Y |     |
| No/Don't Know Response        | Y |     |
| Nonredundant Description      | Y |     |
| Overly Abstract Description   | Y |     |
| Description Type              | V | P   |

| PRIMARY SORTING MEASURE   |     |
|---------------------------|-----|
| Confirmed Correct Sort    | Y   |
| OPTIONAL SORTING MEASURES |     |
| Repeated Sort             | Y   |
| Unconfirmed Target Sort   | Y   |
| Set-Loss Sort             | Y   |
| Non-target Even Sort      | Y   |
| Sort Type                 | V P |

## Free Sorting: Card Set 1 (continued)

### Eighth Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|                |      |             |
|----------------|------|-------------|
| Animals        | Air  | 1 Syllable  |
| Transportation | Land | 2 Syllables |

Verbal Sorts

|       |          |           |        |       |
|-------|----------|-----------|--------|-------|
| Large | Curved   | Uppercase | Blue   | White |
| Small | Straight | Lowercase | Yellow | Red   |

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Airplane Bus Car Duck Eagle Tiger

#### PRIMARY DESCRIPTION MEASURES

|                             |   |   |   |
|-----------------------------|---|---|---|
| 1st Group Description Score | 0 | 1 | 2 |
| 2nd Group Description Score | 0 | 1 | 2 |

#### OPTIONAL DESCRIPTION MEASURES

|                             |     |
|-----------------------------|-----|
| Incorrect Description       | Y   |
| Repeated Description        | Y   |
| No/Don't Know Response      | Y   |
| Noncredit Description       | Y   |
| Overly Abstract Description | Y   |
| Description Type            | V P |

#### PRIMARY SORTING MEASURE

|                        |   |
|------------------------|---|
| Confirmed Correct Sort | Y |
|------------------------|---|

#### OPTIONAL SORTING MEASURES

|                         |     |
|-------------------------|-----|
| Repeated Sort           | Y   |
| Unconfirmed Target Sort | Y   |
| Set-Loss Sort           | Y   |
| Nonlargest Even Sort    | Y   |
| Sort Type               | V P |

### Ninth Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|                |      |             |
|----------------|------|-------------|
| Animals        | Air  | 1 Syllable  |
| Transportation | Land | 2 Syllables |

Verbal Sorts

|       |          |           |        |       |
|-------|----------|-----------|--------|-------|
| Large | Curved   | Uppercase | Blue   | White |
| Small | Straight | Lowercase | Yellow | Red   |

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Airplane Bus Car Duck Eagle Tiger

#### PRIMARY DESCRIPTION MEASURES

|                             |   |   |   |
|-----------------------------|---|---|---|
| 1st Group Description Score | 0 | 1 | 2 |
| 2nd Group Description Score | 0 | 1 | 2 |

#### OPTIONAL DESCRIPTION MEASURES

|                             |     |
|-----------------------------|-----|
| Incorrect Description       | Y   |
| Repeated Description        | Y   |
| No/Don't Know Response      | Y   |
| Noncredit Description       | Y   |
| Overly Abstract Description | Y   |
| Description Type            | V P |

#### PRIMARY SORTING MEASURE

|                        |   |
|------------------------|---|
| Confirmed Correct Sort | Y |
|------------------------|---|

#### OPTIONAL SORTING MEASURES

|                         |     |
|-------------------------|-----|
| Repeated Sort           | Y   |
| Unconfirmed Target Sort | Y   |
| Set-Loss Sort           | Y   |
| Nonlargest Even Sort    | Y   |
| Sort Type               | V P |

### Tenth Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|                |      |             |
|----------------|------|-------------|
| Animals        | Air  | 1 Syllable  |
| Transportation | Land | 2 Syllables |

Verbal Sorts

|       |          |           |        |       |
|-------|----------|-----------|--------|-------|
| Large | Curved   | Uppercase | Blue   | White |
| Small | Straight | Lowercase | Yellow | Red   |

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Airplane Bus Car Duck Eagle Tiger

#### PRIMARY DESCRIPTION MEASURES

|                             |   |   |   |
|-----------------------------|---|---|---|
| 1st Group Description Score | 0 | 1 | 2 |
| 2nd Group Description Score | 0 | 1 | 2 |

#### OPTIONAL DESCRIPTION MEASURES

|                             |     |
|-----------------------------|-----|
| Incorrect Description       | Y   |
| Repeated Description        | Y   |
| No/Don't Know Response      | Y   |
| Noncredit Description       | Y   |
| Overly Abstract Description | Y   |
| Description Type            | V P |

#### PRIMARY SORTING MEASURE

|                        |   |
|------------------------|---|
| Confirmed Correct Sort | Y |
|------------------------|---|

#### OPTIONAL SORTING MEASURES

|                         |     |
|-------------------------|-----|
| Repeated Sort           | Y   |
| Unconfirmed Target Sort | Y   |
| Set-Loss Sort           | Y   |
| Nonlargest Even Sort    | Y   |
| Sort Type               | V P |

## Free Sorting: Card Set 1

Raw Score

Total Description Score

Number of Confirmed Correct Sorts

## Condition 1—Free Sorting: Card Set 2

Discontinue administration of Card Set 2 after either (a) the examinee indicates that he or she cannot identify any more sorts, even after receiving the single prompt to keep trying; (b) 240 seconds (4 minutes) of cumulative **sorting** time have elapsed; or (c) the examinee has completed 10 attempted sorts.

### First Sort

Description:

Sorting Time  
(Seconds)

| PRIMARY DESCRIPTION MEASURES  |     |     |
|-------------------------------|-----|-----|
| 1st Group Description Score   | 0   | 1 2 |
| 2nd Group Description Score   | 0   | 1 2 |
| OPTIONAL DESCRIPTION MEASURES |     |     |
| Incorrect Description         | Y   |     |
| Repeated Description          | Y   |     |
| No/Don't Know Response        | Y   |     |
| Noncredit Description         | Y   |     |
| Overly Abstract Description   | Y   |     |
| Description Type              | V P |     |

Sort:

|            |      |          |                  |         |            |                 |                 |
|------------|------|----------|------------------|---------|------------|-----------------|-----------------|
| Clothing   | Head | Plural   | Filled Triangles | Cursive | Slope Up   | Triangles Above | Diagonals Close |
| Body Parts | Feet | Singular | Empty Triangles  | Printed | Slope Down | Triangles Below | Diagonals Apart |

Verbal Sorts

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Ears Hat Mouth Shoe Socks Toes

| PRIMARY SORTING MEASURE   |     |
|---------------------------|-----|
| Confirmed Correct Sort    | Y   |
| OPTIONAL SORTING MEASURES |     |
| Repeated Sort             | Y   |
| Unconfirmed Target Sort   | Y   |
| Self-Loss Sort            | Y   |
| Nontarget Even Sort       | Y   |
| Sort Type                 | V P |

### Second Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|            |      |          |                  |         |            |                 |                 |
|------------|------|----------|------------------|---------|------------|-----------------|-----------------|
| Clothing   | Head | Plural   | Filled Triangles | Cursive | Slope Up   | Triangles Above | Diagonals Close |
| Body Parts | Feet | Singular | Empty Triangles  | Printed | Slope Down | Triangles Below | Diagonals Apart |

Verbal Sorts

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Ears Hat Mouth Shoe Socks Toes

| PRIMARY DESCRIPTION MEASURES  |     |     |
|-------------------------------|-----|-----|
| 1st Group Description Score   | 0   | 1 2 |
| 2nd Group Description Score   | 0   | 1 2 |
| OPTIONAL DESCRIPTION MEASURES |     |     |
| Incorrect Description         | Y   |     |
| Repeated Description          | Y   |     |
| No/Don't Know Response        | Y   |     |
| Noncredit Description         | Y   |     |
| Overly Abstract Description   | Y   |     |
| Description Type              | V P |     |

| PRIMARY SORTING MEASURE   |     |
|---------------------------|-----|
| Confirmed Correct Sort    | Y   |
| OPTIONAL SORTING MEASURES |     |
| Repeated Sort             | Y   |
| Unconfirmed Target Sort   | Y   |
| Self-Loss Sort            | Y   |
| Nontarget Even Sort       | Y   |
| Sort Type                 | V P |

### Third Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|            |      |          |                  |         |            |                 |                 |
|------------|------|----------|------------------|---------|------------|-----------------|-----------------|
| Clothing   | Head | Plural   | Filled Triangles | Cursive | Slope Up   | Triangles Above | Diagonals Close |
| Body Parts | Feet | Singular | Empty Triangles  | Printed | Slope Down | Triangles Below | Diagonals Apart |

Verbal Sorts

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Ears Hat Mouth Shoe Socks Toes

| PRIMARY DESCRIPTION MEASURES  |     |     |
|-------------------------------|-----|-----|
| 1st Group Description Score   | 0   | 1 2 |
| 2nd Group Description Score   | 0   | 1 2 |
| OPTIONAL DESCRIPTION MEASURES |     |     |
| Incorrect Description         | Y   |     |
| Repeated Description          | Y   |     |
| No/Don't Know Response        | Y   |     |
| Noncredit Description         | Y   |     |
| Overly Abstract Description   | Y   |     |
| Description Type              | V P |     |

| PRIMARY SORTING MEASURE   |     |
|---------------------------|-----|
| Confirmed Correct Sort    | Y   |
| OPTIONAL SORTING MEASURES |     |
| Repeated Sort             | Y   |
| Unconfirmed Target Sort   | Y   |
| Self-Loss Sort            | Y   |
| Nontarget Even Sort       | Y   |
| Sort Type                 | V P |

## Free Sorting: Card Set 2 (continued)

### Fourth Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|                        |              |                    |                                     |                    |                        |                                    |                                    |
|------------------------|--------------|--------------------|-------------------------------------|--------------------|------------------------|------------------------------------|------------------------------------|
| Clothing<br>Body Parts | Head<br>Feet | Plural<br>Singular | Filled Triangles<br>Empty Triangles | Cursive<br>Printed | Slope Up<br>Slope Down | Triangles Above<br>Triangles Below | Diagonals Close<br>Diagonals Apart |
|------------------------|--------------|--------------------|-------------------------------------|--------------------|------------------------|------------------------------------|------------------------------------|

Verbal Sorts

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Ears Hat Mouth Shoe Socks Toes

| PRIMARY DESCRIPTION MEASURES  |   |   |   |
|-------------------------------|---|---|---|
| 1st Group Description Score   | 0 | 1 | 2 |
| 2nd Group Description Score   | 0 | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |   |   |   |
| Incorrect Description         |   | Y |   |
| Repeated Description          |   | Y |   |
| No/Don't Know Response        |   | Y |   |
| Noncredit Description         |   | Y |   |
| Overly Abstract Description   |   | Y |   |
| Description Type              |   | V | P |

| PRIMARY SORTING MEASURE   |     |
|---------------------------|-----|
| Confirmed Correct Sort    | Y   |
| OPTIONAL SORTING MEASURES |     |
| Repeated Sort             | Y   |
| Unconfirmed Target Sort   | Y   |
| Set-Loss Sort             | Y   |
| Non-target Even Sort      | Y   |
| Sort Type                 | V P |

### Fifth Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|                        |              |                    |                                     |                    |                        |                                    |                                    |
|------------------------|--------------|--------------------|-------------------------------------|--------------------|------------------------|------------------------------------|------------------------------------|
| Clothing<br>Body Parts | Head<br>Feet | Plural<br>Singular | Filled Triangles<br>Empty Triangles | Cursive<br>Printed | Slope Up<br>Slope Down | Triangles Above<br>Triangles Below | Diagonals Close<br>Diagonals Apart |
|------------------------|--------------|--------------------|-------------------------------------|--------------------|------------------------|------------------------------------|------------------------------------|

Verbal Sorts

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Ears Hat Mouth Shoe Socks Toes

| PRIMARY DESCRIPTION MEASURES  |   |   |   |
|-------------------------------|---|---|---|
| 1st Group Description Score   | 0 | 1 | 2 |
| 2nd Group Description Score   | 0 | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |   |   |   |
| Incorrect Description         |   | Y |   |
| Repeated Description          |   | Y |   |
| No/Don't Know Response        |   | Y |   |
| Noncredit Description         |   | Y |   |
| Overly Abstract Description   |   | Y |   |
| Description Type              |   | V | P |

| PRIMARY SORTING MEASURE   |     |
|---------------------------|-----|
| Confirmed Correct Sort    | Y   |
| OPTIONAL SORTING MEASURES |     |
| Repeated Sort             | Y   |
| Unconfirmed Target Sort   | Y   |
| Set-Loss Sort             | Y   |
| Non-target Even Sort      | Y   |
| Sort Type                 | V P |

### Sixth Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|                        |              |                    |                                     |                    |                        |                                    |                                    |
|------------------------|--------------|--------------------|-------------------------------------|--------------------|------------------------|------------------------------------|------------------------------------|
| Clothing<br>Body Parts | Head<br>Feet | Plural<br>Singular | Filled Triangles<br>Empty Triangles | Cursive<br>Printed | Slope Up<br>Slope Down | Triangles Above<br>Triangles Below | Diagonals Close<br>Diagonals Apart |
|------------------------|--------------|--------------------|-------------------------------------|--------------------|------------------------|------------------------------------|------------------------------------|

Verbal Sorts

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Ears Hat Mouth Shoe Socks Toes

| PRIMARY DESCRIPTION MEASURES  |   |   |   |
|-------------------------------|---|---|---|
| 1st Group Description Score   | 0 | 1 | 2 |
| 2nd Group Description Score   | 0 | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |   |   |   |
| Incorrect Description         |   | Y |   |
| Repeated Description          |   | Y |   |
| No/Don't Know Response        |   | Y |   |
| Noncredit Description         |   | Y |   |
| Overly Abstract Description   |   | Y |   |
| Description Type              |   | V | P |

| PRIMARY SORTING MEASURE   |     |
|---------------------------|-----|
| Confirmed Correct Sort    | Y   |
| OPTIONAL SORTING MEASURES |     |
| Repeated Sort             | Y   |
| Unconfirmed Target Sort   | Y   |
| Set-Loss Sort             | Y   |
| Non-target Even Sort      | Y   |
| Sort Type                 | V P |

### Seventh Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|                        |              |                    |                                     |                    |                        |                                    |                                    |
|------------------------|--------------|--------------------|-------------------------------------|--------------------|------------------------|------------------------------------|------------------------------------|
| Clothing<br>Body Parts | Head<br>Feet | Plural<br>Singular | Filled Triangles<br>Empty Triangles | Cursive<br>Printed | Slope Up<br>Slope Down | Triangles Above<br>Triangles Below | Diagonals Close<br>Diagonals Apart |
|------------------------|--------------|--------------------|-------------------------------------|--------------------|------------------------|------------------------------------|------------------------------------|

Verbal Sorts

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Ears Hat Mouth Shoe Socks Toes

| PRIMARY DESCRIPTION MEASURES  |   |   |   |
|-------------------------------|---|---|---|
| 1st Group Description Score   | 0 | 1 | 2 |
| 2nd Group Description Score   | 0 | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |   |   |   |
| Incorrect Description         |   | Y |   |
| Repeated Description          |   | Y |   |
| No/Don't Know Response        |   | Y |   |
| Noncredit Description         |   | Y |   |
| Overly Abstract Description   |   | Y |   |
| Description Type              |   | V | P |

| PRIMARY SORTING MEASURE   |     |
|---------------------------|-----|
| Confirmed Correct Sort    | Y   |
| OPTIONAL SORTING MEASURES |     |
| Repeated Sort             | Y   |
| Unconfirmed Target Sort   | Y   |
| Set-Loss Sort             | Y   |
| Non-target Even Sort      | Y   |
| Sort Type                 | V P |

## Free Sorting: Card Set 2 (continued)

### Eighth Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|                        |              |                    |
|------------------------|--------------|--------------------|
| Clothing<br>Body Parts | Head<br>Feet | Plural<br>Singular |
|------------------------|--------------|--------------------|

|                                     |
|-------------------------------------|
| Filled Triangles<br>Empty Triangles |
|-------------------------------------|

|                    |
|--------------------|
| Cursive<br>Printed |
|--------------------|

|                        |
|------------------------|
| Slope Up<br>Slope Down |
|------------------------|

|                                    |
|------------------------------------|
| Triangles Above<br>Triangles Below |
|------------------------------------|

|                                    |
|------------------------------------|
| Diagonals Close<br>Diagonals Apart |
|------------------------------------|

Verbal Sorts

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Ears Hat Mouth Shoe Socks Toes

#### PRIMARY DESCRIPTION MEASURES

|                             |   |   |   |
|-----------------------------|---|---|---|
| 1st Group Description Score | 0 | 1 | 2 |
| 2nd Group Description Score | 0 | 1 | 2 |

#### OPTIONAL DESCRIPTION MEASURES

|                             |     |
|-----------------------------|-----|
| Incorrect Description       | Y   |
| Repeated Description        | Y   |
| No/Don't Know Response      | Y   |
| Noncredit Description       | Y   |
| Overly Abstract Description | Y   |
| Description Type            | V P |

#### PRIMARY SORTING MEASURE

|                        |   |
|------------------------|---|
| Confirmed Correct Sort | Y |
|------------------------|---|

#### OPTIONAL SORTING MEASURES

|                         |     |
|-------------------------|-----|
| Repeated Sort           | Y   |
| Unconfirmed Target Sort | Y   |
| Set-Loss Sort           | Y   |
| Non-target Even Sort    | Y   |
| Sort Type               | V P |

### Ninth Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|                        |              |                    |
|------------------------|--------------|--------------------|
| Clothing<br>Body Parts | Head<br>Feet | Plural<br>Singular |
|------------------------|--------------|--------------------|

|                                     |
|-------------------------------------|
| Filled Triangles<br>Empty Triangles |
|-------------------------------------|

|                    |
|--------------------|
| Cursive<br>Printed |
|--------------------|

|                        |
|------------------------|
| Slope Up<br>Slope Down |
|------------------------|

|                                    |
|------------------------------------|
| Triangles Above<br>Triangles Below |
|------------------------------------|

|                                    |
|------------------------------------|
| Diagonals Close<br>Diagonals Apart |
|------------------------------------|

Verbal Sorts

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Ears Hat Mouth Shoe Socks Toes

#### PRIMARY DESCRIPTION MEASURES

|                             |   |   |   |
|-----------------------------|---|---|---|
| 1st Group Description Score | 0 | 1 | 2 |
| 2nd Group Description Score | 0 | 1 | 2 |

#### OPTIONAL DESCRIPTION MEASURES

|                             |     |
|-----------------------------|-----|
| Incorrect Description       | Y   |
| Repeated Description        | Y   |
| No/Don't Know Response      | Y   |
| Noncredit Description       | Y   |
| Overly Abstract Description | Y   |
| Description Type            | V P |

#### PRIMARY SORTING MEASURE

|                        |   |
|------------------------|---|
| Confirmed Correct Sort | Y |
|------------------------|---|

#### OPTIONAL SORTING MEASURES

|                         |     |
|-------------------------|-----|
| Repeated Sort           | Y   |
| Unconfirmed Target Sort | Y   |
| Set-Loss Sort           | Y   |
| Non-target Even Sort    | Y   |
| Sort Type               | V P |

### Tenth Sort

Description:

Cumulative  
Sorting Time  
(Seconds)

Sort:

|                        |              |                    |
|------------------------|--------------|--------------------|
| Clothing<br>Body Parts | Head<br>Feet | Plural<br>Singular |
|------------------------|--------------|--------------------|

|                                     |
|-------------------------------------|
| Filled Triangles<br>Empty Triangles |
|-------------------------------------|

|                    |
|--------------------|
| Cursive<br>Printed |
|--------------------|

|                        |
|------------------------|
| Slope Up<br>Slope Down |
|------------------------|

|                                    |
|------------------------------------|
| Triangles Above<br>Triangles Below |
|------------------------------------|

|                                    |
|------------------------------------|
| Diagonals Close<br>Diagonals Apart |
|------------------------------------|

Verbal Sorts

Perceptual Sorts

For an *incorrect* sort, mark the cards of one group: Ears Hat Mouth Shoe Socks Toes

#### PRIMARY DESCRIPTION MEASURES

|                             |   |   |   |
|-----------------------------|---|---|---|
| 1st Group Description Score | 0 | 1 | 2 |
| 2nd Group Description Score | 0 | 1 | 2 |

#### OPTIONAL DESCRIPTION MEASURES

|                             |     |
|-----------------------------|-----|
| Incorrect Description       | Y   |
| Repeated Description        | Y   |
| No/Don't Know Response      | Y   |
| Noncredit Description       | Y   |
| Overly Abstract Description | Y   |
| Description Type            | V P |

#### PRIMARY SORTING MEASURE

|                        |   |
|------------------------|---|
| Confirmed Correct Sort | Y |
|------------------------|---|

#### OPTIONAL SORTING MEASURES

|                         |     |
|-------------------------|-----|
| Repeated Sort           | Y   |
| Unconfirmed Target Sort | Y   |
| Set-Loss Sort           | Y   |
| Non-target Even Sort    | Y   |
| Sort Type               | V P |

## Free Sorting: Card Set 2

Raw Score

Total Description Score

Number of Confirmed Correct Sorts

## Condition 2-Sort Recognition: Card Set 1

Administer all eight target sorts to the examinee. Discontinue administration of **each sort** after either (a) the examinee provides a correct or incorrect description, (b) the examinee indicates that he or she cannot identify the sorting rules, or (c) 45 seconds have elapsed after the examiner made the sort and the examinee failed to initiate a description response.

### First Sort

### Perceptual Sort

#### RULE

Small Cards      Large Cards  
(Bus Car Eagle)      (Airplane Duck Tiger)

Description:

| PRIMARY DESCRIPTION MEASURES  |   |   |   |
|-------------------------------|---|---|---|
| 1st Group Description Score   | 0 | 1 | 2 |
| 2nd Group Description Score   | 0 | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |   |   |   |
| Incorrect Description         | Y |   |   |
| Repeated Description          | Y |   |   |
| No/Don't Know Response        | Y |   |   |
| Noncredit Description         | Y |   |   |
| Overly Abstract Description   | Y |   |   |
| Description Type              | V | P |   |

### Second Sort

### Verbal Sort

#### RULE

Animals      Transportation  
(Duck Eagle Tiger)      (Airplane Bus Car)

Description:

| PRIMARY DESCRIPTION MEASURES  |   |   |   |
|-------------------------------|---|---|---|
| 1st Group Description Score   | 0 | 1 | 2 |
| 2nd Group Description Score   | 0 | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |   |   |   |
| Incorrect Description         | Y |   |   |
| Repeated Description          | Y |   |   |
| No/Don't Know Response        | Y |   |   |
| Noncredit Description         | Y |   |   |
| Overly Abstract Description   | Y |   |   |
| Description Type              | V | P |   |

### Third Sort

### Perceptual Sort

#### RULE

Straight Outer Edges      Curved Outer Edges  
(Airplane Bus Tiger)      (Car Duck Eagle)

Description:

| PRIMARY DESCRIPTION MEASURES  |   |   |   |
|-------------------------------|---|---|---|
| 1st Group Description Score   | 0 | 1 | 2 |
| 2nd Group Description Score   | 0 | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |   |   |   |
| Incorrect Description         | Y |   |   |
| Repeated Description          | Y |   |   |
| No/Don't Know Response        | Y |   |   |
| Noncredit Description         | Y |   |   |
| Overly Abstract Description   | Y |   |   |
| Description Type              | V | P |   |

### Fourth Sort

### Verbal Sort

#### RULE

One-Syllable Words      Two-Syllable Words  
(Bus Car Duck)      (Airplane Eagle Tiger)

Description:

| PRIMARY DESCRIPTION MEASURES  |   |   |   |
|-------------------------------|---|---|---|
| 1st Group Description Score   | 0 | 1 | 2 |
| 2nd Group Description Score   | 0 | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |   |   |   |
| Incorrect Description         | Y |   |   |
| Repeated Description          | Y |   |   |
| No/Don't Know Response        | Y |   |   |
| Noncredit Description         | Y |   |   |
| Overly Abstract Description   | Y |   |   |
| Description Type              | V | P |   |

### Fifth Sort

### Perceptual Sort

#### RULE

Blue Cards      Yellow Cards  
(Bus Duck Tiger)      (Airplane Car Eagle)

Description:

| PRIMARY DESCRIPTION MEASURES  |   |   |   |
|-------------------------------|---|---|---|
| 1st Group Description Score   | 0 | 1 | 2 |
| 2nd Group Description Score   | 0 | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |   |   |   |
| Incorrect Description         | Y |   |   |
| Repeated Description          | Y |   |   |
| No/Don't Know Response        | Y |   |   |
| Noncredit Description         | Y |   |   |
| Overly Abstract Description   | Y |   |   |
| Description Type              | V | P |   |





## Condition 2--Sort Recognition: Card Set 2

Administer all eight target sorts to the examinee. Discontinue administration of *each sort* after either (a) the examinee provides a correct or incorrect description, (b) the examinee indicates that he or she cannot identify the sorting rules, or (c) 45 seconds have elapsed after the examiner made the sort and the examinee failed to initiate a description response.

### First Sort

### Perceptual Sort

#### RULE

Diagonals Close  
(Ears Shoe Socks)

Diagonals Apart  
(Hat Mouth Toes)

Description:

| PRIMARY DESCRIPTION MEASURES  |   |   |   |
|-------------------------------|---|---|---|
| 1st Group Description Score   | 0 | 1 | 2 |
| 2nd Group Description Score   | 0 | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |   |   |   |
| Incorrect Description         | Y |   |   |
| Repeated Description          | Y |   |   |
| No/Don't Know Response        | Y |   |   |
| Noncredit Description         | Y |   |   |
| Overly Abstract Description   | Y |   |   |
| Description Type              | Y | P |   |

### Second Sort

### Verbal Sort

#### RULE

Body Parts  
(Ears Mouth Toes)

Clothing  
(Hat Shoe Socks)

Description:

| PRIMARY DESCRIPTION MEASURES  |   |   |   |
|-------------------------------|---|---|---|
| 1st Group Description Score   | 0 | 1 | 2 |
| 2nd Group Description Score   | 0 | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |   |   |   |
| Incorrect Description         | Y |   |   |
| Repeated Description          | Y |   |   |
| No/Don't Know Response        | Y |   |   |
| Noncredit Description         | Y |   |   |
| Overly Abstract Description   | Y |   |   |
| Description Type              | Y | P |   |

### Third Sort

### Perceptual Sort

#### RULE

Triangles Above Word  
(Ears Mouth Socks)

Triangles Below Word  
(Hat Shoe Toes)

Description:

| PRIMARY DESCRIPTION MEASURES  |   |   |   |
|-------------------------------|---|---|---|
| 1st Group Description Score   | 0 | 1 | 2 |
| 2nd Group Description Score   | 0 | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |   |   |   |
| Incorrect Description         | Y |   |   |
| Repeated Description          | Y |   |   |
| No/Don't Know Response        | Y |   |   |
| Noncredit Description         | Y |   |   |
| Overly Abstract Description   | Y |   |   |
| Description Type              | Y | P |   |

### Fourth Sort

### Perceptual Sort

#### RULE

Cursive Letters  
(Ears Hat Toes)

Printed Letters  
(Mouth Shoe Socks)

Description:

| PRIMARY DESCRIPTION MEASURES  |   |   |   |
|-------------------------------|---|---|---|
| 1st Group Description Score   | 0 | 1 | 2 |
| 2nd Group Description Score   | 0 | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |   |   |   |
| Incorrect Description         | Y |   |   |
| Repeated Description          | Y |   |   |
| No/Don't Know Response        | Y |   |   |
| Noncredit Description         | Y |   |   |
| Overly Abstract Description   | Y |   |   |
| Description Type              | Y | P |   |

### Fifth Sort

### Verbal Sort

#### RULE

Plural Words  
(Ears Socks Toes)

Singular Words  
(Mouth Shoe Hat)

Description:

| PRIMARY DESCRIPTION MEASURES  |   |   |   |
|-------------------------------|---|---|---|
| 1st Group Description Score   | 0 | 1 | 2 |
| 2nd Group Description Score   | 0 | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |   |   |   |
| Incorrect Description         | Y |   |   |
| Repeated Description          | Y |   |   |
| No/Don't Know Response        | Y |   |   |
| Noncredit Description         | Y |   |   |
| Overly Abstract Description   | Y |   |   |
| Description Type              | Y | P |   |

## Sort Recognition: Card Set 2 (continued)

### Sixth Sort

### Perceptual Sort

#### RULE

Diagonals Slope Up  
(Ears Hat Shoe)

Diagonals Slope Down  
(Mouth Socks Toes)

Description:

| PRIMARY DESCRIPTION MEASURES  |     |   |   |
|-------------------------------|-----|---|---|
| 1st Group Description Score   | 0   | 1 | 2 |
| 2nd Group Description Score   | 0   | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |     |   |   |
| Incorrect Description         | Y   |   |   |
| Repeated Description          | Y   |   |   |
| No/Don't Know Response        | Y   |   |   |
| Noncredit Description         | Y   |   |   |
| Overly Abstract Description   | Y   |   |   |
| Description Type              | V P |   |   |

### Seventh Sort

### Verbal Sort

#### RULE

Related to Head  
(Ears Hat Mouth)

Related to Feet  
(Shoe Socks Toes)

Description:

| PRIMARY DESCRIPTION MEASURES  |     |   |   |
|-------------------------------|-----|---|---|
| 1st Group Description Score   | 0   | 1 | 2 |
| 2nd Group Description Score   | 0   | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |     |   |   |
| Incorrect Description         | Y   |   |   |
| Repeated Description          | Y   |   |   |
| No/Don't Know Response        | Y   |   |   |
| Noncredit Description         | Y   |   |   |
| Overly Abstract Description   | Y   |   |   |
| Description Type              | V P |   |   |

### Eighth Sort

### Perceptual Sort

#### RULE

Filled Triangles  
(Ears Mouth Shoe)

Empty Triangles  
(Hat Socks Toes)

Description:

| PRIMARY DESCRIPTION MEASURES  |     |   |   |
|-------------------------------|-----|---|---|
| 1st Group Description Score   | 0   | 1 | 2 |
| 2nd Group Description Score   | 0   | 1 | 2 |
| OPTIONAL DESCRIPTION MEASURES |     |   |   |
| Incorrect Description         | Y   |   |   |
| Repeated Description          | Y   |   |   |
| No/Don't Know Response        | Y   |   |   |
| Noncredit Description         | Y   |   |   |
| Overly Abstract Description   | Y   |   |   |
| Description Type              | V P |   |   |

## Sort Recognition: Card Set 2

Raw Score

Total Description Score

# D-KEFS Sorting Test: Summary of Scores

## Primary Measures

|                                      | Card Set 1                     | + | Card Set 2                     | = | Raw Score            | Scaled Score         |
|--------------------------------------|--------------------------------|---|--------------------------------|---|----------------------|----------------------|
| <b>Condition 1: Free Sorting</b>     |                                |   |                                |   |                      |                      |
| Confirmed Correct Sorts              | <u>          </u><br>Raw Score | + | <u>          </u><br>Raw Score | = | <input type="text"/> | <input type="text"/> |
| Free Sorting Description Score       | <u>          </u><br>Raw Score | + | <u>          </u><br>Raw Score | = | <input type="text"/> | <input type="text"/> |
| <b>Condition 2: Sort Recognition</b> |                                |   |                                |   |                      |                      |
| Sort Recognition Description Score   | <u>          </u><br>Raw Score | + | <u>          </u><br>Raw Score | = | <input type="text"/> | <input type="text"/> |

## Combined Conditions 1 + 2

|                            | Condition 1:<br>Free Sorting            |   | Condition 2:<br>Sort Recognition        |   | Sum of<br>Scaled Scores | Composite<br>Scaled Score |
|----------------------------|-----------------------------------------|---|-----------------------------------------|---|-------------------------|---------------------------|
|                            | Description<br>Score                    |   | Description<br>Score                    |   |                         |                           |
| Combined Description Score | <input type="text"/><br>Scaled<br>Score | + | <input type="text"/><br>Scaled<br>Score | = | <input type="text"/>    | <input type="text"/>      |

## Contrast Measure: Sort Recognition Versus Free Sorting Description Score

| Condition 2:<br>Sort Recognition        |   | Condition 1:<br>Free Sorting            |   | Scaled-Score<br>Difference | Contrast<br>Scaled Score* |
|-----------------------------------------|---|-----------------------------------------|---|----------------------------|---------------------------|
| Description<br>Score                    |   | Description<br>Score                    |   |                            |                           |
| <input type="text"/><br>Scaled<br>Score | - | <input type="text"/><br>Scaled<br>Score | = | <input type="text"/>       | <input type="text"/>      |

\* A low or high contrast scaled score may reflect different cognitive problems; see examiner's manual.

## Optional Measures

### Screening Pretest

|                           | Raw Score            |   | Cumulative<br>Percentile<br>Rank |
|---------------------------|----------------------|---|----------------------------------|
| Word Reading Errors       | <input type="text"/> | → | <input type="text"/>             |
| Word Comprehension Errors | <input type="text"/> | → | <input type="text"/>             |

## Optional Measures (continued)

### Condition 1: Free Sorting Sorting Measures (Optional)

|                                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                         |                                                          |                                                         |                                                                                                                                              |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Confirmed Correct Sorts: Card Set 1 | Raw Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <input style="width: 40px; height: 20px;" type="text"/> | →                                                        | <input style="width: 40px; height: 20px;" type="text"/> | Scaled Score                                                                                                                                 |
| Confirmed Correct Sorts: Card Set 2 | Raw Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | <input style="width: 40px; height: 20px;" type="text"/> | →                                                        | <input style="width: 40px; height: 20px;" type="text"/> | Scaled Score                                                                                                                                 |
|                                     | Card Set 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | +                                                       | Card Set 2                                               | =                                                       | Total Raw Score                                                                                                                              |
| Confirmed Correct Verbal Sorts      | <input style="width: 100px; height: 20px;" type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | +                                                       | <input style="width: 100px; height: 20px;" type="text"/> | =                                                       | <input style="width: 40px; height: 20px;" type="text"/> → <input style="width: 40px; height: 20px;" type="text"/>                            |
|                                     | Raw Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                         | Raw Score                                                |                                                         |                                                                                                                                              |
| Confirmed Correct Perceptual Sorts  | <input style="width: 100px; height: 20px;" type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | +                                                       | <input style="width: 100px; height: 20px;" type="text"/> | =                                                       | <input style="width: 40px; height: 20px;" type="text"/> → <input style="width: 40px; height: 20px;" type="text"/>                            |
|                                     | Raw Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                         | Raw Score                                                |                                                         |                                                                                                                                              |
| Confirmed/Unconfirmed Target Sorts  | <input style="width: 100px; height: 20px;" type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | +                                                       | <input style="width: 100px; height: 20px;" type="text"/> | =                                                       | <input style="width: 40px; height: 20px;" type="text"/> → <input style="width: 40px; height: 20px;" type="text"/>                            |
|                                     | Raw Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                         | Raw Score                                                |                                                         |                                                                                                                                              |
| Repeated Sorts                      | <input style="width: 100px; height: 20px;" type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | +                                                       | <input style="width: 100px; height: 20px;" type="text"/> | =                                                       | <input style="width: 40px; height: 20px;" type="text"/> → <input style="width: 40px; height: 20px;" type="text"/>                            |
|                                     | Raw Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                         | Raw Score                                                |                                                         |                                                                                                                                              |
| Set-Loss Sorts                      | <input style="width: 100px; height: 20px;" type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | +                                                       | <input style="width: 100px; height: 20px;" type="text"/> | =                                                       | <input style="width: 40px; height: 20px;" type="text"/> → <input style="width: 40px; height: 20px;" type="text"/> Cumulative Percentile Rank |
|                                     | Raw Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                         | Raw Score                                                |                                                         |                                                                                                                                              |
| Nontarget Even Sorts                | <input style="width: 100px; height: 20px;" type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | +                                                       | <input style="width: 100px; height: 20px;" type="text"/> | =                                                       | <input style="width: 40px; height: 20px;" type="text"/> → <input style="width: 40px; height: 20px;" type="text"/> Cumulative Percentile Rank |
|                                     | Raw Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                         | Raw Score                                                |                                                         |                                                                                                                                              |
| Attempted Sorts                     | <input style="width: 100px; height: 20px;" type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | +                                                       | <input style="width: 100px; height: 20px;" type="text"/> | =                                                       | <input style="width: 40px; height: 20px;" type="text"/> → <input style="width: 40px; height: 20px;" type="text"/>                            |
|                                     | Raw Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                         | Raw Score                                                |                                                         |                                                                                                                                              |
| Percent Sorting Accuracy            | <div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">             Confirmed Correct Sorts<br/> <input style="width: 40px; height: 20px;" type="text"/><br/>             Total Raw Score           </div> <div style="margin: 0 10px;">÷</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">             Attempted Sorts<br/> <input style="width: 40px; height: 20px;" type="text"/><br/>             Total Raw Score           </div> </div>                                     |                                                         |                                                          | × 100 =                                                 | <input style="width: 40px; height: 20px;" type="text"/> → <input style="width: 40px; height: 20px;" type="text"/>                            |
|                                     | <div style="display: flex; align-items: center; justify-content: center;"> <div style="margin: 5px;">Cumulative Sorting Time<br/>Cards Sets 1 + 2</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;"> <input style="width: 40px; height: 20px;" type="text"/><br/>             Total Raw Score           </div> <div style="margin: 0 10px;">÷</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">             Attempted Sorts<br/> <input style="width: 40px; height: 20px;" type="text"/><br/>             Total Raw Score           </div> </div> |                                                         |                                                          | Ratio Raw Score                                         | <input style="width: 40px; height: 20px;" type="text"/> → <input style="width: 40px; height: 20px;" type="text"/>                            |

### Condition 1: Free Sorting Description Measures (Optional)

|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                         |                                                          |                                                         |                                                                                                                                              |
|--------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|
| Free Sorting Description Score: Card Set 1 | Raw Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <input style="width: 40px; height: 20px;" type="text"/> | →                                                        | <input style="width: 40px; height: 20px;" type="text"/> | Scaled Score                                                                                                                                 |
| Free Sorting Description Score: Card Set 2 | Raw Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | <input style="width: 40px; height: 20px;" type="text"/> | →                                                        | <input style="width: 40px; height: 20px;" type="text"/> | Scaled Score                                                                                                                                 |
|                                            | Card Set 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | +                                                       | Card Set 2                                               | =                                                       | Total Raw Score                                                                                                                              |
| Free Sorting Incorrect Descriptions*       | <input style="width: 100px; height: 20px;" type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | +                                                       | <input style="width: 100px; height: 20px;" type="text"/> | =                                                       | <input style="width: 40px; height: 20px;" type="text"/> → <input style="width: 40px; height: 20px;" type="text"/>                            |
|                                            | Raw Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                         | Raw Score                                                |                                                         |                                                                                                                                              |
| Free Sorting Repeated Descriptions*        | <input style="width: 100px; height: 20px;" type="text"/>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | +                                                       | <input style="width: 100px; height: 20px;" type="text"/> | =                                                       | <input style="width: 40px; height: 20px;" type="text"/> → <input style="width: 40px; height: 20px;" type="text"/> Cumulative Percentile Rank |
|                                            | Raw Score                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                         | Raw Score                                                |                                                         |                                                                                                                                              |
| Percent Description Accuracy               | <div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">             Free Sorting Description Score<br/> <input style="width: 40px; height: 20px;" type="text"/><br/>             Total Raw Score           </div> <div style="margin: 0 10px;">÷</div> <div style="border: 1px solid black; padding: 5px; margin: 5px;"> <div style="display: flex; align-items: center; justify-content: center;">             Attempted Sorts<br/> <input style="width: 40px; height: 20px;" type="text"/> × 4           </div>             Total Raw Score           </div> </div> |                                                         |                                                          | × 100 =                                                 | <input style="width: 40px; height: 20px;" type="text"/> → <input style="width: 40px; height: 20px;" type="text"/>                            |
|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |                                                         |                                                          | Percent Raw Score                                       | <input style="width: 40px; height: 20px;" type="text"/> → <input style="width: 40px; height: 20px;" type="text"/>                            |

## Optional Measures (continued)

### Condition 2: Sort Recognition Description Measures (Optional)

|                                                | Raw Score                                                                                                           |   | Scaled Score                                                                                                                                                                                                                                                                                                                                         |
|------------------------------------------------|---------------------------------------------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Sort Recognition Description Score: Card Set 1 | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div>                             | → | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div>                                                                                                                                                                                                                                                              |
| Sort Recognition Description Score: Card Set 2 | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div>                             | → | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div>                                                                                                                                                                                                                                                              |
|                                                | Card Set 1                                                                                                          | + | Card Set 2 = Total Raw Score                                                                                                                                                                                                                                                                                                                         |
| Sort Recognition Incorrect Descriptions*       | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Raw Score</small> | + | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Raw Score</small> = <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div> → <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div>                                              |
| Sort Recognition Repeated Descriptions*        | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Raw Score</small> | + | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Raw Score</small> = <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div> → <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Cumulative Percentile Rank</small> |

### Combined Conditions 1 + 2: Description Measures (Optional)

|                                                 | Condition 1:<br>Free Sorting<br>Total                                                                                  | + | Condition 2: Sort<br>Recognition<br>Total                                                                              | = | Combined<br>Raw<br>Score                                                                | → | Scaled<br>Score                                                                                                                      |
|-------------------------------------------------|------------------------------------------------------------------------------------------------------------------------|---|------------------------------------------------------------------------------------------------------------------------|---|-----------------------------------------------------------------------------------------|---|--------------------------------------------------------------------------------------------------------------------------------------|
| Combined Description Score:<br>Verbal Rules     | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Raw Score</small>    | + | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Raw Score</small>    | = | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div> | → | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div>                                              |
| Combined Description Score:<br>Perceptual Rules | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Raw Score</small>    | + | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Raw Score</small>    | = | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div> | → | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div>                                              |
| Combined No/Don't Know Responses                | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Raw Score</small>    | + | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Raw Score</small>    | = | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div> | → | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div>                                              |
| Combined Noncredit Descriptions                 | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Raw Score</small>    | + | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Raw Score</small>    | = | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div> | → | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Cumulative Percentile Rank</small> |
| Combined Overly Abstract Descriptions           | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Raw Score</small>    | + | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Raw Score</small>    | = | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div> | → | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Cumulative Percentile Rank</small> |
|                                                 | Condition 1:<br>Free Sorting<br>Incorrect Descriptions                                                                 | + | Condition 2:<br>Sort Recognition<br>Incorrect Descriptions                                                             | = | Sum of<br>Scaled Scores                                                                 | → | Composite<br>Scaled Score                                                                                                            |
| Combined Incorrect Descriptions*                | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Scaled Score</small> | + | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Scaled Score</small> | = | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div> | → | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div>                                              |
|                                                 | Repeated Descriptions                                                                                                  | + | Repeated Descriptions                                                                                                  | = | Total<br>Raw Score                                                                      | → | Cumulative<br>Percentile<br>Rank                                                                                                     |
| Combined Repeated Descriptions*                 | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Raw Score</small>    | + | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Raw Score</small>    | = | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div> | → | <div style="border: 1px solid black; width: 40px; height: 20px; margin: 0 auto;"></div><br><small>Cumulative Percentile Rank</small> |

\* No/Don't Know responses are not included in these measures

Note: Cumulative percentile ranks for the D-KEFS were scaled to reflect the percentage of the normative sample that obtained raw scores equal to or worse than the raw score obtained by the examinee.

# D-KEFS Twenty Questions Test

Ages 8–89

## Materials

Record Form

Stimulus Booklet (Flat Position)

## Discontinue

Do not discontinue. Administer all four items to examinees in the order in which they appear here. Discontinue each item after the examinee either has identified the target object or has asked 20 yes/no questions without identifying the target object. Do not reveal the target object if the examinee has failed to identify it after asking 20 questions.

## Administration and Recording

Position the stimulus booklet flat on the table in a horizontal (landscape) position directly in front of the examinee's midline, with the pictures facing the examinee.

Say,

Now we are going to do something where you ask me questions. I have picked one of these pictures, and I want you to figure out which one it is by asking me questions. You can only ask questions that I can answer yes or no. You can ask any question at all, as long as I can answer it yes or no. Try to guess the picture that I have picked with the fewest number of questions you can. I'm going to write down your questions so I can remember them. Go ahead and ask me the fewest number of yes/no questions you can to figure out which picture I have selected.

Record verbatim each of the examinee's questions in the order that they are asked. Answer **Yes** if the examinee's question encompasses or identifies the target item or **No** if it does not. Circle **Y** (for yes) or **N** (for no) to indicate your answer to each of the examinee's questions.

Whether or not the examinee correctly identifies the target object for Item 1 after asking 20 yes/no questions or fewer, say,

Good. Let's try the next one. I've picked a new picture, and I want you to ask me the fewest number of yes/no questions you can to figure out which one it is. Go ahead.

Repeat these administration and recording procedures for each of Items 2–4.

## COMMON PROMPTS

- ◊ If an examinee's first question for an item refers only to one object (e.g., "Is it the elephant?"), record and answer the question. Then say, **Remember, try to ask the fewest number of questions you can.** Provide this prompt only once for each item.
- ◊ When answering questions, respond only with yes or no as much as possible. In deciding how to answer, base your response on how most people would respond to the same question. If the question could possibly be answered either way, you may say, **Most people would say yes** or **Most people would say no**. If an answer is true or untrue for an item most of the time, you may say, **Usually yes** or **Usually no**.
- ◊ If you do not know the answer to an examinee's question, say, **That's an excellent question. I'm not sure I know the answer. Try another question.** Do not count this question as one of the 20 questions.
- ◊ If an examinee asks a compound question (e.g., "Is it red and a plant?"), record the response and say, **I can answer only one of those questions. Which one do you want me to answer?** If the examinee asks an either/or question (e.g., "Is it an animal or a fruit?"), ask him or her to rephrase it as a yes/no question. After these prompts, if the examinee provides a yes/no question that clarifies the compound or either/or question, consider both responses as representing one yes/no question.
- ◊ If you are unsure of how to answer a spatial question, say, **Show me the ones you mean.** Pointing to the target object is an acceptable correct response.
- ◊ Some common types of questions ("Is it living?" or "Is it dead?") can be difficult to answer yes or no for some target items. If the object is organic or natural, say, **Yes, it is or once was living.** If the object is inorganic or human-made, say, **No, it never was alive.**
- ◊ If the examinee's question is vague (e.g., "Is it big?"), say, **Could you make your question more specific?** Consider both the vague question and any additional specific question as representing only one question.
- ◊ If an examinee fails to identify the target object after 20 questions but wants to know which one it is, say, **I can't tell you, but try to guess the next one.**

## SPECIAL CONSIDERATIONS

- ◊ If an examinee has difficulty perceiving an object on the stimulus page because of visual problems and asks for clarification (e.g., "Is that a fork?"), record and answer the question; however, do not score or count it as one of the 20 questions allowed for that item.
- ◊ An examinee may have difficulty remembering previously asked questions, your yes/no answers to those questions, or both, and request that the information be repeated. You may provide such information as often as it is requested.
- ◊ If an examinee points to the correct target object but misnames it, the response is still considered correct.

# D-KEFS Twenty Questions Test

Discontinue each item after the examinee asks 20 questions without identifying the target object.

| Total Questions Asked (Circle One) | Item 1 (banana)                 | Examinee's Answer | Weighted Achievement Score (Circle One) | Total Questions Asked (Circle One) | Item 2 (spoon)                  | Examinee's Answer | Weighted Achievement Score (Circle One) |
|------------------------------------|---------------------------------|-------------------|-----------------------------------------|------------------------------------|---------------------------------|-------------------|-----------------------------------------|
| 1                                  |                                 | Y N               | 1                                       | 1                                  |                                 | Y N               | 1                                       |
| 2                                  |                                 | Y N               | 1                                       | 2                                  |                                 | Y N               | 1                                       |
| 3                                  |                                 | Y N               | 2                                       | 3                                  |                                 | Y N               | 2                                       |
| 4                                  |                                 | Y N               | 5                                       | 4                                  |                                 | Y N               | 5                                       |
| 5                                  |                                 | Y N               | 5                                       | 5                                  |                                 | Y N               | 5                                       |
| 6                                  |                                 | Y N               | 4                                       | 6                                  |                                 | Y N               | 4                                       |
| 7                                  |                                 | Y N               | 4                                       | 7                                  |                                 | Y N               | 4                                       |
| 8                                  |                                 | Y N               | 3                                       | 8                                  |                                 | Y N               | 3                                       |
| 9                                  |                                 | Y N               | 3                                       | 9                                  |                                 | Y N               | 3                                       |
| 10                                 |                                 | Y N               | 3                                       | 10                                 |                                 | Y N               | 3                                       |
| 11                                 |                                 | Y N               | 2                                       | 11                                 |                                 | Y N               | 2                                       |
| 12                                 |                                 | Y N               | 2                                       | 12                                 |                                 | Y N               | 2                                       |
| 13                                 |                                 | Y N               | 2                                       | 13                                 |                                 | Y N               | 2                                       |
| 14                                 |                                 | Y N               | 2                                       | 14                                 |                                 | Y N               | 2                                       |
| 15                                 |                                 | Y N               | 1                                       | 15                                 |                                 | Y N               | 1                                       |
| 16                                 |                                 | Y N               | 1                                       | 16                                 |                                 | Y N               | 1                                       |
| 17                                 |                                 | Y N               | 1                                       | 17                                 |                                 | Y N               | 1                                       |
| 18                                 |                                 | Y N               | 1                                       | 18                                 |                                 | Y N               | 1                                       |
| 19                                 |                                 | Y N               | 1                                       | 19                                 |                                 | Y N               | 1                                       |
| 20                                 |                                 | Y N               | 1                                       | 20                                 |                                 | Y N               | 1                                       |
| 21                                 | Failed to guess in 20 questions |                   | 0                                       | 21                                 | Failed to guess in 20 questions |                   | 0                                       |

Item 1: Total Questions Asked Max. = 21

Raw Score

Initial Abstraction Score\* \_\_\_\_\_

Optional Scores:

# Spatial Questions \_\_\_\_\_

# Repeated Questions \_\_\_\_\_

# Set-Loss Questions \_\_\_\_\_

Item 2: Total Questions Asked Max. = 21

Raw Score

Initial Abstraction Score\* \_\_\_\_\_

Optional Scores:

# Spatial Questions \_\_\_\_\_

# Repeated Questions \_\_\_\_\_

# Set-Loss Questions \_\_\_\_\_

\* Minimum number of objects eliminated by the first question asked regardless of the yes or no answer.

# D-KEFS Twenty Questions Test (continued)

Discontinue each item after the examinee asks 20 questions without identifying the target object.

| Total Questions Asked (Circle One) | Item 3 (owl)                        | Examiner's Answer | Weighted Achievement Score (Circle One) | Total Questions Asked (Circle One) | Item 4 (helicopter)                 | Examiner's Answer | Weighted Achievement Score (Circle One) |
|------------------------------------|-------------------------------------|-------------------|-----------------------------------------|------------------------------------|-------------------------------------|-------------------|-----------------------------------------|
| 1                                  |                                     | Y N               | 1                                       | 1                                  |                                     | Y N               | 1                                       |
| 2                                  |                                     | Y N               | 1                                       | 2                                  |                                     | Y N               | 1                                       |
| 3                                  |                                     | Y N               | 2                                       | 3                                  |                                     | Y N               | 2                                       |
| 4                                  |                                     | Y N               | 5                                       | 4                                  |                                     | Y N               | 5                                       |
| 5                                  |                                     | Y N               | 5                                       | 5                                  |                                     | Y N               | 5                                       |
| 6                                  |                                     | Y N               | 4                                       | 6                                  |                                     | Y N               | 4                                       |
| 7                                  |                                     | Y N               | 4                                       | 7                                  |                                     | Y N               | 4                                       |
| 8                                  |                                     | Y N               | 3                                       | 8                                  |                                     | Y N               | 3                                       |
| 9                                  |                                     | Y N               | 3                                       | 9                                  |                                     | Y N               | 3                                       |
| 10                                 |                                     | Y N               | 3                                       | 10                                 |                                     | Y N               | 3                                       |
| 11                                 |                                     | Y N               | 2                                       | 11                                 |                                     | Y N               | 2                                       |
| 12                                 |                                     | Y N               | 2                                       | 12                                 |                                     | Y N               | 2                                       |
| 13                                 |                                     | Y N               | 2                                       | 13                                 |                                     | Y N               | 2                                       |
| 14                                 |                                     | Y N               | 2                                       | 14                                 |                                     | Y N               | 2                                       |
| 15                                 |                                     | Y N               | 1                                       | 15                                 |                                     | Y N               | 1                                       |
| 16                                 |                                     | Y N               | 1                                       | 16                                 |                                     | Y N               | 1                                       |
| 17                                 |                                     | Y N               | 1                                       | 17                                 |                                     | Y N               | 1                                       |
| 18                                 |                                     | Y N               | 1                                       | 18                                 |                                     | Y N               | 1                                       |
| 19                                 |                                     | Y N               | 1                                       | 19                                 |                                     | Y N               | 1                                       |
| 20                                 |                                     | Y N               | 1                                       | 20                                 |                                     | Y N               | 1                                       |
| 21                                 | ← Failed to guess in 20 questions → |                   | 0                                       | 21                                 | ← Failed to guess in 20 questions → |                   | 0                                       |

Item 3:  
Total  
Questions  
Asked  
Max. = 21

Raw Score

Initial Abstraction Score\* \_\_\_\_\_

Optional Scores:

# Spatial Questions \_\_\_\_\_

# Repeated Questions \_\_\_\_\_

# Set-Loss Questions \_\_\_\_\_

Item 3:  
Weighted  
Achievement  
Score  
Max. = 5

Item 4:  
Total  
Questions  
Asked  
Max. = 21

Raw Score

Initial Abstraction Score\* \_\_\_\_\_

Optional Scores:

# Spatial Questions \_\_\_\_\_

# Repeated Questions \_\_\_\_\_

# Set-Loss Questions \_\_\_\_\_

Item 4:  
Weighted  
Achievement  
Score  
Max. = 5



# D-KEFS Twenty Questions Test: Summary of Scores

## Primary Measures

|                            | Item 1<br>Raw Score  |   | Item 2<br>Raw Score  |   | Item 3<br>Raw Score  |   | Item 4<br>Raw Score  |   | Total<br>Raw Score   |   | Scaled<br>Score      |
|----------------------------|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|
| Initial Abstraction Score* | <input type="text"/> | + | <input type="text"/> | + | <input type="text"/> | + | <input type="text"/> | = | <input type="text"/> | → | <input type="text"/> |

\* Minimum number of objects eliminated by the first question asked regardless of the yes or no answer.

|                       |                      |   |                      |   |                      |   |                      |   |                      |   |                      |
|-----------------------|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|
| Total Questions Asked | <input type="text"/> | + | <input type="text"/> | + | <input type="text"/> | + | <input type="text"/> | = | <input type="text"/> | → | <input type="text"/> |
|-----------------------|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|

|                                  |                      |   |                      |   |                      |   |                      |   |                      |   |                      |
|----------------------------------|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|
| Total Weighted Achievement Score | <input type="text"/> | + | <input type="text"/> | + | <input type="text"/> | + | <input type="text"/> | = | <input type="text"/> | → | <input type="text"/> |
|----------------------------------|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|

## Optional Measures

|                   | Item 1<br>Raw Score  |   | Item 2<br>Raw Score  |   | Item 3<br>Raw Score  |   | Item 4<br>Raw Score  |   | Total<br>Raw Score   |   | Cumulative<br>Percentile<br>Rank |
|-------------------|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------------------|
| Spatial Questions | <input type="text"/> | + | <input type="text"/> | + | <input type="text"/> | + | <input type="text"/> | = | <input type="text"/> | → | <input type="text"/>             |

|                    |                      |   |                      |   |                      |   |                      |   |                      |   |                      |
|--------------------|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|
| Repeated Questions | <input type="text"/> | + | <input type="text"/> | + | <input type="text"/> | + | <input type="text"/> | = | <input type="text"/> | → | <input type="text"/> |
|--------------------|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|

|                    |                      |   |                      |   |                      |   |                      |   |                      |   |                      |
|--------------------|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|
| Set-Loss Questions | <input type="text"/> | + | <input type="text"/> | + | <input type="text"/> | + | <input type="text"/> | = | <input type="text"/> | → | <input type="text"/> |
|--------------------|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|---|----------------------|

Note: Cumulative percentile ranks for the D-KEFS were scaled to reflect the percentage of the normative sample that obtained raw scores equal to or worse than the raw score obtained by the examinee.

# D-KEFS Word Context Test

Do not discontinue. Administer all items in the order presented here and in the stimulus booklet.

## Practice Item: sev (apple)

Examinee's Responses:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

## 1. prifa (eat)

Examinee's Responses:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

| Response<br>Correct | 1st Sentence<br>Correct<br>(Circle One) | 1st Sentence<br>Consecutively<br>Correct<br>(Circle One) | Optional:<br># Repeated<br>Incorrect |
|---------------------|-----------------------------------------|----------------------------------------------------------|--------------------------------------|
| Y N                 | 5                                       | 5                                                        | <input type="text"/>                 |
| Y N                 | 4                                       | 4                                                        | Raw Score                            |
| Y N                 | 3                                       | 3                                                        | # No/DK<br>Responses                 |
| Y N                 | 2                                       | 2                                                        | Raw Score                            |
| Y N                 | 1                                       | 1                                                        | # Correct-<br>To-Incorrect           |
|                     |                                         |                                                          | Raw Score                            |

Incorrect responses on all sentences:

0

Incorrect response on Sentence 5:

0

## 2. enton (dance)

Examinee's Responses:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

| Response<br>Correct | 1st Sentence<br>Correct<br>(Circle One) | 1st Sentence<br>Consecutively<br>Correct<br>(Circle One) | Optional:<br># Repeated<br>Incorrect |
|---------------------|-----------------------------------------|----------------------------------------------------------|--------------------------------------|
| Y N                 | 5                                       | 5                                                        | <input type="text"/>                 |
| Y N                 | 4                                       | 4                                                        | Raw Score                            |
| Y N                 | 3                                       | 3                                                        | # No/DK<br>Responses                 |
| Y N                 | 2                                       | 2                                                        | Raw Score                            |
| Y N                 | 1                                       | 1                                                        | # Correct-<br>To-Incorrect           |
|                     |                                         |                                                          | Raw Score                            |

Incorrect responses on all sentences:

0

Incorrect response on Sentence 5:

0

# D-KEFS Word Context Test (continued)

## 3. delz (voice)

Examinee's Responses:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

| Response<br>Correct | 1st Sentence<br>Correct<br>(Circle One) | 1st Sentence<br>Consecutively<br>Correct<br>(Circle One) | Optional:<br># Repeated<br>Incorrect<br><br>Raw Score |
|---------------------|-----------------------------------------|----------------------------------------------------------|-------------------------------------------------------|
| Y N                 | 5                                       | 5                                                        | <input type="text"/>                                  |
| Y N                 | 4                                       | 4                                                        | <input type="text"/>                                  |
| Y N                 | 3                                       | 3                                                        | <input type="text"/>                                  |
| Y N                 | 2                                       | 2                                                        | <input type="text"/>                                  |
| Y N                 | 1                                       | 1                                                        | <input type="text"/>                                  |

Incorrect responses on all sentences:

Incorrect response on Sentence 5:

## 4. vern (horse)

Examinee's Responses:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

| Response<br>Correct | 1st Sentence<br>Correct<br>(Circle One) | 1st Sentence<br>Consecutively<br>Correct<br>(Circle One) | Optional:<br># Repeated<br>Incorrect<br><br>Raw Score |
|---------------------|-----------------------------------------|----------------------------------------------------------|-------------------------------------------------------|
| Y N                 | 5                                       | 5                                                        | <input type="text"/>                                  |
| Y N                 | 4                                       | 4                                                        | <input type="text"/>                                  |
| Y N                 | 3                                       | 3                                                        | <input type="text"/>                                  |
| Y N                 | 2                                       | 2                                                        | <input type="text"/>                                  |
| Y N                 | 1                                       | 1                                                        | <input type="text"/>                                  |

Incorrect responses on all sentences:

Incorrect response on Sentence 5:

## 5. nelzen (make)

Examinee's Responses:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

| Response<br>Correct | 1st Sentence<br>Correct<br>(Circle One) | 1st Sentence<br>Consecutively<br>Correct<br>(Circle One) | Optional:<br># Repeated<br>Incorrect<br><br>Raw Score |
|---------------------|-----------------------------------------|----------------------------------------------------------|-------------------------------------------------------|
| Y N                 | 5                                       | 5                                                        | <input type="text"/>                                  |
| Y N                 | 4                                       | 4                                                        | <input type="text"/>                                  |
| Y N                 | 3                                       | 3                                                        | <input type="text"/>                                  |
| Y N                 | 2                                       | 2                                                        | <input type="text"/>                                  |
| Y N                 | 1                                       | 1                                                        | <input type="text"/>                                  |

Incorrect responses on all sentences:

Incorrect response on Sentence 5:

# D-KEFS Word Context Test (continued)

## 6. gesh (fish)

Examinee's Responses:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

| Response Correct | 1st Sentence Correct (Circle One) | 1st Sentence Consecutively Correct (Circle One) | Optional:<br># Repeated Incorrect                           |
|------------------|-----------------------------------|-------------------------------------------------|-------------------------------------------------------------|
| Y N              | 5                                 | 5                                               | <input type="text"/><br>Raw Score                           |
| Y N              | 4                                 | 4                                               | # No/DK Responses<br><input type="text"/><br>Raw Score      |
| Y N              | 3                                 | 3                                               | # Correct To Incorrect<br><input type="text"/><br>Raw Score |
| Y N              | 2                                 | 2                                               |                                                             |
| Y N              | 1                                 | 1                                               |                                                             |

Incorrect responses on all sentences:

Incorrect response on Sentence 5:

## 7. luri (motor, engine)

Examinee's Responses:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

| Response Correct | 1st Sentence Correct (Circle One) | 1st Sentence Consecutively Correct (Circle One) | Optional:<br># Repeated Incorrect                           |
|------------------|-----------------------------------|-------------------------------------------------|-------------------------------------------------------------|
| Y N              | 5                                 | 5                                               | <input type="text"/><br>Raw Score                           |
| Y N              | 4                                 | 4                                               | # No/DK Responses<br><input type="text"/><br>Raw Score      |
| Y N              | 3                                 | 3                                               | # Correct To Incorrect<br><input type="text"/><br>Raw Score |
| Y N              | 2                                 | 2                                               |                                                             |
| Y N              | 1                                 | 1                                               |                                                             |

Incorrect responses on all sentences:

Incorrect response on Sentence 5:

## 8. krame (tooth, teeth)

Examinee's Responses:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

| Response Correct | 1st Sentence Correct (Circle One) | 1st Sentence Consecutively Correct (Circle One) | Optional:<br># Repeated Incorrect                           |
|------------------|-----------------------------------|-------------------------------------------------|-------------------------------------------------------------|
| Y N              | 5                                 | 5                                               | <input type="text"/><br>Raw Score                           |
| Y N              | 4                                 | 4                                               | # No/DK Responses<br><input type="text"/><br>Raw Score      |
| Y N              | 3                                 | 3                                               | # Correct To Incorrect<br><input type="text"/><br>Raw Score |
| Y N              | 2                                 | 2                                               |                                                             |
| Y N              | 1                                 | 1                                               |                                                             |

Incorrect responses on all sentences:

Incorrect response on Sentence 5:

## 9. kapla (word)

Examinee's Responses:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

| Response<br>Correct | 1st Sentence<br>Correct<br>(Circle One) | 1st Sentence<br>Consecutively<br>Correct<br>(Circle One) |
|---------------------|-----------------------------------------|----------------------------------------------------------|
| Y N                 | 5                                       | 5                                                        |
| Y N                 | 4                                       | 4                                                        |
| Y N                 | 3                                       | 3                                                        |
| Y N                 | 2                                       | 2                                                        |
| Y N                 | 1                                       | 1                                                        |

Optional:

# Repeated  
Incorrect

Raw Score

# No/DK  
Responses

Raw Score

# Correct-  
To-Incorrect

Raw Score

Incorrect responses on all sentences:

Incorrect response on Sentence 5:

## 10. grot (curtain)

Examinee's Responses:

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_

| Response<br>Correct | 1st Sentence<br>Correct<br>(Circle One) | 1st Sentence<br>Consecutively<br>Correct<br>(Circle One) |
|---------------------|-----------------------------------------|----------------------------------------------------------|
| Y N                 | 5                                       | 5                                                        |
| Y N                 | 4                                       | 4                                                        |
| Y N                 | 3                                       | 3                                                        |
| Y N                 | 2                                       | 2                                                        |
| Y N                 | 1                                       | 1                                                        |

Optional:

# Repeated  
Incorrect

Raw Score

# No/DK  
Responses

Raw Score

# Correct-  
To-Incorrect

Raw Score

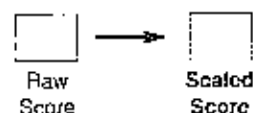
Incorrect responses on all sentences:

Incorrect response on Sentence 5:

## D-KEFS Word Context Test: Summary of Scores

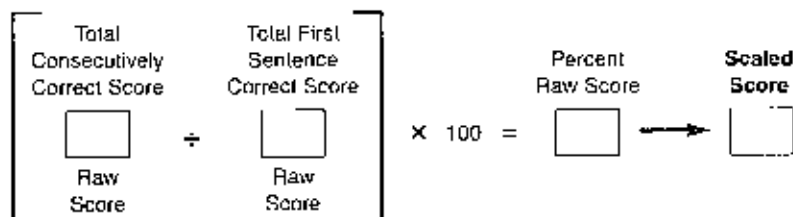
### Primary Measure

Total Consecutively Correct

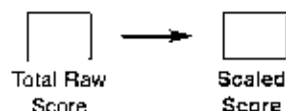


### Optional Measures

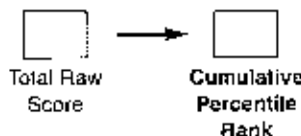
Consistently Correct Ratio



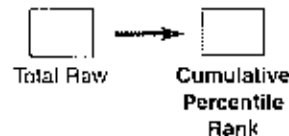
Repeated Incorrect Responses



No/Don't Know Responses



Total Correct-To-Incorrect Errors



Note: Cumulative percentile ranks for the D-KEFS were scaled to reflect the percentage of the normative sample that obtained raw scores equal to or worse than the raw score obtained by the examinee.

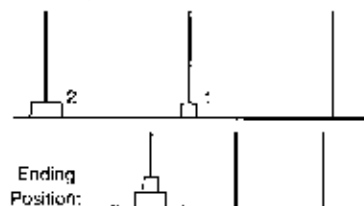
# D-KEFS Tower Test

Discontinue after three consecutive item failures. Disk Labels: 1 = Smallest to 5 = Largest.

## Item 1: Two Disks

Time Limit: 30"

Starting Position  
(Examiner's View)



| 1st Move Time | Total # Moves (Min. = 1) | # Rule Violations | Item Completion Time |
|---------------|--------------------------|-------------------|----------------------|
|               |                          |                   |                      |
|               |                          |                   | Correct Tower<br>Y N |

Demonstrate 1-move solution if examinee fails to solve item in 1 move.

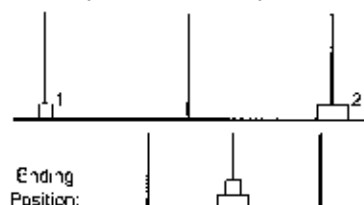
### Achievement Score

| Correct Within Time Limit |          |        |
|---------------------------|----------|--------|
| Failed                    | >1 Moves | 1 Move |
| 0                         | 1        | 2      |

## Item 2: Two Disks

Time Limit: 30"

Starting Position  
(Examiner's View)



| 1st Move Time | Total # Moves (Min. = 2) | # Rule Violations | Item Completion Time |
|---------------|--------------------------|-------------------|----------------------|
|               |                          |                   |                      |
|               |                          |                   | Correct Tower<br>Y N |

Demonstrate 2-move solution if examinee fails to solve item in 2 moves.

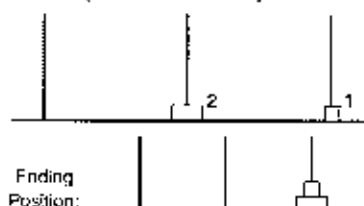
### Achievement Score

| Correct Within Time Limit |          |         |
|---------------------------|----------|---------|
| Failed                    | >2 Moves | 2 Moves |
| 0                         | 1        | 2       |

## Item 3: Two Disks

Time Limit: 30"

Starting Position  
(Examiner's View)



| 1st Move Time | Total # Moves (Min. = 3) | # Rule Violations | Item Completion Time |
|---------------|--------------------------|-------------------|----------------------|
|               |                          |                   |                      |
|               |                          |                   | Correct Tower<br>Y N |

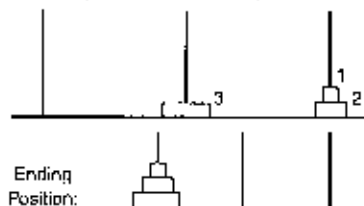
### Achievement Score

| Correct Within Time Limit |          |         |         |
|---------------------------|----------|---------|---------|
| Failed                    | >4 Moves | 4 Moves | 3 Moves |
| 0                         | 1        | 2       | 3       |

## Item 4: Three Disks

Time Limit: 60"

Starting Position  
(Examiner's View)



| 1st Move Time | Total # Moves (Min. = 4) | # Rule Violations | Item Completion Time |
|---------------|--------------------------|-------------------|----------------------|
|               |                          |                   |                      |
|               |                          |                   | Correct Tower<br>Y N |

### Achievement Score

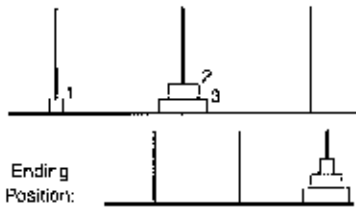
| Correct Within Time Limit |          |         |         |
|---------------------------|----------|---------|---------|
| Failed                    | >5 Moves | 5 Moves | 4 Moves |
| 0                         | 1        | 2       | 3       |

276824-3 / 4 / 10 /

### Item 5: Three Disks

Time Limit: 120"

Starting Position  
(Examiner's View)



| 1st Move Time | Total # Moves<br>(Min. = 7) | # Rule Violations | Item Completion Time |
|---------------|-----------------------------|-------------------|----------------------|
|               |                             |                   |                      |
|               |                             |                   | Correct Tower<br>Y N |

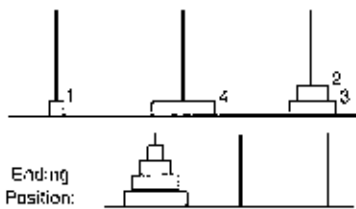
### Achievement Score

| Correct Within Time Limit |          |         |         |         |
|---------------------------|----------|---------|---------|---------|
| Failed                    | >9 Moves | 9 Moves | 8 Moves | 7 Moves |
| 0                         | 1        | 2       | 3       | 4       |

### Item 6: Four Disks

Time Limit: 120"

Starting Position  
(Examiner's View)



| 1st Move Time | Total # Moves<br>(Min. = 9) | # Rule Violations | Item Completion Time |
|---------------|-----------------------------|-------------------|----------------------|
|               |                             |                   |                      |
|               |                             |                   | Correct Tower<br>Y N |

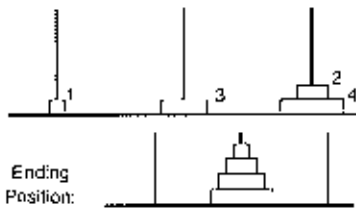
### Achievement Score

| Correct Within Time Limit |           |          |          |         |
|---------------------------|-----------|----------|----------|---------|
| Failed                    | >11 Moves | 11 Moves | 10 Moves | 9 Moves |
| 0                         | 1         | 2        | 3        | 4       |

### Item 7: Four Disks

Time Limit: 180"

Starting Position  
(Examiner's View)



| 1st Move Time | Total # Moves<br>(Min. = 13) | # Rule Violations | Item Completion Time |
|---------------|------------------------------|-------------------|----------------------|
|               |                              |                   |                      |
|               |                              |                   | Correct Tower<br>Y N |

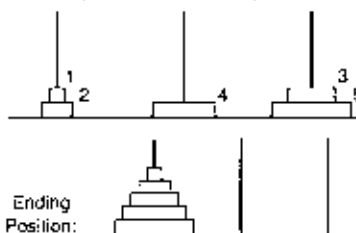
### Achievement Score

| Correct Within Time Limit |           |          |          |          |
|---------------------------|-----------|----------|----------|----------|
| Failed                    | >15 Moves | 15 Moves | 14 Moves | 13 Moves |
| 0                         | 1         | 2        | 3        | 4        |

### Item 8: Five Disks

Time Limit: 240"

Starting Position  
(Examiner's View)



| 1st Move Time | Total # Moves<br>(Min. = 20) | # Rule Violations | Item Completion Time |
|---------------|------------------------------|-------------------|----------------------|
|               |                              |                   |                      |
|               |                              |                   | Correct Tower<br>Y N |

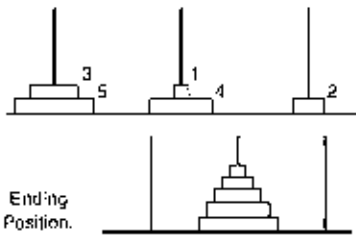
### Achievement Score

| Correct Within Time Limit |           |             |             |          |
|---------------------------|-----------|-------------|-------------|----------|
| Failed                    | >24 Moves | 23-24 Moves | 21-22 Moves | 20 Moves |
| 0                         | 1         | 2           | 3           | 4        |

# Item 9: Five Disks

Time Limit: 240"

Starting Position  
(Examiner's View)



| 1st Move Time | Total # Moves<br>(Min. = 26) | # Rule Violations | Item Completion Time |
|---------------|------------------------------|-------------------|----------------------|
|               |                              |                   |                      |
|               |                              |                   | Correct Tower<br>Y N |

Achievement Score

| Correct Within Time Limit |           |             |             |          |
|---------------------------|-----------|-------------|-------------|----------|
| Failed                    | >32 Moves | 30-32 Moves | 27-29 Moves | 26 Moves |
| 0                         | 1         | 2           | 3           | 4        |

## D-KEFS Tower Test: Summary of Scores

### Totals for Items Administered

|                            |                      |                      |                         |                             |                         |
|----------------------------|----------------------|----------------------|-------------------------|-----------------------------|-------------------------|
| <input type="text"/>       | <input type="text"/> | <input type="text"/> | <input type="text"/>    | <input type="text"/>        | <input type="text"/>    |
| Total # Items Administered | Total 1st-Move Time  | Total # Moves        | Total # Rule Violations | Total Item Completion Times | Total Achievement Score |

### Primary Measure

|                         |                 |                      |
|-------------------------|-----------------|----------------------|
| <input type="text"/>    | →               | <input type="text"/> |
| Total Achievement Score | Total Raw Score | Scaled Score         |

### Optional Measures

|                                |                             |   |                            |   |             |   |                            |
|--------------------------------|-----------------------------|---|----------------------------|---|-------------|---|----------------------------|
| Mean First-Move Time*          | Total 1st-Move Times        | ÷ | Total # Items Administered | = | Ratio Score | → | Scaled Score               |
| Time-Per-Move Ratio*           | Total Item-Completion Times | ÷ | Total # Moves              | = | Ratio Score | → | Scaled Score               |
| Move Accuracy Ratio*           | Total # Moves               | ÷ | Total # Minimum Moves      | = | Ratio Score | → | Scaled Score               |
| Total Rule Violations          | <input type="text"/>        |   |                            | → |             |   | Cumulative Percentile Rank |
| Rule-Violations-Per-Item Ratio | Total # Rule Violations     | ÷ | Total # Items Administered | = | Ratio Score | → | Scaled Score               |

### Total Cumulative Minimum Moves Possible

| Number of Items Administered | Cumulative Minimum Moves Possible |  |
|------------------------------|-----------------------------------|--|
| 1                            | 1                                 |  |
| 2                            | 3                                 |  |
| 3                            | 6                                 |  |
| 4                            | 10                                |  |
| 5                            | 17                                |  |
| 6                            | 26                                |  |
| 7                            | 39                                |  |
| 8                            | 59                                |  |
| 9                            | 85                                |  |

Circle the cumulative minimum number of moves possible for the number of items administered to determine the total number of minimum moves.

\* A low or high ratio scaled score on these measures may reflect different cognitive problems; see examiner's manual.



# D-KEFS Proverb Test

Do not discontinue.

**Condition 1:**  
**Free Inquiry**  
Circle Score

**Condition 2:**  
**Multiple Choice**  
Circle Letter Choice/Score

|                               | Accuracy Score | Abstraction Score | Total Achievement Score (Score 0 if Accuracy = 0) | Circle Letter Choice/Score |          |          |  |
|-------------------------------|----------------|-------------------|---------------------------------------------------|----------------------------|----------|----------|--|
|                               |                |                   |                                                   | 0 Points                   | 2 Points | 4 Points |  |
| Common Proverbs (Items 1-5)   | 0 1 2          | 0 2               |                                                   | Phon Unrel                 | Concrete | Abstract |  |
|                               | 0 1 2          | 0 2               |                                                   | c a<br>0                   | d<br>2   | c<br>4   |  |
|                               | 0 1 2          | 0 2               |                                                   | c b<br>0                   | d<br>2   | a<br>4   |  |
|                               | 0 1 2          | 0 2               |                                                   | a d<br>0                   | c<br>2   | b<br>4   |  |
|                               | 0 1 2          | 0 2               |                                                   | d a<br>n                   | b<br>2   | c<br>4   |  |
| Uncommon Proverbs (Items 6-8) | 0 1 2          | 0 2               |                                                   | a c<br>n                   | b<br>2   | d<br>4   |  |
|                               | 0 1 2          | 0 2               |                                                   | d c<br>n                   | a<br>2   | b<br>4   |  |
|                               | 0 1 2          | 0 2               |                                                   | b d<br>0                   | a<br>2   | c<br>4   |  |
|                               | 0 1 2          | 0 2               |                                                   | d c<br>0                   | a<br>2   | b<br>4   |  |

Total Accuracy Score

Total Abstraction Score

Total Achievement Score

Free Inquiry

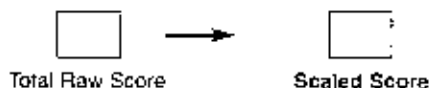
Total Achievement Score

Multiple Choice

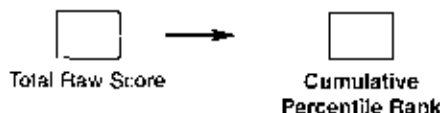
# D-KEFS Proverb Test: Summary of Scores

## Primary Measures

Total Achievement Score: Free Inquiry

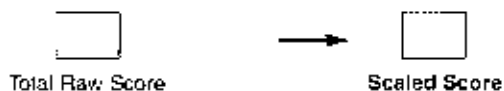


Total Achievement Score: Multiple Choice

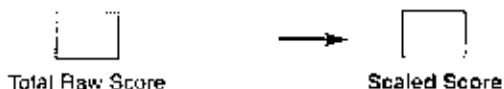


## Optional Measures: Free Inquiry

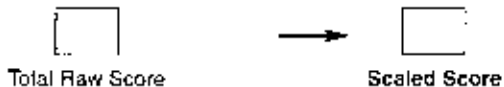
Common Proverb Achievement Score:  
Free Inquiry Items 1–5



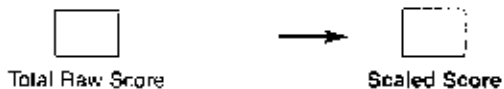
Uncommon Proverb Achievement Score:  
Free Inquiry Items 6–8



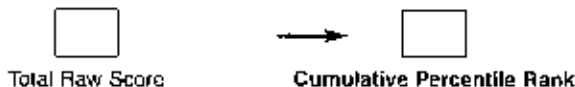
Accuracy Only Score



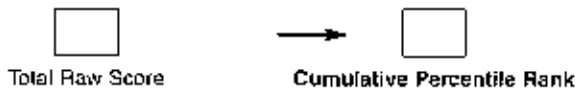
Abstraction Only Score



No/Don't Know Responses

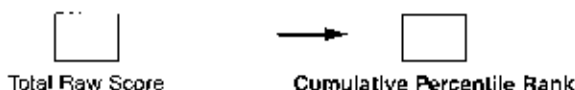


Repeated Responses

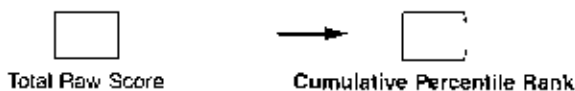


## Optional Measures: Multiple Choice

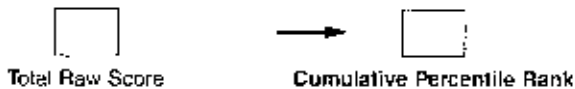
Common Proverb Achievement Score:  
Multiple Choice Items 1–5



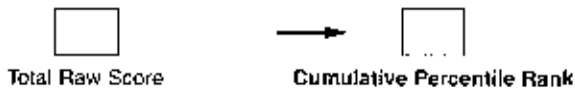
Uncommon Proverb Achievement Score:  
Multiple Choice Items 6–8



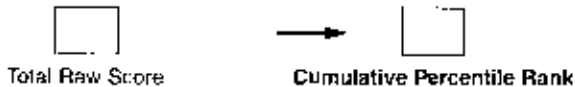
Total Correct Abstract Choices



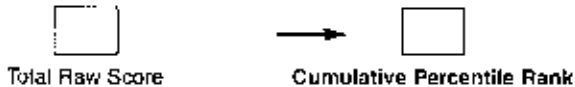
Total Correct Concrete Choices



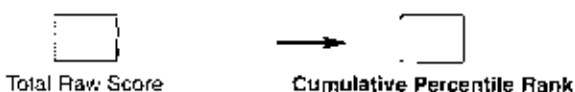
Total Incorrect Phonemic Choices



Total Incorrect Unrelated Choices



Total Incorrect Phonemic +  
Unrelated Choices



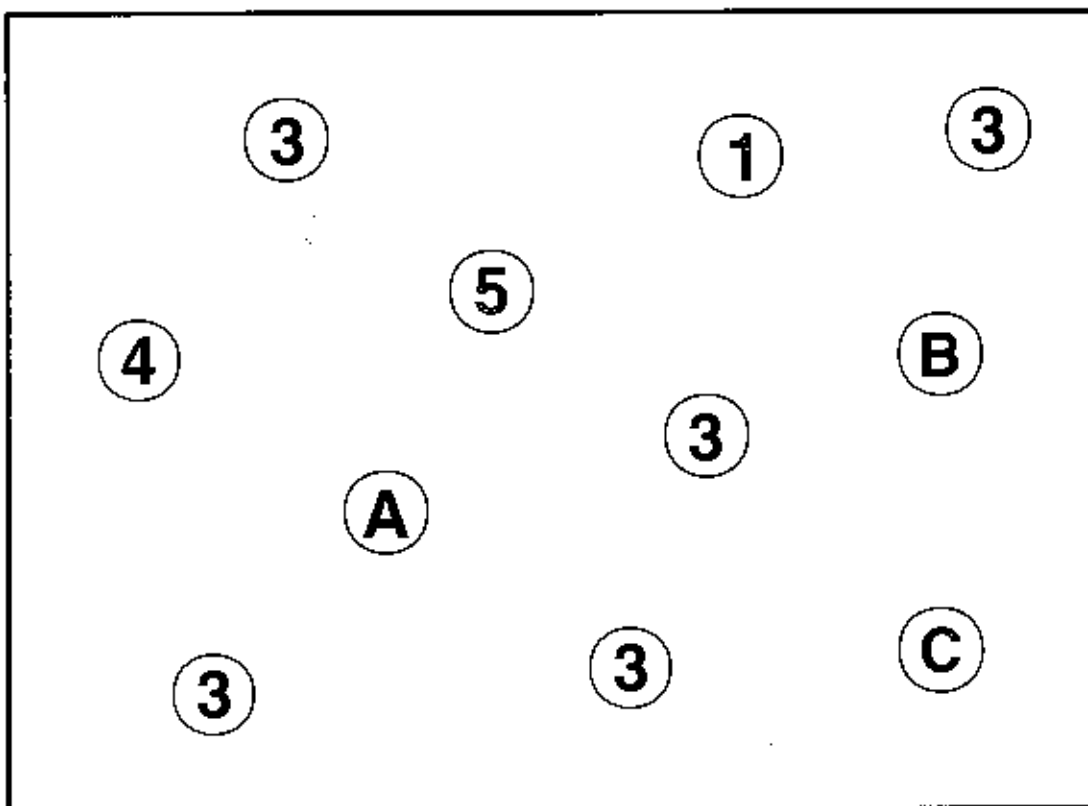
Note: Cumulative percentile ranks for the D-KEFS were scaled to reflect the percentage of the normative sample that obtained raw scores equal to or worse than the raw score obtained by the examinee.

Name \_\_\_\_\_ Age \_\_\_\_\_  
 ID \_\_\_\_\_ Date \_\_\_\_\_  
 Examiner \_\_\_\_\_  
 Notes \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

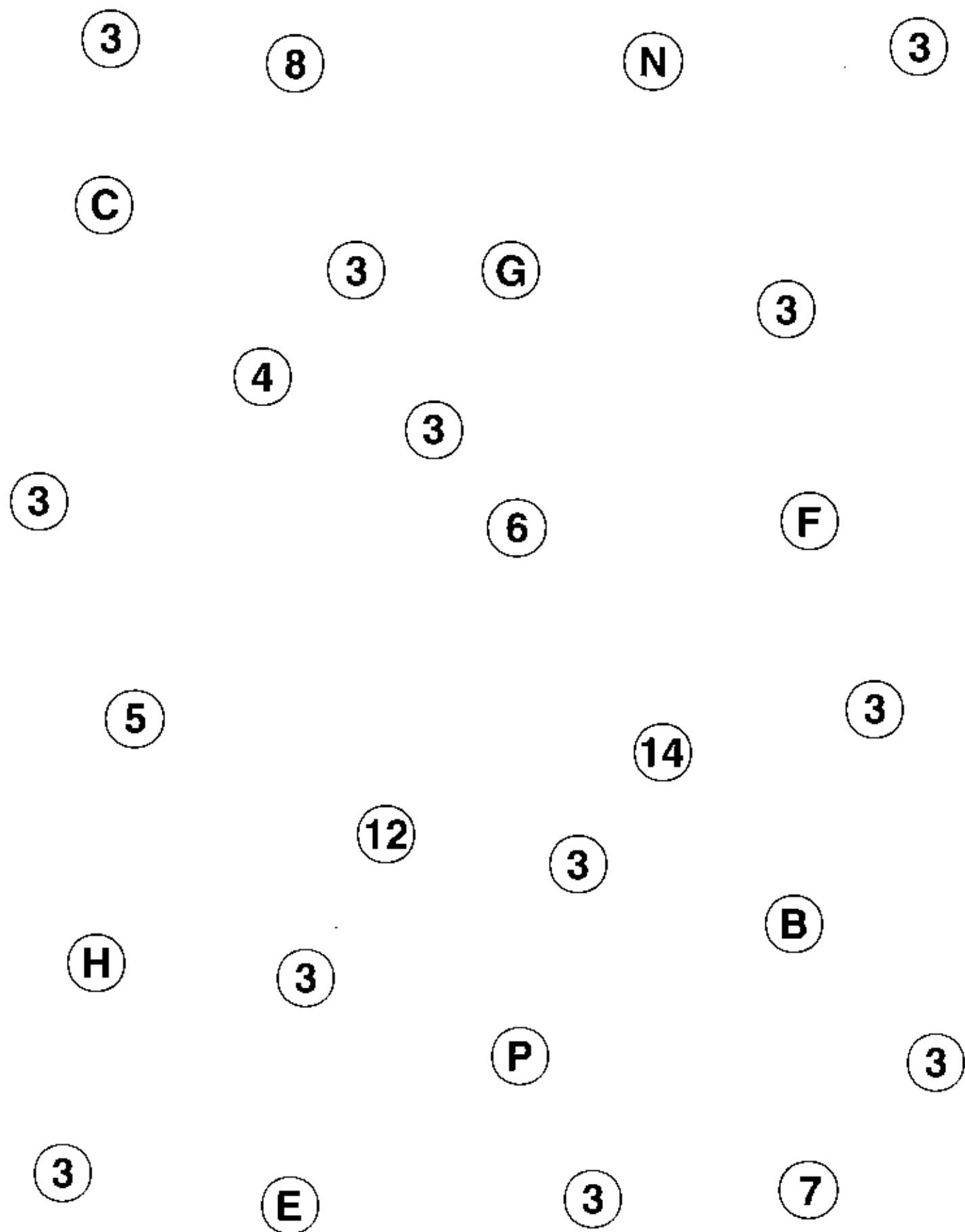
## Trail Making Test

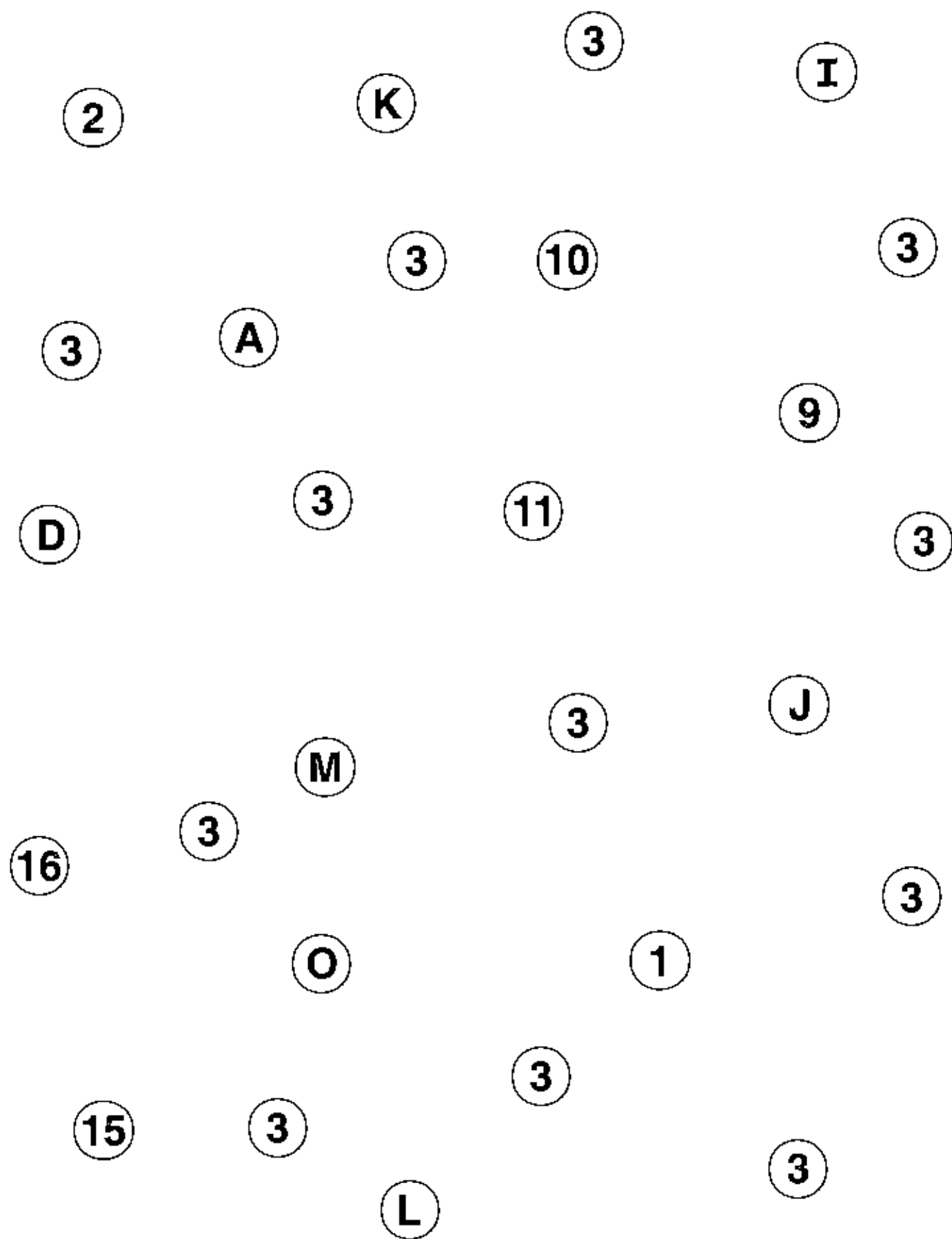
### Condition 1 Visual Scanning

Practice



29 30 A B C D E





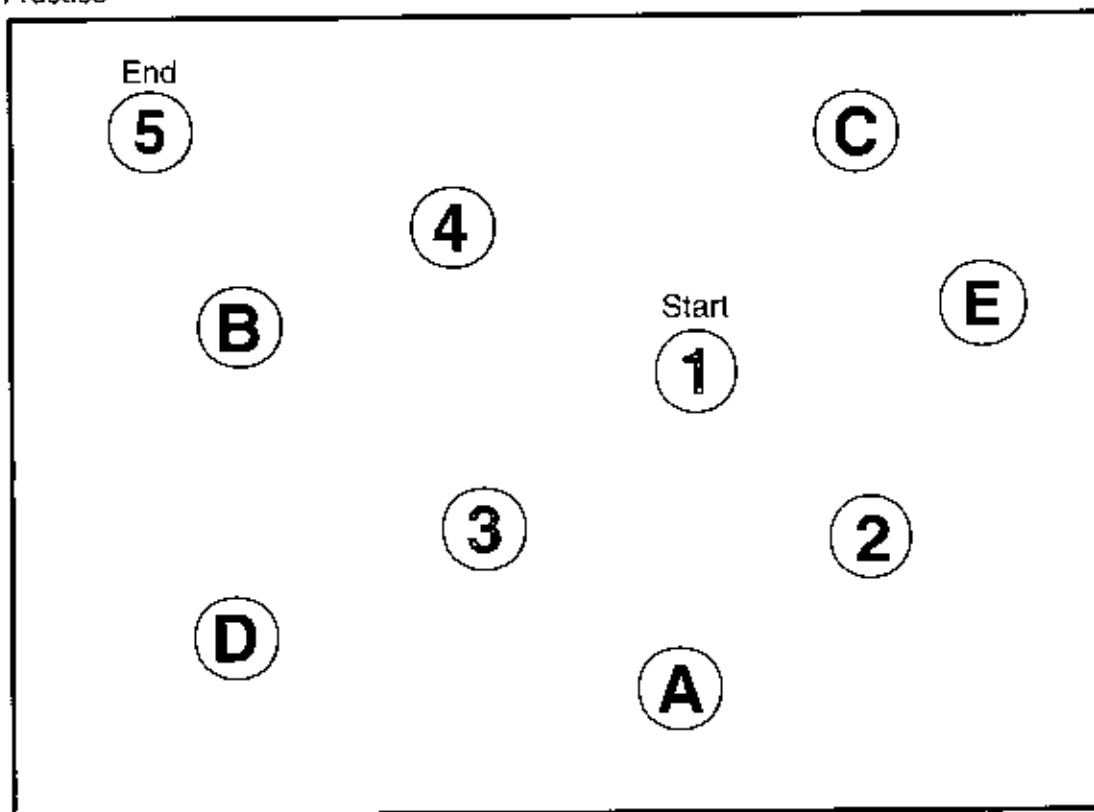


Name \_\_\_\_\_ Age \_\_\_\_\_  
ID \_\_\_\_\_ Date \_\_\_\_\_  
Examiner \_\_\_\_\_  
Notes \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

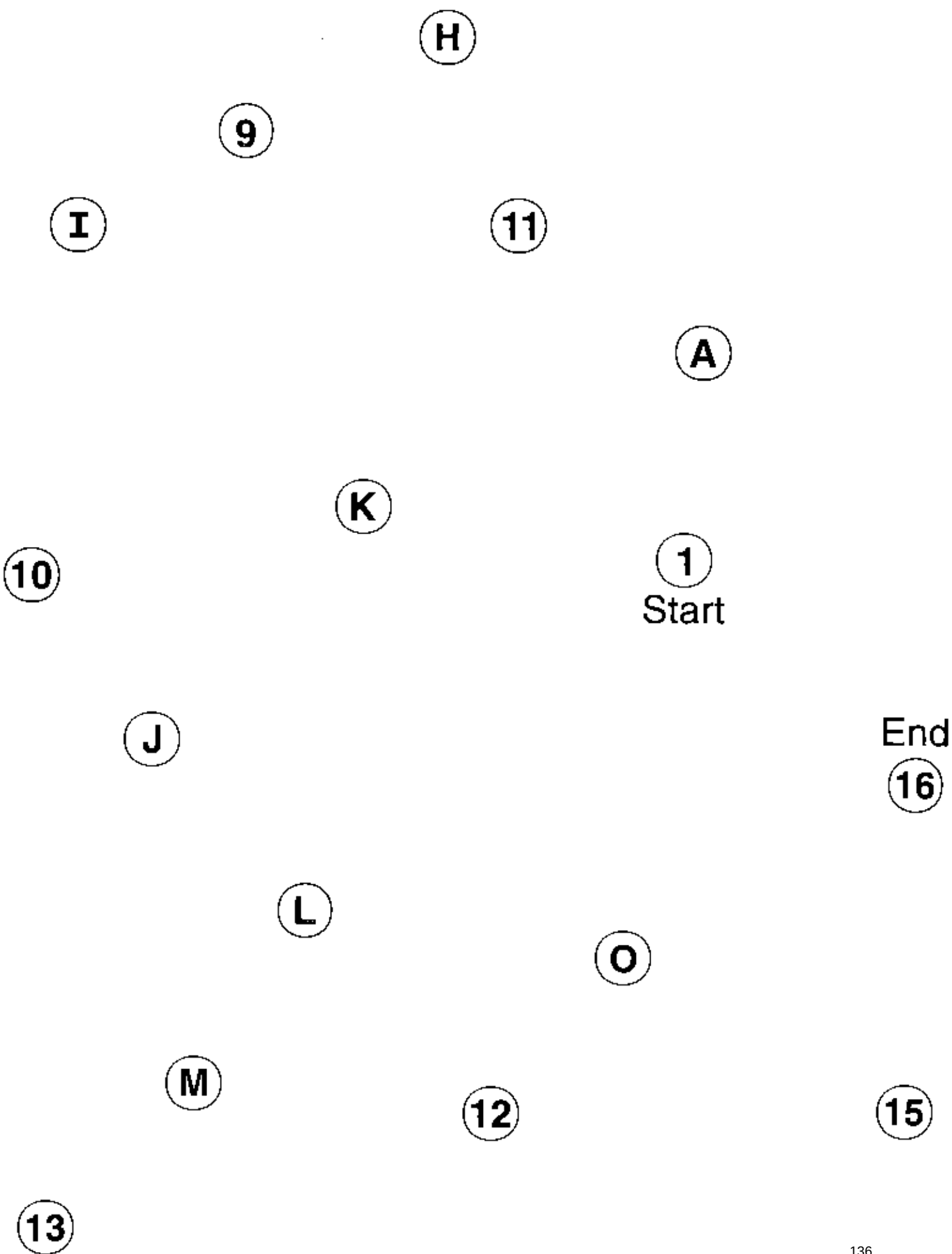
## Trail Making Test

### Condition 2 Number Sequencing

Practice



29 30 ABCDE





**F**

**7**

**8**

**B**

**G**

**C**

**2**

**3**

**P**

**4**

**D**

**E**

**N**

**6**

**5**

**14**



Name \_\_\_\_\_ Age \_\_\_\_\_

ID \_\_\_\_\_ Date \_\_\_\_\_

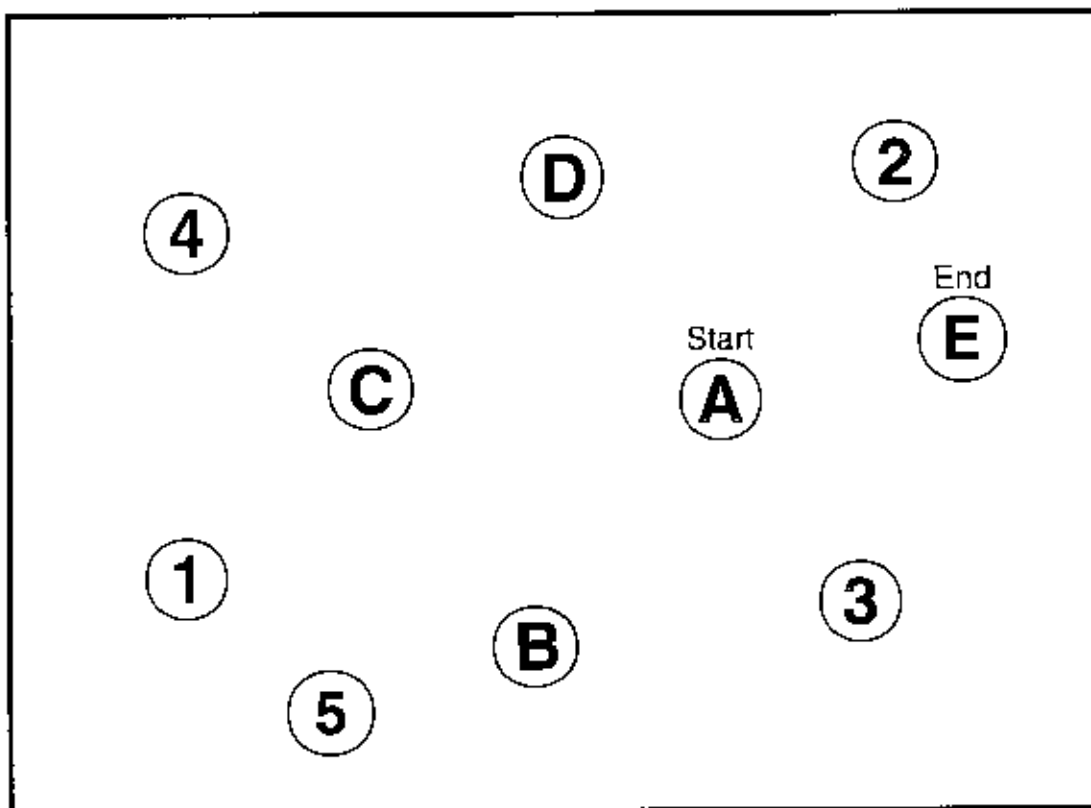
Examiner \_\_\_\_\_

Notes \_\_\_\_\_

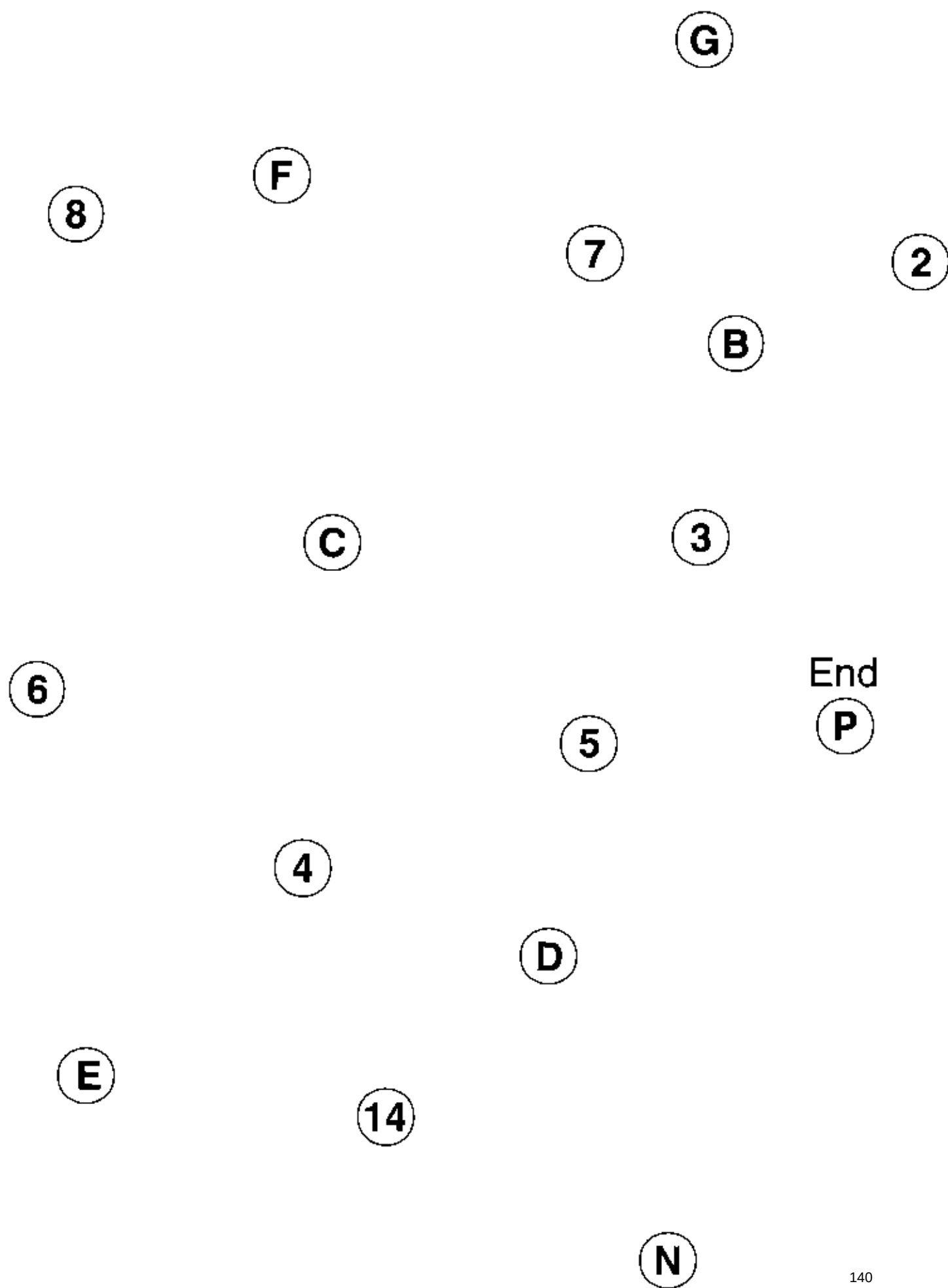
## Trail Making Test

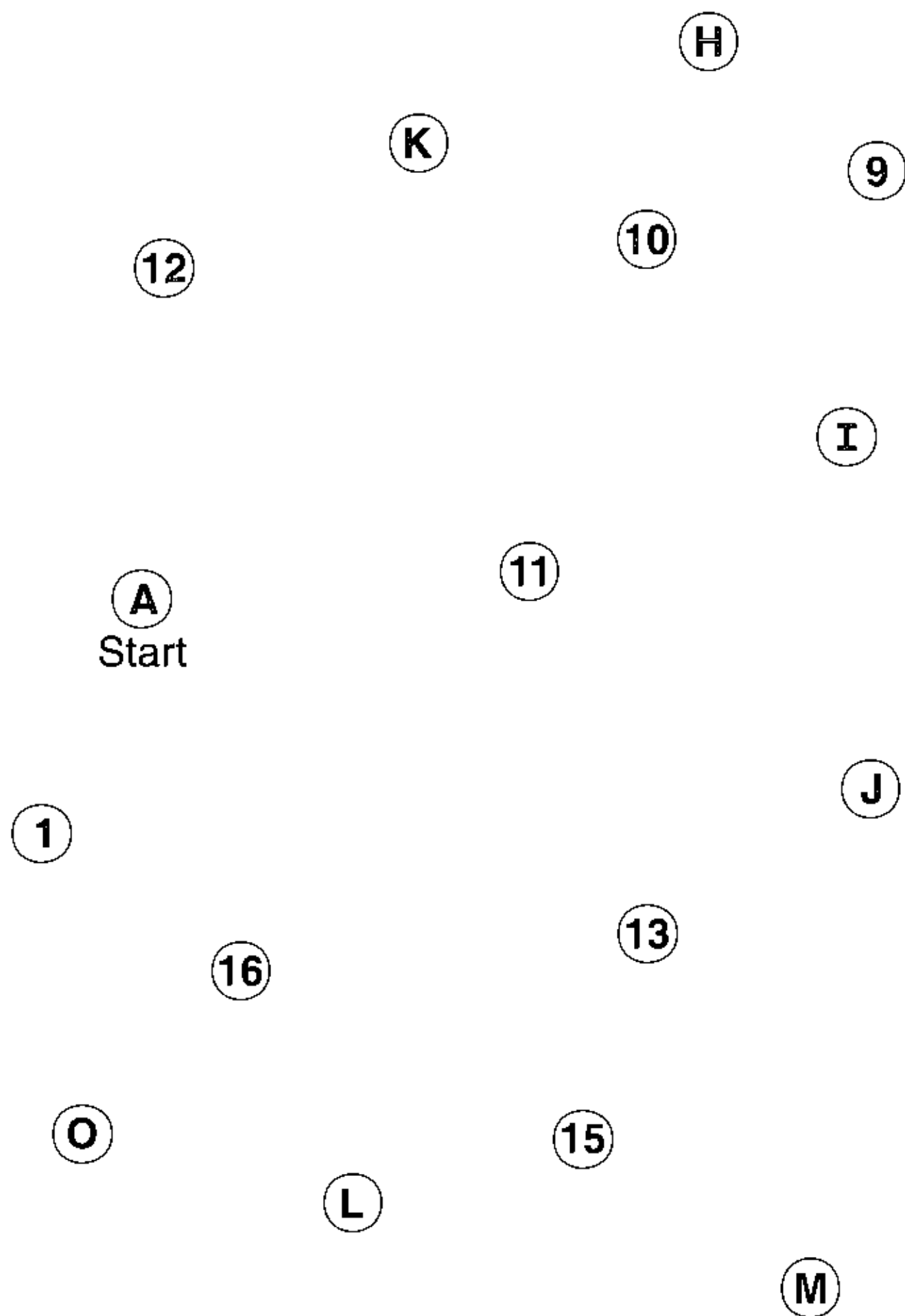
### Condition 3 Letter Sequencing

Practice



29 30 ABCDE





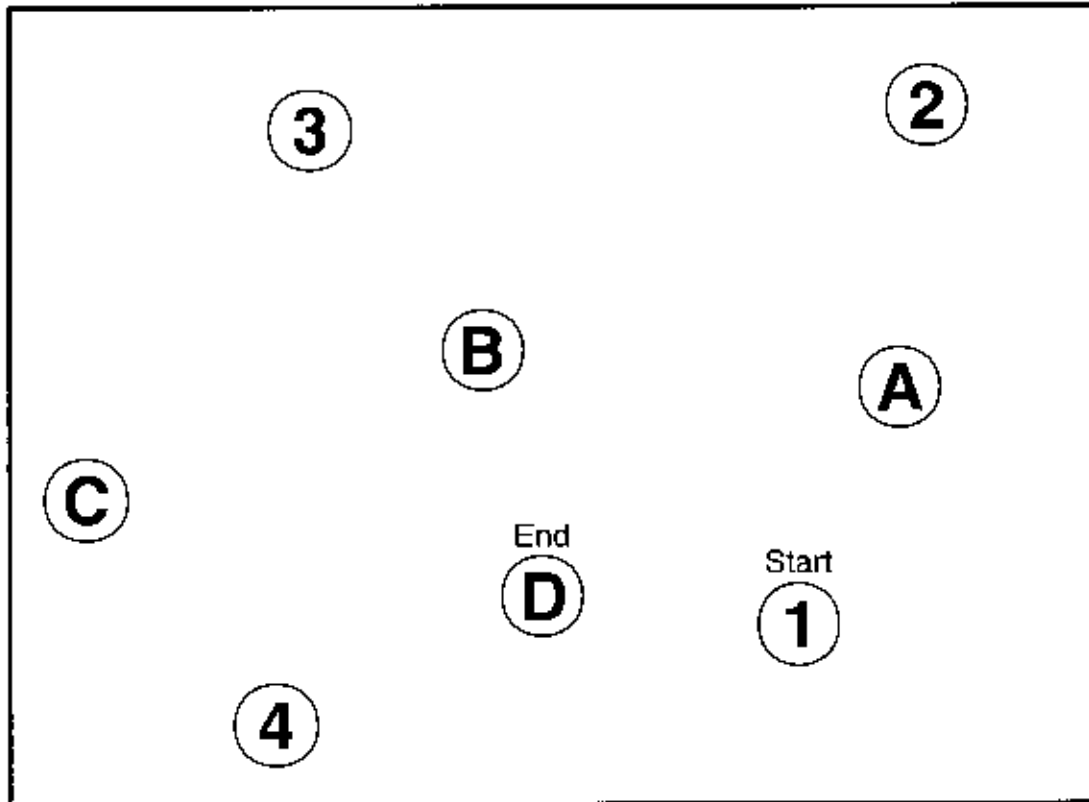


Name \_\_\_\_\_ Age \_\_\_\_\_  
 ID \_\_\_\_\_ Date \_\_\_\_\_  
 Examiner \_\_\_\_\_  
 Notes \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

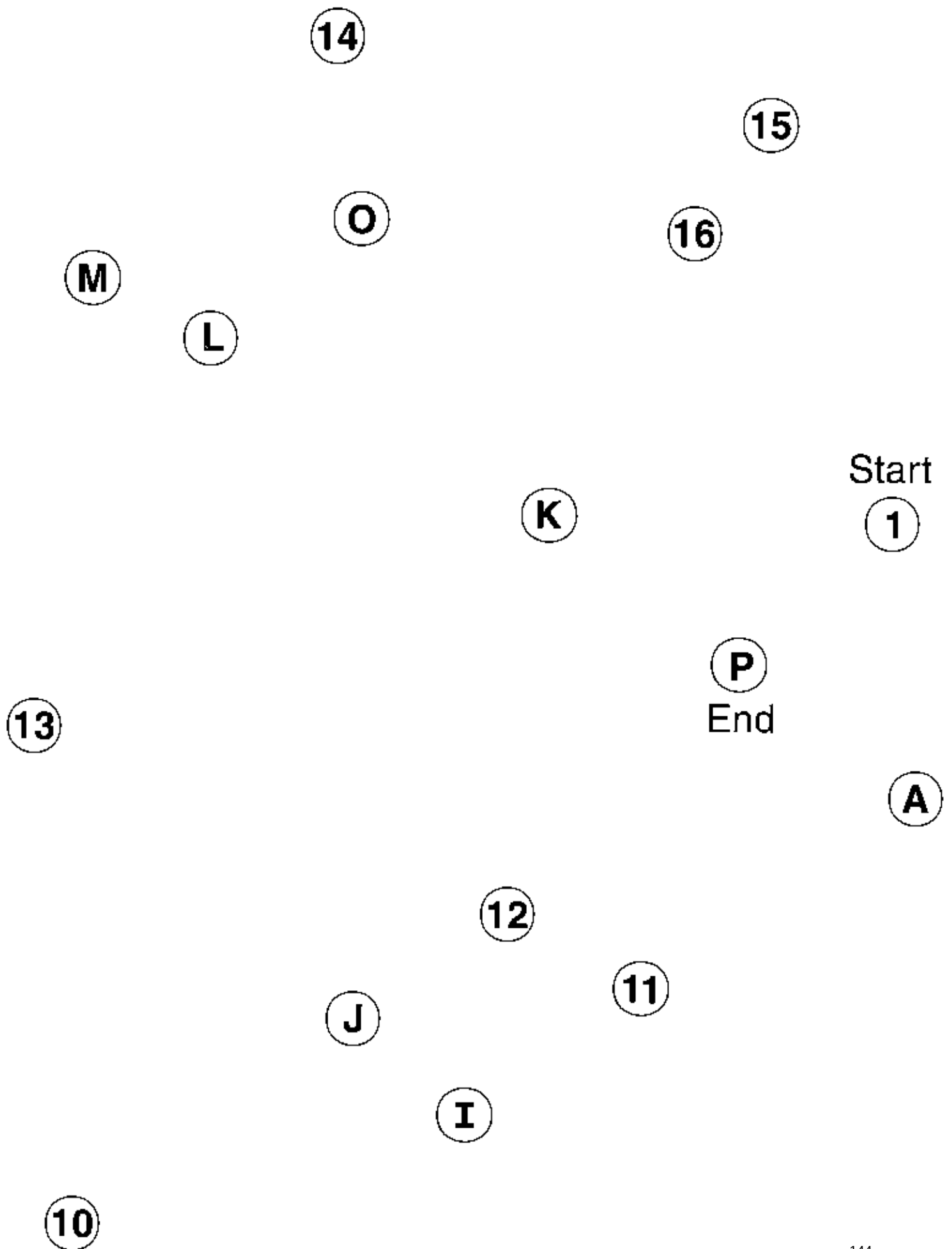
## Trail Making Test

### Condition 4 Number-Letter Switching

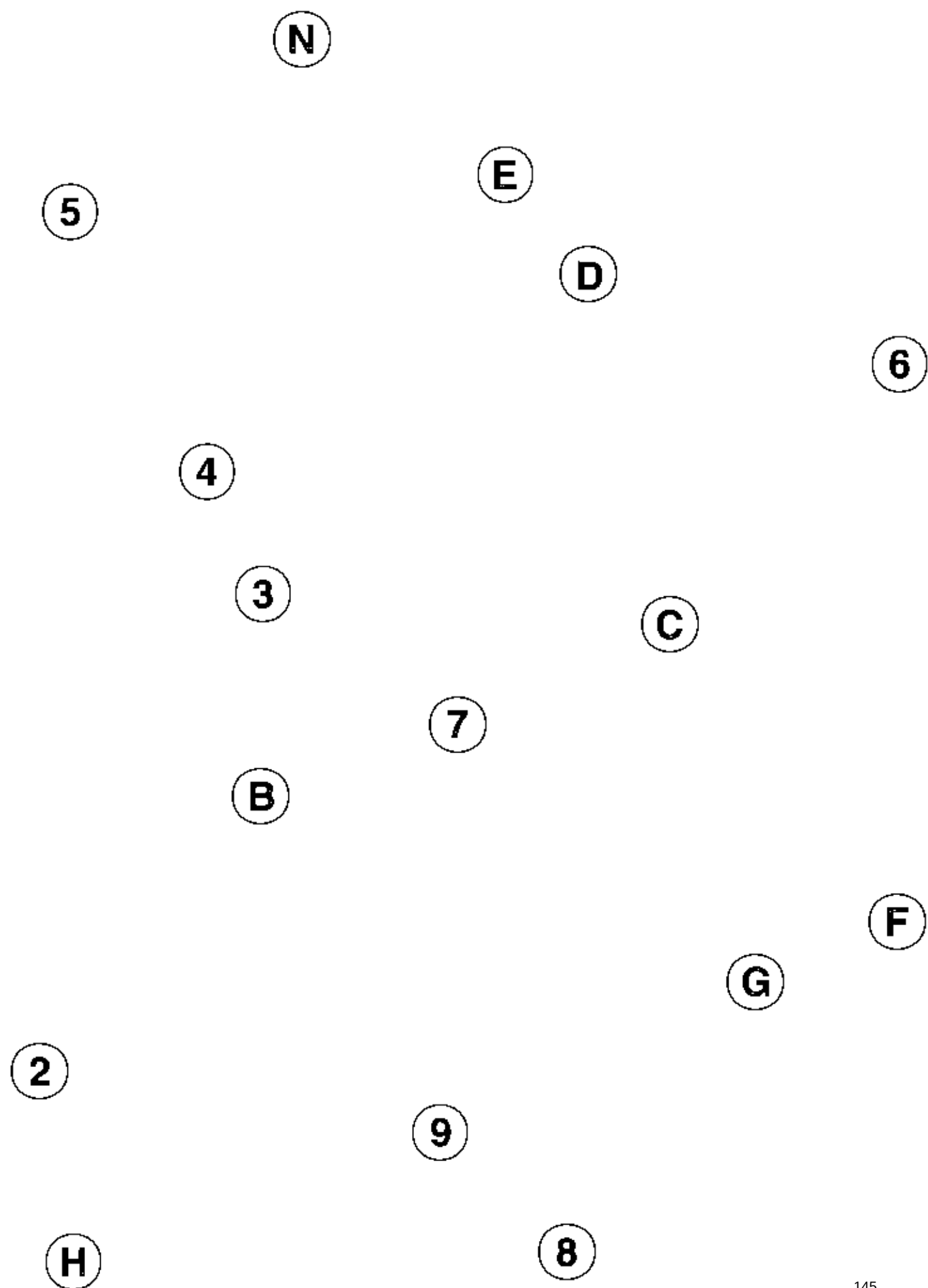
Practice



29 30 A B C D E







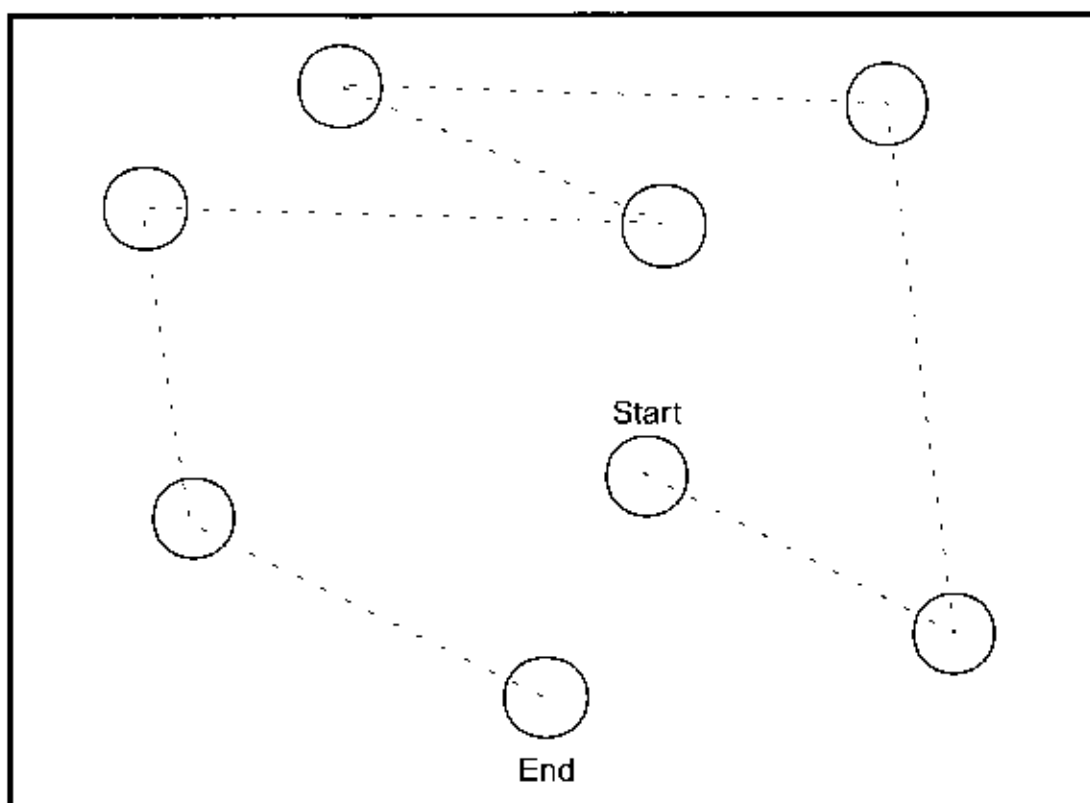


Name \_\_\_\_\_ Age \_\_\_\_\_  
 ID \_\_\_\_\_ Date \_\_\_\_\_  
 Examiner \_\_\_\_\_  
 Notes \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

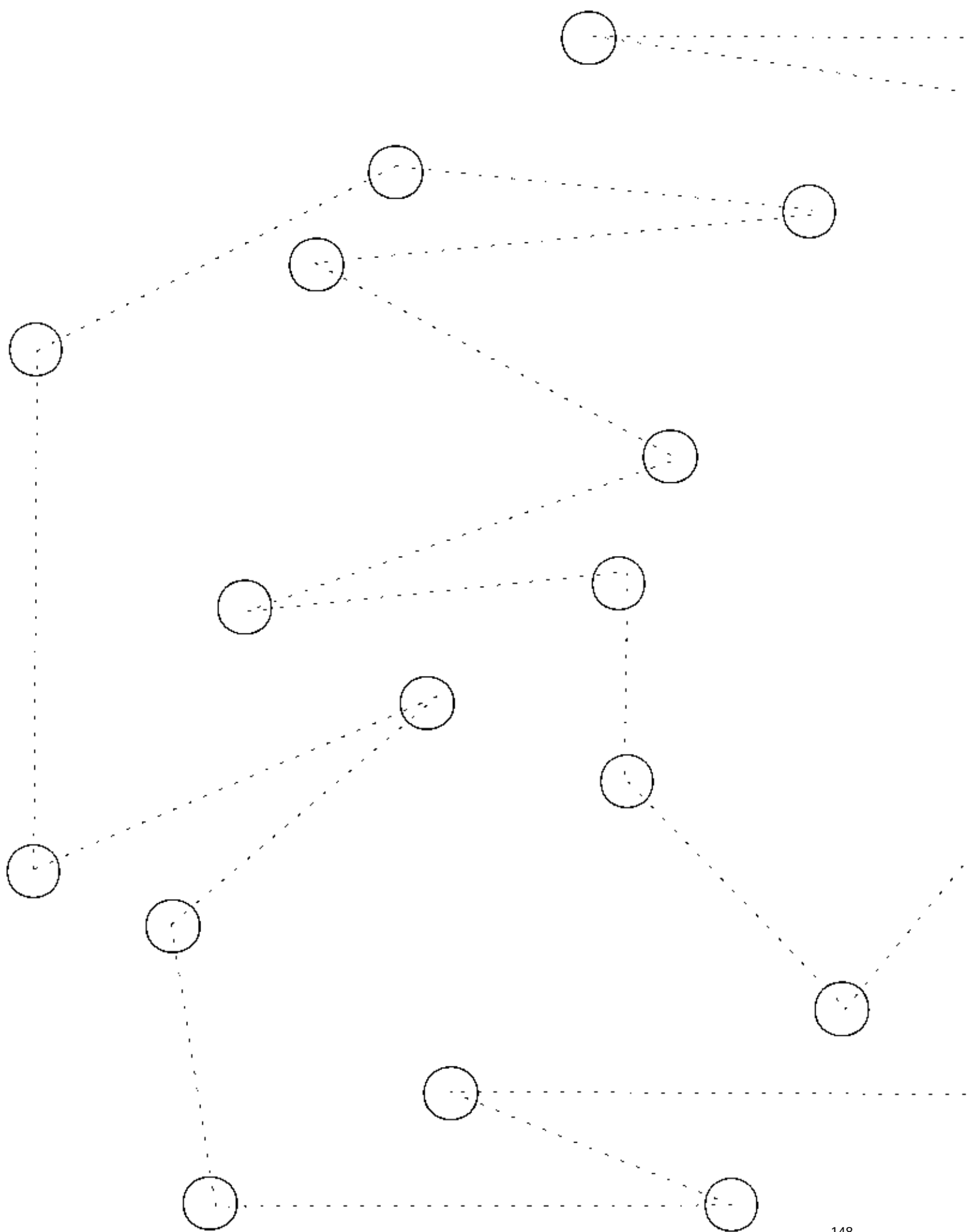
## Trail Making Test

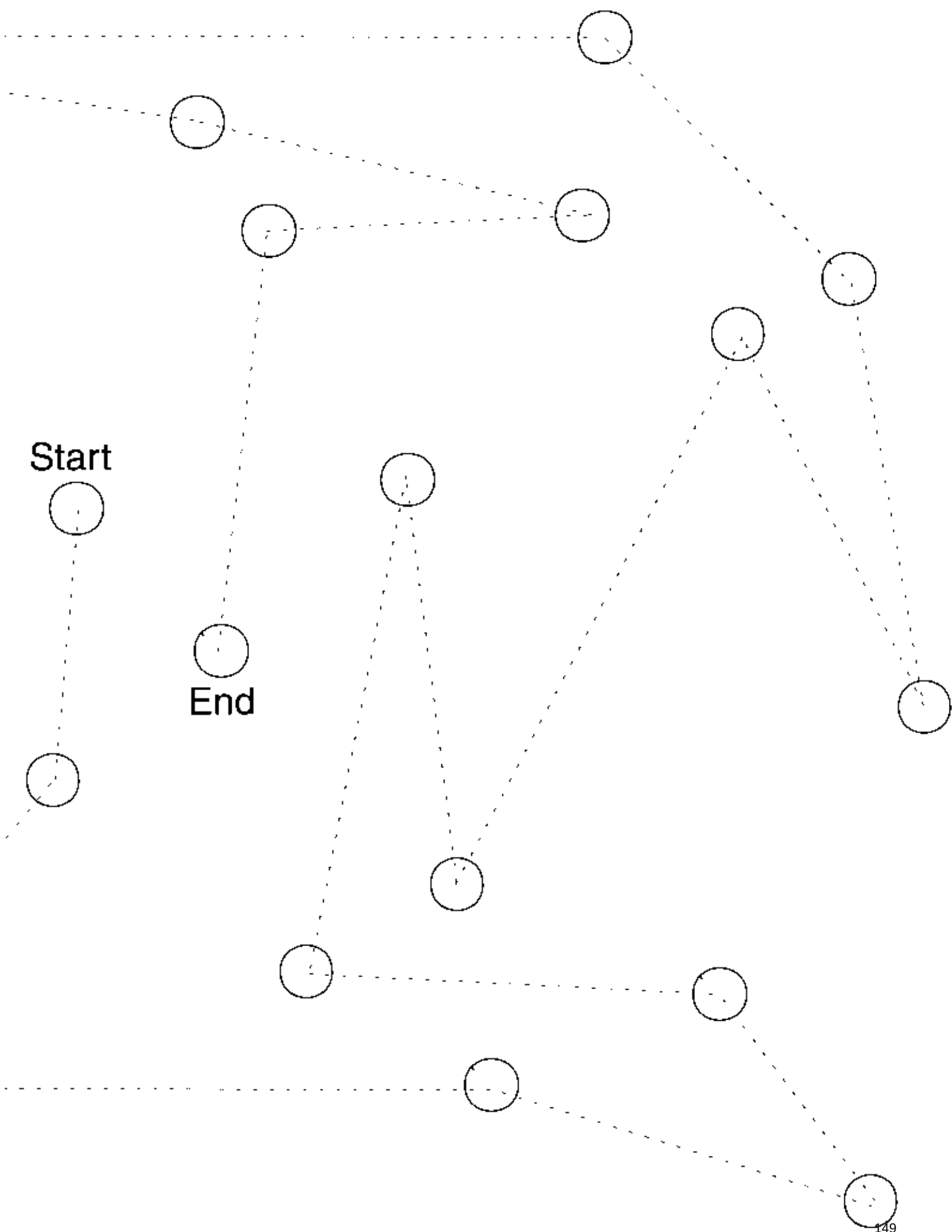
**Condition 5**  
**Motor Speed**

Practice



26 29 30 ABCDE



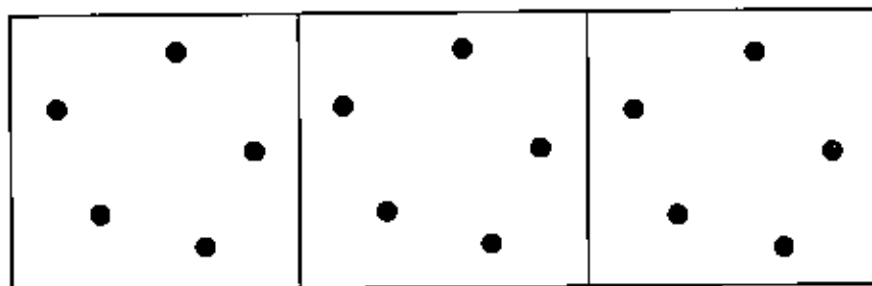


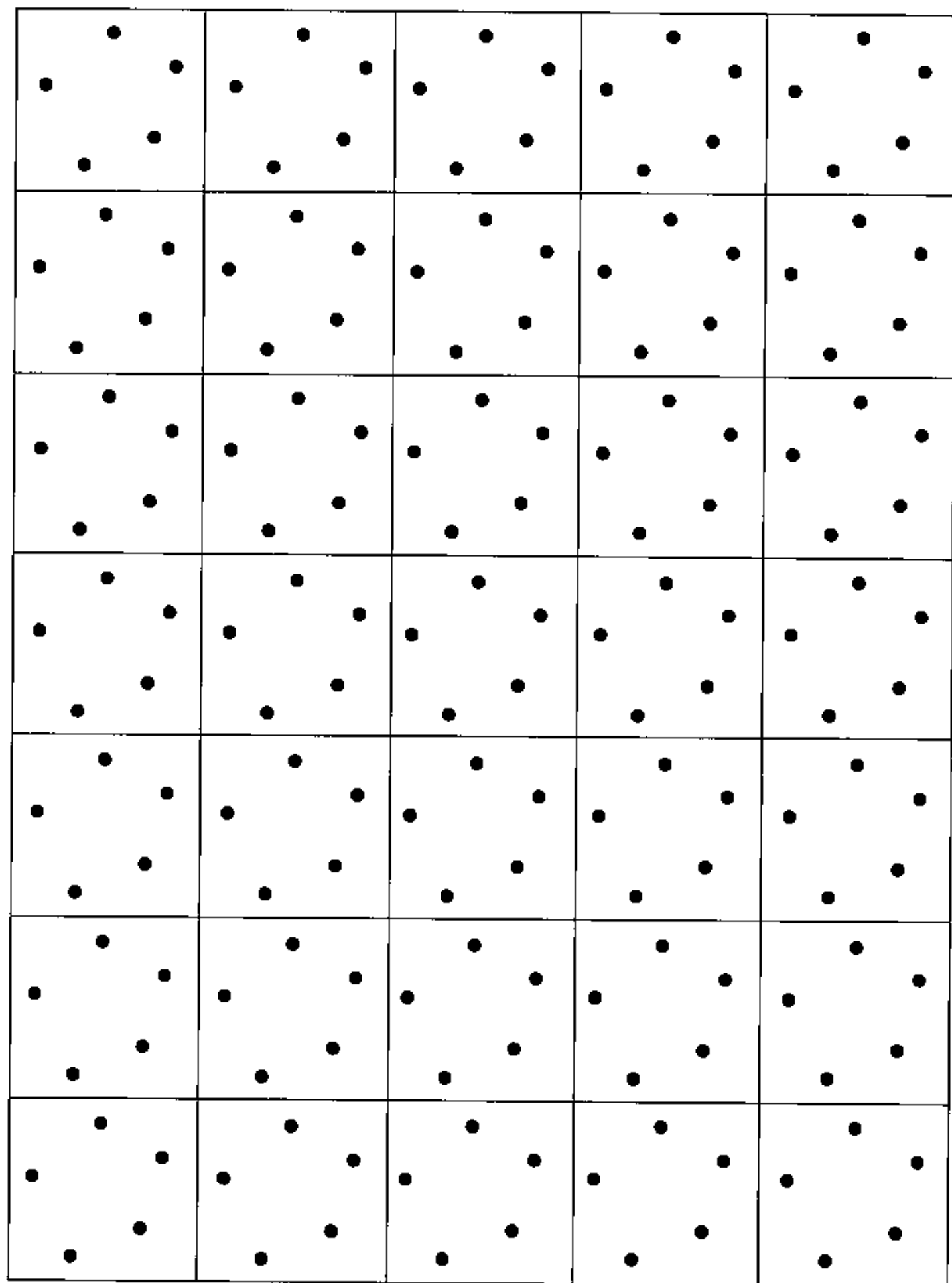


Name \_\_\_\_\_ Age \_\_\_\_\_  
 ID \_\_\_\_\_ Date \_\_\_\_\_  
 Examiner \_\_\_\_\_  
 Notes \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

11/08/01  
 10/11/01

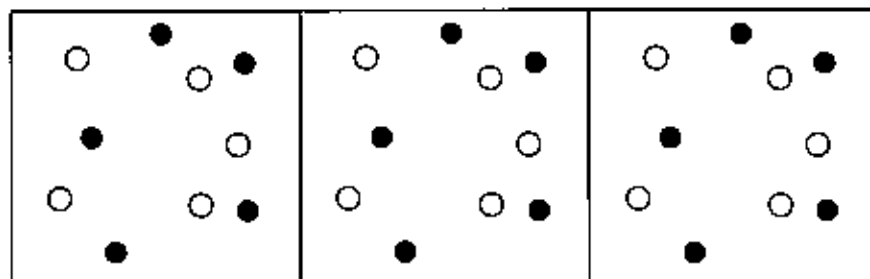
Practice





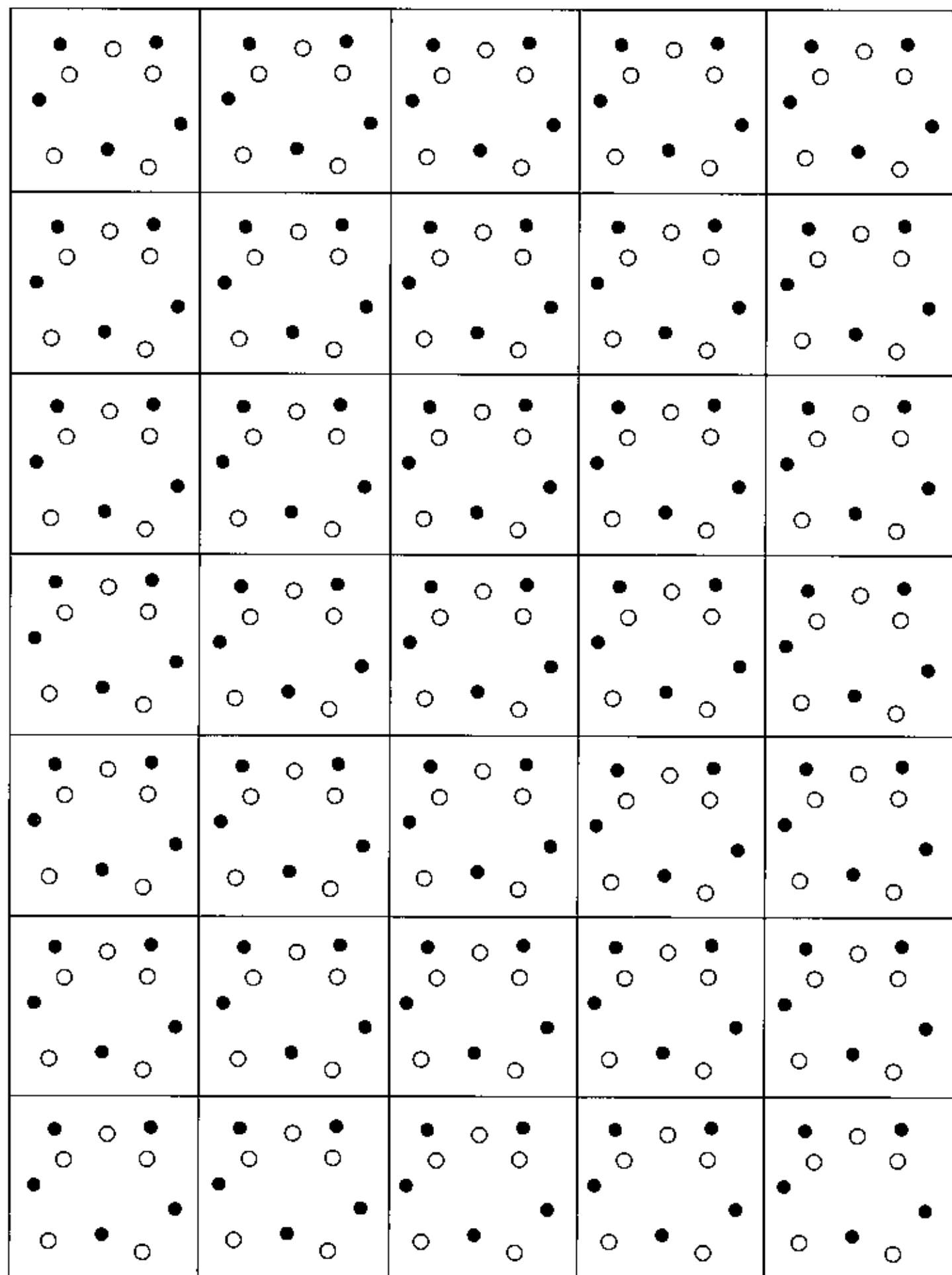


Practice

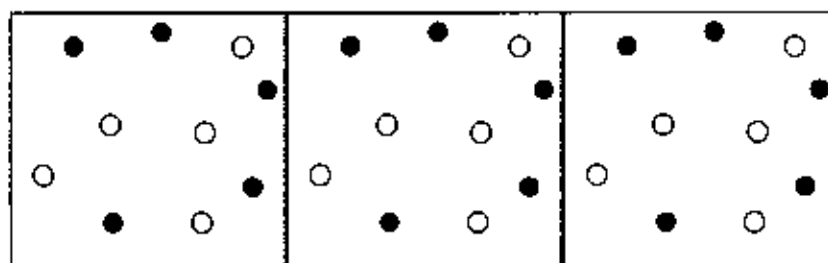


Empty Dots Only

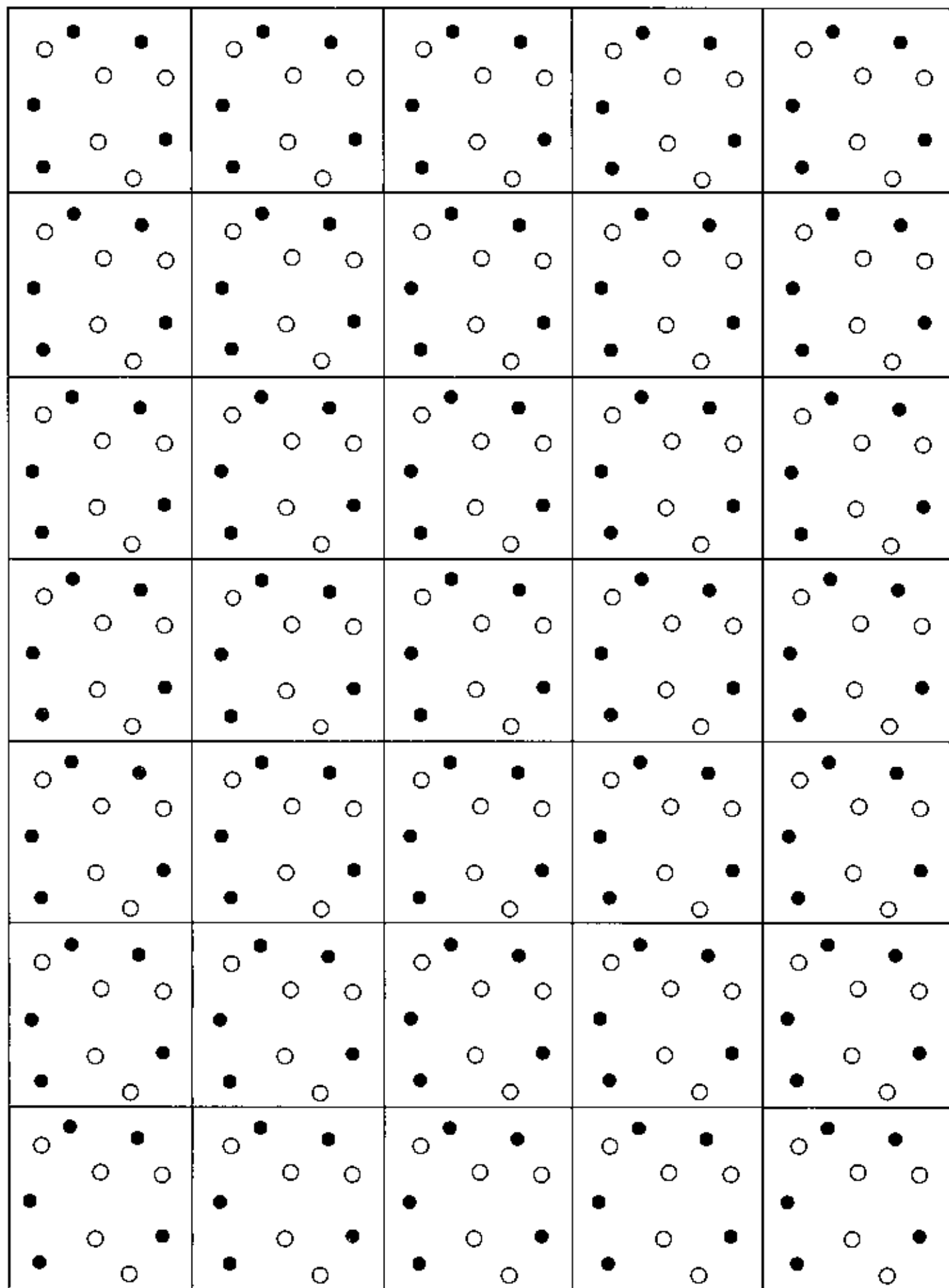
Top



Practice

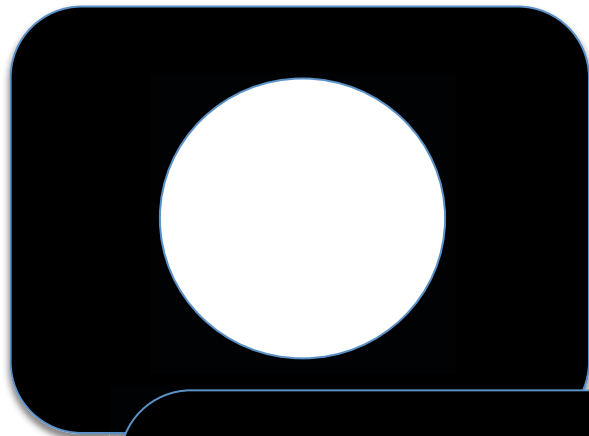


Switching

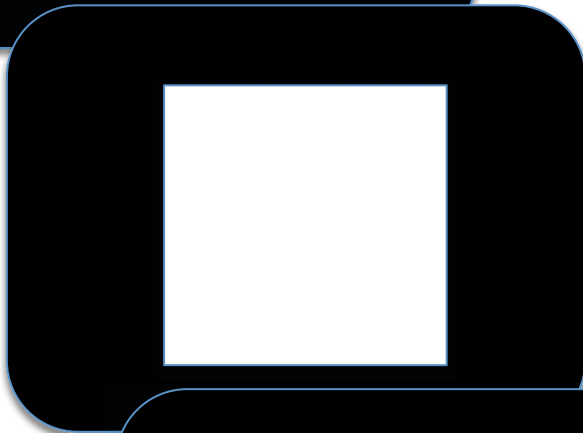


Top

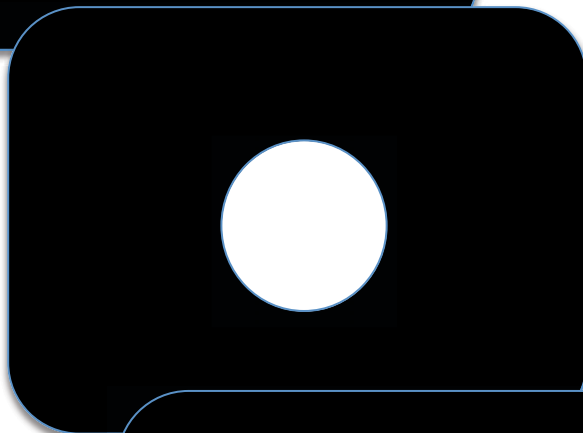
## Go/No-Go Task



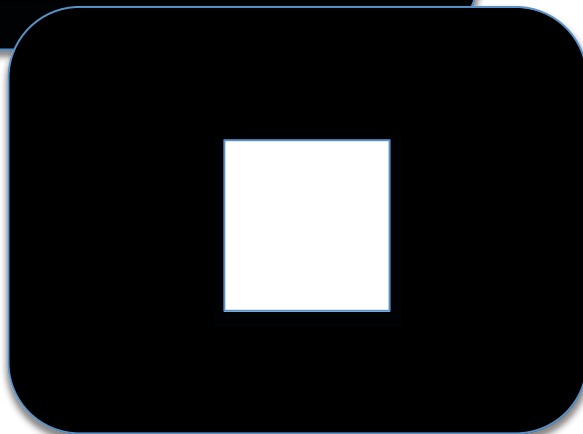
Go



Go



Go



No Go

# Brief Visuospatial Memory Test- Revised

## Response Form

Ralph H. B. Benedict, PhD

Test Date \_\_\_\_/\_\_\_\_/\_\_\_\_

ID# \_\_\_\_\_

Gender \_\_\_\_\_ Ethnicity \_\_\_\_\_ Handedness \_\_\_\_\_ Age \_\_\_\_\_

Education \_\_\_\_\_ Examiner \_\_\_\_\_

Form Administered: 1 2 3 4 5 6 (circle one)

|                                               | Raw score | T score | Percentile |
|-----------------------------------------------|-----------|---------|------------|
| Trial 1                                       |           |         |            |
| Trial 2                                       |           |         |            |
| Trial 3                                       |           |         |            |
| Total Recall <sup>1</sup>                     |           |         |            |
| Learning <sup>2</sup>                         |           |         |            |
| Delayed Recall                                |           |         |            |
| Percent Retained <sup>3</sup>                 |           |         |            |
| Recognition Hits                              |           |         |            |
| Recognition False Alarms                      |           |         |            |
| Recognition Discrimination Index <sup>4</sup> |           |         |            |
| Recognition Response Bias                     |           |         |            |
| Copy (optional)                               |           |         |            |

Normative table/comparison group \_\_\_\_\_

<sup>1</sup>Total Recall = (Trial 1 raw score + Trial 2 raw score + Trial 3 raw score).

<sup>2</sup>Learning = (Higher value of Trial 2 raw score or Trial 3 raw score) – Trial 1 raw score.

<sup>3</sup>Percent Retained = [Delayed Recall raw score ÷ (higher value of Trial 2 raw score or Trial 3 raw score)] × 100.

<sup>4</sup>Recognition Discrimination Index = Recognition Hits raw score – Recognition False Alarms raw score.

### Delay Interval Table

|                             |  |
|-----------------------------|--|
| Time Trial 3 completed      |  |
| Time Delayed Recall started |  |
| Delay interval (minutes)    |  |

T-1



# Brief Visuospatial Memory Test- Revised

## Response Form

Ralph H. B. Benedict, PhD

Test Date \_\_\_\_/\_\_\_\_/\_\_\_\_

ID# \_\_\_\_\_

Gender \_\_\_\_\_ Ethnicity \_\_\_\_\_ Handedness \_\_\_\_\_ Age \_\_\_\_\_

Education \_\_\_\_\_ Examiner \_\_\_\_\_

Form Administered: 1 2 3 4 5 6 (circle one)

|                                               | Raw<br>score | T<br>score | Percentile |
|-----------------------------------------------|--------------|------------|------------|
| Trial 1                                       |              |            |            |
| Trial 2                                       |              |            |            |
| Trial 3                                       |              |            |            |
| Total Recall <sup>1</sup>                     |              |            |            |
| Learning <sup>2</sup>                         |              |            |            |
| Delayed Recall                                |              |            |            |
| Percent Retained <sup>3</sup>                 |              |            |            |
| Recognition Hits                              |              |            |            |
| Recognition False Alarms                      |              |            |            |
| Recognition Discrimination Index <sup>4</sup> |              |            |            |
| Recognition Response Bias                     |              |            |            |
| Copy (optional)                               |              |            |            |

Normative table/comparison group \_\_\_\_\_

<sup>1</sup>Total Recall = (Trial 1 raw score + Trial 2 raw score + Trial 3 raw score).

<sup>2</sup>Learning = (Higher value of Trial 2 raw score or Trial 3 raw score) - Trial 1 raw score.

<sup>3</sup>Percent Retained = [Delayed Recall raw score ÷ (higher value of Trial 2 raw score or Trial 3 raw score)] x 100.

<sup>4</sup>Recognition Discrimination Index = Recognition Hits raw score - Recognition False Alarms raw score.

### Delay Interval Table

|                             |  |
|-----------------------------|--|
| Time Trial 3 completed      |  |
| Time Delayed Recall started |  |
| Delay interval (minutes)    |  |



**T-1**

T-2

T-3

DR

CT

Subject ID: \_\_\_\_\_

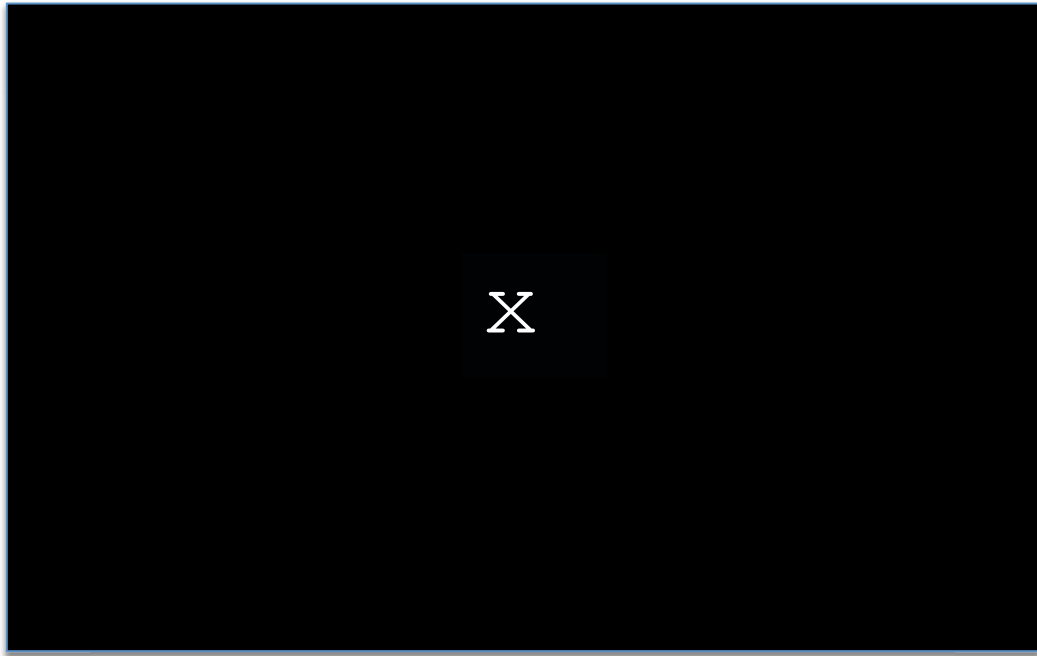
Date: \_\_\_\_\_

Please rate each of the following items in terms of how characteristic they are of you. Use the following scale for answering these items.

| 1<br>extremely<br>uncharacteristic<br>of me                        | 2 | 3 | 4 | 5<br>extremely<br>characteristic<br>of me |   |
|--------------------------------------------------------------------|---|---|---|-------------------------------------------|---|
| Once in a while I can't control the urge to strike another person. | 1 | 2 | 3 | 4                                         | 5 |
| Given enough provocation, I may hit another person.                | 1 | 2 | 3 | 4                                         | 5 |
| If somebody hits me, I hit back.                                   | 1 | 2 | 3 | 4                                         | 5 |
| I get into fights a little more than the average person.           | 1 | 2 | 3 | 4                                         | 5 |
| If I have to resort to violence to protect my rights, I will.      | 1 | 2 | 3 | 4                                         | 5 |
| There are people who pushed me so far that we came to blows.       | 1 | 2 | 3 | 4                                         | 5 |
| I can think of no good reason for ever hitting a person.           | 1 | 2 | 3 | 4                                         | 5 |
| I have threatened people I know.                                   | 1 | 2 | 3 | 4                                         | 5 |
| I have become so mad that I have broken things.                    | 1 | 2 | 3 | 4                                         | 5 |
| I tell my friends openly when I disagree with them.                | 1 | 2 | 3 | 4                                         | 5 |
| I often find myself disagreeing with people.                       | 1 | 2 | 3 | 4                                         | 5 |
| When people annoy me, I may tell them what I think of them.        | 1 | 2 | 3 | 4                                         | 5 |
| I can't help getting into arguments when people disagree with me.  | 1 | 2 | 3 | 4                                         | 5 |
| My friends say that I'm somewhat argumentative.                    | 1 | 2 | 3 | 4                                         | 5 |
| I flare up quickly but get over it quickly.                        | 1 | 2 | 3 | 4                                         | 5 |
| When frustrated, I let my irritation show.                         | 1 | 2 | 3 | 4                                         | 5 |
| I sometimes feel like a powder keg ready to explode.               | 1 | 2 | 3 | 4                                         | 5 |
| I am an even-tempered person.                                      | 1 | 2 | 3 | 4                                         | 5 |
| Some of my friends think I'm a hothead.                            | 1 | 2 | 3 | 4                                         | 5 |
| Sometimes I fly off the handle for no good reason.                 | 1 | 2 | 3 | 4                                         | 5 |
| I have trouble controlling my temper.                              | 1 | 2 | 3 | 4                                         | 5 |
| I am sometimes eaten up with jealousy.                             | 1 | 2 | 3 | 4                                         | 5 |
| At times I feel I have gotten a raw deal out of life.              | 1 | 2 | 3 | 4                                         | 5 |
| Other people always seem to get the breaks.                        | 1 | 2 | 3 | 4                                         | 5 |
| I wonder why sometimes I feel so bitter about things.              | 1 | 2 | 3 | 4                                         | 5 |
| I know that "friends" talk about me behind my back.                | 1 | 2 | 3 | 4                                         | 5 |
| I am suspicious of overly friendly strangers.                      | 1 | 2 | 3 | 4                                         | 5 |

## Psychomotor Vigilance Test

Press the spacebar every time an “x” appears on the screen.



Session 1 \_\_\_\_\_ ID# \_\_\_\_\_ Date \_\_\_\_\_ Time \_\_\_\_\_ AM  
PM

### **PITTSBURGH SLEEP QUALITY INDEX**

#### **INSTRUCTIONS:**

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

1. During the past month, what time have you usually gone to bed at night?

BED TIME \_\_\_\_\_

2. During the past month, how long (in minutes) has it usually taken you to fall asleep each night?

NUMBER OF MINUTES \_\_\_\_\_

3. During the past month, what time have you usually gotten up in the morning?

GETTING UP TIME \_\_\_\_\_

4. During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.)

HOURS OF SLEEP PER NIGHT \_\_\_\_\_

***For each of the remaining questions, check the one best response. Please answer all questions.***

5. During the past month, how often have you had trouble sleeping because you . . .

- a) Cannot get to sleep within 30 minutes

|                                    |                                |                               |                                     |
|------------------------------------|--------------------------------|-------------------------------|-------------------------------------|
| Not during the<br>past month _____ | Less than<br>once a week _____ | Once or twice<br>a week _____ | Three or more<br>times a week _____ |
|------------------------------------|--------------------------------|-------------------------------|-------------------------------------|

- b) Wake up in the middle of the night or early morning

|                                    |                                |                               |                                     |
|------------------------------------|--------------------------------|-------------------------------|-------------------------------------|
| Not during the<br>past month _____ | Less than<br>once a week _____ | Once or twice<br>a week _____ | Three or more<br>times a week _____ |
|------------------------------------|--------------------------------|-------------------------------|-------------------------------------|

- c) Have to get up to use the bathroom

|                                    |                                |                               |                                     |
|------------------------------------|--------------------------------|-------------------------------|-------------------------------------|
| Not during the<br>past month _____ | Less than<br>once a week _____ | Once or twice<br>a week _____ | Three or more<br>times a week _____ |
|------------------------------------|--------------------------------|-------------------------------|-------------------------------------|



d) Cannot breathe comfortably

|                                   |                               |                              |                                    |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|
| Not during the<br>past month_____ | Less than<br>once a week_____ | Once or twice<br>a week_____ | Three or more<br>times a week_____ |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|

e) Cough or snore loudly

|                                   |                               |                              |                                    |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|
| Not during the<br>past month_____ | Less than<br>once a week_____ | Once or twice<br>a week_____ | Three or more<br>times a week_____ |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|

f) Feel too cold

|                                   |                               |                              |                                    |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|
| Not during the<br>past month_____ | Less than<br>once a week_____ | Once or twice<br>a week_____ | Three or more<br>times a week_____ |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|

g) Feel too hot

|                                   |                               |                              |                                    |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|
| Not during the<br>past month_____ | Less than<br>once a week_____ | Once or twice<br>a week_____ | Three or more<br>times a week_____ |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|

h) Had bad dreams

|                                   |                               |                              |                                    |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|
| Not during the<br>past month_____ | Less than<br>once a week_____ | Once or twice<br>a week_____ | Three or more<br>times a week_____ |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|

i) Have pain

|                                   |                               |                              |                                    |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|
| Not during the<br>past month_____ | Less than<br>once a week_____ | Once or twice<br>a week_____ | Three or more<br>times a week_____ |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|

j) Other reason(s), please describe\_\_\_\_\_

---

How often during the past month have you had trouble sleeping because of this?

|                                   |                               |                              |                                    |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|
| Not during the<br>past month_____ | Less than<br>once a week_____ | Once or twice<br>a week_____ | Three or more<br>times a week_____ |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|

6. During the past month, how would you rate your sleep quality overall?

Very good \_\_\_\_\_

Fairly good \_\_\_\_\_

Fairly bad \_\_\_\_\_

Very bad \_\_\_\_\_

7. During the past month, how often have you taken medicine to help you sleep (prescribed or "over the counter")?

|                                   |                               |                              |                                    |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|
| Not during the<br>past month_____ | Less than<br>once a week_____ | Once or twice<br>a week_____ | Three or more<br>times a week_____ |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|

8. During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity?

|                                   |                               |                              |                                    |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|
| Not during the<br>past month_____ | Less than<br>once a week_____ | Once or twice<br>a week_____ | Three or more<br>times a week_____ |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|

9. During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done?

|                            |       |
|----------------------------|-------|
| No problem at all          | _____ |
| Only a very slight problem | _____ |
| Somewhat of a problem      | _____ |
| A very big problem         | _____ |

10. Do you have a bed partner or room mate?

|                                        |       |
|----------------------------------------|-------|
| No bed partner or room mate            | _____ |
| Partner/room mate in other room        | _____ |
| Partner in same room, but not same bed | _____ |
| Partner in same bed                    | _____ |

If you have a room mate or bed partner, ask him/her how often in the past month you have had . . .

- a) Loud snoring

|                                   |                               |                              |                                    |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|
| Not during the<br>past month_____ | Less than<br>once a week_____ | Once or twice<br>a week_____ | Three or more<br>times a week_____ |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|

- b) Long pauses between breaths while asleep

|                                   |                               |                              |                                    |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|
| Not during the<br>past month_____ | Less than<br>once a week_____ | Once or twice<br>a week_____ | Three or more<br>times a week_____ |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|

- c) Legs twitching or jerking while you sleep

|                                   |                               |                              |                                    |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|
| Not during the<br>past month_____ | Less than<br>once a week_____ | Once or twice<br>a week_____ | Three or more<br>times a week_____ |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|

d) Episodes of disorientation or confusion during sleep

|                                   |                               |                              |                                    |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|
| Not during the<br>past month_____ | Less than<br>once a week_____ | Once or twice<br>a week_____ | Three or more<br>times a week_____ |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|

e) Other restlessness while you sleep; please describe\_\_\_\_\_

---

|                                   |                               |                              |                                    |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|
| Not during the<br>past month_____ | Less than<br>once a week_____ | Once or twice<br>a week_____ | Three or more<br>times a week_____ |
|-----------------------------------|-------------------------------|------------------------------|------------------------------------|

Subject # \_\_\_\_\_ Date: \_\_\_\_\_

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you feel right now, THAT IS, at this moment.

There are no right or wrong answers.  
Do not spend too much time on any one statement but give the answer which seems to describe your present feelings best.

|                                                               | Not at all | Somewhat | Moderately so | Very much so |
|---------------------------------------------------------------|------------|----------|---------------|--------------|
| 1. I feel calm. . . . .                                       | 1          | 2        | 3             | 4            |
| 2. I feel secure. . . . .                                     | 1          | 2        | 3             | 4            |
| 3. I am tense . . . . .                                       | 1          | 2        | 3             | 4            |
| 4. I feel regretful . . . . .                                 | 1          | 2        | 3             | 4            |
| 5. I feel at ease . . . . .                                   | 1          | 2        | 3             | 4            |
| 6. I feel upset . . . . .                                     | 1          | 2        | 3             | 4            |
| 7. I am presently worrying over possible misfortunes. . . . . | 1          | 2        | 3             | 4            |
| 8. I feel rested. . . . .                                     | 1          | 2        | 3             | 4            |
| 9. I feel anxious . . . . .                                   | 1          | 2        | 3             | 4            |
| 10. I feel comfortable . . . . .                              | 1          | 2        | 3             | 4            |
| 11. I feel self-confident. . . . .                            | 1          | 2        | 3             | 4            |
| 12. I feel nervous . . . . .                                  | 1          | 2        | 3             | 4            |
| 13. I am jittery . . . . .                                    | 1          | 2        | 3             | 4            |
| 14. I feel "high strung" . . . . .                            | 1          | 2        | 3             | 4            |
| 15. I am relaxed . . . . .                                    | 1          | 2        | 3             | 4            |
| 16. I feel content . . . . .                                  | 1          | 2        | 3             | 4            |
| 17. I am worried . . . . .                                    | 1          | 2        | 3             | 4            |
| 18. I feel over-excited and "rattled". . . . .                | 1          | 2        | 3             | 4            |
| 19. I feel joyful. . . . .                                    | 1          | 2        | 3             | 4            |
| 20. I feel pleasant. . . . .                                  | 1          | 2        | 3             | 4            |

Subject # \_\_\_\_\_ DATE \_\_\_\_\_

DIRECTIONS: A number of statements which people have used to describe themselves are given below. Read each statement and then circle the appropriate number to the right of the statement to indicate how you generally feel.

There are no right or wrong answers.

Do not spend too much time on any one statement but give the answer which seems to describe how you generally feel.

|                                                                                                       | Almost never | Sometimes | Often | Almost always |
|-------------------------------------------------------------------------------------------------------|--------------|-----------|-------|---------------|
| 21. I feel pleasant . . . . .                                                                         | 1            | 2         | 3     | 4             |
| 22. I tire quickly . . . . .                                                                          | 1            | 2         | 3     | 4             |
| 23. I feel like crying . . . . .                                                                      | 1            | 2         | 3     | 4             |
| 24. I wish I could be as happy as others seem to be . . . . .                                         | 1            | 2         | 3     | 4             |
| 25. I am losing out on things because I can't make up my mind soon enough . . . . .                   | 1            | 2         | 3     | 4             |
| 26. I feel rested . . . . .                                                                           | 1            | 2         | 3     | 4             |
| 27. I am "calm, cool, and collected" . . . . .                                                        | 1            | 2         | 3     | 4             |
| 28. I feel that difficulties are piling up so that I cannot overcome them . . . . .                   | 1            | 2         | 3     | 4             |
| 29. I worry too much over something that really doesn't matter . . . . .                              | 1            | 2         | 3     | 4             |
| 30. I am happy . . . . .                                                                              | 1            | 2         | 3     | 4             |
| 31. I am inclined to take things hard . . . . .                                                       | 1            | 2         | 3     | 4             |
| 32. I lack self-confidence . . . . .                                                                  | 1            | 2         | 3     | 4             |
| 33. I feel secure . . . . .                                                                           | 1            | 2         | 3     | 4             |
| 34. I try to avoid facing a crises or difficulty . . . . .                                            | 1            | 2         | 3     | 4             |
| 35. I feel blue . . . . .                                                                             | 1            | 2         | 3     | 4             |
| 36. I am content . . . . .                                                                            | 1            | 2         | 3     | 4             |
| 37. Some unimportant thought runs through my mind and bothers me . . . . .                            | 1            | 2         | 3     | 4             |
| 38. I take disappointments so keenly that I can't put them out of my mind . . . . .                   | 1            | 2         | 3     | 4             |
| 39. I am a steady person . . . . .                                                                    | 1            | 2         | 3     | 4             |
| 40. I get in a state of tension or turmoil as I think over my recent concerns and interests . . . . . | 1            | 2         | 3     | 4             |



# ANAM4™

*Automated Neuropsychological Assessment Metrics*

Quick Start Guide



## **Scope of This Document**

This is a quick start reference to familiarize a first-time user with the basic concepts and operations of the ANAM4™ software.

## **Disclaimer**

The ANAM4™ testing system does not constitute the practice of medicine or the provision of professional health care advice. The information provided by ANAM4™ software is of a general nature and does not represent medical advice, a diagnosis, or prescription for treatment. You are advised to seek the advice of a qualified medical professional or researcher for interpretation of test results. C-SHOP and the University of Oklahoma are not responsible for any decisions made based on information obtained using ANAM4™ software. Your qualified medical professional has the sole responsibility for establishing diagnosis and suggesting appropriate treatment.

## **Further Reading**

For additional information regarding ANAM4™ or ANAM4™ data files, please refer to the ANAM4™ User Guide.

Revision 3, March 2007

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# Requirements

## *Hardware Requirements*

The ANAM4™ system is designed for use on personal computer systems. Minimum hardware requirements include the following:

- **Processor speed:** Pentium 90 MHz microprocessor.
- **Memory:** 32 MB RAM.
- **Storage:** The core ANAM4™ test system requires a minimum of approximately 25MB. Due to data storage requirements and to ensure optimal performance, at least 150MB of free space is highly recommended. A full ANAM4™ installation including ancillary modules (ADEPT™/APR™) requires approximately 50MB of space (130MB if the .NET Framework v2.0 is not already present). Due to data storage requirements and to ensure optimal performance, at least 300MB of free space prior to installation is highly recommended.
- **Response device:** Most standard input devices are supported, including a serial mouse, USB mouse and keyboard, and PS/2 mouse and keyboard. When using laptop computers, most internal keyboards and pointing devices will be adequate for most ANAM4 test modules, but the use of external input devices is highly recommended where practical.

## *Software Requirements*

- **Operating system:** Windows 95/98/2000, NT4.0, or XP. To date, ANAM4™ has not been fully tested on Windows ME or Windows Vista.
- **Windows updates:** Application of all Windows updates. Updates are available at: <http://update.microsoft.com>
- **Flash animation:** For operating systems older than Windows XP, Adobe Flash Player is required to view the opening logo screen. Flash may be acquired via free download: <http://www.adobe.com/go/getflashplayer>

**Note:** When installing Flash Player via the website, uncheck the accompanying Yahoo toolbar before clicking "Install Now" unless you desire the toolbar.

# 1

## Installing and Running ANAM4™

The ANAM4™ test system consists of a library of tests designed for a broad spectrum of clinical and research applications. This library of computer-based tests was constructed to meet the need for precise measurement of cognitive processing efficiency in a variety of psychological assessment contexts that include neuropsychology, readiness to perform, neurotoxicology, pharmacology, and human factors research.

ANAM4™ will be automatically installed from the installation CD. If the installation does not begin automatically, click Start > Run on the task bar. Type your CD drive letter followed by :\\Setup (e.g., D:\\Setup or E:\\Setup). Finally, click **OK** to proceed with the installation.

The default installation directory is C:\\Program Files\\C-SHOP\\ANAM4.



Upon installation, a desktop icon for ANAM4™ will be created.

To run ANAM4™, double-click on the ANAM4™ icon located on your desktop, the AnamMenu.exe file located in the C:\\Program Files\\C-SHOP\\ANAM4 directory, or the ANAM4 program listed in start->Programs->ANAM4.

## 2 Starting ANAM4™

### Starting ANAM4™

1. Double-click the ANAM4 icon on your desktop.

ANAM4 Splash Screen

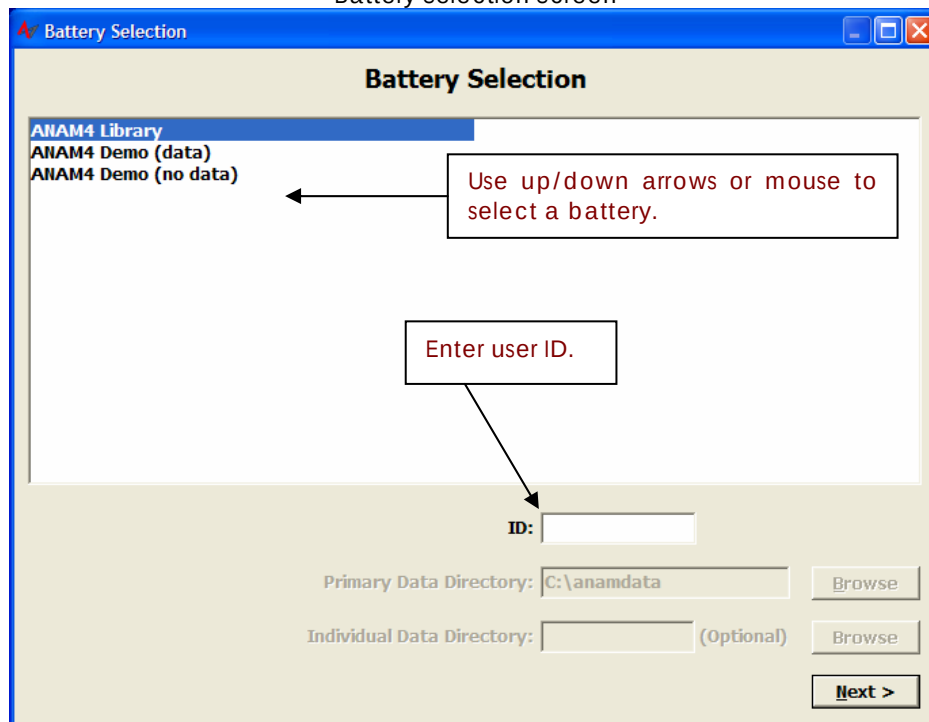


### Selecting a Battery and Entering the User ID

The *Battery Selection* screen allows the user to choose a battery, specify an ID number, and specify data directories.

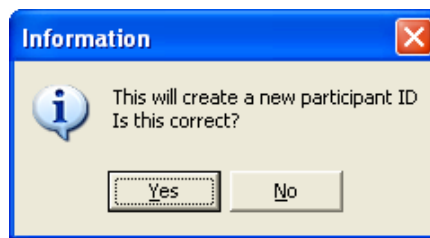
1. Use the up/down cursor keys or mouse to select the desired ANAM4™ battery.

Battery Selection Screen

The image shows the "Battery Selection" screen. It has a title bar that says "Battery Selection". The main area is divided into two sections. The top section is titled "ANAM4 Library" and contains a list of batteries: "ANAM4 Demo (data)" and "ANAM4 Demo (no data)". An arrow points from a text box that says "Use up/down arrows or mouse to select a battery." to the list. The bottom section is titled "Enter user ID." and contains a text box labeled "ID:". Below this, there are two text boxes for "Primary Data Directory:" and "Individual Data Directory:". The "Primary Data Directory:" box contains the text "C:\anamdata" and has a "Browse" button next to it. The "Individual Data Directory:" box is empty and has a "Browse" button next to it. At the bottom right, there is a "Next >" button.

2. Enter a user ID. The user ID can be any alphanumeric character string.

**Note:** If a test ID is entered that has never been used on this computer, you will be asked to verify that you are creating a new participant ID. If this is correct, click **Yes**. If the session is a repeat administration for this person (thus, the participant ID has been used previously), you will not receive this prompt.



### *Changing Data Directories (Folders)*

The default data storage directory is C:\anamdata. All data files will be stored in this directory unless specified otherwise.

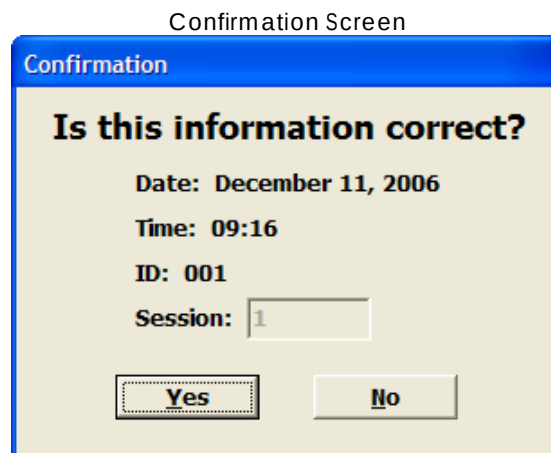
*To change the Primary Data Directory or Individual Data Directory:*

1. Press **<Alt><F1>**. This will unlock the *Primary Data Directory* and *Individual Data Directory* fields for modification.
2. Type the path location of the directory for data storage or click **Browse**. If you select Browse, navigate to the directory where you would like to store the ANAM data files.

After confirming all information on the *Battery Selection* screen, Press **Enter** or click **Next** to continue.

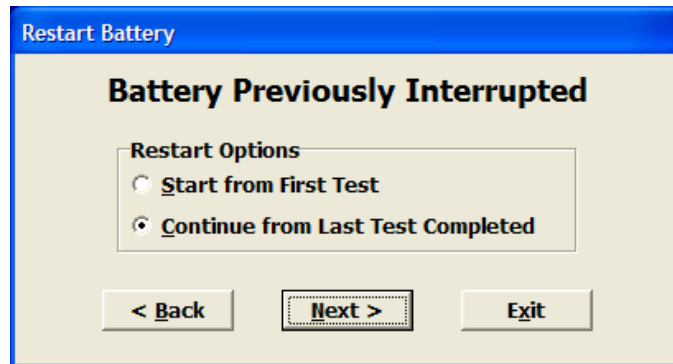
### *Confirming Date, Time, ID, and Session Number*

1. Confirm that the Date and Time on your computer are accurately set. If not, click on **No**, close the *Battery Selection* screen that reappears by clicking on the red close button at the upper right corner, correct the Date/Time setting, and restart ANAM4™.
2. Confirm that the correct Session number is about to be run. If you are certain that it needs to be changed, press **<Alt><F1>** to unlock the field and enter the desired session number.



### Restarting a Previously Cancelled Battery

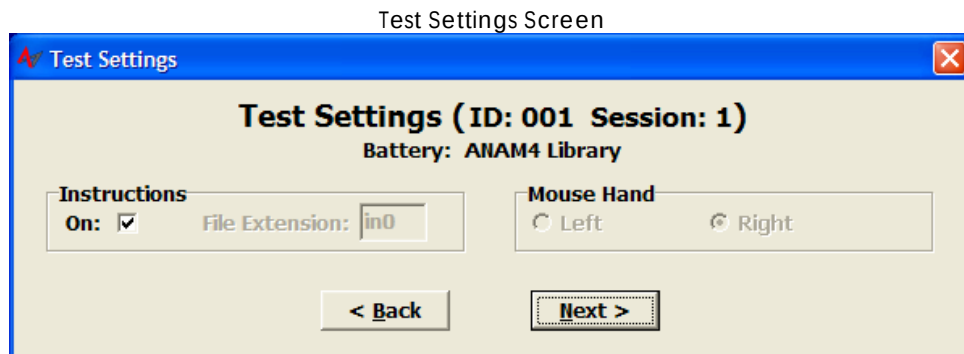
1. If the specified Session was previously canceled before completion, you may see the following screen asking if you wish to *Start from First Test* or *Continue from Last Test Completed*. You are also allowed to go back to the *Battery Selection* screen.



2. Once you have selected the desired option, click on **Next** to continue.

### Selecting Test Settings

The *Test Settings* screen allows the user to customize the ANAM4™ test session.



**Note:** After using the battery a few times for a particular person, you may wish to turn off instructions by deselecting the "Instructions" box. Make sure it is checked **On** the first time through.

1. If you have a participant who uses the computer mouse with the left hand and you wish to obtain responses using the left hand, press **<Alt><F1>** to unlock the Mouse Hand setting and select **Left**.
2. If the Test Settings are correct, press **Enter** or click on **Next** to begin the testing.

### Selecting a Specific Test or Subset of Tests

1. If you wish to select a single test or subset of tests, press **<Alt><F2>** and then click on **Select** under Type of Run.

Expanded Test Settings Screen

**Test Settings (ID: 001 Session: 1)**  
Battery: ANAM4 Library

**Instructions**  
On: ☒ File Extension: in0

**Mouse Hand**  
☐ Left ☒ Right

**Test Parameters**

**Language**  
English

**Feedback Mode**  
☒ None ☐ Negative  
☐ Positive ☐ Both

**Type**  
☐ Practice ☒ **Select** ☐ Restart ☐ Entire

**Random Number Seed**  
☐ Fixed ☒ Session ☐ Random

Fixed Seed

**Type of Run**  
☐ Paused ☒ Continuous

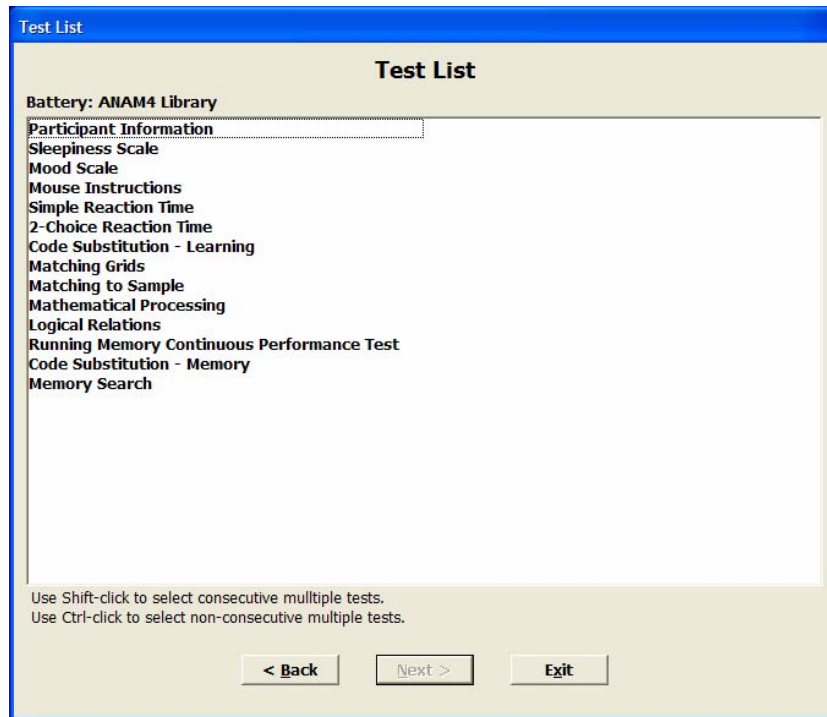
**Response Device**  
☐ Key ☒ Mouse ☐ Mouse/Tone

Response Keys

**Test Results**  
☐ Show Test Results

**Battery Results**  
☐ Show ☐ Save

2. Press **Enter** or click on **Next** to continue. The list of tests within the battery will appear on the next screen.



3. After selecting the desired test or set of tests using the instructions at the bottom of the screen, press **Enter** or click on **Next** to continue.

### *Proceeding through the Battery*

1. Tests will proceed in sequence.

**Note:** If instructions are On, the typical sequence for each test is one or more pages of instructions, a screen with the test name, the test itself, and (if selected from the *Test Settings* screen) a feedback screen summarizing individual Test Results.

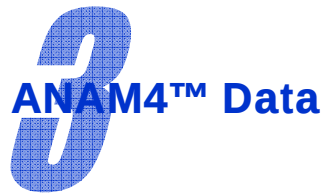
2. If you wish to abort from any test (end the test without collecting data), press **<Alt><F1>** at any time following the instructions screen(s).

**Note:** The **<Alt><F1>** exit function works ONLY after the display of test instructions is complete.



3. After the test aborts, you will see the above window. If you wish to cancel the rest of the battery, click **Yes**. If you wish to continue with the remaining tests, click **No**.
4. At the conclusion of the battery, you will see a "Thank You" message informing you that the Test Battery is complete.





Four types of data files are generated following test administration through the ANAM4™ test system as follows:

- Summary Data Files in Text Format (CSV) – summary statistics computed across all items/trials of a given test (without variable labels)
- Raw Data Files in Text Format (CSV) – individual item/trial information (without variable labels)
- Summary Data Files in XML Format – summary statistics computed across all items/trials of a given test (with variable labels)
- Raw Data Files in XML Format – Individual item/trial information (with variable labels).

### *File Naming*

Data filenames are coded in the following manner. The first letter represents the type of file as follows:

- **S** for summary data in text format
- **R** for raw data in text format
- **X** for summary data in XML format
- **Z** for raw data in XML format.

The next sequence of characters corresponds to the participant ID code (of variable length). The ID code is followed by a P or T designating a Practice or Test session, respectively. The final portion of the filename indicates the session number. A three-letter file extension is used to identify the specific test. A list of test extensions can be found in

### **Chapter 4.**

Example: **S32545T01.SRT** is a summary data file for participant 32545 for Test Session number 1 of the Simple Reaction Time test.

### *ANAM4™ Data Directories*

The default *Primary Data Directory* is C:\anamdata. Data from all completed tests will be saved in this directory. By default, no *Individual Data Directory* is specified. For information on changing the *Primary Data Directory* or *Individual Data Directory*, see **Chapter 2.**

# 4 ANAM4™ Tests

## *ANAM4™ Test Names, Modules, and Extensions*

| Test Name                         | Module Name (.exe) | Extension  |
|-----------------------------------|--------------------|------------|
| 2-Choice Reaction Time            | 2choice            | .2ch       |
| 4-Choice Reaction Time            | 4choice            | .4ch       |
| Code Substitution                 |                    |            |
| Learning                          | codesub            | .cds       |
| Immediate                         | codesub            | .cdi       |
| Delayed                           | codesub            | .cdd       |
| Demographics                      | demog              | .sub       |
| Digit Reaction Time               | digitrt            | .drt       |
| Dual Task (Tracking / Memory)     | dualtask           | .dtn       |
| Grammatical Reasoning             | gram               | .grm       |
| Logical Relations                 | logical            | .lrs       |
| Manikin                           | manikin            | .mkn       |
| Matching Grids                    | matching           | .mtg       |
| Matching to Sample                | mat2samp           | .m2s       |
| Mathematical Processing           | math               | .mth       |
| Memory Search                     | stern              | .stn       |
| Mental State Exam                 | mse                | .mse       |
| Mood Scale                        | mood               | .moo       |
| Procedural Reaction Time          | procr              | .pro       |
| Pursuit Tracking                  | pursuit            | .pur       |
| Reaction Time                     | react              | .rct       |
| Relative Judgment                 | reljudg            | .rlj       |
| Running Memory CPT                | runcpt             | .cpt       |
| Simple Reaction Time              | simplert           | .srt       |
| Sleepiness Scale                  | sleepsc            | .slp       |
| Spatial Processing - Simultaneous | dspat              | .spd       |
| Spatial Processing - Delayed      | spat               | .spa       |
| Standard CPT                      | stdcpt             | .scp       |
| Stroop Test                       | stroop             | .str       |
| Switching                         | switch             | .swt       |
| Symbolic Reaction Time            | symbolrt           | .sym       |
| Tapping                           | tapping            | .tpl, .tpr |
| Tower Puzzle                      | tower              | .atp       |
| Unstable Tracking                 | track              | .trk       |
| Visual Vigilance                  | visvig             | .vis       |

## For More Information

### **ANAM4™ User Manual**

**[www.c-shop.ou.edu/literature/manual.pdf](http://www.c-shop.ou.edu/literature/manual.pdf)**

### **Quick Start Guide for the ADEPT™ Software**

**[www.c-shop.ou.edu/literature/ADEPTquickstart.pdf](http://www.c-shop.ou.edu/literature/ADEPTquickstart.pdf)**

### **Quick Start Guide for the APR™ Software**

**[www.c-shop.ou.edu/literature/APRquickstart.pdf](http://www.c-shop.ou.edu/literature/APRquickstart.pdf)**

### **ANAM4™ Technical Literature**

**[www.c-shop.ou.edu](http://www.c-shop.ou.edu)**

### **Technical Support**

**[www.c-shop.ou.edu](http://www.c-shop.ou.edu)**



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Subject ID: \_\_\_\_\_ Marital Status: \_\_\_\_\_ Age: \_\_\_\_\_ Sex: \_\_\_\_\_

Occupation: \_\_\_\_\_ Education: \_\_\_\_\_

**Instructions:** This questionnaire consists of 21 groups of statements. Please read each group of statements carefully, and then pick out the **one statement** in each group that best describes the way you have been feeling during the **past two weeks, including today**. Circle the number beside the statement you have picked. If several statements in the group seem to apply equally well, circle the highest number for that group. Be sure that you do not choose more than one statement for any group, including Item 16 (Changes in Sleeping Pattern) or Item 18 (Changes in Appetite).

**1. Sadness**

- 0 I do not feel sad.
- 1 I feel sad much of the time.
- 2 I am sad all the time.
- 3 I am so sad or unhappy that I can't stand it.

**2. Pessimism**

- 0 I am not discouraged about my future.
- 1 I feel more discouraged about my future than I used to be.
- 2 I do not expect things to work out for me.
- 3 I feel my future is hopeless and will only get worse.

**3. Past Failure**

- 0 I do not feel like a failure.
- 1 I have failed more than I should have.
- 2 As I look back, I see a lot of failures.
- 3 I feel I am a total failure as a person.

**4. Loss of Pleasure**

- 0 I get as much pleasure as I ever did from the things I enjoy.
- 1 I don't enjoy things as much as I used to.
- 2 I get very little pleasure from the things I used to enjoy.
- 3 I can't get any pleasure from the things I used to enjoy.

**5. Guilty Feelings**

- 0 I don't feel particularly guilty.
- 1 I feel guilty over many things I have done or should have done.
- 2 I feel quite guilty most of the time.
- 3 I feel guilty all of the time.

**6. Punishment Feelings**

- 0 I don't feel I am being punished.
- 1 I feel I may be punished.
- 2 I expect to be punished.
- 3 I feel I am being punished.

**7. Self-Dislike**

- 0 I feel the same about myself as ever.
- 1 I have lost confidence in myself.
- 2 I am disappointed in myself.
- 3 I dislike myself.

**8. Self-Criticalness**

- 0 I don't criticize or blame myself more than usual.
- 1 I am more critical of myself than I used to be.
- 2 I criticize myself for all of my faults.
- 3 I blame myself for everything bad that happens.

**9. Suicidal Thoughts or Wishes**

- 0 I don't have any thoughts of killing myself.
- 1 I have thoughts of killing myself, but I would not carry them out.
- 2 I would like to kill myself.
- 3 I would kill myself if I had the chance.

**10. Crying**

- 0 I don't cry any more than I used to.
- 1 I cry more than I used to.
- 2 I cry over every little thing.
- 3 I feel like crying, but I can't.

Subtotal Page 1

Continued on Back

**11. Agitation**

- 0 I am no more restless or wound up than usual.
- 1 I feel more restless or wound up than usual.
- 2 I am so restless or agitated that it's hard to stay still.
- 3 I am so restless or agitated that I have to keep moving or doing something.

**12. Loss of Interest**

- 0 I have not lost interest in other people or activities.
- 1 I am less interested in other people or things than before.
- 2 I have lost most of my interest in other people or things.
- 3 It's hard to get interested in anything.

**13. Indecisiveness**

- 0 I make decisions about as well as ever.
- 1 I find it more difficult to make decisions than usual.
- 2 I have much greater difficulty in making decisions than I used to.
- 3 I have trouble making any decisions.

**14. Worthlessness**

- 0 I do not feel I am worthless.
- 1 I don't consider myself as worthwhile and useful as I used to.
- 2 I feel more worthless as compared to other people.
- 3 I feel utterly worthless.

**15. Loss of Energy**

- 0 I have as much energy as ever.
- 1 I have less energy than I used to have.
- 2 I don't have enough energy to do very much.
- 3 I don't have enough energy to do anything.

**16. Changes in Sleeping Pattern**

- 0 I have not experienced any change in my sleeping pattern.
- 1a I sleep somewhat more than usual.
- 1b I sleep somewhat less than usual.
- 2a I sleep a lot more than usual.
- 2b I sleep a lot less than usual.
- 3a I sleep most of the day.
- 3b I wake up 1-2 hours early and can't get back to sleep.

**17. Irritability**

- 0 I am no more irritable than usual.
- 1 I am more irritable than usual.
- 2 I am much more irritable than usual.
- 3 I am irritable all the time.

**18. Changes in Appetite**

- 0 I have not experienced any change in my appetite.
- 1a My appetite is somewhat less than usual.
- 1b My appetite is somewhat greater than usual.
- 2a My appetite is much less than before.
- 2b My appetite is much greater than usual.
- 3a I have no appetite at all.
- 3b I crave food all the time.

**19. Concentration Difficulty**

- 0 I can concentrate as well as ever.
- 1 I can't concentrate as well as usual.
- 2 It's hard to keep my mind on anything for very long.
- 3 I find I can't concentrate on anything.

**20. Tiredness or Fatigue**

- 0 I am no more tired or fatigued than usual.
- 1 I get more tired or fatigued more easily than usual.
- 2 I am too tired or fatigued to do a lot of the things I used to do.
- 3 I am too tired or fatigued to do most of the things I used to do.

**21. Loss of Interest in Sex**

- 0 I have not noticed any recent change in my interest in sex.
- 1 I am less interested in sex than I used to be.
- 2 I am much less interested in sex now.
- 3 I have lost interest in sex completely.

Subtotal Page 2

Subtotal Page 1

Total Score



# WASI-II

WECHSLER ABBREVIATED SCALE  
OF INTELLIGENCE™ — SECOND EDITION

## Record Form

Calculation of Examinee's Age

Year Month Day

Test Date

ID: \_\_\_\_\_

Sex: ☐ F ☐ M Handedness: ☐ R ☐ L

Test Age

Address/School/Testing Site: \_\_\_\_\_

Highest Education/Grade: \_\_\_\_\_

Examiner Name: \_\_\_\_\_

### Total Raw Score to T Score Conversion

| Subtest          | Raw Score            | T Scores             |
|------------------|----------------------|----------------------|
| Block Design     | <input type="text"/> | <input type="text"/> |
| Vocabulary       | <input type="text"/> | <input type="text"/> |
| Matrix Reasoning | <input type="text"/> | <input type="text"/> |
| Similarities     | <input type="text"/> | <input type="text"/> |

Sum of T Scores

Verbal Comp. Perc. Rang. Full Scale-4 Full Scale-2

### Examinee Visual/Hearing Aids During Testing

| Check type of aid examinee needed:                 | Used                     | Not Used                 |
|----------------------------------------------------|--------------------------|--------------------------|
| <input type="checkbox"/> Glasses                   | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> Prescription Lenses       | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> Assisted Listening Device | <input type="checkbox"/> | <input type="checkbox"/> |
| <input type="checkbox"/> Other:                    | <input type="checkbox"/> | <input type="checkbox"/> |

### Sum of T Scores to Composite Score Conversion

| Scale        | Sum of T Scores      | Composite Score             | Percentile Rank      | Confidence Interval<br>90% or 95% |
|--------------|----------------------|-----------------------------|----------------------|-----------------------------------|
| Verbal Comp. | <input type="text"/> | VCI <input type="text"/>    | <input type="text"/> | <input type="text"/>              |
| Perc. Rang.  | <input type="text"/> | PRI <input type="text"/>    | <input type="text"/> | <input type="text"/>              |
| Full Scale-4 | <input type="text"/> | FSIQ-4 <input type="text"/> | <input type="text"/> | <input type="text"/>              |
| Full Scale-2 | <input type="text"/> | FSIQ-2 <input type="text"/> | <input type="text"/> | <input type="text"/>              |

### Ranges of Expected Scores

| Scores       | Confidence Level     |                      |
|--------------|----------------------|----------------------|
|              | 90%                  | 68%                  |
| FSIQ-4       | <input type="text"/> | <input type="text"/> |
| WISC-IV FSIQ | <input type="text"/> | <input type="text"/> |
| WAIS-IV FSIQ | <input type="text"/> | <input type="text"/> |

### Subtest T Score Profile

|    | Verbal Comprehension |                      | Perceptual Reasoning |                      |
|----|----------------------|----------------------|----------------------|----------------------|
|    | VC                   | SI                   | BD                   | MR                   |
| 80 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 75 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 70 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 65 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 60 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 55 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 50 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 45 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 40 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 35 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 30 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 25 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 20 | <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |

### Composite Score Profile

|     | VCI                  | PRI                  | FSIQ                 |
|-----|----------------------|----------------------|----------------------|
| 160 | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 155 | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 150 | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 145 | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 140 | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 135 | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 130 | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 125 | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 120 | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 115 | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 110 | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 105 | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 100 | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 95  | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 90  | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 85  | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 80  | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 75  | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 70  | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 65  | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 60  | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 55  | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 50  | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 45  | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| 40  | <input type="text"/> | <input type="text"/> | <input type="text"/> |

PEARSON

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PsychCorp

# 1. Block Design



(Time limit: See item)



**Start**  
Ages 6-8:  
Item 1  
Ages 9-90:  
Item 3



**Reverse**  
Ages 9-90: Does not obtain a perfect score on either Item 3 or Item 4, administer the preceding items in reverse order until two consecutive perfect scores are obtained.



**Discontinue**  
After 2 consecutive scores of 0.



**Stop**  
Ages 6-8:  
After Item 11.



**Record & Score**  
Items 1-4:  
Score 0, 1, or 2 points.  
Items 5-13:  
Score 0, 4, 5, 6, or 7 points.

|      | Design                                                                                  | Presentation Method | Time Limit | Completion Time |         | Constructed Design                                                                  |                                                                                    | Score |   |   |                           |
|------|-----------------------------------------------------------------------------------------|---------------------|------------|-----------------|---------|-------------------------------------------------------------------------------------|------------------------------------------------------------------------------------|-------|---|---|---------------------------|
|      |                                                                                         |                     |            | Trial 1         | Trial 2 | Trial 1                                                                             | Trial 2                                                                            |       |   |   |                           |
| 5-8  | 1.     | Model and Picture   | 30"        |                 |         |    |  | 0     | 1 | 2 |                           |
|      | 2.     | Model and Picture   | 30"        |                 |         |    |  | 0     | 1 | 2 |                           |
| 9-90 | 3.     | Model and Picture   | 45"        |                 |         |    |  | 0     | 1 | 2 |                           |
|      | 4.     | Model and Picture   | 45"        |                 |         |    |  | 0     | 1 | 2 |                           |
|      | 5.     | Picture             | 60"        |                 |         |    |                                                                                    | 0     |   |   | 21-80 16-20 11-15 1-10    |
|      | 6.     | Picture             | 60"        |                 |         |    |                                                                                    | 0     |   |   | 21-80 16-20 11-15 1-10    |
|      | 7.   | Picture             | 60"        |                 |         |  |                                                                                    | 0     |   |   | 21-80 16-20 11-15 1-10    |
|      | 8.   | Picture             | 60"        |                 |         |  |                                                                                    | 0     |   |   | 21-80 16-20 11-15 1-10    |
|      | 9.   | Picture             | 120"       |                 |         |  |                                                                                    | 0     |   |   | 71-120 46-70 31-45 1-30   |
|      | 10.  | Picture             | 120"       |                 |         |  |                                                                                    | 0     |   |   | 61-120 46-60 36-45 1-35   |
|      | 11.  | Picture             | 120"       |                 |         |  |                                                                                    | 0     |   |   | 61-120 46-60 36-45 1-35   |
| 6-8  | 12.  | Picture             | 120"       |                 |         |  |                                                                                    | 0     |   |   | 61-120 46-60 36-45 1-35   |
|      | 13.  | Picture             | 120"       |                 |         |  |                                                                                    | 0     |   |   | 101-120 81-100 66-80 1-55 |

Maximum Raw Score

Ages 6-8: 57

Ages 9-90: 71

Block Design

Total Raw Score

## 2. Vocabulary



**Start**  
Ages 6–90:  
Item 4



**Reverse**  
Ages 6–90: Does not obtain a perfect score on *either* Item 4 or Item 5, administer the preceding items in reverse order until two consecutive perfect scores are obtained.



**Discontinue**  
After 3 consecutive scores of 0.



**Stop**  
Age 6:  
After Item 22.  
Ages 7–11:  
After Item 25.  
Ages 12–14:  
After Item 28.



**Record & Score**  
Items 1–3: Score 0 or 1 point.  
Items 4–5: Score 0 or 2 points.  
Items 6–31: Score 0, 1, or 2 points.  
See the Manual for sample responses.

| Item          | Response | Score |
|---------------|----------|-------|
| 1. Fish       |          | 0 1   |
| 2. Shovel     |          | 0 1   |
| 3. Shell      |          | 0 1   |
| 4. Shirt      |          | 0 2   |
| 5. Car        |          | 0 2   |
| 6. Lamp       |          | 0 1 2 |
| 7. Bird       |          | 0 1 2 |
| 8. Tongue     |          | 0 1 2 |
| 9. Pet        |          | 0 1 2 |
| 10. Lunch     |          | 0 1 2 |
| 11. Bell      |          | 0 1 2 |
| 12. Calendar  |          | 0 1 2 |
| 13. Alligator |          | 0 1 2 |
| 14. Dance     |          | 0 1 2 |



14. Shirt

5. Car

6. Lamp

7. Bird

8. Tongue

9. Pet

10. Lunch

11. Bell

12. Calendar

13. Alligator

14. Dance

If the examinee provides a 2-point response that requires feedback or gives an incorrect (0 point) response, provide corrective feedback as instructed in the Manual.

continue



## 2. Vocabulary (continued)

Discontinue after 3 consecutive scores of 0.

|       | Item                                                                                           | Response | Score |
|-------|------------------------------------------------------------------------------------------------|----------|-------|
|       | 15. Summer                                                                                     |          | 0 1 2 |
|       | 16. Reveal                                                                                     |          | 0 1 2 |
|       | 17. Decade                                                                                     |          | 0 1 2 |
|       | 18. Entertain                                                                                  |          | 0 1 2 |
|       | 19. Tradition                                                                                  |          | 0 1 2 |
|       | 20. Enthusiastic                                                                               |          | 0 1 2 |
|       | 21. Improvise                                                                                  |          | 0 1 2 |
|       | 22. Haste                                                                                      |          | 0 1 2 |
| 6     |  23. Trend   |          | 0 1 2 |
|       | 24. Impulse                                                                                    |          | 0 1 2 |
|       | 25. Ruminant                                                                                   |          | 0 1 2 |
| 7-11  |  26. Mollify |          | 0 1 2 |
|       | 27. Extirpate                                                                                  |          | 0 1 2 |
|       | 28. Panacea                                                                                    |          | 0 1 2 |
| 12-14 |              |          |       |

| Item            | Response | Score |
|-----------------|----------|-------|
| 29. Perfunctory |          | 0 1 2 |
| 30. Insipid     |          | 0 1 2 |
| 31. Pavid       |          | 0 1 2 |

Maximum Raw Score

Age 6: 41

Ages 7-11: 47

Ages 12-14: 53

Ages 15-90: 59

Vocabulary  
Total Raw Score

### 3. Matrix Reasoning

- Start**  
Ages 6-8:  
Sample Items A & B,  
then Item 1.  
Ages 9-90:  
Sample Items A & B,  
then Item 4.
- Reverse**  
Ages 9-90: Does not obtain a perfect score  
on either Item 4 or Item 5, administer the  
preceding items in reverse order until two  
consecutive perfect scores are obtained.

**Discontinue**  
After 3 consecutive  
scores of 0.

**STOP**  
Stop  
Ages 6-8:  
After Item 24.

**Record & Score**  
Score 0 or 1 point.  
Correct responses are in color.

| Item | Response  | Score |
|------|-----------|-------|
| SA   | 1 2 3 4 5 |       |
| SB   | 1 2 3 4 5 |       |
| 1.   | 1 2 3 4 5 | 0 1   |
| 2.   | 1 2 3 4 5 | 0 1   |
| 3.   | 1 2 3 4 5 | 0 1   |
| 4.   | 1 2 3 4 5 | 0 1   |
| 5.   | 1 2 3 4 5 | 0 1   |
| 6.   | 1 2 3 4 5 | 0 1   |
| 7.   | 1 2 3 4 5 | 0 1   |
| 8.   | 1 2 3 4 5 | 0 1   |
| 9.   | 1 2 3 4 5 | 0 1   |
| 10.  | 1 2 3 4 5 | 0 1   |
| 11.  | 1 2 3 4 5 | 0 1   |
| 12.  | 1 2 3 4 5 | 0 1   |
| 13.  | 1 2 3 4 5 | 0 1   |
| 14.  | 1 2 3 4 5 | 0 1   |

| Item | Response  | Score |
|------|-----------|-------|
| 15.  | 1 2 3 4 5 | 0 1   |
| 16.  | 1 2 3 4 5 | 0 1   |
| 17.  | 1 2 3 4 5 | 0 1   |
| 18.  | 1 2 3 4 5 | 0 1   |
| 19.  | 1 2 3 4 5 | 0 1   |
| 20.  | 1 2 3 4 5 | 0 1   |
| 21.  | 1 2 3 4 5 | 0 1   |
| 22.  | 1 2 3 4 5 | 0 1   |
| 23.  | 1 2 3 4 5 | 0 1   |
| 24.  | 1 2 3 4 5 | 0 1   |
| 25.  | 1 2 3 4 5 | 0 1   |
| 26.  | 1 2 3 4 5 | 0 1   |
| 27.  | 1 2 3 4 5 | 0 1   |
| 28.  | 1 2 3 4 5 | 0 1   |
| 29.  | 1 2 3 4 5 | 0 1   |
| 30.  | 1 2 3 4 5 | 0 1   |

Maximum Raw Score

Ages 6-8: 24

Ages 9-90: 30

Matrix Reasoning  
Total Raw Score

## 4. Similarities



**Start**  
Ages 6–8:  
Item 1  
Ages 9–90:  
Item 4



**Reverse**  
Ages 9–90: Does not obtain a perfect score on *either* Item 4 or Item 5; administer the preceding items in reverse order until two consecutive perfect scores are obtained.



**Discontinue**  
After 3 consecutive scores of 0.



**Stop**  
Ages 6–8:  
After Item 22.



**Record & Score**  
Items 1–3: Score 0 or 1 point.  
Correct responses are in color.  
Items 4–5: Score 0 or 2 points.  
Items 6–24: Score 0, 1, or 2 points.  
See Manual for sample responses.

| Picture Item | Response | Score |
|--------------|----------|-------|
|--------------|----------|-------|

| Picture Item | Response | Score |
|--------------|----------|-------|
|--------------|----------|-------|

| Picture Item | Response | Score |
|--------------|----------|-------|
|--------------|----------|-------|

6–8

1. 1 2 **3** 4 5 0 1

2. 1 2 3 **4** 5 0 1

3. 1 **2** 3 4 5 0 1

| Verbal Items | Response | Score |
|--------------|----------|-------|
|--------------|----------|-------|

9–90 † 4. Green–Blue

0 2

† 5. Square–Triangle

0 2

6. Cow–Bear

0 1 2

7. Shirt–Jacket

0 1 2

8. Pen–Crayon

0 1 2

9. Hat–Umbrella

0 1 2

10. Airplane–Bus

0 1 2

11. Door–Window

0 1 2

12. Child–Adult

0 1 2

§ If the examinee provides a response that suggests he or she does not understand the task, provide the specified prompt in the Manual.

† If the examinee provides a 2-point response that requires feedback or provides an incorrect (0 point) response, provide corrective feedback as instructed in the Manual.



# 4. Similarities (continued)

Discontinue after 3 consecutive scores of 0.

| Verbal Items        | Response | Score |
|---------------------|----------|-------|
| 13. Shoulder—Ankle  |          | 0 1 2 |
| 14. Love—Hate       |          | 0 1 2 |
| 15. Smooth—Rough    |          | 0 1 2 |
| 16. Hand—Flag       |          | 0 1 2 |
| 17. Wall—Line       |          | 0 1 2 |
| 18. Heat—Wind       |          | 0 1 2 |
| 19. More—Less       |          | 0 1 2 |
| 20. Shadow—Echo     |          | 0 1 2 |
| 21. Tradition—Habit |          | 0 1 2 |
| 22. Peace—War       |          | 0 1 2 |
| 23. Time—Progress   |          | 0 1 2 |
| 24. Memory—Practice |          | 0 1 2 |

6-8 **STOP**

Maximum Raw Score  
Ages 6-8: 41  
Ages 9-90: 45

Similarities  
Total Raw Score 196

Examinee Name: \_\_\_\_\_ Age: \_\_\_\_\_  
Parent/Guardian Name: \_\_\_\_\_  
Examiner Name: \_\_\_\_\_

# Record Form

## Behavioral Observations

Referral source/Reason for referral/Presenting complaint(s)

Physical appearance

Language (e.g., first/native language, other language, English fluency, expressive and receptive language ability, articulation)

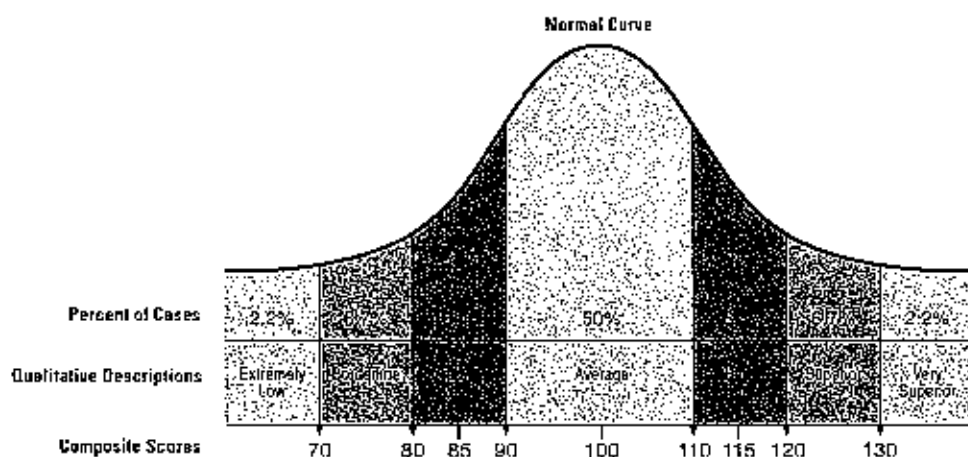
Attention and concentration

Attitude toward testing (e.g., rapport, eager to speak, working habits, interest, motivation, reaction to success/failure)

Affect/Mood

Unusual behaviors/Verbalizations (e.g., perseverations, stereotypic movements, bizarre and atypical verbalizations)

Other notes



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## CD-RISC

Subject #:

Date: \_\_\_\_\_

Time: \_\_\_\_\_

Think about how you have been feeling over the past month. Using the scale below, please rate each of the following statements for how well they describe you **DURING THE PAST MONTH.**

| 0               | 1           | 2              | 3          | 4                        |
|-----------------|-------------|----------------|------------|--------------------------|
| not true at all | rarely true | sometimes true | often true | true nearly all the time |

1. \_\_\_\_\_ Able to adapt to change
2. \_\_\_\_\_ Close and secure relationships
3. \_\_\_\_\_ Sometimes fate or God can help
4. \_\_\_\_\_ Can deal with whatever comes
5. \_\_\_\_\_ Past success gives confidence for new challenge
6. \_\_\_\_\_ See the humorous side of things
7. \_\_\_\_\_ Coping with stress strengthens
8. \_\_\_\_\_ Tend to bounce back after illness or hardship
9. \_\_\_\_\_ Things happen for a reason
10. \_\_\_\_\_ Best effort no matter what
11. \_\_\_\_\_ You can achieve your goals
12. \_\_\_\_\_ When things look hopeless, I don't give up
13. \_\_\_\_\_ Know where to turn for help
14. \_\_\_\_\_ Under pressure, focus and think clearly
15. \_\_\_\_\_ Prefer to take the lead in problem solving
16. \_\_\_\_\_ Not easily discouraged by failure
17. \_\_\_\_\_ Think of self as strong person
18. \_\_\_\_\_ Make unpopular or difficult decisions
19. \_\_\_\_\_ Can handle unpleasant feelings
20. \_\_\_\_\_ Have to act on a hunch
21. \_\_\_\_\_ Strong sense of purpose
22. \_\_\_\_\_ In control of your life
23. \_\_\_\_\_ I like challenges
24. \_\_\_\_\_ You work to attain your goals
25. \_\_\_\_\_ Pride in your achievements

# Craig Handicap Assessment and Reporting Technique Scoring Short Form

1. How many hours in a typical 24-hour day do you have someone with you to provide physical assistance for personal care activities such as eating, bathing, dressing, toileting and mobility?

\_\_\_\_\_ hours paid assistance      \_\_\_\_\_ hours unpaid (family, others)

- A. Total the hours of paid and unpaid care, multiply by 4, and subtract that number from 100.

## PHYSICAL INDEPENDENCE

100  
minus  
\_\_\_\_\_  
=

2. How much time is someone with you in your home to assist you with activities that require remembering, decision making, or judgment?

- 1 \_\_\_\_\_ Someone else is always with me to observe or supervise.  
2 \_\_\_\_\_ Someone else is always around, but they only check on me now and then.  
3 \_\_\_\_\_ Sometimes I am left alone for an hour or two.  
4 \_\_\_\_\_ Sometimes I am left alone for most of the day  
5 \_\_\_\_\_ I have been left alone all day and all night, but someone checks in on me.  
6 \_\_\_\_\_ I am left alone without anyone checking on me.

3. How much of the time is someone with you to help you with remembering, decision making, or judgment when you go away from your home?

- 1 \_\_\_\_\_ I am restricted from leaving, even with someone else.  
2 \_\_\_\_\_ Someone is always with me to help with remembering, decision making or judgment when I go anywhere.  
3 \_\_\_\_\_ I go to places on my own as long as they are familiar.  
4 \_\_\_\_\_ I do not need help going anywhere.

- A. Assign points as follows: response #1 = 0 points; response #2 = 1 point; response #3 = 2 points; response #4 = 3 points; response #5 = 4 points; and response #6 = 5 points.

## COGNITIVE INDEPENDENCE

\_\_\_\_\_  
x11  
=  
\_\_\_\_\_

- B. Multiply points in "A" by 11.

+

- C. Assign points as follows: response #1 = 0 points; response #2 = 1 point; response #3 = 2 points; and response #4 = 3 points.

\_\_\_\_\_  
x15  
=  
\_\_\_\_\_

- D. Multiply points in "C" by 15.

=

Add the sums of "B" and "D". If the total sum is greater than 100, enter 100.

4. On a typical day, how many hours are you out of bed? \_\_\_\_\_ hours
5. In a typical week, how many days do you get out of your house and go somewhere?  
\_\_\_\_\_ days
6. In the last year, how many nights have you spent away from your home (excluding hospitalizations?)  
\_\_\_\_\_ none \_\_\_\_\_ 1-2 \_\_\_\_\_ 3-4 \_\_\_\_\_ 5 or more

7. How many hours per week do you spend working in a job for which you get paid?  
hours \_\_\_\_\_
8. How many hours per week do you spend in school working toward a degree or in an accredited technical training program (including hours in class and studying)?  
hours \_\_\_\_\_
9. How many hours per week do you spend in active homemaking including parenting, housekeeping, and food preparation? \_\_\_\_\_ hours
10. How many hours per week do you spend in home maintenance activities such as gardening, house repairs or home improvement? \_\_\_\_\_ hours
11. How many hours per week do you spend in recreational activities such as sports, exercise, playing cards, or going to movies? Please do not include time spent watching TV or listening to the radio. \_\_\_\_\_ hours

- A. Multiply the number of hours out of bed by 3.
- B. Multiply the number of days per week out of the house by 7.
- C. Assign points as follows: no nights out = 0; 1-2 nights out = 10; 3-4 nights out = 15; 5 or more nights = 20. If the total sum is greater than 100, enter 100.

Add the sums of "A", "B", and "C". If the total sum is greater than 100, enter 100.

#### MOBILITY

\_\_\_\_\_.  
+  
\_\_\_\_\_.  
+  
\_\_\_\_\_.  
=

#### OCCUPATION

- A. Multiply the number of hours working by 2.5.
- B. Multiply the number of hours in school by 2.5.
- C. Multiply the number of hours in active homemaking by 2.5.
- D. Multiply the number of hours in home maintenance by 2.5.
- E. Multiply the number of recreational activities by 1.25

Add the sums of "A", "B", "C", "D", and "E". If the total sum is greater than 100, enter 100.

\_\_\_\_\_.  
+  
\_\_\_\_\_.  
+  
\_\_\_\_\_.  
+  
\_\_\_\_\_.  
+  
\_\_\_\_\_.  
=



# **SOCIAL INTEGRATION**

12. How many people do you live with?

13. Is one of them your spouse or significant other?

14. of the people you live with how many are relatives?

15. How many business or organizational associates do you visit, phone, or write to at least once a month? \_\_\_\_\_ Associates

16. How many friends (non-relatives contacted outside business or organizational settings) do you visit, phone, or write to at least once a month? \_\_\_\_\_ Friends

17. With how many strangers have you initiated a conversation in the last month (for example, to ask information or place an order)?

none \_\_\_\_ 1-2 \_\_\_\_ 3-5 \_\_\_\_ 6 or more

A. Assign 38 points if living with spouse/partner OR assign 25 points if living with unrelated roommate and/or an attendant.

Add an additional six points for every relative that lives in the household.

B. Multiply number of business associates by 2.5. A maximum score for this component is 25 points.

C. If living with more than one roommate, add extra roommate to number of friends contacted monthly. Multiply by 13. A Maximum score for this component is 65 points.

D. Assign points as follows: none = 0 points; 1-2 = 15 points; 3-5 = 23 points; 6 or more = 30 points.

Add the sums from "A", "B", "C", and "D". If the total sum is greater than 100, enter 100.

\_\_\_\_\_.  
+

\_\_\_\_\_.  
+

\_\_\_\_\_.  
+

\_\_\_\_\_.  
+

\_\_\_\_\_.

=

**ECONOMIC  
SELF  
SUFFICIENCY**

18. Approximately what was the combined annual income, in the last year, of **all family members in your household**? (consider all sources including wages and earnings, disability benefits, pensions and retirement income, income from court settlements, investments and trust funds, child support and alimony, contributions from relatives, and any other source.)

- a. Less than 25,000 - If no ask e; if yes ask b
- b. Less than 20,000 - If no code 22500; if yes ask c
- c. Less than 15,000 - If no code 17500; if yes ask d
- d. Less than 10,000 - If no code 12500; if yes code 5000
- e. Less than 35,000 - If no ask f; if yes code 30000
- f. Less than 50,000 - If no ask g; if yes code 42500
- g. Less than 75,000 - If no code h; if yes code 62500
- h. 75,000 or more code 80000

- A. Calculate family size by adding respondent, plus partner (if living with respondent), plus other relatives in household.

\_\_\_\_\_  
Family size

\_\_\_\_\_  
(#19)  
minus

19. Approximately how much did you pay last year for medical care expenses? (Consider any amounts paid by yourself or the family members in your household and **not reimbursed** by insurance or benefits.)

- a. Less than 1000 if "no" ask b if "yes" code 500.
- b. Less than 2500 if "no" ask c if "yes" code 1750.
- c. Less than 5000 if "no" ask d if "yes" code 3750.
- d. Less than 10000 if "no" code e if "yes" code 7500.
- e. 10000 or more code 15000

- B. Subtract the unreimbursed medical expenses from the annual income (amount in question #19 minus amount in question #20.

\_\_\_\_\_  
(#20)

=

- C. Determine poverty level from family size calculated in "A".

=

- D. Divide the value from "B" by the poverty level from "C".

\_\_\_\_\_  
divided by

\_\_\_\_\_

- E. Multiply by 50

\_\_\_\_\_  
Poverty level

\*50  
=

\_\_\_\_\_  
=

If the total sum is greater than 100, enter 100.

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**Purpose:** 22 nonoverlapping full scales provide a comprehensive assessment of adult psychopathology in ages 18 years and older

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**Admin:** Individual or group

**Time:** 50-60 minutes to administer; 15-20 minutes to score

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### PAI® Scales and Subscales

The 344 PAI items constitute 22 nonoverlapping scales covering the constructs most relevant to a broad-based assessment of mental disorders: 4 validity scales, 11 clinical scales, 5 treatment scales, and 2 interpersonal scales. To facilitate interpretation and to cover the full range of complex clinical constructs, 10 scales contain conceptually derived subscales.

The PAI Clinical scales were developed to provide information about critical diagnostic features of 11 important clinical constructs. These 11 scales may be divided into three broad classes of disorders: those within the neurotic spectrum, those within the psychotic spectrum, and those associated with behavior disorder or impulse control problems.

The Treatment scales were developed to provide indicators of potential complications in treatment that would not necessarily be apparent from diagnostic information. These five scales include two indicators of potential for harm to self or others, two measures of the respondent's environmental circumstances, and one indicator of the respondent's motivation for treatment.

The Interpersonal scales were developed to provide an assessment of the respondent's interpersonal style along two dimensions: a warmly affiliative versus a cold rejecting style, and a dominating/controlling versus a meekly submissive style. These axes provide a useful way of conceptualizing many different mental disorders: persons at the extremes of these dimensions may present with a variety of disorders. A number of studies provide evidence that diagnostic groups differ on these dimensions.

The PAI includes a Borderline Features scale and an Antisocial Features scale. Both of these scales specifically assess character pathology. The Borderline Features scale is the only PAI scale that has four subscales, reflecting the factorial complexity of the construct. The Antisocial Features scale includes a total of three facets: one assessing antisocial behaviors, and the other two assessing antisocial traits.

Subject ID: \_\_\_\_\_

Date: \_\_\_\_\_

The following questions concern your alcohol consumption. Place an X in one box that best describes your answer to each question.

| Questions                                                                                                                            | 0      | 1                 | 2                             | 3                | 4                         |  |
|--------------------------------------------------------------------------------------------------------------------------------------|--------|-------------------|-------------------------------|------------------|---------------------------|--|
| 1. How often do you have a drink containing alcohol?                                                                                 | Never  | Monthly or less   | 2-4 times a month             | 2-3 times a week | 4 or more times a week    |  |
| 2. How many drinks containing alcohol do you have on a typical day when you are drinking?                                            | 1 or 2 | 3 or 4            | 5 or 6                        | 7 to 9           | 10 or more                |  |
| 3. How often do you have six or more drinks on one occasion?                                                                         | Never  | Less than monthly | Monthly                       | Weekly           | Daily or almost daily     |  |
| 4. How often during the last year have you found that you were not able to stop drinking once you had started?                       | Never  | Less than monthly | Monthly                       | Weekly           | Daily or almost daily     |  |
| 5. How often during the last year have you failed to do what was normally expected of you because of drinking?                       | Never  | Less than monthly | Monthly                       | Weekly           | Daily or almost daily     |  |
| 6. How often during the last year have you needed a first drink in the morning to get yourself going after a heavy drinking session? | Never  | Less than monthly | Monthly                       | Weekly           | Daily or almost daily     |  |
| 7. How often during the last year have you had a feeling of guilt or remorse after drinking?                                         | Never  | Less than monthly | Monthly                       | Weekly           | Daily or almost daily     |  |
| 8. How often during the last year have you been unable to remember what happened the night before because of your drinking?          | Never  | Less than monthly | Monthly                       | Weekly           | Daily or almost daily     |  |
| 9. Have you or someone else been injured because of your drinking?                                                                   | No     |                   | Yes, but not in the last year |                  | Yes, during the last year |  |
| 10. Has a relative, friend, doctor, or other health care worker been concerned about your drinking or suggested you cut down?        | No     |                   | Yes, but not in the last year |                  | Yes, during the last year |  |
|                                                                                                                                      |        |                   |                               |                  | <b>Total</b>              |  |

# Rivermead Post Concussion Symptoms Questionnaire

Modified (Rpq-3 And Rpq-13)<sup>42</sup> Printed With Permission: Modified Scoring System From Eyres 2005 <sup>28</sup>

Subject ID:

Date:

After a head injury or accident some people experience symptoms that can cause worry or nuisance. We would like to know if you now suffer any of the symptoms given below. Because many of these symptoms occur normally, we would like you to compare yourself now with before the accident. For each symptom listed below please circle the number that most closely represents your answer.

0 = not experienced at all  
1 = no more of a problem  
2 = a mild problem  
3 = a moderate problem  
4 = a severe problem

Compared with **before** the accident, do you **now** (i.e., over the last 24 hours) suffer from:

|                                                  | not<br>experienced | no more of a<br>problem | mild problem | moderate<br>problem | severe<br>problem |
|--------------------------------------------------|--------------------|-------------------------|--------------|---------------------|-------------------|
| Headaches                                        | 0                  | 1                       | 2            | 3                   | 4                 |
| Feelings of dizziness                            | 0                  | 1                       | 2            | 3                   | 4                 |
| Nausea and/or vomiting                           | 0                  | 1                       | 2            | 3                   | 4                 |
| Noise sensitivity (easily upset by loud noise)   | 0                  | 1                       | 2            | 3                   | 4                 |
| Sleep disturbance                                | 0                  | 1                       | 2            | 3                   | 4                 |
| Fatigue, tiring more easily                      | 0                  | 1                       | 2            | 3                   | 4                 |
| Being irritable, easily angered                  | 0                  | 1                       | 2            | 3                   | 4                 |
| Feeling depressed or tearful                     | 0                  | 1                       | 2            | 3                   | 4                 |
| Feeling frustrated or impatient                  | 0                  | 1                       | 2            | 3                   | 4                 |
| Forgetfulness, poor memory                       | 0                  | 1                       | 2            | 3                   | 4                 |
| Poor concentration                               | 0                  | 1                       | 2            | 3                   | 4                 |
| Taking longer to think                           | 0                  | 1                       | 2            | 3                   | 4                 |
| Blurred vision                                   | 0                  | 1                       | 2            | 3                   | 4                 |
| Light sensitivity (easily upset by bright light) | 0                  | 1                       | 2            | 3                   | 4                 |
| Double vision                                    | 0                  | 1                       | 2            | 3                   | 4                 |
| Restlessness                                     | 0                  | 1                       | 2            | 3                   | 4                 |

Are you experiencing any other difficulties? Please specify, and rate as above.

|    |   |   |   |   |   |
|----|---|---|---|---|---|
| 1. | 0 | 1 | 2 | 3 | 4 |
| 2. | 0 | 1 | 2 | 3 | 4 |

Administration only:

|                                            |  |
|--------------------------------------------|--|
| <b>RPQ-3</b> (total for first three items) |  |
| <b>RPQ-13</b> (total for next 13 items)    |  |

# Rivermead Post Concussion Symptoms Questionnaire (cont.)

Modified (Rpq-3 And Rpq-13)<sup>42</sup> Printed With Permission: Modified Scoring System From Eyres 2005<sup>28</sup>

## Administration only

Individual item scores reflect the presence and severity of post concussive symptoms. Post concussive symptoms, as measured by the RPQ, may arise for different reasons subsequent to (although not necessarily directly because of) a traumatic brain injury. The symptoms overlap with broader conditions, such as pain, fatigue and mental health conditions such as depression<sup>72</sup>.

The questionnaire can be repeated to monitor a patient's progress over time. There may be changes in the severity of symptoms, or the range of symptoms. Typical recovery is reflected in a reduction of symptoms and their severity within three months.

## Scoring

The scoring system has been modified from Eyres, 2005<sup>24</sup>.

The items are scored in two groups. The first group (RPQ-3) consists of the first three items (headaches, feelings of dizziness and nausea) and the second group (RPQ-13) comprises the next 13 items. The total score for RPQ-3 items is potentially 0–12 and is associated with early symptom clusters of post concussive symptoms. If there is a higher score on the RPQ-3, earlier reassessment and closer monitoring is recommended.

The RPQ-13 score is potentially 0–52, where higher scores reflect greater severity of post concussive symptoms. The RPQ-13 items are associated with a later cluster of symptoms, although the RPQ-3 symptoms of headaches, dizziness and nausea may also be present. The later cluster of symptoms is associated with having a greater impact on participation, psychosocial functioning and lifestyle. Symptoms are likely to resolve within three months. A gradual resumption of usual activities is recommended during this period, appropriate to symptoms. If the symptoms do not resolve within three months, consideration of referral for specialist assessment or treatment services is recommended.

## References:

- Eyres, S., Carey, A., Gilworth, G., Neumann, V., Tennant, A. (2005). Construct validity and reliability of the Rivermead Post Concussion Symptoms Questionnaire. *Clinical Rehabilitation*, 19, 878-887.
- King, N. S., Crawford, S., Wenden, F.J., Moss, N.E.G. Wade, D.T. (1995). The Rivermead Post Concussion Symptoms Questionnaire: a measure of symptoms commonly experienced after head injury and its reliability *Journal of Neurology*, 242, 587-592.
- Potter, S., Leigh, E., Wade, D., Fleminger, S. (2006). The Rivermead Post Concussion Symptoms Questionnaire *Journal of Neurology*, October 1-12.

## Snaith-Hamilton Pleasure Scale

This questionnaire is designed to measure your ability to experience pleasure in the last few days.

It is important to read each statement very carefully.

Circle the answer that corresponds to how much you agree or disagree with each statement.

- |                                                                                                                     |                   |          |          |                   |
|---------------------------------------------------------------------------------------------------------------------|-------------------|----------|----------|-------------------|
| 1. I would enjoy my favorite television or radio program. ....                                                      | Strongly Disagree | Disagree | Agree    | Strongly Agree    |
| 2. I would enjoy being with my family or close friends. ....                                                        | Definitely Agree  | Agree    | Disagree | Strongly Disagree |
| 3. I would find pleasure in my hobbies and past-times. ....                                                         | Strongly Disagree | Disagree | Agree    | Strongly Agree    |
| 4. I would be able to enjoy my favorite meal. ....                                                                  | Definitely Agree  | Agree    | Disagree | Strongly Disagree |
| 5. I would enjoy a warm bath or refreshing shower. ....                                                             | Definitely Agree  | Agree    | Disagree | Strongly Disagree |
| 6. I would find pleasure in the scent of flowers or the smell<br>of a fresh sea breeze or freshly baked bread. .... | Strongly Disagree | Disagree | Agree    | Strongly Agree    |
| 7. I would enjoy seeing other people's smiling faces. ....                                                          | Definitely Agree  | Agree    | Disagree | Strongly Disagree |
| 8. I would enjoy looking smart when I have made<br>an effort with my appearance. ....                               | Strongly Disagree | Disagree | Agree    | Strongly Agree    |
| 9. I would enjoy reading a book, magazine, or newspaper. ....                                                       | Definitely Agree  | Agree    | Disagree | Strongly Disagree |
| 10. I would enjoy a cup of tea or coffee or my favorite drink. ....                                                 | Strongly Disagree | Disagree | Agree    | Strongly Agree    |
| 11. I would find pleasure in small things, e.g. bright sunny day,<br>a telephone call from a friend. ....           | Strongly Disagree | Disagree | Agree    | Strongly Agree    |
| 12. I would be able to enjoy a beautiful landscape or view. ....                                                    | Definitely Agree  | Agree    | Disagree | Strongly Disagree |
| 13. I would get pleasure from helping others. ....                                                                  | Strongly Disagree | Disagree | Agree    | Strongly Agree    |
| 14. I would feel pleasure when I receive praise from other people. ....                                             | Definitely Agree  | Agree    | Disagree | Strongly Disagree |

## Satisfaction with Life Scale

Below are five statements with which you may agree or disagree.

Indicate your agreement with each item by placing the appropriate number on the line preceding that item.

Please be open and honest in your responding.

The 7-point scale is as follows:

1 = strongly disagree

2 = disagree

3 = slightly disagree

4 = neither agree nor disagree

5 = slightly agree

6 = agree

7 = strongly agree

\_\_\_ 1. In most ways my life is close to my ideal.

\_\_\_ 2. The conditions of my life are excellent.

\_\_\_ 3. I am satisfied with my life.

\_\_\_ 4. So far I have gotten the important things I want in life.

\_\_\_ 5. If I could live my life over, I would change almost nothing.



## EDINBURGH HANDEDNESS SURVEY

Subject ID#: \_\_\_\_\_

Date: \_\_\_\_\_

Please indicate your preferences in the use of hands in the following activities by putting a + in the appropriate column. Where the preference is so strong that you would never try to use the other hand unless absolutely forced to, put ++. If in any case you are really indifferent put + in both columns.

Some of the activities require both hands. In these cases the part of the task, or object, for which the hand preference is wanted is indicated in brackets.

Please try to answer all the questions, and only leave a blank if you have no experience at all of the object or task.

---

|    |                        | LEFT | RIGHT |
|----|------------------------|------|-------|
| 1  | Writing                |      |       |
| 2  | Drawing                |      |       |
| 3  | Throwing               |      |       |
| 4  | Scissors               |      |       |
| 5  | Toothbrush             |      |       |
| 6  | Knife [without fork]   |      |       |
| 7  | Spoon                  |      |       |
| 8  | Broom [upper hand]     |      |       |
| 9  | Striking Match [match] |      |       |
| 10 | Opening Box [lid]      |      |       |

---

Do not write below this line

L.Q.: \_\_\_\_\_

DECILE: \_\_\_\_\_

Have you ever used marijuana?

*For our purposes, marijuana usage is considered any instance in which you intentionally consumed (smoked, ingested, etc.) any quantity of marijuana.*

☐ **NO**      ☐ **YES**

At what age did you start? \_\_\_\_\_

At what specific age (in years) was your marijuana usage the heaviest? \_\_\_\_\_

During your lifetime, approximately how many occasions have you used marijuana?

☐ 0-50      ☐ 51-100      ☐ 101-500      ☐ 501s-1000 ☐ 1001-5000 ☐ over 5000

Consider the extent of marijuana use throughout your lifetime. Please approximate the number of times per month on average which you used marijuana at the following ages:

| 16-18 years of age | 19-21 years of age | 22-24 years of age | 25-27 years of age | 28-30 years of age | 30+ years of age |
|--------------------|--------------------|--------------------|--------------------|--------------------|------------------|
|                    |                    |                    |                    |                    |                  |

During your lifetime, on average, how many times per month have you used marijuana?

\_\_\_\_\_

In the past four weeks, did you use marijuana?

☐ **NO**      ☐ **YES**

How often? \_\_\_\_\_ daily / weekly (*circle one*)

On average, how much do you consume per occasion? \_\_\_\_\_

**If YES**, please review the printed calendar reflecting all the days in the past month. Indicate the number of times you used marijuana on each of these days. If you abstained from marijuana use during a given day, please write a "0" on that day. Please fill out every day in the calendar with your best guess of marijuana use.

## Test 9 Sentence Reading Fluency ⌚ 📖

### Administration Overview

- This test has a 3-minute time limit.
- You will need a stopwatch or a watch or clock with a second hand to administer this test.
- If you are not using a stopwatch, note the *exact starting time* in minutes and seconds.
- Give the subject *exactly 3 minutes* to complete as many items as possible.
- Record the *exact finishing time* in minutes and seconds on the Test Record.
- Use the Response Booklet and a pencil with eraser for this test.

### Scoring

- 1 = Correct response  
0 = Incorrect response
- Use the Sentence Reading Fluency Scoring Guide to score this test.
- When calculating the number correct, do not include points for sample items or the practice exercise.
- Record both the Number Correct and the Number Incorrect on the Test Record. Do not count unattempted items as incorrect.

### Starting Point

- Administer Sample Items A and B and the Practice Exercise to all subjects.

## Sample Items



Open Response Booklet to Sentence Reading Fluency sample items and place directly in front of subject. Say: **I want you to read some sentences and decide if the answer is yes or no.**

Point to Sample Item A and say: **Look at this sentence. It says, "A cow is an animal." (Pause.) Is that true? (Pause for response.) Because the answer is yes, you would circle the letter Y (point to circled Y). Now look at the second sentence. It says, "A fish can read." (Pause.) Is that true? (Pause for response.) Because the answer is no, you would circle the letter N (point to circled N).**

- A. A cow is an animal.      ☒ Y      ☐ N
- B. A fish can read.      ☐ Y      ☒ N

## Practice Exercise

Give subject a pencil with eraser and say: **Now look at the next four sentences. Draw a circle around the correct answer for each sentence. Work as quickly as you can without making mistakes. Go ahead.**

- C. An apple is blue.      ☐ Y      ☒ N
- D. A wheel is round.      ☒ Y      ☐ N
- E. A man has two legs.      ☒ Y      ☐ N
- F. Ice is hot.      ☐ Y      ☒ N

### ◆ C-F: Error

Say: **Read the sentence aloud and tell me if the answer is "yes" or "no."** If subject still gives incorrect answer, explain sentence and correct answer.

### ◆ C-F: No Response

Say: **Read the sentence aloud and tell me if the answer is "yes" or "no."** If subject cannot read sentence, point to next sentence and say: **Try the next one.**

### ◆ 2 or Fewer Correct

If subject has 2 or fewer items correct on Practice Exercise, record score of 0 for Test 9 Sentence Reading Fluency without administering test items.

## Test Items



Open Response Booklet to Sentence Reading Fluency test items and hold up booklet so subject cannot study items. Say: Start here (point to first sentence) and read as many sentences as you can. Decide if the answer is yes or no. After you get to the bottom (point to bottom of first column), go to the top (point to top of second column). There are three pages. Keep working until I tell you to stop. Work as quickly as you can without making mistakes. If you do make a mistake, cross out the one you do not want. If you have trouble reading a word or cannot think of the answer, skip that one and go on to the next one. You will have three minutes. Tell me if you finish before I say, "Stop."



Place Response Booklet, opened to test items, directly in front of subject and say: Go ahead. Begin timing 3 minutes.

### ◆ No Stopwatch

If not using stopwatch, record exact starting time in minutes and seconds.

Make sure subject continues to top of next page after completing each page.

### ◆ Early Finish

If subject finishes test items in less than 3 minutes, record exact finishing time in minutes and seconds on Test Record.

Allow subject to work for exactly 3 minutes and then say: Stop. Put your pencil down. Collect pencil and Response Booklet.

Record exact finishing time in minutes and seconds on Test Record.

End of Test 9  
Sentence Reading  
Fluency

## Test 9 Sentence Reading Fluency

### Sample Items

- A. A cow is an animal. .... ☒ Y    N
- B. A fish can read. .... Y    ☒ N

### Practice Exercise

- C. An apple is blue. .... Y    N
- D. A wheel is round. .... Y    N
- E. A man has two legs. .... Y    N
- F. Ice is hot. .... Y    N

- |                                           |   |                                                      |   |
|-------------------------------------------|---|------------------------------------------------------|---|
| 1. Fire is hot. .... Y                    | N | 26. A door may have a lock. .... Y                   | N |
| 2. Dogs can eat. .... Y                   | N | 27. A hat goes on your foot. .... Y                  | N |
| 3. A bird can fly. .... Y                 | N | 28. Elephants are large animals. .... Y              | N |
| 4. Cats have five legs. .... Y            | N | 29. Many spiders can spin webs. .... Y               | N |
| 5. A clock tells time. .... Y             | N | 30. A butterfly has ten wings. .... Y                | N |
| 6. A bus has wings. .... Y                | N | 31. Glasses help people to hear. .... Y              | N |
| 7. Cars have four wheels. .... Y          | N | 32. Most poodles graduate from school. .... Y        | N |
| 8. People can drive cars. .... Y          | N | 33. Some fish live in the ocean. .... Y              | N |
| 9. Candy is sweet. .... Y                 | N | 34. The color of grass is red. .... Y                | N |
| 10. A penny is round. .... Y              | N | 35. A school bus has a driver. .... Y                | N |
| 11. Milk is always blue. .... Y           | N | 36. A plumber may fix a leak. .... Y                 | N |
| 12. Some days are sunny. .... Y           | N | 37. Snow is often green in color. .... Y             | N |
| 13. Windows can be washed. .... Y         | N | 38. May is the month after March. .... Y             | N |
| 14. Lawn chairs love to dance. .... Y     | N | 39. Most houses have only one room. .... Y           | N |
| 15. Birds sleep in big beds. .... Y       | N | 40. A fan may produce a breeze. .... Y               | N |
| 16. Most snakes fly through trees. .... Y | N | 41. Many people like to play games. .... Y           | N |
| 17. People like to drink gum. .... Y      | N | 42. People love to swim in puddles. .... Y           | N |
| 18. A table has six arms. .... Y          | N | 43. A beaver roars like a lion. .... Y               | N |
| 19. An eagle is a bird. .... Y            | N | 44. Some children like to watch cartoons. .... Y     | N |
| 20. Tires are always flat. .... Y         | N | 45. Some children fly kites on<br>windy days. .... Y | N |
| 21. Pilots fly red bikes. .... Y          | N | 46. Some people take medicine for colds. .... Y      | N |
| 22. A train goes on the track. .... Y     | N | 47. Berries can be different colors. .... Y          | N |
| 23. A shoe goes on your head. .... Y      | N | 48. A dog may bark at a cat. .... Y                  | N |
| 24. A bird may build a nest. .... Y       | N | 49. A boat can talk to a man. .... Y                 | N |
| 25. Milk comes out of gas pumps. .... Y   | N |                                                      |   |

50. You can drink milk through a straw. .... Y N
51. A bicycle needs gas each day. .... Y N
52. Fish like to prepare gourmet dinners. .... Y N
53. An ocean has plenty of water. .... Y N
54. Candy is always bitter to taste. .... Y N
55. A magazine has only fourteen pages. .... Y N
56. Children may eat soup with a spoon. .... Y N
57. A plant's roots are above the ground. .... Y N
58. Most people smile when they  
are sad. .... Y N
59. All monkeys talk in complete  
sentences. .... Y N
60. May is the last day of the week. .... Y N
61. Big horses often sleep in  
small garages. .... Y N
62. Floodwaters can cause soil erosion. .... Y N
63. Winter is a season of the year. .... Y N
64. Most people drive airplanes to  
the store. .... Y N
65. A monkey is an insect that flies. .... Y N
66. All mountains are very flat on top. .... Y N
67. Roosters like to ride the  
bus to school. .... Y N
68. Some people buy new homes  
in small towns. .... Y N
69. Most people use keys to comb  
their hair. .... Y N

70. A highway can have more than  
one lane. .... Y N
71. A carpenter may build things  
with wood. .... Y N
72. A hospital has more than one doctor. .... Y N
73. Plans cannot be revised in a meeting. .... Y N
74. Mice run in marathon races  
on Saturdays. .... Y N
75. There are many different types  
of jewelry. .... Y N
76. Some adults rent apartments  
in large cities. .... Y N
77. Squirrels always deposit their  
money in banks. .... Y N
78. Photo albums may hold  
many pictures. .... Y N
79. Games can be played with a  
deck of cards. .... Y N
80. A pitcher may be used to pour water. .... Y N
81. Many bears walk down the middle  
of streets. .... Y N
82. A trailer can be used to  
transport horses. .... Y N
83. An old flashlight may need  
batteries to operate. .... Y N
84. Some librarians put books back  
in the oven. .... Y N
85. Some boys like to go swimming  
on hot days. .... Y N
86. A car is so much bigger than a bus. .... Y N

Go to the next page →



87. Most dogs can fly over the tops of mountains. .... Y N
88. Tennis is a game some people like to play. .... Y N
89. Parts of a hidden cavern may be unexplored. .... Y N
90. Money is often used to start forest fires. .... Y N
91. Every year all cars need to have new engines. .... Y N
92. A lion eats paper when it is hungry. .... Y N
93. You can see only one color in a rainbow. .... Y N
94. A talented athlete may like several different sports. .... Y N
95. Most people fill their pillows with rocks before sleeping. .... Y N
96. The letter A is the last letter of the alphabet. .... Y N
97. Children and adults are all the same height and weight. .... Y N
98. One may see flowers along a trail in the spring. .... Y N
99. Drivers may use a map to find certain locations. .... Y N
100. People can use credit cards to buy clothes and supplies. .... Y N
101. Calendars display the months, weeks, and days of a year. .... Y N
102. A classroom teacher works all day in a grocery store. .... Y N

103. Large dinosaurs may be found roaming in most national parks. .... Y N
104. Some people like to go to another country for vacation. .... Y N
105. A hammer is often used to write a funny story. .... Y N
106. A map is used to help you find some numbers. .... Y N
107. You may see an acrobat walk a tightrope at the circus. .... Y N
108. A person can make a hotel reservation for just one night. .... Y N
109. A variety of animal species can be found in the jungle. .... Y N
110. Drivers never get tickets when they go over the speed limit. .... Y N



Date Injury Occurred (mm/dd/yyyy):

Time of Injury (24 hour clock):

Day of week of injury:

☐Monday ☐Tuesday ☐Wednesday ☐Thursday ☐Friday ☐Saturday ☐Sunday

Source of information: ☐Clinician

☐Player ☐Parent ☐Coach ☐Other

Reliability of injury data: ☐Verified ☐Estimated ☐Unknown

1. Who was the clinical assessment completed by?

☐Athletic Trainer ☐Coach ☐Physicians Assistant

☐Medical Doctor ☐Physical Therapist ☐Other

2. How confident was clinician that injury was a concussion?

☐Not at all Confident ☐Barely Confident ☐Somewhat Confident

☐Fairly Confident ☐Very Confident

3. If injury data is ESTIMATED, injury data type (point in time):

☐Time participant became symptomatic

☐Time of first trauma activation

☐Time of presentation to emergency dept

4. How many hours after the injury did the first evaluation take place?

5. How many hours after the injury did the second evaluation take place?

6. How many hours after the injury did the third evaluation take place?

7. Does subject have a baseline? ☐Yes ☐No

8. Was athlete taken out of game? ☐Yes ☐No

9. Did the athlete immediately report the injury? ☐Yes ☐No

a. If no, how many minutes/hours after injury did athlete report it to someone?

10. Did athlete continue participation after suspected injury event? ☐Yes ☐No

a. If so, for how long?

b. For how many plays?

11. Did athlete go to ER? ☐Yes ☐No

12. Treated at hospital before study center? ☐Yes ☐No

13. Date treated at hospital: mm/dd/yyyy

14. Time treated at hospital: 24 hour clock

15. Hospital admission date:

☐ NA

16. Hospital admission time (mm/dd/yyyy; 24 hour clock):
17. Symptom onset date: mm/dd/yyyy
18. Symptom onset time: 24 hr clock
19. Were initial medical services received immediately after injury? ☐Yes ☐No ☐Unknown
20. Medical Services received:
- ☐CT/MRI
  - ☐Hospitalization
  - ☐Specialized therapies
  - ☐Evaluation (neuro, psych)
  - ☐Medications
  - ☐Education on symptoms or course of injury
  - ☐Other, specify:
21. At the time of injury, was any protective equipment worn? Helmet, mouthguard, tape, brace, other
22. Sport at time of injury
23. Position at time of injury
24. Injury occurred during: Game, practice, dryland/fitness, other
25. Injury involved: Sudden onset and contact with another player; sudden onset and no contact with another player; Gradual onset/overuse; unknown
26. Cause of injury (will depend on sport) – body check, tackle, intentional player contact (elbowing, roughing, cross-check, dueling for header, etc)
27. Mechanism of injury: direct blow to head, fell and hit head, hit head on environment, non head injury
28. Was a penalty called directly related to the injury event: Yes/no if yes, describe; who received penalty
29. Describe events surrounding the injury:
30. Injury location for each type of injury (often more than one injury at time of injury- list of all injury types and body parts)
31. Mechanism of Injury: ☐ Contact with another player ☐ Impact with ground ☐ Impact with object (i.e. ball)
32. Likelihood participant under influence of alcohol:
- ☐None ☐Suspected ☐Confirmed ☐Unknown
33. Location of impact:
- ☐Frontal
  - ☐L temporal
  - ☐R temporal

- ☐ L parietal  
☐ R parietal  
☐ Occipital  
☐ Neck  
☐ Indirect force

## 34. Injury Description:

SYMPTOMS35. Loss of consciousness ☐ Yes ☐ Noa. Duration: ☐ < 1 min ☐ 1-30 min ☐ 30 - 24 hr36. Dizziness ☐ Yes ☐ Noa. Duration: ☐ 0-1hr ☐ 1-24hr ☐ >24hr37. Retrograde amnesia ☐ Yes ☐ Noa. Duration: ☐ 0-1hr ☐ 1-24hr ☐ >24hr38. Amnesia of event ☐ Yes ☐ Noa. Duration: ☐ 0-1hr ☐ 1-24hr ☐ >24hr39. Post traumatic amnesia ☐ Yes ☐ Noa. Duration: ☐ 0-1hr ☐ 1-24hr ☐ >24hr40. Confusion/disorientation ☐ Yes ☐ No

41. How long did symptoms last after injury/impact? days, hours, minutes

42. Symptoms:

- ☐ Dizziness  
☐ Off-balance  
☐ Fogginess/ confusion  
☐ Nausea/vomiting  
☐ Memory loss  
☐ Vision changes  
☐ Headache

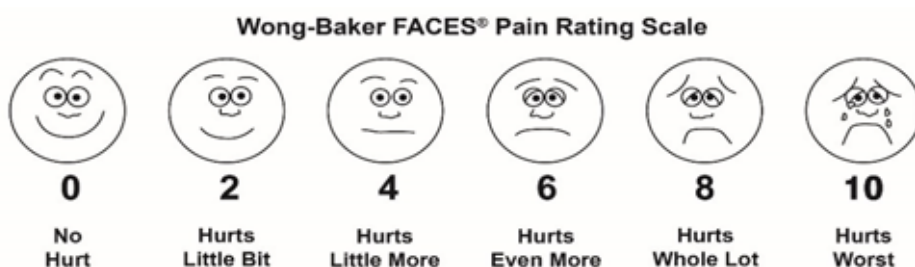
43. Baseline headache impact test-6 (HIT-6)

44. Follow-up headache impact test-6 (HIT-6)

45. Brain imaging abnormality: ☐ Yes ☐ No ☐ No imaging

a. Type of imaging:

46. Pain Assessment :

**Faces Rating Scale (Wong Baker):****Explanation:**

# Frontal Cortical Surface Area is Associated with Lexical-Semantic Knowledge in Adults with Mild Traumatic Brain Injury

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## Objective

Verbal fluency (VF), a task sensitive to mTBI deficits, requires accurate search and retrieval of lexical-semantic knowledge, thereby utilizing vocabulary, attention, working memory, and self-monitoring. Prior research on a two-component model of VF has been used to indirectly associate lexical-semantic knowledge to cortical damage in patients with mTBI. This study, however, aims to directly link VF components to frontal and temporal cortical surface area (CSA). We hypothesized that patients with mTBI would exhibit fewer clusters and more switches compared to healthy controls. We further hypothesized that clusters would be associated with temporal, while switches would be associated with frontal CSA.

## Participants and Methods

Sixty young adults participated ( $M_{\text{age}}=23.49$ ;  $SD=5.34$ ), including 20 healthy controls (HCs), 22 sub-acute mTBI patients (2-4 weeks post-injury), and 18 chronic mTBI patients (6-12 months post-injury). Participants were administered the D-KEFS semantic VF task, and responses were coded for total clusters and switches. T1-weighted anatomical images were acquired and FreeSurfer was used to measure CSA.

## Results

The three groups differed significantly on total switches ( $F(2,53)=3.34$ ,  $p=.04$ ,  $\eta^2=.11$ ), where the chronic mTBI group produced more switches compared to HCs. The three groups showed no significant difference in semantic clusters ( $F(2,53)=6.38$ ,  $p=.10$ ,  $\eta^2=.08$ ). Switching was significantly correlated with CSA in the left caudal middle frontal region ( $r=.27$ ,  $p=.04$ ) and left parsopercularis ( $r=-0.29$ ,  $p=.03$ ), whereas clustering was significantly correlated with CSA in the left parahippocampus ( $r=-0.27$ ,  $p=.04$ ).

## Conclusions

These findings provide direct evidence for cortical characteristics associated with VF deficits often observed in patients with mTBI. Switching was directly linked to frontal regions, which play a critical role in attention and task maintenance. The increased use of switching in patients 6-12 months post-injury may be indicative of long-lasting disruptions to frontal brain regions, and further highlight the clinical importance of targeting executive function skills in treatment approaches for patients with mTBI.

# **Self-Initiated Verbal Recall Strategies Following Mild Traumatic Brain Injury**

Corinne Meinhausen<sup>1</sup>, Simon Esbit<sup>1</sup>, Natalie S. Dailey<sup>1</sup>, and William D. S. Killgore<sup>1</sup>

<sup>1</sup>Social, Cognitive and Affective Neuroscience Laboratory (SCAN Lab), Department of Psychiatry, College of Medicine, University of Arizona, Tucson, AZ, USA.

## *Objective*

Impaired memory is frequently reported following an mTBI, yet little is known about the recovery timeline. This study sought to identify the self-initiated memory retrieval strategies used at different timepoints post mTBI. We predicted poorer total verbal recall and differences in recall strategy utilization during the sub-acute stage compared to the chronic stage and healthy controls (HCs). We evaluated two verbal recall strategies, serial clustering (recalling words in the order in which they were heard) and semantic clustering (grouping words by meaning) as well as recall distribution.

## *Participants and Methods*

One hundred and eight adults completed this study. Groups consisted of those 2-12 weeks post-mTBI (sub-acute, n=40), 6-12 months post-mTBI (chronic, n=39), and healthy controls (HC, n=29). Serial clustering (SRC) and semantic clustering (SMC) utilization and the percentage of words recalled from the beginning (PR), middle (MR), and end (RR) was assessed using the California Verbal Learning Test, 2nd Edition (CVLT-II). A Multivariate Analysis of Variance (MANOVA) was calculated to determine whether the three groups differed on total words recalled, PR, MR, and RR. Due to non-normality, the non-parametric Kruskal-Wallis test was used to assess SMC, SRC, and recall distribution.

## *Results*

Overall performance on the CVLT-II was similar across groups. There were no significant differences in PR, MR or RR. There was a significant main effect of group on semantic ( $\chi^2(2) = 8.54, p = .01$ ) and serial clustering ( $\chi^2(2) = 9.07, p = .01$ ). Post-hoc analyses of significant effects indicated the sub-acute group produced significantly more semantic clusters than the HC group ( $p = .03$ ), and the chronic mTBI group ( $p = .05$ ) and significantly fewer serial clusters than the HC group ( $p = .03$ ) and chronic mTBI ( $p = .03$ ) groups.

## *Conclusions*

The findings indicate differences in verbal recall strategy utilization in the early stages of mTBI recovery, compared to later stages of recovery and healthy controls. This may suggest semantic clustering is used as a compensatory strategy in response to serial clustering deficits present during the first three months of mTBI recovery.

## Exploring Verbal Recall Throughout Mild Traumatic Brain Injury Recovery

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### *Objective*

Impaired memory is often reported after a mild traumatic brain injury (mTBI). However, little is known about the memory deficits across the recovery timeline. This study explores the efficacy of semantic and serial recall strategies in acute (2-12 weeks) and chronic (6-12 months) stages of mTBI recovery. Semantic clustering involves recalling words based on their meaning; whereas, serial clustering involves recalling words in the order they were presented. We predicted all participants would exhibit a positive relationship between total verbal recall and semantic clustering and a positive relationship between total verbal recall and serial clustering.

### *Participants and Methods*

One hundred and nine adults completed this study, including 29 HCs ( $M_{age}=2.83$ ;  $SD=3.73$ ), 39 in the acute group ( $M_{age}=24.93$ ;  $SD=7.34$ ) and 41 in the chronic group ( $M_{age}=23.08$ ;  $SD=5.74$ ). The California Verbal Learning Test, 2nd Edition (CVLT) assessed episodic verbal recall and recall strategies with an orally presented wordlist. We explored the relationship between recall strategy and total verbal recall using Pearson's Correlation.

### *Results*

There were significant positive relationships between total verbal recall and semantic clustering for all three groups (HC,  $r=0.56$ ; acute,  $r=0.74$ ; and chronic,  $r=0.41$ ; all  $p<0.01$ ). Whereas, there was only a significant relationship between total verbal recall and serial clustering for the acute group ( $r=-0.35$ ,  $p=0.02$ ).

### *Conclusions*

All groups displayed significant relationships between total verbal recall and the use of semantic clustering. This finding is consistent with previous literature, and supports the advantage of strong lexical-semantic networks during verbal recall. Furthermore, the acute group had a negative relationship between total verbal recall and the use of serial clustering. Our findings suggest that people in the acute stage of mTBI recovery might benefit from avoiding serial clustering in favor of semantic clustering to perform optimally in verbal recall.

## Reduced Cortical Thickness as a Biomarker of Daytime Sleepiness in Mild Traumatic Brain Injury

Dailey, N. S.·Raikes, A. C.·Alkozei, A.·Grandner, M. A.·Killgore, W. D.  
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Tucson, AZ.

**Introduction:** Sleep disruptions, including the increase of daytime sleepiness, are reported in roughly 70% of all individuals who have suffered a mild traumatic brain injury (mTBI). Prior research using magnetic resonance imaging (MRI) has identified associations between functional brain changes and daytime sleepiness following mTBI. In the present study, we aimed to identify whether structural differences in cortical thickness are associated with increased daytime sleepiness in adults with mTBI.

**Methods:** A total of 58 adults between 18 and 45 years of age ( $M=23.58\pm5.31$ ) participated in the study, including 19 healthy controls and 39 individuals with a documented mTBI. Individuals with mTBI were further divided based on time-since-injury into a sub-acute ( $n=22$ ) or chronic ( $n=17$ ) group. Daytime sleepiness was assessed using the Epworth Sleepiness Scale (ESS) and cortical thickness was measured using high-resolution T1-weighted structural MRI. Whole-brain vertex-wise estimations of cortical thickness were calculated using FreeSurfer (v.6.0) and entered into a GLM to identify between-group differences in cortical thickness and the association with ESS.

**Results:** Significant differences in cortical thickness were found between the two mTBI groups (cluster-forming threshold  $p<.01$ ; cluster-wise threshold  $p<.05$ ; two-tailed; FWE-corrected). Specifically, lower cortical thickness in the left hemisphere was found in the inferior parietal lobule ( $p=.01$ ), precuneus ( $p=.03$ ), and pars triangularis ( $p=.04$ ) for the sub-acute, compared to chronic group. Furthermore, a significant negative correlation was found between ESS and cortical thickness in the inferior parietal lobule ( $r=-.55$ ,  $p=.009$ ) for the sub-acute mTBI group.

**Conclusion:** More daytime sleepiness was associated with reduced inferior parietal cortical thickness in those 2 to 12-weeks post-injury, an association not observed in those 6 to 12-months post-injury or healthy controls. The inferior parietal lobule is part of the frontoparietal attention network and has been associated with vulnerability to sleep loss. Our findings suggest structural damage to the attention network following mTBI may be one factor affecting daytime sleepiness in mTBI. These findings may reflect a potential biomarker of sleep disturbances in mTBI.

**Support:** USAMRMC grant (W81XWH-12-0386).



## The Compounding Impact of Daytime Sleepiness and Brain Injury on Sustained Vigilance

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Tucson, AZ.

**Introduction:** Daytime sleepiness is among the most frequent self-reported complaints by individuals who have sustained a mild traumatic brain injury (mTBI). Previous research demonstrates reduced vigilance and processing speed following mTBI. It has yet to be determined, however, if sustaining a mTBI alone, or the combination of daytime sleepiness and brain injury more greatly impacts cognitive function. The goal of this preliminary analysis was to determine the association between vigilance, daytime sleepiness, and mTBI.

**Methods:** A total of 137 adults ( $M_{age} = 24.89 \pm 7.2$ ; 83 females) participated in the study, including 33 healthy controls (HCs) and 104 individuals with a documented mTBI within the preceding 12 months. Daytime sleepiness was assessed using the Epworth Sleepiness Scale (ESS), while daytime vigilance was measured using the Psychomotor Vigilance Task (PVT). To assess the effect of mTBI and daytime sleepiness on vigilance, we fit a Poisson regression to the number of lapses on the PVT, with group and ESS scores as predictors.

**Results:** ESS scores were significantly higher ( $p < .001$ ) and there were significantly more PVT lapses ( $p = .03$ ) in those with a recent mTBI, compared to HCs. For those with mTBI, the rate of lapses increased by 7.5% for every 1-point increase in ESS score ( $p < .001$ ). Furthermore, when compared to HCs, the PVT lapse rate was 1.8x higher for individuals with a history of mTBI ( $p < 0.001$ ), after controlling for ESS scores.

**Conclusion:** Daytime sleepiness was negatively associated with sustained vigilance for all participants. However, the magnitude of this association was roughly twice as high in individuals who had sustained a mTBI in the previous year. These findings provide evidence of a significant compounding effect of daytime sleepiness and brain injury on sustained vigilant attention. Clinical evaluation of mTBI would benefit from routine assessment of daytime sleepiness.

**Support:** USAMRMC grant (W81XWH-12-0386).

# **Self-Initiated Recall Strategies in Mild Traumatic Brain Injury: Identifying the Neural Correlates**

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## **Objective**

In memory tasks, serial and semantic clustering are self-initiated recall strategies that can improve performance. Emerging evidence suggests adults with acute mild traumatic brain injury (mTBI) are more likely to use semantic clustering compared to adults with chronic mTBI. However, the neural mechanisms associated with recall strategies remain unknown. We hypothesized that white matter integrity and time since injury predict the use recall strategies.

## **Participants and Methods**

Fifty-six adults participated, including 20 controls, 22 adults with acute mTBI (2-12weeks post-injury), and 15 adults with chronic mTBI (6-12months post-injury). Serial and semantic clustering was measured using the California Verbal Learning Test. The superior longitudinal fasciculus (SLF) and uncinate fasciculus (UF) were targeted using diffusion weighted imaging and measured by fractional anisotropy, mean diffusivity, radial diffusivity, and axial diffusivity. Separate stepwise linear regressions were calculated to determine the relationship between white matter integrity and time since injury on the use of serial and semantic clustering.

## **Results**

Fractional anisotropy in the left SLF ( $b=-.28$ ,  $p=.03$ ) and axial diffusivity in the right UF ( $b=.25$ ,  $p=.05$ ) significantly predicted serial clustering, accounting for 16% of the total variance ( $p<.05$ ). In contrast, fractional anisotropy in the left UF ( $b=.30$ ,  $p=.03$ ) significantly predicted semantic clustering, accounting for 9% of the total variance ( $p<.05$ ). Finally, contrary to our hypothesis, time since injury was not a significant predictor of recall strategy.

## **Conclusions**

Serial clustering is associated with reduced white matter integrity in the left SLF, and increased integrity in the right UF, whereas semantic clustering is associated with increased integrity in the left UF. Adults who utilize serial clustering may exhibit disrupted axonal integrity within left-lateralized language pathways, impeding their ability to use a higher-level recall strategy, such as semantic clustering.

# Disrupted Thalamocortical Connectivity following Mild Traumatic Brain Injury: Associations with Daytime Sleepiness

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## Introduction

Changes in sleep are commonly reported by upwards of 70% of individuals who have experienced a mild traumatic brain injury (mTBI). Among those with mTBI, increased daytime sleepiness is one of the most frequent self-reported complaints. Previous research demonstrates changes to thalamocortical connectivity associated with daytime sleepiness in healthy populations. The present study focused on identifying this association following a mTBI. We hypothesized that thalamocortical connectivity and daytime sleepiness associations would differ significantly between adults with mTBI and healthy controls (HC).

## Methods

A total of 64 individuals participated in the study, including 23 HC and 41 individuals with mTBI. Individuals in the mTBI group had a documented injury sustained within the past 12 months. Daytime sleepiness was assessed using the Epworth Sleepiness Scale (ESS), while functional connectivity was measured using resting-state functional magnetic resonance imaging (rs-fMRI). A seed-to-voxel analysis, using bilateral thalamic seed regions, was conducted in the CONN toolbox to identify differences in the association between thalamocortical connectivity and ESS between the two groups.

## Results

Daytime sleepiness was significantly greater in those with mTBI ( $M = 9.83$ ,  $SD = 3.86$ ) compared to HCs ( $M = 5.35$ ,  $SD = 3.58$ ) ( $t = -4.57$ ,  $p < .001$ ). Significant anticorrelations between thalamocortical connectivity and ESS were found in the HC compared to limited associations in the mTBI group (whole-brain height threshold  $p < .001$  uncorrected, two-sided; cluster threshold  $p < .05$  FWE-corrected). Specifically, lower ESS scores were associated with greater functional connectivity between the thalamus and bilateral premotor cortices (BA6; R,  $p < .001$ ; L,  $p < .05$ ), left primary somatosensory cortex (BA1;  $p < .001$ ), left primary motor cortex (BA4;  $p < .01$ ), right hippocampus ( $p < .05$ ), an association that was weaker in mTBI.

**Conclusion:** Lower daytime sleepiness was associated with greater thalamocortical connectivity, specifically to somatosensory and motor regions, in healthy controls, but not in those with mTBI. It is well established that thalamocortical projections are critically involved in sleep and arousal states. Our findings suggest well-established thalamocortical associations with sleepiness are disrupted following mTBI. These findings may reflect a neurobiological underpinning for sleep disturbances in mTBI.

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## Curriculum Vitae

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### **CHRONOLOGY OF EDUCATION**

8/83 - 5/85 A.A. (Liberal Arts), San Antonio College  
8/83 - 5/85 A.A.S (Radio-TV-Film), San Antonio College  
8/85 - 5/90 B.A. (Psychology), *Summa cum laude* with Distinction, University of New Mexico  
8/90 - 5/92 M.A. (Clinical Psychology), Texas Tech University  
8/92 - 8/96 Ph.D. (Clinical Psychology), Texas Tech University  
Dissertation Title: *Development and validation of a new instrument for the measurement of transient mood states: The facial analogue mood scale (FAMS)*. Lubbock, TX: Texas Tech University;1995. Advisor: Bill Locke, Ph.D.

### **POST-DOCTORAL TRAINING**

8/95 - 7/96 Predoctoral Fellow, Clinical Psychology, Yale School of Medicine  
8/96 - 7/97 Postdoctoral Fellow, Clinical Neuropsychology, University of OK Health Sciences Center  
8/97 - 7/99 Postdoctoral Fellow, Clinical Neuropsychology, University of Pennsylvania Medical School  
7/99 - 9/00 Research Fellow, Neuroimaging, McLean Hospital/ Harvard Medical School  
9/13 - 5/14 Certificate in Applied Biostatistics, Harvard Medical School

### **LICENSURE/CERTIFICATION**

2001 - Licensed Psychologist, #966, State of New Hampshire

## **CHRONOLOGY OF EMPLOYMENT**

### ***Academic Appointments***

10/00 - 8/02 Instructor in Psychology in the Department of Psychiatry  
Harvard Medical School, Boston, MA

9/02 - 7/07 Clinical Instructor in Psychology in the Department of Psychiatry  
Harvard Medical School, Boston, MA

8/07 - 10/10 Instructor in Psychology in the Department of Psychiatry  
Harvard Medical School, Boston, MA

4/08- Faculty Affiliate, Division of Sleep Medicine  
Harvard Medical School, Boston, MA

10/10 - 10/12 Assistant Professor of Psychology in the Department of Psychiatry  
Harvard Medical School, Boston, MA

10/12 - 6/14 Associate Professor of Psychology in the Department of Psychiatry  
Harvard Medical School, Boston, MA

7/14- Associate Professor of Psychology in the Department of Psychiatry (part-time)  
Harvard Medical School, Boston, MA

7/14- Professor of Psychiatry—Tenured  
University of Arizona College of Medicine, Tucson, AZ

7/14- Professor of Medical Imaging  
University of Arizona College of Medicine, Tucson, AZ

9/14- Professor of Psychology  
University of Arizona College of Science, Tucson, AZ

### ***Hospital/Clinical/Institutional Appointments***

10/00 - 8/02 Assistant Research Psychologist, McLean Hospital, Belmont, MA

8/02 - 7/04 Research Psychologist, Department of Behavioral Biology, Walter Reed Army Institute of Research, Silver Spring, MD

7/04 - 10/07 Chief, Neurocognitive Performance Branch, Walter Reed Army Institute of Research, Silver Spring, MD

10/07 - 3/10 DoD Contractor, Chief Psychologist, GovSource, Inc., U.S. Department of Defense (DoD)

8/08 Consulting Psychologist, The Brain Institute, University of Utah

9/02 - 4/05 Special Volunteer, National Institute on Deafness and Other Communication Disorders (NIDCD), National Institutes of Health (NIH), Bethesda, MD

9/02 - 7/07 Research Consultant, McLean Hospital, Belmont, MA

8/05 - 5/06 Neuropsychology Postdoctoral Research Program Training Supervisor, Walter Reed Hospital, Washington, DC

8/07 - Research Psychologist, McLean Hospital, Belmont, MA

7/10 - 6-11 DoD Contractor, Consulting Psychologist, Clinical Research Management (CRM)

7/11 - 6/14 Director, Social Cognitive, and Affective Neuroscience (SCAN) Laboratory, McLean Hospital, Belmont, MA

7/14- Director, Social, Cognitive, and Affective Neuroscience (SCAN) Laboratory, University of Arizona, Tucson, AZ

3/16 -12/18 ORISE Knowledge Preservation Fellow; Walter Reed Army Institute of Research, Silver Spring, MD

1/19- Senior Statistical Analyst: TechWerks, LLC; Walter Reed Army Institute of Research, Silver Spring, MD

### ***Military Positions***

11/01 - 8/02 First Lieutenant, Medical Service Corps, United States Army Reserve (USAR)  
8/02 - 7/05 Captain, Medical Service Corps, United States Army-Active Regular Army (RA)  
8/05 - 10/07 Major, Medical Service Corps, United States Army-Active Regular Army (RA)  
10/07 - 7/12 Major, Medical Service Corps, United States Army Reserve (USAR)  
7/12 – 9/19 Lieutenant Colonel, Medical Service Corps, United States Army Reserve (USAR)  
3/16 - Deputy Consultant to the Surgeon General of the Army (SGA) for 71F Research Psychology, US Army Reserves  
9/19- Colonel, Medical Service Corps, United States Army Reserve (USAR)

### **HONORS AND AWARDS**

1990 Outstanding Senior Honors Thesis in Psychology, University of New Mexico  
1990-1995 Maxey Scholarship in Psychology, Texas Tech University  
2001 Rennick Research Award, Co-Author, International Neuropsychological Society  
2002 Honor Graduate, AMEDD Officer Basic Course, U.S. Army Medical Department Center and School  
2002 Lynch Leadership Award Nominee, AMEDD Officer Basic Course, U.S. Army Medical Department Center and School  
2003 Outstanding Research Presentation Award, 2003 Force Health Protection Conference, U.S. Army Center for Health Promotion and Preventive Medicine  
2003 Who's Who in America  
2004 Who's Who in Medicine and Healthcare  
2005 Edward L. Buescher Award for Excellence in Research by a Young Scientist, Walter Reed Army Institute of Research (WRAIR) Association  
2009 Merit Poster Award, International Neuropsychological Society  
2009 Outstanding Research Presentation Award, 2009 Force Health Protection Conference, U.S. Army Center for Health Promotion and Preventive Medicine  
2010 Best Paper Award, Neuroscience, 27<sup>th</sup> U.S. Army Science Conference  
2011 Published paper included in *Best of Sleep Medicine 2011*  
2011 Blue Ribbon Finalist, 2011 Top Poster Award in Clinical and Translational Research, Society of Biological Psychiatry  
2012 Defense Advanced Research Projects Agency (DARPA) Young Faculty Award in Neuroscience  
2014 Blue Ribbon Finalist, 2014 Top Poster Award in Basic Neuroscience, Society of Biological Psychiatry  
2014 Harvard Medical School Excellence in Mentoring Award Nominee  
2014 AASM Young Investigator Award (co-author), Honorable Mention, American Academy of Sleep Medicine  
2017 Trainee Abstract Merit Award (mentor/co-author), Sleep Research Society  
2018 Trainee Abstract Merit Award (mentor/co-author), Sleep Research Society.  
2020 Nelson Butters Award for Best Paper by a Postdoctoral Fellow (mentor/co-author), International Neuropsychological Society

## **SERVICE/OUTREACH**

### ***Local/State Service/Outreach***

2003 Scientific Review Committee, Walter Reed Army Institute of Research (WRAIR), Silver Spring, MD  
2005 Scientific Review Committee, Walter Reed Army Institute of Research (WRAIR), Silver Spring, MD  
2012-14 McLean Hospital Research Committee, McLean Hospital, Belmont, MA  
2016 House Ad Hoc Committee on Treatment of Traumatic Brain Injuries and Benefits of Hyperbaric Oxygen Therapy, Arizona House of Representatives

### ***National/International Service/Outreach***

2004 University of Alabama, Clinical Nutrition Research Center (UAB CNRC)  
Pilot/Feasibility Study Program Review Committee  
2006 U.S. Small Business Administration, Small Business Technology Transfer (STTR)  
Program Review Committee  
2006 Cognitive Performance Assessment Program Area Steering Committee, U.S. Army  
Military Operational Medicine Research Program Funding Panel  
2006 External Member, Doctoral Thesis Committee, Belinda J. Liddle, Ph.D., University of  
Sydney, Australia  
2007 Cognitive Performance Assessment Program Area Steering Committee, U.S. Army  
Military Operational Medicine Research Program Funding Panel  
2008 United States Army Medical Research and Materiel Command (USAMRMC)  
Congressionally Directed Medical Research Programs (CDMRP) Extramural Grant  
Review Panel  
2008-2011 Long-Distance High School Research Mentor, Christina Song, NY  
2009 NIH-CSR Brain Disorders and Clinical Neuroscience N02 Member Study Conflict  
Section Review Panel  
2009 Sleep Physiology and Fatigue Interventions Program Area Steering Committee, U.S.  
Army Military Operational Medicine Research Program  
2009 Scotland, UK, Biomedical and Therapeutic Research Committee, Grant Reviewer  
2010 Canada, Social Sciences and Humanities Research Council of Canada, Grant Reviewer  
2011 National Science Foundation (NSF) Grant Reviewer  
2011- National Network of Depression Centers (NNDC), Military Task Group  
2011 Israel, Israel Science Foundation (ISF), Grant Reviewer  
2011 Scientific Review Committee, US Army Institute of Environmental Medicine (USARIEM)  
2012 National Science Foundation (NSF) Grant Reviewer  
2012- American Academy of Sleep Medicine, Member  
2013 Israel, Israel Science Foundation (ISF), Grant Reviewer  
2014- Organization for Human Brain Mapping, Member  
2015- Human Affectome Project Advisory Board Member  
2016- Sleep Research Society Member  
2017-2018 External Reviewer, Doctoral Thesis Reviewer, Kalina R. Rossa, Queensland University of  
Technology, Australia.  
2018 Marsden Fund Council Grant Proposal Referee, Royal Society Te Aparangi, New Zealand.  
2018 External Faculty Promotion Dossier Reviewer, Oregon Health & Science University

2018-2019 Long-Distance High School Research Mentor, Taleen Postian, Byram Hills HS, NY  
 2019 External Reviewer, Doctoral Thesis Reviewer, William Ryan McMahon, Monash University, Australia.

### ***Departmental Committees***

2006 Chair, Undergraduate Honors Thesis Committee, Jessica Richards, Department of Psychology, University of Maryland, Baltimore County, MD

2012- Member, Research Committee, McLean Hospital, Belmont, MA

2014 Psychiatry Senior Research Manager Candidate Search Committee, Department of Psychiatry, University of Arizona, Tucson, AZ

2014-2015 Member, Faculty Search Committee, Department of Psychology, University of Arizona, Tucson, AZ.

2014-2016 Member, Comprehensive Examination Committee, Natalie Bryant, Department of Psychology, University of Arizona, Tucson, AZ

2014-2015 Chair/Research Faculty Mentor, Undergraduate Honors Thesis Committee, Haley Kent, Department of Biochemistry, University of Arizona, Tucson, AZ

2014- Member, Psychiatry Research Investigator Committee, Department of Psychiatry, University of Arizona, Tucson, AZ.

2015 Member, Dissertation Committee, Ryan S. Smith, Ph.D., Department of Psychology, University of Arizona, Tucson AZ.

2015 Imaging Excellence Cluster Hire Search Committee, Department of Medical Imaging, University of Arizona, Tucson, AZ

2015- Member, Mentoring Committee, Department of Psychiatry, University of Arizona, Tucson, AZ

2016 Member, Chief of Neuroradiology Faculty Search Committee, Department of Medical Imaging, University of Arizona, Tucson, AZ

2016-2017 Member, Dissertation Committee, Brian Arizmendi, Department of Psychology, University of Arizona, Tucson, AZ

2016-2017 Member, Masters Thesis Committee, Saren Seeley, Department of Psychology, University of Arizona, Tucson, AZ

2016-2017 Member, Masters Thesis Committee, Mairead McConnell, Department of Psychology, University of Arizona, Tucson, AZ

2016-2018 Member, Masters Thesis Committee, John Vanuk, Department of Psychology, University of Arizona, Tucson, AZ

2016-2017 Faculty Advisor, Undergraduate Honor Thesis Committee, Matthew Nettles, Neuroscience/Cognitive Science, University of Arizona, Tucson, AZ

2016- Scientific Review Committee, Department of Psychiatry, University of Arizona, Tucson, AZ

2017-2018 Faculty Advisor, Undergraduate Honors Thesis Committee, Debby Waugaman, Psychology, University of Arizona, Tucson, AZ

2017-2018 Faculty Advisor, Undergraduate Honors Thesis Committee, Jun Lee, Department of Psychology, University of Arizona, Tucson, AZ

2017- Chair, Psychiatry Research Committee, Department of Psychiatry, University of Arizona, Tucson, AZ

2017- Member, Promotion and Tenure Committee, Department of Psychiatry, University of Arizona, Tucson, AZ



- 2019 Member, Comprehensive Examination Committee, Ji-Soo Kim, Department of Psychology, University of Arizona, Tucson, AZ
- 2019 Member, Comprehensive Examination Committee, John Vanuk, Department of Psychology, University of Arizona, Tucson, AZ
- 2019- Member, Masters Thesis Committee, Veronica Kraft, Department of Psychology, University of Arizona, Tucson, AZ
- 2019 Faculty Advisor, Undergraduate Honors Thesis Committee, Giovanna Gutierrez, Department of Neuroscience and Cognitive Science, University of Arizona, Tucson, AZ
- 2019-2020 Faculty Advisor, Undergraduate Honors Thesis Committee, Corinne Meinhausen, Department of Neuroscience and Cognitive Science, University of Arizona, Tucson, AZ
- 2019- Faculty Advisor, Undergraduate Honors Thesis Committee, Jared Kleiner, Department of Neuroscience and Cognitive Science, University of Arizona, Tucson, AZ

### ***University Committees/Service***

- 2014 Ad Hoc Member, Interview Committee for Defense and Security Research Institute Director Position, University of Arizona, Tucson, AZ.
- 2014-2018 Member, Mechanisms of Emotion, Social Relationships, and Health Interdisciplinary Developing Research Program, Clinical and Translational Science Institute, BIO5, University of Arizona, Tucson, AZ
- 2015 Vice President's Executive Committee for Defense and Security Strategic Planning, University of Arizona, Tucson, AZ
- 2015- MRI Operations Committee, University of Arizona, Tucson, AZ
- 2016 Faculty Mentor, Undergraduate Biology Research Program (UBRP), University of Arizona, Tucson, AZ
- 2016 Faculty Mentor, Border Latino & American Indian Summer Exposure to Research (BLAISER) Program, University of Arizona, Tucson, AZ
- 2016 Faculty Mentor, Medical Student Research Committee (MSRC) Program, University of Arizona College of Medicine, Tucson, AZ
- 2018 Administrative Review Committee: Psychiatry Department Chair
- 2019 Reviewer, Psychology Department Faculty Pilot Grant Program
- 2019 Reviewer, Arizona Alzheimer's Consortium
- 2019- 3T Faculty Advisory Committee, University of Arizona, Tucson, AZ
- 2019 Faculty Mentor, Steps 2 STEM High School Research Internship Program, Tucson, AZ
- 2020 Sleep & Circadian Science Center Construction Manager at Risk Search Committee, Tucson, AZ

### ***Editorial Board Membership***

- 2009-2018 Editorial Board Member, International Journal of Eating Disorders
- 2012- Editorial Board Member, Dataset Papers in Neuroscience
- 2012- Editorial Board Member, Dataset Papers in Psychiatry
- 2012- Editor, Journal of Sleep Disorders: Treatment and Care

### ***Ad Hoc Journal Reviewer (104 Journals)***

|            |                                                                |
|------------|----------------------------------------------------------------|
| 2001-2012  | Reviewer, Psychological Reports                                |
| 2001-2012  | Reviewer, Perceptual and Motor Skills                          |
| 2002       | Reviewer, American Journal of Psychiatry                       |
| 2002-2013  | Reviewer, Biological Psychiatry                                |
| 2003       | Reviewer, Clinical Neurology and Neurosurgery                  |
| 2004-2016  | Reviewer, NeuroImage                                           |
| 2004-2006  | Reviewer, Neuropsychologia                                     |
| 2004-2016  | Reviewer, Journal of Neuroscience                              |
| 2004       | Reviewer, Consciousness and Cognition                          |
| 2005       | Reviewer, Experimental Brain Research                          |
| 2005       | Reviewer, Schizophrenia Research                               |
| 2005-2012  | Reviewer, Archives of General Psychiatry                       |
| 2005       | Reviewer, Behavioral Brain Research                            |
| 2005-2009  | Reviewer, Human Brain Mapping                                  |
| 2005-2013  | Reviewer, Psychiatry Research: Neuroimaging                    |
| 2006       | Reviewer, Journal of Abnormal Psychology                       |
| 2006       | Reviewer, Psychopharmacology                                   |
| 2006       | Reviewer, Developmental Science                                |
| 2006       | Reviewer, Acta Psychologica                                    |
| 2006, 2015 | Reviewer, Neuroscience Letters                                 |
| 2006-2020  | Reviewer, Journal of Sleep Research                            |
| 2006-2016  | Reviewer, Physiology and Behavior                              |
| 2006-2020  | Reviewer, SLEEP                                                |
| 2007       | Reviewer, Journal of Clinical and Experimental Neuropsychology |
| 2008       | Reviewer, European Journal of Child and Adolescent Psychiatry  |
| 2008       | Reviewer, Judgment and Decision Making                         |
| 2008-2010  | Reviewer, Aviation, Space, & Environmental Medicine            |
| 2008       | Reviewer, Journal of Psychophysiology                          |
| 2008       | Reviewer, Brazilian Journal of Medical and Biological Research |
| 2008       | Reviewer, The Harvard Undergraduate Research Journal           |
| 2008       | Reviewer, Bipolar Disorders                                    |
| 2008-2013  | Reviewer, Chronobiology International                          |
| 2008       | Reviewer, International Journal of Obesity                     |
| 2009       | Reviewer, European Journal of Neuroscience                     |
| 2009-2018  | Reviewer, International Journal of Eating Disorders            |
| 2009       | Reviewer, Psychophysiology                                     |
| 2009       | Reviewer, Traumatology                                         |
| 2009       | Reviewer, Clinical Medicine: Therapeutics                      |
| 2009       | Reviewer, Acta Pharmacologica Sinica                           |
| 2009       | Reviewer, Collegium Antropologicum                             |
| 2009       | Reviewer, Journal of Psychopharmacology                        |
| 2009-2014  | Reviewer, Obesity                                              |
| 2009       | Reviewer, Scientific Research and Essays                       |
| 2009       | Reviewer, Child Development Perspectives                       |
| 2009-2010  | Reviewer, Personality and Individual Differences               |
| 2009-2010  | Reviewer, Noise and Health                                     |
| 2009-2010  | Reviewer, Sleep Medicine                                       |
| 2010       | Reviewer, Nature and Science of Sleep                          |

|           |                                                             |
|-----------|-------------------------------------------------------------|
| 2010      | Reviewer, Psychiatry and Clinical Neurosciences             |
| 2010      | Reviewer, Learning and Individual Differences               |
| 2010      | Reviewer, Cognitive, Affective, and Behavioral Neuroscience |
| 2010      | Reviewer, BMC Medical Research Methodology                  |
| 2010-2011 | Reviewer, Journal of Adolescence                            |
| 2010-2012 | Reviewer, Brain Research                                    |
| 2011      | Reviewer, Brain                                             |
| 2011-2019 | Reviewer, Social Cognitive and Affective Neuroscience       |
| 2011      | Reviewer, Journal of Traumatic Stress                       |
| 2011      | Reviewer, Social Neuroscience                               |
| 2011-2014 | Reviewer, Brain and Cognition                               |
| 2011      | Reviewer, Frontiers in Neuroscience                         |
| 2011-2012 | Reviewer, Sleep Medicine Reviews                            |
| 2012      | Reviewer, Journal of Experimental Psychology: General       |
| 2012      | Reviewer, Ergonomics                                        |
| 2012-2017 | Reviewer, Behavioral Sleep Medicine                         |
| 2012      | Reviewer, Neuropsychology                                   |
| 2012      | Reviewer, Emotion                                           |
| 2012      | Reviewer, JAMA                                              |
| 2012      | Reviewer, BMC Neuroscience                                  |
| 2012-2015 | Reviewer, Cognition and Emotion                             |
| 2012      | Reviewer, Journal of Behavioral Decision Making             |
| 2012      | Reviewer, Psychosomatic Medicine                            |
| 2012-2014 | Reviewer, PLoS One                                          |
| 2012      | Reviewer, American Journal of Critical Care                 |
| 2012-2014 | Reviewer, Journal of Sleep Disorders: Treatment and Care    |
| 2013      | Reviewer, Experimental Psychology                           |
| 2013      | Reviewer, Clinical Interventions in Aging                   |
| 2013      | Reviewer, Frontiers in Psychology                           |
| 2013      | Reviewer, Brain Structure and Function                      |
| 2013      | Reviewer, Appetite                                          |
| 2013-2018 | Reviewer, JAMA Psychiatry                                   |
| 2014      | Reviewer, Acta Psychologica                                 |
| 2014      | Reviewer, Neurology                                         |
| 2014      | Reviewer, Applied Neuropsychology: Child                    |
| 2014-2016 | Reviewer, Journal of Applied Psychology                     |
| 2015      | Reviewer, Early Childhood Research Quarterly                |
| 2015      | Reviewer, Behavioral Neuroscience                           |
| 2015-2020 | Reviewer, Scientific Reports                                |
| 2016-2018 | Reviewer, Neuroscience & Biobehavioral Reviews              |
| 2016      | Reviewer, Psychological Science                             |
| 2016      | Reviewer, Medicine & Science in Sports and Exercise         |
| 2016      | Reviewer, Archives of Clinical Neuropsychology              |
| 2016      | Reviewer, Advances in Cognitive Psychology                  |
| 2017      | Reviewer, Data in Brief                                     |
| 2017      | Reviewer, Neuroscience                                      |
| 2017-2018 | Reviewer, Sleep Health                                      |
| 2017      | Reviewer, Journal of Experimental Social Psychology         |

|           |                                                                               |
|-----------|-------------------------------------------------------------------------------|
| 2017-2018 | Reviewer, Neural Plasticity                                                   |
| 2018      | Reviewer, NeuroImage: Clinical                                                |
| 2018      | Reviewer, Journal of Psychiatric Research                                     |
| 2018      | Reviewer, Journal of Clinical Sleep Medicine                                  |
| 2019      | Reviewer, Harvard Review of Psychiatry                                        |
| 2019      | Reviewer, Progress in Brain Research                                          |
| 2020      | Reviewer, Journal of Experimental Psychology: Learning, Memory, and Cognition |
| 2020      | Reviewer, Psychiatry Research                                                 |

## **PUBLICATIONS/CREATIVE ACTIVITY**

### ***Refereed Journal Articles***

1. **Killgore WD.** The Affect Grid: a moderately valid, nonspecific measure of pleasure and arousal. Psychol Rep. 83(2):639-42, 1998.
2. **Killgore WD.** Empirically derived factor indices for the Beck Depression Inventory. Psychol Rep. 84(3 Pt 1):1005-13, 1999.
3. **Killgore WD.** Affective valence and arousal in self-rated depression and anxiety. Percept Mot Skills. 89(1):301-4, 1999.
4. **Killgore WD, Adams RL.** Prediction of Boston Naming Test performance from vocabulary scores: preliminary guidelines for interpretation. Percept Mot Skills. 89(1):327-37, 1999.
5. **Killgore WD, Gangestad SW.** Sex differences in asymmetrically perceiving the intensity of facial expressions. Percept Mot Skills. 89(1):311-4, 1999.
6. **Killgore WD.** The visual analogue mood scale: can a single-item scale accurately classify depressive mood state? Psychol Rep. 85(3 Pt 2):1238-43, 1999.
7. **Killgore WD, DellaPietra L, Casasanto DJ.** Hemispheric laterality and self-rated personality traits. Percept Mot Skills. 89(3 Pt 1):994-6, 1999.
8. **Killgore WD, Glosser G, Casasanto DJ, French JA, Alsop DC, Detre JA.** Functional MRI and the Wada test provide complementary information for predicting post-operative seizure control. Seizure. 8(8):450-5, 1999.
9. **Killgore WD.** Evidence for a third factor on the Positive and Negative Affect Schedule in a college student sample. Percept Mot Skills. 90(1):147-52, 2000.
10. **Killgore WD, Dellapietra L.** Item response biases on the logical memory delayed recognition subtest of the Wechsler Memory Scale-III. Psychol Rep. 86(3 Pt 1):851-7, 2000.

11. **Killgore WD**, Casasanto DJ, Yurgelun-Todd DA, Maldjian JA, Detre JA. Functional activation of the left amygdala and hippocampus during associative encoding. *Neuroreport*. 11(10):2259-63, 2000.
12. Yurgelun-Todd DA, Gruber SA, Kanayama G, **Killgore WD**, Baird AA, Young AD. fMRI during affect discrimination in bipolar affective disorder. *Bipolar Disord*. 2(3 Pt 2):237-48, 2000.
13. **Killgore WD**. Sex differences in identifying the facial affect of normal and mirror-reversed faces. *Percept Mot Skills*. 91(2):525-30, 2000.
14. **Killgore WD**, DellaPietra L. Using the WMS-III to detect malingering: empirical validation of the rarely missed index (RMI). *J Clin Exp Neuropsychol*. 22(6):761-71, 2000.
15. **Killgore WD**. Academic and research interest in several approaches to psychotherapy: a computerized search of literature in the past 16 years. *Psychol Rep*. 87(3 Pt 1):717-20, 2000.
16. Maldjian JA, Detre JA, **Killgore WD**, Judy K, Alsop D, Grossman M, Glosser G. Neuropsychologic performance after resection of an activation cluster involved in cognitive memory function. *AJR Am J Roentgenol*. 176(2):541-4, 2001.
17. **Killgore WD**, Oki M, Yurgelun-Todd DA. Sex-specific developmental changes in amygdala responses to affective faces. *Neuroreport*. 12(2):427-33, 2001.
18. **Killgore WD**, Yurgelun-Todd DA. Sex differences in amygdala activation during the perception of facial affect. *Neuroreport*. 12(11):2543-7, 2001.
19. Casasanto DJ, **Killgore WD**, Maldjian JA, Glosser G, Alsop DC, Cooke AM, Grossman M, Detre JA. Neural correlates of successful and unsuccessful verbal memory encoding. *Brain Lang*. 80(3):287-95, 2002.
20. **Killgore WD**. Laterality of lesions and trait-anxiety on working memory performance. *Percept Mot Skills*. 94(2):551-8, 2002.
21. **Killgore WD**, Cupp DW. Mood and sex of participant in perception of happy faces. *Percept Mot Skills*. 95(1):279-88, 2002.
22. Yurgelun-Todd DA, **Killgore WD**, Young AD. Sex differences in cerebral tissue volume and cognitive performance during adolescence. *Psychol Rep*. 91(3 Pt 1):743-57, 2002.
23. Yurgelun-Todd DA, **Killgore WD**, Cintron CB. Cognitive correlates of medial temporal lobe development across adolescence: a magnetic resonance imaging study. *Percept Mot Skills*. 96(1):3-17, 2003.
24. **Killgore WD**, Young AD, Femia LA, Bogorodzki P, Rogowska J, Yurgelun-Todd DA. Cortical and limbic activation during viewing of high- versus low-calorie foods. *Neuroimage*. 19(4):1381-94, 2003.

25. **Killgore WD**, Yurgelun-Todd DA. Activation of the amygdala and anterior cingulate during nonconscious processing of sad versus happy faces. *Neuroimage*. 21(4):1215-23, 2004.
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152. Alkozei, A, **Killgore, WD**, Smith, R, Dailey, N.S., Bajaj, S, Raikes, A, & Haack, M. Chronic sleep restriction differentially affects implicit biased toward food among men and women: Preliminary evidence. *Journal of Sleep Research*, 27, e12629, 2018.
153. Smith, R, Bajaj, S, Dailey, NS, Alkozei, A, Smith, C, Sanova, A, Lane, RD, & **Killgore, WD**. Greater cortical thickness within the limbic visceromotor network predicts higher levels of trait emotional awareness. *Consciousness and Cognition*, 57, 54-61, 2018.

154. Bajaj, S, Dailey, NS, Rosso, IM, Rauch, SL, & **Killgore, WD**. Time-dependent differences in cortical measures and their associations with behavioral measures following mild traumatic brain injury. *Human Brain Mapping*, 39, 1886-1897, 2018.
155. Smith, R, Lane, RD, Alkozei, A, Bao, J, Smith, C, Sanova, A, Nettles, M, & **Killgore, WD**. The role of medial prefrontal cortex in the working memory maintenance of one's own emotional responses. *Scientific Reports*, 8, 3460, 2018.
156. **Killgore, WD**, Kent, HC, Knight, SA, & Alkozei, A. Changes in morning salivary melatonin correlate with prefrontal responses during working memory performance. *NeuroReport*, 29, 488-494, 2018.
157. Alkozei, A, Smith, R, Demers, LA, Divatia, S, Weber, M, Berryhill, SM, & **Killgore, WD**. Increases in emotional intelligence after an online training program are associated with better decision-making in the Iowa Gambling Task. *Psychological Reports*, 33294118771705, 2018.
158. Dailey, NS, Smith, R, Bajaj, S, Alkozei, A, Gottschlich, MK, Raikes, AC, Satterfield, BC, & **Killgore, WD**. Elevated aggression and reduced white matter integrity in mild traumatic brain injury: A DTI study. *Frontiers in Behavioral Neuroscience*, 12, 118, 2018.
159. Raikes, AC, Bajaj, S, Dailey, NS, Smith, R, Alkozei, A, Satterfield, BC, & **Killgore, WD**. Diffusion tensor imaging (DTI) correlates of self-reported sleep quality and depression following mild traumatic brain injury. *Frontiers in Neurology*, 9, 468, 2018.
160. Smith, R, Sanova, A, Alkozei, A, Lane, RD, & **Killgore, WD**. Higher levels of trait emotional awareness are associated with more efficient global information integration throughout the brain: A graph-theoretic analysis of resting state functional connectivity. *Social Cognitive and Affective Neuroscience*, 13, 665-675, 2018.
161. Alkozei, A, Smith, R, & **Killgore, WD**. Implicit self-esteem is associated with higher levels of trait gratitude in women but not men. *Journal of Positive Psychology*, DOI: 10.1080/17439760.2018.1497691, 2018.
162. Bajaj, S, Raikes, A, Smith, R, Dailey, NS, Alkozei, A, Vanuk, JR, & **Killgore, WD**. The relationship between general intelligence and cortical structure in healthy individuals. *Neuroscience*, 388, 36-44, 2018.
163. Alkozei, A, Haack, M, Skalamera, J, Smith, R, Satterfield, BC, Raikes, A, & **Killgore, WD**. Chronic sleep restriction affects the associations between implicit bias and explicit social decision-making. *Sleep Health*, 4, 456-462, 2018.
164. Raikes, A, & **Killgore, WD**. Potential for the development of light therapies in mild traumatic brain injury. *Concussion*, 3, CNC57, 2018.
165. Smith, R, Lane, RD, Sanova, A, Smith, C, & **Killgore, WD**. Common and unique neural systems underlying the working memory maintenance of emotional vs. bodily reactions to affective stimuli: The moderating role of trait emotional awareness. *Frontiers in Human Neuroscience*,



12, 370, 2018.

166. Dailey, NS, Smith, R, Vanuk, JR, Raikes, AC, & **Killgore, WD**. Resting-state functional connectivity as a biomarker of aggression in mild traumatic brain injury. *NeuroReport*, 29, 1413-1417, 2018.
167. McConnell, MH, **Killgore, WD**, & O'Connor, MF. Yearning predicts subgenual anterior cingulate activity in bereaved individuals. *Heliyon*, 4, e00852, 2018.
168. Smith, R, **Killgore, WD**, Alkozei, A, & Lane, RD. A neuro-cognitive process model of emotional intelligence. *Biological Psychology*, 139, 131-151, 2018.
169. Raikes, AC, Satterfield, BC, & **Killgore, WD**. Evidence of actigraphic and subjective sleep disruption following mild traumatic brain injury. *Sleep Medicine*, 54, 62-69, 2019.
170. Smith, R, Weihs, KL, Alkozei, A, **Killgore, WD**, & Lane RD. An embodied neurocomputational framework for organically integrating biopsychosocial processes: An application to the role of social support in health and disease. *Psychosomatic Medicine*, 81, 125-145, 2019.
171. Satterfield, BC, Raikes, AC, & **Killgore, WD**. Rested-baseline responsivity of the ventral striatum is associated with caloric and macronutrient intake during one night of sleep deprivation. *Frontiers in Psychiatry*, 9, 749, 2019.
172. Raikes, AC, Athey, A, Alfonso-Miller, P, **Killgore, WD**, & Grandner, MA. Insomnia and daytime sleepiness: Risk factors for sports-related concussion. *Sleep Medicine*, 58, 66-74 (2019).
173. Smith, R, Alkozei, A, & **Killgore, WD**. Parameters as trait indicators: Exploring a complementary neurocomputational approach to conceptualizing and measuring trait differences in emotional intelligence. *Frontiers in Psychology*, 10, 848 (2019).
174. Vanuk, JR, Alkozei, A, Raikes, AC, Allen, JJB, & **Killgore, WD**. Ability-based emotional intelligence is associated with greater cardiac vagal control and reactivity. *Frontiers in Human Neuroscience*, 11, 181 (2019).
175. Bajaj, S, Raikes, AC, Smith RS, Vanuk, JR, & **Killgore WD**. The role of prefrontal cortical surface area and volume in preclinical suicidal ideation in a non-clinical sample. *Frontiers in Psychiatry*, 21, 445 (2019).
176. Bajaj, S, & **Killgore, WD**. Sex differences in limbic network and risk-taking propensity in healthy individuals. *Journal of Neuroscience Research*, 98, 371-383 (2020).
177. Satterfield, BC & **Killgore, WD**. Habitual sleep duration predicts caloric and macronutrient intake during sleep deprivation. *Sleep Health*, 6, 88-91 (2020).
178. Bajaj, S, & **Killgore, WD**. Vulnerability to mood degradation during sleep deprivation is influenced by white-matter compactness of the triple-network model. *NeuroImage*, 202,

116123 (2020).

179. Alkozei, A, Smith, R, Waugaman, D, Kotzin, M, Bajaj, S, & **Killgore, WD**. The mediating role of interpretation bias on the relationship between trait gratitude and depressive symptoms. *International Journal of Applied Positive Psychology* (in press).
180. **Killgore, WD**, Vanuk, JR, Shane, BR, Weber, M, & Bajaj, S. A randomized, double-blind, placebo-controlled trial of blue wavelength light exposure on sleep and recovery of brain structure, function and cognition following mild traumatic brain injury. *Neurobiology of Disease*, 134, 104679 (2020).
181. Li, Huanjie, Smith, SM, Gruber, S, Lukas, SE, Silveri, MM, Hill, KP, **Killgore, WD**, & Nickerson, LD. Denoising scanner effects from multimodal MRI data using linked independent component analysis. *NeuroImage*, 208, 116288 (2020).
182. Grandner, MA, Olivier, K, Gallagher, R, Hale, L, Barrett, M, Branas, C, **Killgore, WD**, Parthasarathy, S, Gehrels, J, & Alfonso-Miller, P. Quantifying impact of real-world barriers to sleep: The Brief Index of Sleep Control (BRISC). *Sleep Medicine* (in press).
183. Grandner, MA, Hall, C, Jaszewski, A., Alfonso-Miller, P, Gehrels, J, **Killgore, WD**, & Athey, A. Mental health in student athletes: Associations with sleep duration, sleep quality, insomnia, fatigue, and sleep apnea symptoms. *Athletic Training and Sports Care* (in press).
184. Raikes, AC, Dailey, NS, Shane, BR, Forbeck, B, Alkozei, A, & **Killgore WD**. Daily morning blue light therapy improves daytime sleepiness, sleep quality, and quality of life following a mild traumatic brain injury. *Journal of Head Trauma Rehabilitation* (in press).
185. Khader, W, Tubbs, AS, Haghighi, Athey, A, **Killgore, WD**, Gehrels, J, Alfonso-Miller, P, Perlis, ML, Fernandez, F, & Grandner, MA. Insomnia and insufficient sleep duration predict suicide ideation in university students and athletes. *Journal of Affective Disorders* (in press).
186. **Killgore, WD**, & Kamimori, GH. Multiple caffeine doses maintain vigilance, attention, complex motor sequence expression, and manual dexterity during 77 hours of total sleep deprivation. *Neurobiology of Sleep and Circadian Rhythms* (in press).
187. **Killgore, WD**, Cloonan, SA, Taylor, EC, & Dailey, NS. Loneliness: A signature mental health concern in the era of COVID-19. *Psychiatry Research*, 290, 113117 (2020).
188. **Killgore, WD**, Cloonan, SA, Taylor, EC, Fernandez, F, Grandner, MA, & Dailey, NS. Suicidal ideation during the COVID-19 pandemic: The role of insomnia. *Psychiatry Research*, 290, 113134 (2020).
189. **Killgore, WD**, Taylor, EC, Cloonan, SA, & Dailey, NS. Psychological resilience during the COVID-19 lockdown. *Psychiatry Research* (in press).
190. **Killgore, WD**, Dailey, NS, Raikes, AC, Vanuk, JR, Taylor E, & Alkozei, A. Blue light exposure enhances neural efficiency of the task positive network during a cognitive interference task.

Neuroscience Letters (in press).

***Book Chapters/Editorials/Other Published Articles***

1. **Killgore, WD.** Cortical and limbic activation during visual perception of food. In Dube, L, Bechara, A, Dagher, A, Drewnowski, A, Lebel, J, James, P, & Yada, R. (Eds), *Obesity Prevention: The Role of Brain and Society on Individual Behavior*. Elsevier, Boston, 2010, pp. 57-71.
2. **Killgore, WD.** Asleep at the trigger: Warfighter judgment and decision-making during prolonged wakefulness. In Bartone, P. (Ed), *Applying Research Psychology to Improve Performance and Policy*. 2010, pp. 59-77.
3. **Killgore, WD.** Effects of Sleep Deprivation on Cognition. In Kerkhof, G. & Van Dongen, H. *Progress in Brain Research: Sleep and Cognition*. Elsevier, B.V. New York, 2010, pp. 105-129.
4. **Killgore, WD.** Caffeine and other alerting agents. In Thorpy, M. & Billiard, M. (Eds), *Sleepiness: Causes, Consequences, Disorders and Treatment*. Cambridge University Press, UK, 2011, pp. 430-443.
5. **Killgore WD.** Priorities and challenges for caffeine research: Energy drinks, PTSD, and withdrawal reversal. *The Experts Speak Column, J Caffeine Res*, 1, 11-12, 2011.
6. **Killgore, WD.** Odor identification ability predicts executive function deficits following sleep deprivation. In Lee-Chiong, T (Ed), *Best of Sleep Medicine 2011*. National Jewish Health, Denver CO, 2011, pp. 31-33.
7. **Killgore, WD.** Socio-emotional and neurocognitive effects of sleep loss. In Matthews, G. (Ed), *Handbook of Operator Fatigue*. Ashgate, London UK, 2012, pp. 227-243.
8. **Killgore, WD.** Sleepless nights and bulging waistlines (Editorial). *Journal of Sleep Disorders: Treatment and Care*, 1(1), doi: [10.4172/jsdtc.1000e101](https://doi.org/10.4172/jsdtc.1000e101), 2012.
9. **Killgore, WD, & Penetar, DM.** Sleep and Military Operational Effectiveness. In Kushida, CA (Ed), *The Encyclopedia of Sleep*, 2013, vol. 1, pp. 311-319. Academic Press, Waltham, MA.
10. **Killgore, WD, Weiner, MR, & Schwab, ZJ.** Sleep deprivation, personality, and psychopathic changes. In Kushida, CA (Ed), *The Encyclopedia of Sleep*, 2013, vol. 1, pp. 264-271. Academic Press, Waltham, MA.
11. Schoenberg, MR, & **Killgore, WD.** Psychologic and Psychiatric Assessment. In Kushida, CA (Ed), *The Encyclopedia of Sleep*, 2013, vol. 2, pp. 23-26. Academic Press, Waltham, MA.

12. **Killgore, WD.** Sleep loss and performance. In Moore, BA, & Barnett, JE (Eds), *Military Psychologists' Desk Reference*, 2013, pp. 241-246. Oxford University Press, New York.
13. Weber, M., & **Killgore, WD.** What are the emerging therapeutic uses of bright light therapy for neurological disorders? (Editorial). *Future Neurology*, 8, 495-497, 2013.
14. **Killgore WD & Weber, M.** Sleep deprivation and cognitive performance. In Bianchi, M (Ed), *Sleep Deprivation and Disease: Effects on the Body, Brain and Behavior*, 2014, pp. 209-229. Springer, New York.
15. **Killgore, WD.** Sleep deprivation and behavioral risk taking. In Watson, RR, *Sleep Modulation by Obesity, Diabetes, Age and Diet*, 2015, pp. 279-287. Elsevier, San Diego, CA.
16. **Killgore, WD.** Lighting the way to better sleep and health (Editorial). *Journal of Sleep Disorders: Treatment and Care*, 5:1, 2016.
17. Singh, P, & **Killgore WD.** Time dependent differences in gray matter volume post mild traumatic brain injury. *Neural Regeneration Research*, 11, 920-921, 2016.
18. Klimova, A, Singh, P, & **Killgore WD.** White matter abnormalities in MS: Advances in diffusion tensor imaging/tractography. In Watson, RR & Killgore, WD (Eds), *Nutrition and Lifestyle in Neurological Autoimmune Diseases: Multiple Sclerosis*. Elsevier, San Diego, CA, pp. 21-28, 2017.
19. Alkozei, A, Smith, R, & **Killgore, WD.** Grateful people are happy and healthy—But why? *Frontiers for Young Minds* (in press).
20. Smith, R, Alkozei, A, & **Killgore WD.** How do emotions work? *Frontiers for Young Minds* (in press).
21. Satterfield, BC, & **Killgore, WD.** Sleep loss, executive function, and decision-making. In Grandner, MG (Ed), *Sleep and Health*. Elsevier, San Diego (in press).
22. Satterfield, BC, Raikes, AC, & **Killgore, WD.** Sleep in social cognition and judgment. In Krizan, Z. (Ed), *Sleep, Personality, and Social Behavior*. Springer Nature (in press).
23. Raikes, AC, Athey, A, Alfonso-Miller, P, **Killgore, WD**, & Grandner, MA. Author response: Concussion assessment tools—A possible measure of sleepiness? *Sleep Medicine*, 66, 260-261, 2020.

## **Books**

1. Watson, RR, & **Killgore, WD** (Eds.). *Nutrition and lifestyle in neurological autoimmune diseases: Multiple Sclerosis*. Elsevier, San Diego, CA, 2017.

### ***Published U.S. Government Technical Reports***

1. **Killgore, WD**, Estrada, A, Rouse, T, Wildzunas, RM, Balkin, TJ. Sleep and performance measures in soldiers undergoing military relevant training. USAARL Report No. 2009-13. June, 2009.
2. Kelley, AM, **Killgore, WD**, Athy, JR, Dretsch, M. Risk propensity, risk perception, and sensation seeking in U.S. Army Soldiers: A preliminary study of a risk assessment battery. USAARL Report No. 2010-02. DTIC #: ADA511524. October, 2009.

### **CONFERENCES/SCHOLARLY PRESENTATIONS**

#### ***Colloquia***

- |      |                                                                                                                                                                                          |
|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 2000 | <i>The Neurobiology of Emotion in Children</i> , McLean Hospital, Belmont, MA [Invited Lecture]                                                                                          |
| 2001 | <i>The Neurobiology of Emotion in Children and Adolescents</i> , McLean Hospital, Belmont, MA [Invited Lecture]                                                                          |
| 2002 | Cortico-Limbic Activation in Adolescence and Adulthood, Youth Advocacy Project, Cape Cod, MA [Invited Lecture]                                                                           |
| 2008 | Lecture on <i>Sleep Deprivation, Executive Function, and Resilience to Sleep Loss</i> ; 105 <sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]         |
| 2008 | Lecture on <i>The Role of Research Psychology in the Army</i> ; 105 <sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]                                 |
| 2008 | Lecture on <i>Combat Stress Control: Basic Battlemind Training</i> ; 105 <sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]                            |
| 2009 | Lecture entitled <i>Evaluate a Casualty, Prevent Shock, and Prevent Cold Weather injuries</i> ; 105 <sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture] |
| 2009 | Lecture on <i>Combat Exposure and Sleep Deprivation Effects on Risky Decision-Making</i> ; 105 <sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]      |
| 2009 | Lecture on the <i>Sleep History and Readiness Predictor (SHARP)</i> ; 105 <sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]                           |
| 2009 | Lecture on <i>The Use of Actigraphy for Measuring Sleep in Combat and Military Training</i> ; 105 <sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]   |
| 2010 | Lecture entitled <i>Casualty Evaluation</i> ; 105 <sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]                                                   |

- 2010 Lecture entitled *Combat Stress and Risk-Taking Behavior Following Deployment*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2010 Lecture entitled *Historical Perspectives on Combat Medicine at the Battle of Gettysburg*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2010 Lecture entitled *Sleep Loss, Stimulants, and Decision-Making*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2010 Lecture entitled *PTSD: New Insights from Brain Imaging*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2011 Lecture entitled *Effects of bright light therapy on sleep, cognition and brain function after mild traumatic brain injury*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2011 Lecture entitled *Laboratory Sciences and Research Psychology in the Army*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2011 Lecture entitled *Tools for Assessing Sleep in Military Settings*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2011 Lecture entitled *The Brain Basis of Emotional Trauma and Practical Issues in Supporting Victims of Trauma*, U.S. Department of Justice, United States Attorneys Office, Serving Victims of Crime Training Program, Holyoke, MA [Invited Lecture]
- 2011 Lecture entitled *The Brain Altering Effects of Traumatic Experiences*; 105<sup>th</sup> Reinforcement Training Unit (RTU), U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2012 Lecture entitled *Sleep Loss, Caffeine, and Military Performance*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2012 Lecture entitled *Using Light Therapy to Treat Sleep Disturbance Following Concussion*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2013 Lecture entitled *Brain Responses to Food: What you See Could Make you Fat*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2013 Lecture entitled *Predicting Resilience Against Sleep Loss*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2014 Lecture entitled *Get Some Shut-Eye or Get Fat: Sleep Loss Affects Brain Responses to Food*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2014 Lecture entitled *Emotional Intelligence: Developing a Training Program*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]

- 2014 Lecture entitled *Supporting Cognitive and Emotional Health in Warfighters*. Presented to the Senior Vice President for the Senior Vice President for Health Sciences and Dean of the Medical School, University of Arizona, Tucson, AZ [Invited Lecture]
- 2015 Lecture entitled *Understanding the Effects of Mild TBI (Concussion) on the Brain*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2015 Presentation entitled *Superhuman Brains: The Neurocircuitry that Underlies the Ability to Resist Sleep Deprivation*. Presented at the Neuroscience Datablitz, University of Arizona, Tucson, AZ [Invited Lecture]
- 2015 Presentation entitled: *SCAN Lab Traumatic Stress Study*. Presented at the Tucson Veteran Center, Tucson AZ [Invited Lecture]
- 2016 Presentation entitled: *SCAN Lab Overview*. Presented at the University of Arizona 2016 Sleep workshop, Tucson, AZ [Invited Lecture]
- 2016 Lecture entitled *Trauma Exposure and the Brain*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2016 Presentation entitled *Supporting Cognitive and Emotional Health in Warfighters*. UAHS Development Team, University of Arizona Health Sciences Center, Tucson, AZ [Invited Lecture]
- 2016 Lecture entitled *Novel Approaches for Reducing Depression in the Military*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2016 Presentation entitled: *SCAN Lab Traumatic Stress and TBI Studies*. Presented at the Tucson Veteran Center, Tucson AZ [Invited Lecture]
- 2016 Lecture entitled *The Battle for Mosul: An S2 Brief*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2017 Lecture entitled *A New Experimental Treatment for Sleep Problems Following Mild TBI*; 105<sup>th</sup> IMA Detachment, U.S. Army Reserve Center, Boston, MA [Invited Lecture]
- 2017 Lecture entitled *Basics of Neuroimaging Research*; UA Psychiatry Resident Neuroscience Course, University of Arizona Department of Psychiatry, Tucson, AZ [Invited Lecture]
- 2019 Presentation entitled *Physiology Student Opportunities in the Social Cognitive and Affective Neuroscience Lab*. Presented at the University of Arizona Physiology Honors Academy, Tucson, AZ [Invited Discussant]
- 2019 Presentation entitled *Morning Blue Light Exposure Improves Sleep and Fear Extinction Recall in PTSD*. Presented at the University of Arizona Sleep Lecture Series, Tucson, AZ [Invited Lecture]

- 2019 Presentation entitled Morning Blue Light Exposure Improves Sleep and Fear Extinction Recall in PTSD. Presented at the Annual Club Hypnos Meeting Datablitz, San Antonio, TX [*Invited Lecture*]

### **Seminars**

- 2001 *Using Functional MRI to Study the Developing Brain*, Judge Baker Children's Center, Harvard Medical School, Boston, MA [*Invited Lecture*]
- 2002 Lecture on the *Changes in the Lateralized Structure and Function of the Brain during Adolescent Development*, Walter Reed Army Institute of Research, Washington, DC [*Invited Lecture*]
- 2005 Lecture on *Functional Neuroimaging, Cognitive Assessment, and the Enhancement of Soldier Performance*, Walter Reed Army Institute of Research, Washington, DC [*Invited Lecture*]
- 2005 Lecture on *The Sleep History and Readiness Predictor*: Presented to the Medical Research and Materiel Command, Ft. Detrick, MD [*Invited Lecture*]
- 2006 Lecture on *Optimization of Judgment and Decision Making Capacities in Soldiers Following Sleep Deprivation*, Brain Imaging Center, McLean Hospital, Belmont MA [*Invited Lecture*]
- 2006 Briefing to the Chairman of the Cognitive Performance Assessment Program Area Steering Committee, U.S. Army Military Operational Medicine Research Program, entitled *Optimization of Judgment and Decision Making Capacities in Soldiers Following Sleep Deprivation*, Walter Reed Army Institute of Research [*Invited Lecture*]
- 2005 Briefing to the Chairman of the National Research Council (NRC) Committee on Strategies to Protect the Health of Deployed U.S. Forces, John H. Moxley III, on the *Optimization of Judgment and Decision Making Capacities in Soldiers Following Sleep Deprivation*, Walter Reed Army Institute of Research, Washington, DC [*Invited Lecture*]
- 2006 Lecture on *Norming a Battery of Tasks to Measure the Cognitive Effects of Operationally Relevant Stressors*, Cognitive Performance Assessment Program Area Steering Committee, U.S. Army Military Operational Medicine Research Program, Washington, DC [*Invited Lecture*]
- 2007 Lecture on *Cerebral Responses During Visual Processing of Food*, U.S. Army Institute of Environmental Medicine, Natick, MA [*Invited Lecture*]
- 2007 Briefing on the *Measurement of Sleep-Wake Cycles and Cognitive Performance in Combat Aviators*, U.S. Department of Defense, Defense Advanced Research Projects Agency (DARPA), Washington, DC [*Invited Lecture*]



- 2007 Lecture on *The Effects of Fatigue and Pharmacological Countermeasures on Judgment and Decision-Making*, U.S. Army Aeromedical Research Laboratory, Fort Rucker, AL [Invited Lecture]
- 2008 Lecture on the *Validation of Actigraphy and the SHARP as Methods of Measuring Sleep and Performance in Soldiers*, U.S. Army Aeromedical Research Laboratory, Fort Rucker, AL [Seminar]
- 2009 Lecture on Sleep Deprivation, *Executive Function, and Resilience to Sleep Loss*: Walter Reed Army Institute of Research AIBS Review, Washington DC [Invited Lecture]
- 2009 Lecture Entitled *Influences of Combat Exposure and Sleep Deprivation on Risky Decision-Making*, Evans U.S. Army Hospital, Fort Carson, CO [Invited Lecture]
- 2009 Lecture on *Making Bad Choices: The Effects of Combat Exposure and Sleep Deprivation on Risky Decision-Making*, 4<sup>th</sup> Army, Division West, Quarterly Safety Briefing to the Commanding General and Staff, Fort Carson, CO [Invited Lecture]
- 2010 Lecture on *Patterns of Cortico-Limbic Activation Across Anxiety Disorders*, Center for Anxiety, Depression, and Stress, McLean Hospital, Belmont, MA [Invited Lecture]
- 2010 Lecture on *Cortico-Limbic Activation Among Anxiety Disorders*, Neuroimaging Center, McLean Hospital, Belmont, MA [Invited Lecture]
- 2011 Lecture on *Shared and Differential Patterns of Cortico-Limbic Activation Across Anxiety Disorders*, McLean Research Day Brief Communications, McLean Hospital, Belmont, MA [Invited Lecture]
- 2011 Lecture Entitled *The effects of emotional intelligence on judgment and decision making*, *Military Operational Medicine Research Program Task Area C, R & A Briefing*, Walter Reed Army Institute of Research, Silver Spring, MD [Invited Lecture]
- 2011 Lecture Entitled *Effects of bright light therapy on sleep, cognition, brain function, and neurochemistry following mild traumatic brain injury*, *Military Operational Medicine Research Program Task Area C, R & A Briefing*, Walter Reed Army Institute of Research, Silver Spring, MD [Invited Lecture]
- 2012 Briefing to GEN (Ret) George Casey Jr., former Chief of Staff of the U.S. Army, entitled *Research for the Soldier*. McLean Hospital, Belmont, MA. [Invited Lecture]
- 2012 Lecture Entitled *Effects of bright light therapy on sleep, cognition, brain function, and neurochemistry following mild traumatic brain injury*, *Military Operational Medicine Research Program In Progress Review (IPR) Briefing*, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [Invited Lecture]
- 2013 Lecture Entitled *Update on the Effects of Bright light therapy on sleep, cognition, brain function, and neurochemistry following mild traumatic brain injury*, *Military Operational Medicine Research Program In Progress Review (IPR) Briefing*, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [Invited Lecture]

- 2013 Lecture Entitled *Internet Based Cognitive Behavioral Therapy: Effects on Depressive Cognitions and Brain Function*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [*Invited Lecture*]
- 2013 Seminar Entitled *Predicting Resilience Against Sleep Loss*, United States Military Academy at West Point, West Point, NY [*Invited Symposium*].
- 2014 Lecture entitled *Sleep Loss, Brain Function, and Cognitive Performance*, presented to the Psychiatric Genetics and Translational Research Seminar, Massachusetts General Hospital/Harvard Medical School, Boston, MA [*Invited Lecture*]
- 2014 Grand Rounds Lecture entitled *Sleep Loss, Brain Function, and Performance of the Emotional-Executive System*. University of Arizona Psychiatry Grand Rounds, Tucson, AZ [*Invited Lecture*]
- 2014 Psychology Department Colloquium entitled *Sleep Loss, Brain Function, and Performance of the Emotional-Executive System*. University of Arizona Department of Psychology, Tucson, AZ [*Invited Lecture*]
- 2014 Lecture Entitled *Internet Based Cognitive Behavioral Therapy: Effects on Depressive Cognitions and Brain Function*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [*Invited Lecture*]
- 2014 Lecture Entitled *The Neurobiological Basis and Potential Modification of Emotional Intelligence Through Affective/Behavioral Training*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [*Invited Lecture*]
- 2014 Lecture entitled *Supporting Cognitive and Emotional Health in Warfighters*. Presented to the Senior Vice President for Health Sciences and Dean of the Medical School, University of Arizona, Tucson, AZ [*Invited Lecture*]
- 2015 Lecture entitled *Sleep Loss and Brain Responses to Food*. Presented for the Sleep Medicine Lecture Series, University of Arizona Medical Center, Tucson, AZ [*Invited Lecture*]
- 2015 Presentation entitled *Superhuman Brains: The Neurocircuitry that Underlies the Ability to Resist Sleep Deprivation*. Presented at the Neuroscience Datablitz, University of Arizona, Tucson, AZ [*Invited Lecture*]
- 2015 Lecture entitled *Sleep Deprivation Selectively Impairs Emotional Aspects of Cognition*. Presented at the Pamela Turbeville Speaker Series, McClelland Institute for Children, Youth, and Families, Tucson, AZ, [*Invited Lecture*]
- 2015 Lecture Entitled *Multimodal Neuroimaging to Predict Resistance to Sleep Deprivation*, presented at the Pulmonary Research Conference, Department of Medicine, Sleep

Medicine Sleep Lecture Series, University of Arizona College of Medicine, Tucson, AZ [*Invited Lecture*].

- 2015      Lecture entitled Sleep Deprivation Selectively Impairs Emotional Aspects of Cognition. Presented at the Pamela Turbeville Speaker Series, McClelland Institute for Children, Youth, and Families, Tucson, AZ, [*Invited Lecture*]
- 2015      Lecture Entitled *Effects of bright light therapy on sleep, cognition, brain function, and neurochemistry following mild traumatic brain injury*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [*Invited Lecture*]
- 2015      Lecture Entitled *A Non-Pharmacologic Method for Enhancing Sleep in PTSD*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [*Invited Lecture*]
- 2015      Lecture Entitled *Internet Based Cognitive Behavioral Therapy: Effects on Depressive Cognitions and Brain Function*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [*Invited Lecture*]
- 2015      Lecture Entitled *Operating Under the Influence: The Effects of Sleep Loss and Stimulants on Decision-Making and Performance*. Presented at the annual SAFER training for interns and residents, University of Arizona Department of Psychiatry, Tucson AZ [*Invited Lecture*]
- 2016      Lecture entitled *Translational Neuroimaging: Using MRI Techniques to Promote Recovery and Resilience*. Functional Neuroimaging Course, Spring 2016, Psychology Department, University of Arizona, Tucson, AZ [*Invited Lecture*]
- 2016      Lecture entitled *Supporting Cognitive and Emotional Health in Warfighters*. Presented at the Department of Behavioral Biology, Walter Reed Army Institute of Research, Silver Spring, MD [*Invited Lecture*]
- 2016      Lecture Entitled *Internet Based Cognitive Behavioral Therapy: Effects on Depressive Cognitions and Brain Function*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [*Invited Lecture*]
- 2016      Lecture Entitled *A Model for Predicting Cognitive and Emotional Health from Structural and Functional Neurocircuitry following TBI*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [*Invited Lecture*]
- 2016      Lecture Entitled *Refinement and Validation of a Military Emotional Intelligence Training Program*, Military Operational Medicine Research Program 2016

Resilience In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [*Invited Lecture*]

- 2017 Lecture Entitled *Bright Light Therapy for Treatment of Sleep Problems following Mild TBI*, Military Operational Medicine Research Program Combat Casualty Care In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [*Invited Lecture*]
- 2017 Lecture Entitled *Refinement and Validation of a Military Emotional Intelligence Training Program*, Military Operational Medicine Research Program 2017 Resilience In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [*Invited Lecture*]
- 2018 Lecture Entitled *Introduction to Chronobiology (Part 1)*, Sleep Research Seminar Series, Walter Reed Army Institute of Research, Silver Spring, MD [*Invited Lecture*]
- 2018 Lecture Entitled *Introduction to Chronobiology (Part 2)*, Sleep Research Seminar Series, Walter Reed Army Institute of Research, Silver Spring, MD [*Invited Lecture*]
- 2018 Lecture Entitled *A Non-Pharmacologic Method for Enhancing Sleep in PTSD*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [*Invited Lecture*]
- 2018 Lecture Entitled *Refinement and Validation of a Military Emotional Intelligence Training Program*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [*Invited Lecture*]
- 2019 Lecture Entitled *Update: A Non-Pharmacologic Method for Enhancing Sleep in PTSD*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [*Invited Lecture*]
- 2019 Lecture Entitled *Update: Refinement and Validation of a Military Emotional Intelligence Training Program*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [*Invited Lecture*]
- 2019 Grand Rounds Lecture entitled *Light Therapy: Implications for Recovery Following PTSD and mTBI*. University of Arizona Psychiatry Grand Rounds, Tucson, AZ [*Invited Lecture*]

### **Symposia/Conferences**

- 1999 Oral Platform Presentation entitled *Functional MRI lateralization during memory encoding predicts seizure outcome following anterior temporal lobectomy*, 27<sup>th</sup> Annual

- Meeting of the International Neuropsychological Society, Boston, MA. [*Submitted Presentation*]
- 2000 Lecture on the *Neurobiology of Emotional Development in Children*, 9th Annual Parents as Teachers Born to Learn Conference, St. Louis, MO [*Invited Lecture*]
- 2001 Oral Platform Presentation entitled *Sex differences in functional activation of the amygdala during the perception of happy faces*, 29<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Chicago, IL. [*Submitted Presentation*]
- 2002 Oral Platform Presentation entitled *Developmental changes in the lateralized activation of the prefrontal cortex and amygdala during the processing of facial affect*, 30<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Toronto, Ontario, Canada. [*Submitted Presentation*]
- 2002 Oral Platform Presentation *Gray and white matter volume during adolescence correlates with cognitive performance: A morphometric MRI study*, 30<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Toronto, Ontario, Canada. [*Submitted Presentation*]
- 2004 Lecture on *Sleep Deprivation, Cognition, and Stimulant Countermeasures*: Seminar Presented at the Bi-Annual 71F Research Psychology Short Course, Ft. Detrick, MD, U.S. Army Medical Research and Materiel Command [*Invited Lecture*]
- 2004 Lecture on the *Regional Cerebral Blood Flow Correlates of Electroencephalographic Activity During Stage 2 and Slow Wave Sleep: An H215O PET Study*: Presented at the Bi-Annual 71F Research Psychology Short Course, Ft. Detrick, MD, U.S. Army Medical Research and Materiel Command [*Invited Lecture*]
- 2004 Oral Platform Presentation entitled *Regional cerebral metabolic correlates of electroencephalographic activity during stage-2 and slow-wave sleep: An H215O PET Study*, 18th Associated Professional Sleep Societies Annual Meeting, Philadelphia, PA. [*Submitted Presentation*]
- 2006 Lecture on *The Sleep History and Readiness Predictor*: Presented at the Bi-Annual 71F Research Psychology Short Course, Ft. Rucker, AL, U.S. Army Medical Research and Materiel Command [*Invited Lecture*]
- 2007 Symposium on *Cortical and Limbic Activation in Response to Visual Images of Low and High-Caloric Foods*, 6th Annual Meeting of the International Society for Behavioral Nutrition and Physical Activity (ISBNPA), Oslo, Norway [*Invited Lecture*]
- 2008 Lecture on *Sleep Deprivation, Executive Function, & Resilience to Sleep Loss*, First Franco-American Workshop on War Traumatism, IMN SSA, Toulon, France [*Invited Lecture*]
- 2009 Symposium Entitled *Sleep Deprivation, Judgment, and Decision-Making*, 23<sup>rd</sup> Annual Meeting of the Associated Professional Sleep Societies, Seattle, WA [*Invited Symposium*]

- 2009 Symposium Session Moderator for *Workshop on Components of Cognition and Fatigue: From Laboratory Experiments to Mathematical Modeling and Operational Applications*, Washington State University, Spokane, WA [Invited Speaker]
- 2009 Lecture on *Comparative Studies of Stimulant Action as Countermeasures for Higher Order Cognition and Executive Function Impairment that Results from Disrupted Sleep Patterns*, Presented at the NIDA-ODS Symposium entitled: Caffeine: Is the Next Problem Already Brewing, Rockville, MD [Invited Lecture]
- 2010 Oral Platform Presentation entitled *Sleep deprivation selectively impairs emotional aspects of cognitive functioning*, 27<sup>th</sup> Army Science Conference, Orlando, FL. [Submitted Presentation]
- 2010 Oral Platform Presentation entitled *Exaggerated amygdala responses to masked fearful faces are specific to PTSD versus simple phobia*, 27<sup>th</sup> Army Science Conference, Orlando, FL. [Submitted Presentation]
- 2012 Oral Symposium Presentation entitled *Shared and distinctive patterns of cortico-limbic activation across anxiety disorders*, 32<sup>nd</sup> Annual Conference of the Anxiety Disorders Association of America, Arlington, VA. [Invited Symposium]
- 2012 Oral Platform Presentation entitled *Shared and unique patterns of cortico-limbic activation across anxiety disorders*. 40<sup>th</sup> Meeting of the International Neuropsychological Society, Montreal, Canada. [Submitted Presentation]
- 2013 Lecture entitled *Brain responses to visual images of food: Could your eyes be the gateway to excess?* Presented to the NIH Nutrition Coordinating Committee and the Assistant Surgeon General of the United States, Bethesda, MD [Invited Lecture]
- 2014 Symposium Entitled *Operating Under the Influence: The Effects of Sleep Loss and Stimulants on Decision-Making and Performance*, Invited Faculty Presenter at the 34<sup>th</sup> Annual Cardiothoracic Surgery Symposium (CREF), San Diego, CA [Invited Symposium].
- 2014 Symposium Entitled *The Effects of Sleep Loss on Food Preference*, SLEEP 2014, Minneapolis, MN [Invited Symposium]
- 2015 Symposium Entitled *The Neurobiological Basis and Potential Modification of Emotional Intelligence in Military Personnel*. Invited presentation at the Yale Center for Emotional Intelligence, New Haven, CT [Invited Lecture]
- 2015 Lecture Entitled *Predicting Resilience to Sleep Loss with Multi-Modal Neuroimaging*. Invited presentation at the DARPA Sleep Workshop 2015, Arlington, VA [Invited Lecture]
- 2015 Symposium Entitled: *The Brain and Food: How your (sleepy) Eyes Might be the Gateway to Excess*, Invited Faculty Presenter at the 2015 University of Arizona Update on Psychiatry, Tucson, AZ [Invited Symposium].

- 2015 Oral Platform presentation entitled *Multimodal Neuroimaging to Predict Resistance to Sleep Deprivation*, Associated Professional Sleep Societies (APSS) SLEEP meeting, Seattle, WA [*Invited Lecture*]
- 2015 Symposium Entitled presentation entitled *Sleep Deprivation and Emotional Decision Making*, Virginia Tech Sleep Workshop, Arlington, VA [*Invited Symposium*]
- 2016 Oral Platform presentation entitled *Default Mode Activation Predicts Vulnerability to Sleep Deprivation in the Domains of Mood, Sleepiness, and Vigilance*. Presentation given at the Associated Professional Sleep Societies (APSS) SLEEP meeting, Denver, CO [*Invited Lecture*]
- 2016 Symposium presentation entitled *Short Wavelength Light Therapy Facilitates Recovery from Mild Traumatic Brain Injury*, 2016 Military Health Systems Research Symposium (MHSRS), Orlando, FL [*Invited Lecture*]
- 2017 Lecture Entitled: *Military Update on Blue Light Therapy for mTBI*. Lecture presented at the DoD Sleep Research Meeting breakout session at the Associated Professional Sleep Societies (APSS) SLEEP meeting, Boston, MA [*Invited Lecture*]
- 2017 Symposium entitled: *Judgment and Decision Making During Sleep Loss*. Invited symposium presentation at the SLEEP 2017 Trainee Symposium Series, Associated Professional Sleep Societies (APSS) SLEEP meeting, Boston, MA [*Invited Lecture*]
- 2017 Oral Platform presentation entitled *Short Wavelength Light Therapy Facilitates Recovery from Mild Traumatic Brain Injury*. Presentation given at the Associated Professional Sleep Societies (APSS) SLEEP meeting, Boston, MA [*Invited Lecture*]
- 2017 Symposium entitled: What makes a super-soldier: Identifying the neural correlates of individual differences in resilience against sleep deprivation. Invited symposium presentation at the 2017 Military Health Systems Research Symposium (MHSRS), Orlando, FL [*Invited Lecture*]
- 2018 Oral Platform presentation entitled: *Short Wavelength Light Therapy Enhances Brain and Cognitive Recovery Following Mild Traumatic Brain Injury*. Presentation given at the Arizona Research Institute for Biomedical Imaging (ARIBI) Workshop, Tucson, AZ [*Invited Lecture*]
- 2018 Session Chair: *Healthy Shiftwork? Measures, Mitigation and Functional Outcomes*. Session presented at the Associated Professional Sleep Societies (APSS) SLEEP Conference (Session O02), Baltimore, MD [*Session Chair*]

- 2018      Lecture Entitled: *Lapses During Sleep Loss are Predicted by Gray Matter Volume of the Ascending Reticular Activating Systems*. Lecture presented at the 2<sup>nd</sup> Annual DoD Sleep Research Meeting breakout session at the Associated Professional Sleep Societies (APSS) SLEEP meeting, Baltimore, MD [*Invited Lecture*]
- 2018      Oral Platform presentation entitled *Resistance to Sleep Deprivation is Predicted by Gray Matter Volume in the Posterior Brain Stem*. Presentation given at the Associated Professional Sleep Societies (APSS) SLEEP meeting, Baltimore, MD [*Invited Lecture*]
- 2018      Oral Platform presentation entitled *Why Can't You Just Stay Awake? Resistance to Sleep Deprivation is Associated with Measurable Differences in Brainstem Gray Matter*. Presentation given at the Military Health Systems Research Symposium (MHSRS) 2018 Meeting, Orlando, FL [*Invited Lecture*]
- 2019      Oral Platform presentation entitled *Morning Blue Light Exposure Improves Sleep and Fear Extinction Recall in PTSD*. Presentation given at the Associated Professional Sleep Societies (APSS) SLEEP 2019 meeting, San Antonio, TX [*Invited Lecture*]
- 2019      Oral Platform presentation entitled *Blue Light Exposure Enhances Sleep and Fear Extinction Recall in PTSD*. Presentation given at the Military Health Systems Research Symposium (MHSRS) 2019 Meeting, Orlando, FL [*Invited Lecture*]
- 2019      Oral Platform presentation entitled *Baseline GABA Levels are Associated with Time-on-Task Performance During Sleep Deprivation*. Presentation given at the Military Health Systems Research Symposium (MHSRS) 2019 Meeting, Orlando, FL [*Invited Lecture*]

### **PEER REVIEWED PUBLISHED ABSTRACTS**

1.      **Killgore, WD.** Development and validation of a new instrument for the measurement of transient mood states: The facial analogue mood scale (FAMS) [Abstract]. Dissertation Abstracts International: Section B: The Sciences & Engineering 1995; 56 (6-B): 3500.
2.      **Killgore, WD, & Locke, B.** A nonverbal instrument for the measurement of transient mood states: The Facial Analogue Mood Scale (FAMS) [Abstract]. Proceedings of the Annual Conference of the Oklahoma Center for Neurosciences 1996, Oklahoma City, OK.
3.      **Killgore, WD, Scott, JG, Oommen, KJ, & Jones, H.** Lateralization of seizure focus and performance on the MMPI-2 [Abstract]. Proceedings of the Annual Conference of the Oklahoma Center for Neurosciences 1996, Oklahoma City, OK.
4.      **Killgore, WD, & Adams, RL.** Vocabulary ability and Boston Naming Test performance:



Preliminary guidelines for interpretation [Abstract]. Archives of Clinical Neuropsychology 1997; 13(1).

5. **Killgore, WD**, Glosser, G, Cooke, AN, Grossman, M, Maldjian, J, Judy, K, Baltuch, G, King, D, Alsop, D, & Detre, JA. Functional activation during verbal memory encoding in patients with lateralized focal lesions [Abstract]. Epilepsia 1998; 39(Suppl. 6): 99.
6. **Killgore, WD**. A new method for assessing subtle cognitive deficits: The Clock Trail Making Test [Abstract]. Archives of Clinical Neuropsychology 1998; 14(1): 92.
7. **Killgore, WD**, & DellaPietra, L. Item response biases on the WMS-III Auditory Delayed Recognition Subtests [Abstract]. Archives of Clinical Neuropsychology 1998; 14(1): 92.
8. **Killgore, WD**, Glosser, G, Alsop, DC, Cooke, AN, McSorley, C, Grossman, M, & Detre, JA. Functional activation during material specific memory encoding [Abstract]. NeuroImage 1998; 7: 811.
9. **Killgore, WD**, & DellaPietra, L. Using the WMS-III to detect malingering: Empirical development of the Rarely Missed Index. [Abstract]. Journal of the International Neuropsychological Society 1999; 5(2).
10. **Killgore, WD**, Glosser, G, & Detre, JA. Prediction of seizure outcome following anterior temporal lobectomy: fMRI vs. IAT [Abstract]. Archives of Clinical Neuropsychology 1999; 14(1): 143.
11. **Killgore, WD**, Glosser, G, King, D, French, JA, Baltuch, G, & Detre, JA. Functional MRI lateralization during memory encoding predicts seizure outcome following anterior temporal lobectomy [Abstract]. Journal of the International Neuropsychological Society 1999; 5(2): 122.
12. **Killgore, WD**, Casasanto, DJ, Maldjian, JA, Alsop, DC, Glosser, G, French, J, & Detre, J. A. Functional activation of mesial temporal lobe during nonverbal encoding [abstract]. Epilepsia, 1999; 40 (Supplement 7): 188.
13. **Killgore, WD**, Casasanto, DJ, Maldjian, JA, Gonzales-Atavales, J, & Detre, JA. Associative memory for faces preferentially activates the left amygdala and hippocampus [abstract]. Journal of the International Neuropsychological Society, 2000; 6: 157.
14. Casasanto, DJ, **Killgore, WD**, Maldjian, JA, Gonzales-Atavales, J, Glosser, G, & Detre, JA. Task-dependent and task-invariant activation in mesial temporal lobe structures during fMRI explicit encoding tasks [abstract]. Journal of the International Neuropsychological Society, 2000; 6: 134. [*\*Winner of Rennick Research Award for Best Research by a Graduate Student*].
15. **Killgore, WD**, Glahn, D, & Casasanto, DJ. Development and validation of the Design Organization Test (DOT): A rapid screening instrument for assessing for visuospatial ability [abstract]. Journal of the International Neuropsychological Society, 2000; 6: 147.
16. Casasanto DJ, **Killgore, WD**, Glosser, G, Maldjian, JA, & Detre, JA. Hemispheric specialization during episodic memory encoding in the human hippocampus and MTL. Proceedings of the

Society for Cognitive Science 2000: Philadelphia, PA.

17. Casasanto, DJ, Glosser, G, **Killgore, WD**, Siddiqi, F, Falk, M, Maldjian, J, Lev-Reis, I, & Detre, JA. fMRI evidence for the functional reserve model of post-ATL neuropsychological outcome prediction. Poster Presented at the David Mahoney Institute of Neurological Sciences 17th Annual Neuroscience Retreat, University of Pennsylvania, April 17, 2000.
18. Casasanto, DJ, **Killgore, WD**, Maldjian, JA, Glosser, G, Grossman, M, Alsop, D. C, & Detre, JA. Neural Correlates of Successful and Unsuccessful Verbal Encoding [abstract]. *Neuroimage*, 2000 11: S381.
19. Siddiqi, F, Casasanto, DJ, **Killgore, WD**, Detre, JA, Glosser, G, Alsop, DC, & Maldjian, JA. Hemispheric effects of frontal lobe tumors on mesial temporal lobe activation during scene encoding [abstract]. *Neuroimage*, 2000 11: S448.
20. Oki, M, Gruber, SA, **Killgore, WD**, Yurgelun-Todd, DA. Bilateral thalamic activation occurs during lexical but not semantic processing [abstract]. *Neuroimage*, 2000 11: S353.
21. Yurgelun-Todd, DA, Gruber, SA, **Killgore, WD**, & Tohen, M. Neuropsychological performance in first-episode bipolar disorder [Abstract]. *Collegium Internationale Neuro-Psychopharmacologicum*. Brussels, Belgium. July, 2000.
22. **Killgore, WD**, & DellaPietra, L. Detecting malingering with the WMS-III: A revision of the Rarely Missed Index (RMI) [abstract]. *Journal of the International Neuropsychological Society*, 2001; 7 (2): 143-144.
23. Casasanto, DJ, Glosser, G, **Killgore, WD**, Siddiqi, F, Falk, M, Roc, A, Maldjian, JA, Levy-Reis, I, Baltuch, G, & Detre, JA. Presurgical fMRI predicts memory outcome following anterior temporal lobectomy [abstract]. *Journal of the International Neuropsychological Society*, 2001; 7 (2): 183.
24. **Killgore, WD**, & Yurgelun-Todd, DA. Amygdala but not hippocampal size predicts verbal memory performance in bipolar disorder [abstract]. *Journal of the International Neuropsychological Society*, 2001; 7 (2): 250-251.
25. **Killgore, WD**, Kanayama, G, & Yurgelun-Todd, DA. Sex differences in functional activation of the amygdala during the perception of happy faces [abstract]. *Journal of the International Neuropsychological Society*, 2001; 7 (2): 198.
26. **Killgore, WD**, Gruber, SA, Oki, M, & Yurgelun-Todd, DA. Amygdalar volume and verbal memory in schizophrenia and bipolar disorder: A correlative MRI study [abstract]. Meeting of the International Congress on Schizophrenia Research. Whistler, British Columbia. April 2001.
27. Kanayama, G, **Killgore, WD**, Gruber, SA, & Yurgelun-Todd, DA. fMRI BOLD activation of the supramarginal gyrus in schizophrenia [abstract]. Meeting of the International Congress on Schizophrenia Research. Whistler, British Columbia. April 2001.
28. Gruber, SA, **Killgore, WD**, Renshaw, PF, Pope, HG. Jr, Yurgelun-Todd, DA. Gender

differences in cerebral blood volume after a 28-day washout period in chronic marijuana smokers [abstract]. Meeting of the International Congress on Schizophrenia Research. Whistler, British Columbia. April 2001.

29. Rohan, ML, **Killgore, WD**, Eskesen, JG, Renshaw, PF, & Yurgelun-Todd, DA. Match-warped EPI anatomic images and the amygdala: Imaging in hard places. Proceedings of the International Society for Magnetic Resonance in Medicine, 2001; 9: 1237.
30. **Killgore, WD** & Yurgelun-Todd, DA. Developmental changes in the lateralized activation of the prefrontal cortex and amygdala during the processing of facial affect [Abstract]. Oral platform paper presented at the 30th Annual Meeting of the International Neuropsychological Society, Toronto, Ontario, Canada, February 13-16, 2002.
31. Yurgelun-Todd, DA. & **Killgore, WD**. Gray and white matter volume during adolescence correlates with cognitive performance: A morphometric MRI study [Abstract]. Oral platform paper presented at the 30th Annual Meeting of the International Neuropsychological Society, Toronto, Ontario, Canada, February 13-16, 2002.
32. **Killgore, WD**, Reichardt, R. Kautz, M, Belenky, G, Balkin, T, & Wesensten, N. Daytime melatonin-zolpidem cocktail: III. Effects on salivary melatonin and performance [abstract]. Poster presented at the 17th Annual Meeting of the Associated Professional Sleep Societies, Chicago, Illinois, June 3-8, 2003.
33. **Killgore, WD**, Young, AD, Femia, LA, Bogorodzki, P, Rogowska, J, & Yurgelun-Todd, DA. Cortical and limbic activation during viewing of high- versus low-calorie foods [abstract]. Poster Presented at the Organization for Human Brain Mapping Annual Meeting, New York, NY, June 18-22, 2003.
34. **Killgore, WD**, & Yurgelun-Todd, DA. Amygdala activation during masked presentations of sad and happy faces [abstract]. Poster presented at the Organization for Human Brain Mapping Annual Meeting, New York, NY, June 18-22, 2003.
35. **Killgore, WD**, Stetz, MC, Castro, CA, & Hoge, CW. Somatic and emotional stress symptom expression prior to deployment by soldiers with and without previous combat experience [abstract]. Poster presented at the 6th Annual Force Health Protection Conference, Albuquerque, NM, August, 11-17, 2003. [**\*Winner: Best Paper Award**]
36. Wesensten, NJ, Balkin, TJ, Thorne, D, **Killgore, WD**, Reichardt, R, & Belenky, G. Caffeine, dextroamphetamine, and modafinil during 85 hours of sleep deprivation: I. Performance and alertness effects [abstract]. Poster presented at the 75th Annual Meeting of the Aerospace Medical Association, Anchorage, AK, May 2-6 2004.
37. **Killgore, WD**, Braun, AR, Belenky, G, Wesensten, NJ, & Balkin, TJ. Regional cerebral metabolic correlates of electroencephalographic activity during stage-2 and slow-wave sleep: An H215O PET Study [abstract]. Oral platform presentation at the 18th Associated Professional Sleep Societies Annual Meeting, Philadelphia, PA, June 5-10, 2004.
38. **Killgore, WD**, Arora, NS, Braun, AR, Belenky, G, Wesensten, NJ, & Balkin, TJ. Sleep

strengthens the effective connectivity among cortical and subcortical regions: Evidence for the restorative effects of sleep using H215O PET [abstract]. Poster presented at the 17th Congress of the European Sleep Research Society, Prague, Czech Republic, October 5-9, 2004.

39. **Killgore, WD**, Arora, NS, Braun, AR, Belenky, G, Wesensten, NJ, & Balkin, TJ. An H215O PET study of regional cerebral activation during stage 2 sleep [abstract]. Poster presented at the 17th Congress of the European Sleep Research Society, Prague, Czech Republic, October 5-9, 2004.
40. Wesensten, N, **Killgore, WD**, Belenky, G, Reichardt, R, Thorne, D, & Balkin, T. Caffeine, dextroamphetamine, and modafinil during 85 H of sleep deprivation. II. Effects of tasks of executive function [abstract]. Poster presented at the 17th Congress of the European Sleep Research Society, Prague, Czech Republic, October 5-9, 2004.
41. Balkin, T, Reichardt, R, Thorne, D, **Killgore, WD**, Belenky, G, & Wesensten, N. Caffeine, dextroamphetamine, and modafinil during 85 hours of sleep deprivation. I. Psychomotor vigilance and objective alertness effects [abstract]. Oral paper presentation at the 17th Congress of the European Sleep Research Society, Prague, Czech Republic, October 5-9, 2004.
42. Belenky, G, Reichardt, R, Thorne, D, **Killgore, WD**, Balkin, T, & Wesensten, N. Caffeine, dextroamphetamine, and modafinil during 85 hours of sleep deprivation. III. Effect on recovery sleep and post-recovery sleep performance [abstract]. Oral paper presentation at the 17th Congress of the European Sleep Research Society, Prague, Czech Republic, October 5-9, 2004.
43. Vo, A, Green, J, Campbell, W, **Killgore, WD**, Labutta, R, & Redmond, D. The quantification of disrupted sleep in migraine via actigraphy: A pilot study [abstract]. Abstract presented at the Associated Professional Sleep Societies 19th Annual Meeting, Denver, CO, June 18-23, 2005. SLEEP, 28 (Supplement), A281.
44. Kendall, AP, **Killgore, WD**, Kautz, M, & Russo, MB. Left-visual field deficits in attentional processing after 40 hours of sleep deprivation [abstract]. Abstract presented at the Associated Professional Sleep Societies 19th Annual Meeting, Denver, CO, June 18-23, 2005. SLEEP, 28 (Supplement), A143.
45. Reichardt, RM, Grugle, NL, Balkin, TJ, & **Killgore, WD**. Stimulant countermeasures, risk propensity, and IQ across 2 nights of sleep deprivation [abstract]. Abstract presented at the Associated Professional Sleep Societies 19th Annual Meeting, Denver, CO, June 18-23, 2005. SLEEP, 28 (Supplement), A145.
46. Killgore, DB, McBride, SA, Balkin, TJ, & **Killgore, WD**. Post-stimulant hangover: The effects of caffeine, modafinil, and dextroamphetamine on sustained verbal fluency following sleep deprivation and recovery sleep [abstract]. Abstract presented at the Associated Professional Sleep Societies 19th Annual Meeting, Denver, CO, June 18-23, 2005. SLEEP, 28 (Supplement), A137.
47. **Killgore, WD**, Balkin, TJ, & Wesensten, NJ. Impaired decision-making following 49 hours of sleep deprivation [abstract]. Abstract presented at the Associated Professional Sleep Societies 19th Annual Meeting, Denver, CO, June 18-23, 2005. SLEEP, 28 (Supplement), A138.

48. **Killgore, WD**, McBride, SA, Killgore, DB, & Balkin, TJ. Stimulant countermeasures and risk propensity across 2 nights of sleep deprivation [abstract]. Abstract presented at the Associated Professional Sleep Societies 19th Annual Meeting, Denver, CO, June 18-23, 2005. *SLEEP*, 28 (Supplement), A136.
49. McBride, SA, Balkin, TJ, & **Killgore, WD**. The effects of 24 hours of sleep deprivation on odor identification accuracy [abstract]. Abstract presented at the Associated Professional Sleep Societies 19th Annual Meeting, Denver, CO, June 18-23, 2005. *SLEEP*, 28 (Supplement), A137.
50. Picchioni, D, **Killgore, WD**, Braun, AR, & Balkin, TJ. PET correlates of EEG activity during non-REM sleep. Poster presentation at the annual UCLA/Webosciences Sleep Training Workshop, Lake Arrowhead, CA, September, 2005.
51. **Killgore, WD**, Killgore, DB, McBride, SA, & Balkin, TJ. Sustained verbal fluency following sleep deprivation and recovery sleep: The effects of caffeine, modafinil, and dextroamphetamine. Poster presented at the 34th Meeting of the International Neuropsychological Society, Boston, MA, February 1-4, 2006.
52. **Killgore, WD**, Balkin, TJ, & Wesensten, NJ. Decision-making is impaired following 2-days of sleep deprivation. Poster presented at the 34th Meeting of the International Neuropsychological Society, Boston, MA, February 1-4, 2006.
53. **Killgore, WD**, & Yurgelun-Todd, DA. Neural correlates of emotional intelligence in adolescent children. Poster presented at the 34th Meeting of the International Neuropsychological Society, Boston, MA, February 1-4, 2006.
54. **Killgore, WD**, & Yurgelun-Todd, DA. Social anxiety predicts amygdala activation in adolescents viewing fearful faces. Poster presented at the 34th Meeting of the International Neuropsychological Society, Boston, MA, February 1-4, 2006.
55. McBride, SA & **Killgore, WD**. Sleepy people smell worse: Olfactory deficits following extended wakefulness. Paper presented at the Workshop on Trace Gas Detection Using Artificial, Biological, and Computational Olfaction. Monell Chemical Senses Center, Philadelphia, PA, March 29-31, 2006.
56. **Killgore, WD**, Day LM, Li, C, Kamimori, GH, Balkin, TJ, & Killgore DB. Moral reasoning is affected by sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. *SLEEP*, 29 (Supplement), A137.
57. **Killgore, WD**, Killgore DB, Kahn-Green, E, Conrad, A, Balkin, TJ, & Kamimori, G. H. Introversion-Extroversion predicts resilience to sleep loss [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. *SLEEP*, 29 (Supplement), A137.
58. Newman, R, Kamimori, GH, **Killgore, WD**. Sleep deprivation diminishes constructive thinking [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies,

Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A136-137.

59. Huck, NO, Kendall, AP, McBride, SA, **Killgore, WD**. The perception of facial emotion is enhanced by psychostimulants following two nights of sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A136.
60. O'Sullivan, M, Reichardt, RM, Krugler, AL, Killgore, DB, & **Killgore, WD**. Premorbid intelligence correlates with duration and quality of recovery sleep following sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A372.
61. McBride, SA, **Killgore, WD**, Kahn-Green, E, Conrad, A, & Kamimori, GH. Caffeine administered to maintain overnight alertness does not disrupt performance during the daytime withdrawal period [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A136.
62. McBride, SA, Killgore DB, Balkin, TJ, Kamimori, GH, & **Killgore, WD**. Sleepy people smell worse: Olfactory decrements as a function of sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A135.
63. Day, LM, Li, C, Killgore, DB, Kamimori, GH, & **Killgore, WD**. Emotional intelligence moderates the effect of sleep deprivation on moral reasoning [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A135.
64. Murray, CJ, Killgore, DB, Kamimori, GH, & **Killgore, WD**. Individual differences in stress management capacity predict responsiveness to caffeine during sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A43.
65. Murray, CJ, Newman, R, O'Sullivan, M, Killgore, DB, Balkin, TJ, & **Killgore, WD**. Caffeine, dextroamphetamine, and modafinil fail to restore Stroop performance during sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A370-371.
66. Richards, J, Killgore, DB, & **Killgore, WD**. The effect of 44 hours of sleep deprivation on mood using the Visual Analog Mood Scales [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A132.
67. Richards, J, & **Killgore, WD**. The effect of caffeine, dextroamphetamine, and modafinil on alertness and mood during sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A43.

68. Lipizzi, EL, Leavitt, BP, Killgore, DB, Kamimori, GH, & **Killgore, WD**. Decision making capabilities decline with increasing duration of wakefulness [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A131.
69. Lipizzi, EL, Killgore, DB, Kahn-Green, E, Kamimori, GH, & **Killgore, WD**. Emotional intelligence scores decline during sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A131.
70. Kahn-Green, E, Day, L, Conrad, A, Leavitt, BP, Killgore, DB, & **Killgore, WD**. Short-term vs. long-term planning abilities: Differential effects of stimulants on executive function in sleep deprived individuals [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A370.
71. Kahn-Green, E, Conrad, A, Killgore, DB, Kamimori, GH, & **Killgore, WD**. Tired and frustrated: Using a projective technique for assessing responses to stress during sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A130.
72. Killgore, DB, Kahn-Green, E, Balkin, TJ, Kamimori, GH, & **Killgore, WD**. 56 hours of wakefulness is associated with a sub-clinical increase in symptoms of psychopathology [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A130.
73. Killgore, DB, McBride, SA, Balkin, TJ, Leavitt, BP, & **Killgore, WD**. Modafinil improves humor appreciation during sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A42.
74. Reichardt, RM, Killgore, DB, Lipizzi, EL, Li, CJ, Krugler, AL, & **Killgore, WD**. The effects of stimulants on recovery sleep and post-recovery verbal performance following 61-hours of sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A42.
75. Bailey, JD, Richards, J, & **Killgore, WD**. Prediction of mood fluctuations during sleep deprivation with the SAFTE Model [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A60.
76. Kendall, AP, McBride, S. A, & **Killgore, WD**. Visuospatial perception of line orientation is resistant to one night of sleep loss [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A369.
77. Kendall, AP, McBride, SA, Kamimori, GH, & **Killgore, WD**. The interaction of coping skills and stimulants on sustaining vigilance: Poor coping may keep you up at night [abstract].

Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A129.

78. Muckle, A, Killgore, DB, & **Killgore, WD**. Gender differences in the effects of stimulant medications on the ability to estimate unknown quantities when sleep deprived [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A369.
79. Krugler, AL, **Killgore, WD**, & Kamimori, G. H. Trait anger predicts resistance to sleep loss [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A129.
80. **Killgore, WD**, Cotting, DI, Vo, A. H, Castro, CA, & Hoge, CW. The invincibility syndrome: Combat experiences predict risk-taking propensity following redeployment [abstract]. Abstract presented at the 9th Annual Force Health Protection Conference, Albuquerque, NM, August 6-11, 2006.
81. **Killgore, WD**, Wesensten, NJ, & Balkin, TJ. Stimulants improve tactical but not strategic planning during prolonged wakefulness [abstract]. Abstract presented at the 9th Annual Force Health Protection Conference, Albuquerque, NM, August 6-11, 2006.
82. **Killgore, WD**, Balkin, TJ, Wesensten, NJ, & Kamimori, G. H. The effects of sleep loss and caffeine on decision-making [abstract]. Abstract presented at the 9th Annual Force Health Protection Conference, Albuquerque, NM, August 6-11, 2006.
83. **Killgore, WD**, Balkin, TJ, & Kamimori, GH. Sleep loss can impair moral judgment [abstract]. Abstract presented at the 9th Annual Force Health Protection Conference, Albuquerque, NM, August 6-11, 2006.
84. **Killgore, WD**, Lipizzi, EL, Reichardt, RM, Kamimori, GH, & Balkin, TJ. Can stimulants reverse the effects of sleep deprivation on risky decision-making [abstract]? Abstract presented at the 25th Army Science Conference, Orlando, FL, November 27-30, 2006.
85. **Killgore, WD**, Killgore, DB, Kamimori, GH, & Balkin, TJ. Sleep deprivation impairs the emotional intelligence and moral judgment capacities of Soldiers [abstract]. Abstract presented at the 25th Army Science Conference, Orlando, FL, November 27-30, 2006.
86. **Killgore, WD**, Cotting, DI, Vo, AH, Castro, C.A, & Hoge, CW. The post-combat invincibility syndrome: Combat experiences increase risk-taking propensity following deployment [abstract]. Abstract presented at the 25th Army Science Conference, Orlando, FL, November 27-30, 2006.
87. Adam, GE, Szelenyi, ER, **Killgore, WD**, & Lieberman, HR. A double-blind study of two days of caloric deprivation: Effects on judgment and decision-making. Oral paper presentation at the Annual Scientific Meeting of the Aerospace Medical Association, New Orleans, LA, May, 2007.
88. Killgore, DB, Kahn-Greene, ET, Kamimori, GH, & **Killgore, WD**. The effects of acute caffeine withdrawal on short category test performance in sleep deprived individuals [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN,



June 9-14, 2007. SLEEP, 30 (Supplement), A43.

89. Richards, JM, Lipizzi, EL, Kamimori, GH, & **Killgore, WD**. Extroversion predicts change in attentional lapses during sleep deprivation [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A137.
90. Lipizzi, EL, Richards, JM, Balkin, TJ, Grugle, NL, & **Killgore, WD**. Morningness-Eveningness and Intelligence [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A345.
91. Lipizzi, EL, Richards, JM, Balkin, TJ, Grugle, NL, & **Killgore WD**. Morningness-Eveningness affects risk-taking propensity during sleep deprivation [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A136.
92. McBride, SA, Ganesan, G, Kamimori, GH, & **Killgore, WD**. Odor identification ability predicts vulnerability to attentional lapses during 77 hours of sleep deprivation [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A135.
93. Smith, KL, McBride, S. A, Kamimori, GH, & **Killgore, WD**. Individual differences in odor discrimination predict mood dysregulation following 56 hours of sleep deprivation [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A136.
94. McBride, SA, Leavitt, BP, Kamimori, GH, & **Killgore, WD**. Odor identification accuracy predicts resistance to sleep loss. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A137.
95. Killgore, DB, McBride, SA, Balkin, TJ, Grugle, NL. & **Killgore, WD**. Changes in odor discrimination predict executive function deficits following 45 hours of wakefulness [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A136.
96. Rupp, TL, Killgore, DB, Balkin, TJ, Grugle, NL, & **Killgore, WD**. The effects of modafinil, dextroamphetamine, and caffeine on verbal and nonverbal fluency in sleep deprived individuals [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A43.
97. Newman, RA, Krugler, AL, Kamimori, GH, & **Killgore, WD**. Changes in state and trait anger following 56 hours of sleep deprivation [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A138.
98. Rupp, TL, Grugle, NL, Krugler, AL, Balkin, TJ, & **Killgore, WD**. Caffeine, dextroamphetamine, and modafinil improve PVT performance after sleep deprivation and

recovery sleep [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A44.

99. **Killgore, WD**, Lipizzi, EL, Balkin, TJ, Grugle, NL, & Killgore, DB. The effects of sleep deprivation and stimulants on self-reported sensation seeking propensity [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A42.
100. **Killgore, WD**, Richards, JM, Balkin, TJ, Grugle, NL, & Killgore DB. The effects of sleep deprivation and stimulants on risky behavior [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A41.
101. Newman, RA, Smith, KL, Balkin, TJ, Grugle, NL, & **Killgore, WD**. The effects of caffeine, dextroamphetamine, and modafinil on executive functioning following 45 hours of sleep deprivation [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A45.
102. Richards, JM, Lipizzi, EL, Balkin, TJ, Grugle, NL, & **Killgore, WD**. Objective alertness predicts mood changes during 44 hours of sleep deprivation [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A56.
103. **Killgore, WD**, & Yurgelun-Todd, DA. Cortical and Limbic Activation in Response to Visual Images of Low and High-Caloric Food [abstract]. Oral symposium presented at the 6<sup>th</sup> Annual Conference of the Society of Behavioral Nutrition and Physical Activity (ISBNPA), Oslo, Norway, June 20-23, 2007. Proceedings of the ISBNPA, 2007, 75.
104. Estrada, A, **Killgore, WD**, Rouse, T, Balkin, TJ, & Wildzunas, RM. Total sleep time measured by actigraphy predicts academic performance during military training [abstract]. Abstract presented at the 22nd Meeting of the Associated Professional Sleep Societies, Baltimore, MD, June 7-12, 2008. SLEEP, 31 (Supplement), A134.
105. **Killgore, WD**, Lipizzi, EL, Smith, KL, Killgore, DB, Rupp, TL, Kamimori, GH, & Balkin, T. J. Nonverbal intelligence is inversely related to the ability to resist sleep loss [abstract]. Abstract presented at the 22nd Meeting of the Associated Professional Sleep Societies, Baltimore, MD, June 7-12, 2008. SLEEP, 31 (Supplement), A134.
106. **Killgore, WD**, Lipizzi, EL, Killgore, DB, Rupp, TL, Kamimori, GH, & Balkin, TJ. Emotional intelligence predicts declines in emotion-based decision-making following sleep deprivation [abstract]. Abstract presented at the 22nd Meeting of the Associated Professional Sleep Societies, Baltimore, MD, June 7-12, 2008. SLEEP, 31 (Supplement), A134.
107. Reid, CT, Smith, K, **Killgore, WD**, Rupp, TL, & Balkin, TJ. Higher intelligence is associated with less subjective sleepiness during sleep restriction [abstract]. Abstract presented at the 22nd Meeting of the Associated Professional Sleep Societies, Baltimore, MD, June 7-12, 2008. SLEEP, 31 (Supplement), A375.

108. Newman, R, **Killgore, WD**, Rupp, T. L, & Balkin, TJ. Better baseline olfactory discrimination is associated with worse PVT and MWT performance with sleep restriction and recovery [abstract]. Abstract presented at the 22nd Meeting of the Associated Professional Sleep Societies, Baltimore, MD, June 7-12, 2008. SLEEP, 31 (Supplement), A375.
109. Smith, KL, Reid, CT, **Killgore, WD**, Rupp, TL, & Balkin, TJ. Personality factors associated with performance and sleepiness during sleep restriction and recovery [abstract]. Abstract presented at the 22nd Meeting of the Associated Professional Sleep Societies, Baltimore, MD, June 7-12, 2008. SLEEP, 31 (Supplement), A376.
110. Lipizzi, EL, **Killgore, WD**, Rupp, TL, & Balkin, TJ. Risk-taking behavior is elevated during recovery from sleep restriction [abstract]. Abstract presented at the 22nd Meeting of the Associated Professional Sleep Societies, Baltimore, MD, June 7-12, 2008. SLEEP, 31 (Supplement), A376.
111. Lipizzi, EL, Rupp, TL, **Killgore, WD**, & Balkin, TJ. Sleep restriction increases risk-taking behavior [abstract]. Poster presented at the 11th Annual Force Health Protection Conference, Albuquerque, NM, August, 9-15, 2008.
112. **Killgore, WD**, Estrada, A, Balkin, TJ, & Wildzunas, RM. Sleep duration during army training predicts course performance [abstract]. Poster presented at the 11th Annual Force Health Protection Conference, Albuquerque, NM, August, 11-17, 2008.
113. **Killgore, WD**, Lipizzi, EL, Smith, KL, Killgore, DB, Rupp, TL, Kamimori, GH, & Balkin, TJ. Higher cognitive ability is associated with reduced relative resistance to sleep loss [abstract]. Poster presented at the 11th Annual Force Health Protection Conference, Albuquerque, NM, August, 11-17, 2008.
114. **Killgore, WD**, Rupp, TL, Grugle, NL, Lipizzi, EL, & Balkin, TJ. Maintaining alertness during sustained operations: Which stimulant is most effective after 44 hours without sleep [abstract]? Poster presented at the 11th Annual Force Health Protection Conference, Albuquerque, NM, August, 11-17, 2008.
115. **Killgore, WD**, Newman, RA, Lipizzi, EL, Kamimori, GH, & Balkin, TJ. Sleep deprivation increases feelings of anger but reduces verbal and physical aggression in Soldiers [abstract]. Poster presented at the 11th Annual Force Health Protection Conference, Albuquerque, NM, August, 11-17, 2008.
116. Kelley, AM, Dretsch, M, **Killgore, WD**, & Athy, JR. Risky behaviors and attitudes about risk in Soldiers. Abstract presented at the 29<sup>th</sup> Annual Meeting of the Society for Judgment and Decision Making, Chicago, IL, November, 2008.
117. **Killgore, WD**, Ross, AJ, Silveri, MM, Gruber, SA, Kamiya, T, Kawada, Y, Renshaw, PF, & Yurgelun-Todd, DA. Citicoline affects appetite and cortico-limbic responses to images of high calorie foods. Abstract presented at the Society for Neuroscience, Washington DC, November 19, 2008.
118. Britton, JC, Stewart, SE, Price, LM, **Killgore, WD**, Gold, AL, Jenike, MA, & Rauch, SL.

Reduced amygdalar activation in response to emotional faces in pediatric Obsessive-Compulsive Disorder. Abstract presented at the Annual meeting of the American College of Neuropsychopharmacology, Scottsdale, AZ, December 7-11, 2008.

119. **Killgore, WD**, Balkin, TJ, Estrada, A, & Wildzunas, RM. Sleep and performance measures in soldiers undergoing military relevant training. Abstract presented at the 26<sup>th</sup> Army Science Conference, Orlando, FL, December 1-4, 2008.
120. **Killgore, WD** & Yurgelun-Todd, DA. Cerebral correlates of amygdala responses during non-conscious perception of affective faces in adolescent children. Abstract presented at the 37<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Atlanta, GA, February 11-14, 2009.
121. **Killgore, WD**, Killgore, DB, Grugle, NL, & Balkin, TJ. Odor identification ability predicts executive function deficits following sleep deprivation. Abstract presented the 37<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Atlanta, GA, February 11-14, 2009.
122. **Killgore, WD**, Rupp, TL, Killgore, DB, Grugle, NL, and Balkin, TJ. Differential effects of stimulant medications on verbal and nonverbal fluency during sleep deprivation. Abstract presented the 37<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Atlanta, GA, February 11-14, 2009.
123. **Killgore, WD**, Killgore, DB, Kamimori, GH, & Balkin, TJ. When being smart is a liability: More intelligent individuals may be less resistant to sleep deprivation. Abstract presented the 37<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Atlanta, GA, February 11-14, 2009.
124. **Killgore, WD**, Britton, JC, Price, LM, Gold, AL, Deckersbach, T, & Rauch, SL. Introversion is associated with greater amygdala and insula activation during viewing of masked affective stimuli. Abstract presented the 37<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Atlanta, GA, February 11-14, 2009.
125. **Killgore, WD**, Britton, JC, Price, LM, Gold, AL, Deckersbach, T, & Rauch, SL. Amygdala responses of specific animal phobics do not differ from healthy controls during masked fearful face perception. Abstract presented the 37<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Atlanta, GA, February 11-14, 2009.
126. **Killgore, WD**, Britton, JC, Price, LM, Gold, AL, Deckersbach, T, & Rauch, SL. Small animal phobics show sustained amygdala activation in response to masked happy facial expressions. Abstract presented the 37<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Atlanta, GA, February 11-14, 2009. [**\*Merit Poster Award**]
127. Price, LM, **Killgore, WD**, Britton, JC, Kaufman, ML, Gold, AL, Deckersbach, T, & Rauch, SL. Anxiety sensitivity correlates with insula activation in response to masked fearful faces in specific animal phobics and healthy subjects. Abstract presented at the Annual Conference of the Anxiety Disorders Association of America, Santa Ana Pueblo, New Mexico, March 12-15, 2009.
128. **Killgore, WD**, Britton, JC, Price, LM, Gold, AL, Deckersbach, T, & Rauch, SL. Neuroticism is

inversely correlated with amygdala and insula activation during masked presentations of affective stimuli. Abstract presented at the Annual Conference of the Anxiety Disorders Association of America, Santa Ana Pueblo, New Mexico, March 12-15, 2009.

129. **Killgore, WD**, Kelley, AM, & Balkin, TJ. Development and validation of a scale to measure the perception of invincibility. Abstract presented at the Annual Conference of the Anxiety Disorders Association of America, Santa Ana Pueblo, New Mexico, March 12-15, 2009.
130. Kelly, AM, **Killgore WD**, Athy, J, & Dretsch, M. Risk propensity, risk perception, risk aversion, and sensation seeking in U.S. Army soldiers. Abstract presented at the 80<sup>th</sup> Annual Scientific Meeting of the Aerospace Medical Association, Los Angeles, CA, May 3-7, 2009.
131. Britton, JC, Stewart, SE, Price, LM, **Killgore, WD**, Jenike, MA, & Rauch, SL. The neural correlates of negative priming in pediatric obsessive-compulsive disorder (OCD). Abstract presented at the 64<sup>th</sup> Annual Scientific Meeting of the Society of Biological Psychiatry, Vancouver, Canada, May 14-16, 2009.
132. **Killgore, WD**, Killgore, DB, Kamimori, GH, & Balkin, TJ. Caffeine protects against increased risk-taking behavior during severe sleep deprivation. Abstract presented at the 23<sup>rd</sup> Annual Meeting of the Associated Professional Sleep Societies, Seattle, Washington, June 7-12, 2009.
133. Killgore, DB, **Killgore, WD**, Grugle, NL, & Balkin, TJ. Executive functions predict the ability to sustain psychomotor vigilance during sleep loss. Abstract presented at the 23<sup>rd</sup> Annual Meeting of the Associated Professional Sleep Societies, Seattle, Washington, June 7-12, 2009.
134. **Killgore, WD**, & Yurgelun-Todd, DA. Trouble falling asleep is associated with reduced activation of dorsolateral prefrontal cortex during a simple attention task. Abstract presented at the 23<sup>rd</sup> Annual Meeting of the Associated Professional Sleep Societies, Seattle, Washington, June 7-12, 2009.
135. **Killgore, WD**, Kelley, AM, & Balkin, TJ. A new scale for measuring the perception of invincibility. Abstract presented at the 12<sup>th</sup> Annual Force Health Protection Conference, Albuquerque, New Mexico, August 14-21, 2009.
136. **Killgore, WD**, Killgore, DB, Grugle, NL, & Balkin, TJ. Executive functions contribute to the ability to resist sleep loss. Abstract presented at the 12<sup>th</sup> Annual Force Health Protection Conference, Albuquerque, New Mexico, August 14-21, 2009.
137. **Killgore, WD**, Killgore, DB, Kamimori, GH, & Balkin, TJ. Caffeine reduces risk-taking behavior during severe sleep deprivation. Abstract presented at the 12<sup>th</sup> Annual Force Health Protection Conference, Albuquerque, New Mexico, August 14-21, 2009. [**\*Winner Best Paper Award: Research**]
138. **Killgore, WD**, Castro, CA, & Hoge, CW. Normative data for the Evaluation of Risks Scale—Bubble Sheet Version (EVAR-B) for large scale surveys of returning combat veterans. Abstract presented at the 12<sup>th</sup> Annual Force Health Protection Conference, Albuquerque, New Mexico, August 14-21, 2009.

139. **Killgore, WD**, Castro, CA, & Hoge, CW. Combat exposure and post-deployment risky behavior. Abstract presented at the 12<sup>th</sup> Annual Force Health Protection Conference, Albuquerque, New Mexico, August 14-21, 2009.
140. **Killgore, WD**, Price, LM, Britton, JC, Simon, N, Pollack, MH, Weiner, MR, Schwab, ZJ, Rosso, IM, & Rauch, SL. Paralimbic responses to masked emotional faces in PTSD: Disorder and valence specificity. Abstract presented at the Annual McLean Hospital Research Day, January 29, 2010.
141. **Killgore, WD**, Killgore, DB, Kamimori, GH, & Balkin, TJ. Caffeine minimizes behavioral risk-taking during 75 hours of sleep deprivation. Abstract presented at the 38<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Acapulco, Mexico, February 3-6, 2010.
142. **Killgore, WD** & Balkin, TJ. Vulnerability to sleep loss is affected by baseline executive function capacity. Abstract presented at the 38<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Acapulco, Mexico, February 3-6, 2010.
143. **Killgore, WD**, Smith, KL, Reichardt, RM., Killgore, DB, & Balkin, TJ. Intellectual capacity is related to REM sleep following sleep deprivation. Abstract presented at the 38<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Acapulco, Mexico, February 3-6, 2010.
144. **Killgore, WD** & Yurgelun-Todd, DA. Cerebral correlates of amygdala responses to masked fear, anger, and happiness in adolescent and pre-adolescent children. Abstract presented at the 38<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Acapulco, Mexico, February 3-6, 2010.
145. **Killgore, WD**, Post, A, & Yurgelun-Todd, DA. Sex differences in cortico-limbic responses to images of high calorie food. Abstract presented at the 38<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Acapulco, Mexico, February 3-6, 2010.
146. **Killgore, WD** & Yurgelun-Todd, DA. Self-reported insomnia is associated with increased activation within the default-mode network during a simple attention task. Abstract presented at the 38<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Acapulco, Mexico, February 3-6, 2010.
147. **Killgore, WD**, Price, LM, Britton, JC, Gold, AL, Deckersbach, T, & Rauch, SL. Neural correlates of anxiety sensitivity factors during presentation of masked fearful faces. Abstract presented at the 38<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Acapulco, Mexico, February 3-6, 2010.
148. **Killgore, WD**, Grugle, NL, Conrad, TA, & Balkin, TJ. Baseline executive function abilities predict risky behavior following sleep deprivation. Abstract presented at the 24th Annual Meeting of the Associated Professional Sleep Societies, San Antonio, Texas, June 5-9, 2010.
149. **Killgore, WD**, Grugle, NL, & Balkin, TJ. Judgment of objective vigilance performance is affected by sleep deprivation and stimulants. Abstract presented at the 24th Annual Meeting of the Associated Professional Sleep Societies, San Antonio, Texas, June 5-9, 2010.

150. Killgore, DB, **Killgore, WD**, Grugle, NL, & Balkin, TJ. Resistance to sleep loss and its relationship to decision making during sleep deprivation. Abstract presented at the 24th Annual Meeting of the Associated Professional Sleep Societies, San Antonio, Texas, June 5-9, 2010.
151. Killgore DB, **Killgore, WD**, Grugle, NL, & Balkin, TJ. Subjective sleepiness and objective performance: Differential effects of stimulants during sleep deprivation. Abstract presented at the 24th Annual Meeting of the Associated Professional Sleep Societies, San Antonio, Texas, June 5-9, 2010.
152. Rupp, TL, **Killgore, WD**, & Balkin, TJ. Vulnerability to sleep deprivation is differentially mediated by social exposure in extraverts vs. introverts. Oral presentation at the “Data Blitz” section at the 24th Annual Meeting of the Associated Professional Sleep Societies, San Antonio, Texas, June 5-9, 2010.
153. Rupp, TL, **Killgore, WD**, & Balkin, TJ. Extraverts may be more vulnerable than introverts to sleep deprivation on some measures of risk-taking and executive functioning. Abstract presented at the 24th Annual Meeting of the Associated Professional Sleep Societies, San Antonio, Texas, June 5-9, 2010.
154. Rupp, TL, **Killgore, WD**, & Balkin, TJ. Vulnerability to sleep deprivation is differentially mediated by social exposure in extraverts vs. introverts. Abstract presented at the 24th Annual Meeting of the Associated Professional Sleep Societies, San Antonio, Texas, June 5-9, 2010.
155. Capaldi, VF, Guerrero, ML, & **Killgore, WD**. Sleep disorders among OIF and OEF Soldiers. Abstract presented at the 24th Annual Meeting of the Associated Professional Sleep Societies, San Antonio, Texas, June 5-9, 2010.
156. **Killgore, WD**, Killgore, DB, Kamimori, GH, & Balkin, TJ. Caffeine reduces behavioral risk-taking during sleep deprivation. Abstract presented at the 65<sup>th</sup> Annual Meeting of the Society for Biological Psychiatry, New Orleans, Louisiana, May 20-22, 2010.
157. **Killgore, WD**, Price, LM, Britton, JC, Simon, N, Pollack, MH, Weiner, MR, Schwab, ZJ, Rosso, IM, & Rauch, SL. Paralimbic responses to masked emotional faces in PTSD: Disorder and valence specificity. Abstract presented at the 65<sup>th</sup> Annual Meeting of the Society for Biological Psychiatry, New Orleans, Louisiana, May 20-22, 2010.
158. Rosso, IM, Makris, N, Britton, JC, Price, LM, Gold, AL, Deckersbach, T, **Killgore, WD**, & Rauch SL. Anxiety sensitivity correlates with insular cortex volume and thickness in specific animal phobia. Abstract presented at the 65<sup>th</sup> Annual Meeting of the Society for Biological Psychiatry, New Orleans, Louisiana, May 20-22, 2010.
159. Rupp, TL, **Killgore, WD**, & Balkin, TJ. Vulnerability to sleep deprivation is mediated by social exposure in extraverts versus introverts. Oral platform presentation at the 20<sup>th</sup> Congress of the European Sleep Research Society, Lisbon, Portugal, September 14-18, 2010.
160. **Killgore, WD**, Estrada, A, & Balkin, TJ. A tool for monitoring soldier fatigue and predicting cognitive readiness: The Sleep History and Readiness Predictor (SHARP). Abstract presented at the 27<sup>th</sup> Army Science Conference, Orlando, FL, November 29-December 2, 2010.

161. **Killgore, WD**, Kamimori, GH, & Balkin, TJ. Caffeinated gum minimizes risk-taking in soldiers during prolonged sleep deprivation. Abstract presented at the 27<sup>th</sup> Army Science Conference, Orlando, FL, November 29-December 2, 2010.
162. **Killgore, WD**, Britton, JC, Schwab, ZJ, Weiner, MR, Rosso, IM, & Rauch, SL. Exaggerated amygdala responses to masked fearful faces are specific to PTSD versus simple phobia. Oral platform presentation at the 27<sup>th</sup> Army Science Conference, Orlando, FL, November 29-December 2, 2010. [**\*Winner Best Paper in Neuroscience**]
163. **Killgore, WD**, Kamimori, GH, & Balkin, TJ. Sleep deprivation selectively impairs emotional aspects of cognitive functioning. Oral platform presentation at the 27<sup>th</sup> Army Science Conference, Orlando, FL, November 29-December 2, 2010.
164. Rupp, TL, **Killgore, WD**, & Balkin, TJ. Evaluation of personality and social exposure as individual difference factors influencing response to sleep deprivation. Oral platform presentation at the 27<sup>th</sup> Army Science Conference, Orlando, FL, November 29-December 2, 2010.
165. **Killgore, WD**, Britton, JC, Rosso, IM, Schwab, ZJ, Weiner, MR, & Rauch, SL. Shared and differential patterns of amygdalo-cortical activation across anxiety disorders. Abstract presented at the 49<sup>th</sup> Annual Meeting of the American College of Neuropsychopharmacology, Miami Beach, FL, December 5-9, 2010.
166. Rosso, IM, **Killgore, WD**, Britton, JC, Weiner, MR, Schwab, ZJ, & Rauch, SL. Neural correlates of PTSD symptom dimensions during emotional processing: A functional magnetic resonance imaging study. Abstract presented at the 49<sup>th</sup> Annual Meeting of the American College of Neuropsychopharmacology, Miami Beach, FL, December 5-9, 2010.
167. **Killgore, WD**, Rosso, IM, Britton, JC, Schwab, ZJ, Weiner, MR, & Rauch, SL. Cortico-limbic activation differentiates among anxiety disorders with and without a generalized threat response. Abstract presented at the McLean Hospital Research Day, January 13, 2011.
168. Weiner, MR, Schwab, ZJ, Rauch, SL, & **Killgore WD**. Personality factors predict brain responses to images of high-calorie foods. Abstract presented at the McLean Hospital Research Day, January 13, 2011.
169. Schwab, ZJ, Weiner, MR, Rauch, SL, & **Killgore, WD**. Emotional and cognitive intelligence: Support for the neural efficiency hypothesis. Abstract presented at the McLean Hospital Research Day, January 13, 2011.
170. Crowley, DJ, Covell, MJ, **Killgore, WD**, Schwab, ZJ, Weiner, MR, Acharya, D, Rosso, IM, & Silveri, MM. Differential influence of facial expression on inhibitory capacity in adolescents versus adults. Abstract presented at the McLean Hospital Research Day, January 13, 2011.
171. **Killgore, WD**, Britton, JC, Rosso, IM, Schwab, ZJ, Weiner, MR, & Rauch, SL. Similarities and differences in cortico-limbic responses to masked affect probes across anxiety disorders. Abstract presented at the 39<sup>th</sup> Annual Meeting of the International Neuropsychological Society,



Boston, MA, February 2-5, 2011.

172. Rosso, IM, **Killgore, WD**, Britton, JC, Weiner, MR, Schwab, ZJ, & Rauch, SL. Hyperarousal and reexperiencing symptoms of post-traumatic stress disorder are differentially associated with limbic-prefrontal brain responses to threatening stimuli. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.
173. Schwab, ZJ, Weiner, MR, Rauch, SL, & **Killgore, WD**. Neural correlates of cognitive and emotional intelligence in adults. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.
174. Schwab, ZJ, Weiner, MR, Rauch, SL, & **Killgore, WD**. Cognitive and emotional intelligences: Are they distinct or related constructs? Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.
175. Schwab, ZJ, Weiner, MR, Rauch, SL, & **Killgore, WD**. Discrepancy scores between cognitive and emotional intelligence predict neural responses to affective stimuli. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.
176. **Killgore, WD**, Schwab, ZJ, Weiner, MR, & Rauch, SL. Smart people go with their gut: Emotional intelligence correlates with non-conscious insular responses to facial trustworthiness. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.
177. **Killgore, WD**, Weiner, MR, Schwab, ZJ, & Rauch, SL. Whom can you trust? Neural correlates of subliminal perception of facial trustworthiness. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.
178. Weiner, MR, Schwab, ZJ, & Rauch, SL, **Killgore, WD**. Impulsiveness predicts responses of brain reward circuitry to high-calorie foods. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.
179. Weiner, MR, Schwab, ZJ, & Rauch, SL, **Killgore, WD**. Conscientiousness predicts brain responses to images of high-calorie foods. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.
180. Crowley, DJ, Covell, MJ, **Killgore, WD**, Schwab, ZJ, Weiner, MR, Acharya, D, Rosso, IM, & Silveri, MM. Differential influence of facial expression on inhibitory capacity in adolescents versus adults. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.
181. Gruber, SA, Dahlgren, MK, **Killgore, WD**, Sagar, KA, & Racine, MT. Marijuana: Age of onset of use impacts executive function and brain activation. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.
182. **Killgore, WD**, Conrad, TA, Grugle, NL, & Balkin, TJ. Baseline executive function abilities correlate with risky behavior following sleep deprivation. Abstract presented at the 39th Annual

Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.

183. **Killgore, WD**, Grugle, NL, Killgore, DB, & Balkin, TJ. Resistance to sleep loss and decision making during sleep deprivation. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.
184. **Killgore, WD**, Rosso, IM, Britton, JC, Schwab, ZJ, Weiner, MR, & Rauch, SL. Cortico-limbic activation differentiates among anxiety disorders with and without a generalized threat response. Abstract presented at the 66<sup>th</sup> Annual Meeting of the Society for Biological Psychiatry, San Francisco, CA, May 12-14, 2011. [*\*Blue Ribbon Finalist: Clinical/Translational*]
185. Schwab, ZJ, Weiner, MR, Rauch, SL, & **Killgore, WD**. Emotional and cognitive intelligence: Support for the neural efficiency hypothesis. Abstract presented at the 66<sup>th</sup> Annual Meeting of the Society for Biological Psychiatry, San Francisco, CA, May 12-14, 2011.
186. Weiner, MR, Schwab, ZJ, Rauch, SL, & **Killgore WD**. Personality factors predict brain responses to images of high-calorie foods. Abstract presented at the 66<sup>th</sup> Annual Meeting of the Society for Biological Psychiatry, San Francisco, CA, May 12-14, 2011.
187. **Killgore, WD**, Grugle, NL, & Balkin, TJ. Sleep deprivation impairs recognition of specific emotions. Abstract presented at the 25<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 11-15, 2011.
188. **Killgore, WD**, & Balkin, TJ. Does vulnerability to sleep deprivation influence the effectiveness of stimulants on psychomotor vigilance? Abstract presented at the 25<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 11-15, 2011.
189. Killgore, DB, **Killgore, WD**, Grugle, NJ, & Balkin, TJ. Sleep deprivation impairs recognition of specific emotions. Abstract presented at the 25<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 11-15, 2011.
190. Weiner, MR, Schwab, ZJ, & **Killgore, WD**. Daytime sleepiness is associated with altered brain activation during visual perception of high-calorie foods: An fMRI study. Abstract presented at the 25<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 11-15, 2011.
191. Schwab, ZJ, Weiner, MR, & **Killgore, WD**. Functional MRI correlates of morningness-eveningness during visual presentation of high calorie foods. Abstract presented at the 25<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 11-15, 2011.
192. **Killgore, WD**, Weiner, MR, & Schwab, ZJ. Daytime sleepiness affects prefrontal regulation of food intake. Abstract presented at the McLean Hospital Research Day, January 11, 2012.
193. Kipman, M, Schwab ZJ, Weiner, MR, DelDonno, S, Rauch SL, & **Killgore WD**. The insightful yet bitter comedian: The role of emotional versus cognitive intelligence in humor appreciation. Abstract presented at the McLean Hospital Research Day, January 11, 2012.

194. Weber, M, & **Killgore, WD**. Gray matter correlates of emotional intelligence. Abstract presented at the McLean Hospital Research Day, January 11, 2012.
195. Schwab, ZJ, & **Killgore, WD**. Sex differences in functional brain responses to food. Abstract presented at the McLean Hospital Research Day, January 11, 2012.
196. DelDonno, S, Schwab, ZJ, Kipman M, Rauch, SL, & **Killgore, WD**. The influence of cognitive and emotional intelligence on performance on the Iowa Gambling Task. Abstract presented at the McLean Hospital Research Day, January 11, 2012.
197. Song, CH, Kizielewicz, J, Schwab, ZJ, Weiner, MR, Rauch, SL, & **Killgore, WD**. Time is of the essence: The Design Organization Test as a valid, reliable, and brief measure of visuospatial ability. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.
198. Kipman, M, Schwab, ZJ, DelDonno, S, & **Killgore, WD**. Gender differences in the contribution of cognitive and emotional intelligence to the left visual field bias for facial perception. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.
199. Kipman, M., Schwab, ZJ, Weiner, MR, DelDonno, S, Rauch, SL, & **Killgore, WD**. Contributions of emotional versus cognitive intelligence in humor appreciation. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.
200. Schwab, ZJ, & **Killgore, WD**. Disentangling emotional and cognitive intelligence. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.
201. Schwab, ZJ, & **Killgore, WD**. Sex differences in functional brain responses to food. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.
202. DelDonno, S, Schwab, ZJ, Kipman, M, Rauch, SL, & **Killgore, WD**. The influence of cognitive and emotional intelligence on performance on the Iowa Gambling Task. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.
203. **Killgore, WD**, Britton, JC, Rosso, IM, Schwab, ZJ, Weiner, MR, & Rauch, SL. Shared and unique patterns of cortico-limbic activation across anxiety disorders. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.
204. **Killgore, WD**, & Balkin, TJ. Sleep deprivation degrades recognition of specific emotions. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.
205. **Killgore, WD**, & Schwab, ZJ. Emotional intelligence correlates with somatic marker circuitry

responses to subliminal cues of facial trustworthiness. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.

206. **Killgore, WD**, & Schwab, ZJ. Trust me! Neural correlates of the ability to identify facial trustworthiness. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.
207. **Killgore, WD**, Schwab, ZJ, Weiner, MR, Kipman, M, DelDonno, S, & Rauch SL. Overeating is associated with altered cortico-limbic responses to images of high calorie foods. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.
208. **Killgore, WD**, Weiner, MR, & Schwab, ZJ. Daytime sleepiness affects prefrontal regulation of food intake. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.
209. Weber, M, DelDonno, S, Kipman M, Schwab, ZJ, & **Killgore WD**. Grey matter correlates of self-reported sleep duration. Abstract presented at the Harvard Medical School Research Day, Boston, MA, March 28, 2012.
210. **Killgore, WD**. Overlapping and distinct patterns of neurocircuitry across PTSD, Panic Disorder, and Simple Phobia. Abstract presented at the 32nd Annual Conference of the Anxiety Disorders Association of America, Arlington, VA, April 12-15, 2012.
211. **Killgore, WD**, Britton, JC, Rosso, IM, Schwab, ZJ, & Rauch, SL. Shared and unique patterns of cortico-limbic activation across anxiety disorders. Abstract presented at the 67<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, Philadelphia, PA, May 3-5, 2012.
212. **Killgore, WD**, Schwab, ZJ, & Rauch, SL. Daytime sleepiness affects prefrontal inhibition of food consumption. Abstract presented at the 67<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, Philadelphia, PA, May 3-5, 2012.
213. Rosso, IM, Britton, JC, Makris, N, **Killgore, WD**, Rauch SL, & Stewart ES. Impact of major depression comorbidity on prefrontal and anterior cingulate volumes in pediatric OCD. Abstract presented at the 67<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, Philadelphia, PA, May 3-5, 2012.
214. Kipman, M, Weber, M, DelDonno, S., Schwab, ZJ, & **Killgore, WD**. Morningness-Eveningness correlates with orbitofrontal gray matter volume. Abstract presented at the 26<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.
215. Kipman, M, Schwab, ZJ, Weber, M, DelDonno, S, & **Killgore, WD**. Yawning frequency is correlated with reduced medial thalamic volume. Abstract presented at the 26<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.
216. Weber, M, DelDonno, S, Kipman M, Schwab, ZJ, & **Killgore WD**. Grey matter correlates of daytime sleepiness. Abstract presented at the 26<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.

217. Weber, M, DelDonno, S, Kipman M, Schwab, ZJ, & **Killgore WD**. Grey matter correlates of self-reported sleep duration. Abstract presented at the 26<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.
218. DelDonno, S, Weber, M, Kipman M, Schwab, ZJ, & **Killgore, WD**. Resistance to insufficient sleep correlates with olfactory cortex gray matter. Abstract presented at the 26<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.
219. DelDonno, S, Schwab, ZJ, Kipman, M, Weber, M, & **Killgore, WD**. Weekend sleep is related to greater coping and resilience capacities. Abstract presented at the 26<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.
220. Schwab, ZJ, DelDonno, S, Weber, M, Kipman M, & **Killgore, WD**. Habitual caffeine consumption and cerebral gray matter volume. Abstract presented at the 26<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.
221. Schwab, ZJ, & **Killgore, WD**. Daytime sleepiness affects prefrontal regulation of food intake. Abstract presented at the 26<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.
222. **Killgore, WD**, Schwab, ZJ, DelDonno S, Kipman, M, Weber M, & Rauch, SL. Greater nocturnal sleep time is associated with increased default mode functional connectivity. Abstract presented at the 26<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.
223. **Killgore, WD**, Kamimori, GH, & Balkin, TJ. Caffeine improves efficiency of planning and sequencing abilities during sleep deprivation. Abstract presented at the 26<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.
224. Sneider, JT, **Killgore, WD**, Crowley, DJ, Cohen-Gilbert, JE, Schwab, ZJ, & Silveri, MM. Inhibitory capacity in emerging adult binge drinkers: Influence of Facial Cues. Abstract presented at the 35<sup>th</sup> Annual Scientific Meeting of the Research Society on Alcoholism, San Francisco, CA, June 23-27, 2012.
225. **Killgore WD**. Multimodal neuroimaging to predict cognitive resilience against sleep loss. Abstract presented at the DARPA Young Faculty Award 2012 Meeting, Arlington, VA, July 30-31, 2012. [***\*Winner Young Faculty Award in Neuroscience***]
226. Cohen-Gilbert, JE, **Killgore WD**, Crowley, DJ, Covell, MJ, Schwab, ZJ, Weiner, MR, Acharya, D, Sneider, JT, & Silveri, MM. Differential influence of safe versus threatening facial expressions on inhibitory control across adolescence and adulthood. Abstract presented at the Society for Neuroscience 2012 Meeting, New Orleans, LA, October 13-17, 2012.
227. Weber, M, DelDonno, S, Kipman M, Schwab, ZJ, & **Killgore WD**. Grey matter correlates of self-reported sleep duration. Abstract presented at the Harvard Division of Sleep Medicine Annual Poster Session, Boston, MA, September 27, 2012.

228. Weber, M, DelDonno, SR, Kipman, M, Preer, LA, Schwab ZJ, Weiner, MR, & **Killgore, WD**. The effect of morning bright light therapy on sleep, cognition and emotion following mild traumatic brain injury. Abstract presented at the 2012 Sleep Research Network Meeting, 22-23 October 2012, Bethesda, MD.
229. Sneider, JT, **Killgore, WD**, Crowley, DJ, Cohen-Gilbert, JE, Schwab, ZJ, & Silveri, MM. Inhibitory capacity in emerging adult binge drinkers: Influence of Facial Cues. Abstract presented at the Annual McLean Hospital Research Day, January 16, 2013.
230. Cohen-Gilbert, JE, **Killgore WD**, Crowley, DJ, Covell, MJ, Schwab, ZJ, Weiner, MR, Acharya, D, Sneider, JT, & Silveri, MM. Differential influence of safe versus threatening facial expressions on inhibitory control across adolescence and adulthood. Abstract presented at the Annual McLean Hospital Research Day, January 16, 2013.
231. Tkachenko, O, Schwab, ZJ, Kipman, M, DelDonno, S, Gogel, H., Preer, L, & **Killgore, WD**. Smarter women need less sleep. Abstract presented at the Annual McLean Hospital Research Day, January 16, 2013.
232. DelDonno, S, Kipman, M, Schwab, ZJ, & **Killgore, WD**. The contributions of emotional intelligence and facial perception to social intuition. Abstract presented at the Annual McLean Hospital Research Day, January 16, 2013.
233. Kipman, M, Schwab, ZJ, DelDonno, S, Weber, M, Rauch, SL, & **Killgore, WD**. The neurocircuitry of impulsive behavior. Abstract presented at the Annual McLean Hospital Research Day, January 16, 2013.
234. Preer, LA, Tkachenko, O, Gogel, H, Schwab, ZJ, Kipman, M, DelDonno, SR, Weber, M, Webb, CA, & **Killgore, WD**. Emotional intelligence as a mediator of the association between anxiety sensitivity and anxiety symptoms. Abstract presented at the Annual McLean Hospital Research Day, January 16, 2013.
235. Gogel, H, DelDonno, S, Kipman M, Preer, LA, Schwab, ZJ, Tkachenko, O, & **Killgore, WD**. Validation of the Design Organization Test (DOT) in a healthy population. Abstract presented at the Annual McLean Hospital Research Day, January 16, 2013.
236. Brennan, BP, Schwab, ZS, Athey, AJ, Ryan, EM, Pope, HG, **Killgore, WD**, Jenike, MA, & Rauch, SL. A functional magnetic resonance imaging study of rostral anterior cingulate cortex activation in obsessive-compulsive disorder using an emotional counting stroop paradigm. Abstract presented at the Annual McLean Hospital Research Day, January 16, 2013.
237. Cohen-Gilbert, JE, Schwab, ZJ, **Killgore, WD**, Crowley, DJ, & Silveri MM. Influence of Binge Drinking on the Neural Correlates of Inhibitory Control during Emotional Distraction in Young Adults. Abstract presented at the 3<sup>rd</sup> International Conference on Applications of Neuroimaging to Alcoholism (ICANA-3), New Haven, CT, February 15-18, 2013.
238. Weber, M, & **Killgore, WD**. The interrelationship between ‘sleep credit’, emotional intelligence and mental health – a voxel-based morphometric study. Abstract presented at Harvard Medical School Psychiatry Research Day, April 10, 2013.

239. Cohen-Gilbert, JE, Schwab, ZJ, **Killgore, WD**, Crowley, DJ, & Silveri MM. Influence of Binge Drinking on the Neural Correlates of Inhibitory Control during Emotional Distraction in Young Adults. Abstract presented at Harvard Medical School Psychiatry Research Day, April 10, 2013.
240. Mundy, EA, Weber, M, Rauch, SL, **Killgore, WD**, & Rosso, IM. The relationship between subjective stress levels in childhood and anxiety as well as perceived stress as an adult. Abstract presented at Harvard Medical School Psychiatry Research Day, April 10, 2013.
241. Webb, CA, **Killgore, WD**, Britton, JC, Schwab, ZJ, Price, LM, Weiner, MR, Gold, AL, Rosso, IM, Simon, NM, Pollack, MH, & Rauch, SL. Comparing categorical versus dimensional predictors of functional response across three anxiety disorders. Abstract presented at the 68<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.
242. Preer, LA, Tkachenko, O, Gogel, H, Schwab, ZJ, Kipman, M, DelDonno, SR, Weber, M, Webb, CA, Rauch, SL, & **Killgore, WD**. Linking Sleep Trouble to Neuroticism, Emotional Control, and Impulsiveness. Abstract presented at the 68<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.
243. Preer, LA, Tkachenko, O, Gogel, H, Schwab, ZJ, Kipman, M, DelDonno, SR, Weber, M, Webb, CA, Rauch, SL, & **Killgore, WD**. Emotional Intelligence as a Mediator of the Association between Anxiety Sensitivity and Anxiety Symptoms. Abstract presented at the 68<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.
244. Kipman, M, Schwab, ZJ, DelDonno, S, Weber, M, Rauch, SL, & **Killgore, WD**. The neurocircuitry of impulsive behavior. Abstract presented at the 68<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.
245. Weber, M, **Killgore, WD**, Rosso, IM, Britton, JC, Simon, NM, Pollack, MH, & Rauch, SL. Gray matter correlates of posttraumatic stress disorder—A voxel based morphometry study. Abstract presented at the 68<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.
246. Weber, M, Penetar, DM, Trksak, GH, DelDonno, SR, Kipman, M, Schwab, ZJ, & **Killgore, WD**. Morning blue wavelength light therapy improves sleep, cognition, emotion and brain function following mild traumatic brain injury. Abstract presented at the 68<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.
247. Tkachenko, O, Schwab, ZJ, Kipman, M, Preer, LA, Gogel, H, DelDonno, SR, Weber, M, Webb, CA, Rauch, SL, & **Killgore, WD**. Difficulty in falling asleep and staying asleep linked to a sub-clinical increase in symptoms of psychopathology. Abstract presented at the 68<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.
248. **Killgore, WD**, Schwab, ZJ, Kipman, M, DelDonno, SR, Rauch, SL, & Weber, M. Problems with sleep initiation and sleep maintenance correlate with functional connectivity among primary sensory cortices. Abstract presented at the 68<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.

249. **Killgore, WD**, Schwab, ZJ, Kipman, M, DelDonno, SR, Rauch, SL, & Weber, M. A Couple of Hours Can Make a Difference: Self-Reported Sleep Correlates with Prefrontal-Amygdala Connectivity and Emotional Functioning. Abstract presented at the 68<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.
250. Brennan, BP, Schwab, ZS, Athey, AJ, Ryan, EM, Pope, HG, **Killgore, WD**, Jenike, MA, & Rauch, SL. A functional magnetic resonance imaging study of rostral anterior cingulate cortex activation in obsessive-compulsive disorder using an emotional counting stroop paradigm. Abstract presented at the 68<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.
251. Weber, M, & **Killgore, WD**. The interrelationship between ‘sleep credit’, emotional intelligence and mental health – a voxel-based morphometric study. Abstract presented at the SLEEP 2013 Annual Meeting, Baltimore, MD, June 1-5, 2013.
252. Weber, M, Penetar, DM, Trksak, GH, DelDonno, SR, Kipman, M, Schwab, ZJ, & **Killgore, WD**. Morning blue wavelength light therapy improves sleep, cognition, emotion and brain function following mild traumatic brain injury. Abstract presented at the SLEEP 2013 Annual Meeting, Baltimore, MD, June 1-5, 2013.
253. **Killgore, WD**, Schwab, ZJ, Kipman, M, DelDonno, SR, & Weber, M. Problems with Sleep Initiation and Sleep Maintenance Correlate with Functional Connectivity Among Primary Sensory Cortices. Abstract presented at the SLEEP 2013 Annual Meeting, Baltimore, MD, June 1-5, 2013.
254. **Killgore, WD**, Schwab, ZJ, Kipman, M, DelDonno, SR, & Weber, M. A Couple of Hours Can Make a Difference: Self-Reported Sleep Correlates with Prefrontal-Amygdala Connectivity and Emotional Functioning. Abstract presented at the SLEEP 2013 Annual Meeting, Baltimore, MD, June 1-5, 2013.
255. Tkachenko, O, Schwab, ZJ, Kipman, M, DelDonno, SR, Preer, LA, Gogel, H, Weber, M, Webb, CA, & **Killgore, WD**. Difficulty in falling asleep and staying asleep linked to a sub-clinical increase in symptoms of psychopathology. Abstract presented at the SLEEP 2013 Annual Meeting, Baltimore, MD, June 1-5, 2013.
256. Preer, LA, Tkachenko, O, Gogel, H, Schwab, ZJ, Kipman, M, DelDonno, SR, Weber, M, Webb, CA, & **Killgore, WD**. Linking Sleep Initiation Trouble to Neuroticism, Emotional Control, and Impulsiveness. Abstract presented at the SLEEP 2013 Annual Meeting, Baltimore, MD, June 1-5, 2013.
257. **Killgore, WD**. Sleep duration contributes to cortico-limbic functional connectivity, emotional functioning, & psychological health. Abstract presented at the 52<sup>nd</sup> Annual Meeting of the American College of Neuropsychopharmacology, Hollywood, FL, December 8-12, 2013.
258. Preer, L, Tkachenko, O, Gogel, H, Bark, JS, Kipman, M, Olson, EA, & **Killgore, WD**. The role of personality in sleep initiation problems. Abstract presented at the Annual McLean Hospital Research Day, January 22, 2014.



259. Demers, LA, Olson, EA, Weber, M, Divatia, S, Preer, L, & **Killgore, WD**. Paranoid traits are related to deficits in complex social decision-making and reduced superior temporal sulcus volume. Abstract presented at the Annual McLean Hospital Research Day, January 22, 2014.
260. Tkachenko, O, Weber, M, Gogel, H, & **Killgore, WD**. Predisposition towards unhealthy foods linked with increased gray matter in the cerebellum. Abstract presented at the Annual McLean Hospital Research Day, January 22, 2014.
261. Olson, EA, Weber, M, Tkachenko, O, & **Killgore, WD**. Daytime sleepiness is associated with decreased integration of remote outcomes on the IGT. Abstract presented at the Annual McLean Hospital Research Day, January 22, 2014.
262. Cui, J, Tkachenko, O, & **Killgore, WD**. Can the activation of anterior cingulate predict the emotional suppression? An fMRI study with masked faces. Abstract presented at the Annual McLean Hospital Research Day, January 22, 2014.
263. Gogel, H, & **Killgore WDS**. A psychometric validation of the Design Organization Test (DOT) in a healthy sample. Abstract presented at the 42nd Annual Meeting of the International Neuropsychological Society, Seattle WA, February 12-15, 2014.
264. **Killgore, WD**, Kipman, M, Tkachenko, O, Gogel, H., Preer, L, Demers, LA, Divatia, SC, Olson, EA, & Weber, M. Predicting resilience against sleep loss with multi-modal neuroimaging. Abstract presented at the 42nd Annual Meeting of the International Neuropsychological Society, Seattle WA, February 12-15, 2014.
265. **Killgore, WD**, Weber, M, Bark, JS, Kipman, M, Gogel, H, Preer, L, Tkachenko, O, Demers, LA, Divatia, SC, & Olson, EA. Physical exercise correlates with hippocampal volume in healthy adults. Abstract presented at the 42nd Annual Meeting of the International Neuropsychological Society, Seattle WA, February 12-15, 2014.
266. **Killgore, WD**, Tkachenko, O, Weber, M, Kipman, M, Preer, L, Gogel, H, & Olson, EA. The association between sleep, functional connectivity, and emotional functioning. Abstract presented at the 42nd Annual Meeting of the International Neuropsychological Society, Seattle WA, February 12-15, 2014.
267. Preer, L, Tkachenko, O, Gogel, H, Bark, JS, Kipman, M, Olson, EA, & **Killgore, WD**. The role of personality in sleep initiation problems. Abstract presented at the 42nd Annual Meeting of the International Neuropsychological Society, Seattle WA, February 12-15, 2014.
268. Tkachenko, O, Weber, M, Olson, EA, Gogel, H, Preer, LA, Divatia, SC, Demers, LA, & **Killgore, WD**. Gray matter volume within the medial prefrontal cortex correlates with behavioral risk taking. Abstract presented at the 42nd Annual Meeting of the International Neuropsychological Society, Seattle WA, February 12-15, 2014.
269. Olson, EA, Weber, M, Bark JS, Demers L, Divatia, SC, Gogel, H, Kipman M, Preer, L, Tkachenko, O, & **Killgore, WD**. Sex differences in threat evaluation of emotionally neutral faces. Abstract presented at the 42nd Annual Meeting of the International Neuropsychological Society, Seattle WA, February 12-15, 2014.

270. Cui, J, Tkachenko, O, & **Killgore, WD**. Can the activation of anterior cingulate predict the emotional suppression? An fMRI study with masked faces. Abstract presented at the 36nd Annual Conference of the Anxiety Disorders Association of America, Chicago, IL, March 27-30, 2014.
271. Webb, CA, Weber, M, Mundy, EA, & **Killgore, WD**. Reduced gray matter volume in the anterior cingulate, orbitofrontal cortex and thalamus as a function of depressive symptoms: A voxel-based morphometric analysis. Abstract presented at the 36nd Annual Conference of the Anxiety Disorders Association of America, Chicago, IL, March 27-30, 2014.
272. Weber, M, Penetar, DM, Trksak, GH, Kipman, M, Tkachenko, O, Bark, JS, Jorgensen, AL, Rauch, SL, & **Killgore, WD**. Light therapy may improve sleep and facilitate recovery from mild traumatic brain injury. Abstract presented at the 10<sup>th</sup> World Congress on Brain Injury, San Francisco, CA, March 19-22, 2014.
273. Cui, J, Tkachenko, O, & **Killgore, WD**. Can the activation of anterior cingulate predict the emotional suppression? An fMRI study with masked faces. Abstract presented at the 21st Annual Meeting of the Cognitive Neuroscience Society, Boston, MA, April 5-8, 2014.
274. Divatia, S, Demers, LA, Preer, L, Olson, EA, Weber, M, & **Killgore, WD**. Advantageous decision making linked with increased gray matter volume in the ventromedial prefrontal cortex. Abstract presented at the 21st Annual Meeting of the Cognitive Neuroscience Society, Boston, MA, April 5-8, 2014.
275. Demers, LA, Olson, EA, Weber, M, Divatia, S, Preer, L, & **Killgore, WD**. Paranoid traits are related to deficits in complex social decision making and reduced superior temporal sulcus volume. Abstract presented at the 21st Annual Meeting of the Cognitive Neuroscience Society, Boston, MA, April 5-8, 2014.
276. Preer, LA, Weber, M, Tkachenko, O, Divatia, S, Demers, LA, Olson, EA, & **Killgore, WD**. Gray matter volume in the amygdala is associated with facial assessments of trustworthiness. Abstract presented at the 21st Annual Meeting of the Cognitive Neuroscience Society, Boston, MA, April 5-8, 2014.
277. Tkachenko, O, Weber, M, Gogel, H, & **Killgore, WD**. Predisposition towards unhealthy foods linked with increased gray matter volume in the cerebellum. Abstract presented at the 21st Annual Meeting of the Cognitive Neuroscience Society, Boston, MA, April 5-8, 2014.
278. Olson, EA, Weber, M, Gogel, H, & **Killgore, WD**. Daytime sleepiness is associated with decreased integration of remote outcomes on the IGT. Abstract presented at the 21st Annual Meeting of the Cognitive Neuroscience Society, Boston, MA, April 5-8, 2014.
279. Demers, LA, Preer, LA, Gogel, H, Olson, EA, Weber, M, & **Killgore, WD**. Left-hemifield bias on sad chimeric face task correlates with interpersonal emotional intelligence. Abstract presented at the 69th Annual Meeting of the Society of Biological Psychiatry, New York, NY, May 8-10, 2014.

280. Weber, M, **Killgore, WD**, Olson, EA, Rosso, IM, & Rauch, SL. Morphological brain network organization in relation to trauma and posttraumatic stress disorder. Abstract presented at the 69th Annual Meeting of the Society of Biological Psychiatry, New York, NY, May 8-10, 2014.
281. Divatia, S, Demers, LA, Preer, L, Gogel, H, Kipman, M, & **Killgore, WD**. Schizotypal and manic traits are associated with poorer perception of emotions in healthy individuals. Abstract presented at the 69th Annual Meeting of the Society of Biological Psychiatry, New York, NY, May 8-10, 2014.
282. **Killgore, WD**, Weber, M, Olson, EA, & Rauch, SL. Sleep reduction and functioning of the emotion regulation circuitry. Abstract presented at the 69th Annual Meeting of the Society of Biological Psychiatry, New York, NY, May 8-10, 2014. [**\*Blue Ribbon Finalist for Top Poster Award: Basic Neuroscience**]
283. Webb, CA, Weber, M, Mundy, EA, & **Killgore, WD**. Reduced gray matter volume in the anterior cingulate, orbitofrontal cortex and thalamus as a function of depressive symptoms: A voxel-based morphometric analysis. Abstract presented at the 69th Annual Meeting of the Society of Biological Psychiatry, New York, NY, May 8-10, 2014.
284. Marin MF, Song H, Landau AJ, Lasko NB, Foy Preer LA, Campbell A, Pace-Schott EF, **Killgore WD**, Orr SP, Pitman RK, Simon NM, Milad MR (2014). Psychophysiological and Neuroimaging Correlates of Fear Extinction Deficits Across Anxiety Disorders. Abstract presented at the 69th Annual Meeting of the Society of Biological Psychiatry, New York, NY, May 8-10, 2014.
285. **Killgore, WD**. The effects of sleep loss on food preference. Abstract presented at SLEEP 2014, Minneapolis, MN, May 31-June 4, 2014.
286. Weber, M, & **Killgore, WD**. Sleep habits reflect in functional brain network organization. Abstract presented at SLEEP 2014, Minneapolis, MN, May 31-June 4, 2014. [**\*2014 AASM Young Investigator Award, Honorable Mention**]
287. Freed, MC, Novak, LA, **Killgore, WD**, Koehlmoos, TP, Ginsberg, JP, Krupnick, J, Rauch S, Rizzo, A, Engle, CC. DoD IRB delays: Do they really matter? And if so, why and for whom? Abstract presented at the Military Health System Research Symposium, Fort Lauderdale, FL, August 18-21, 2014.
288. Freed, MC, Novak, LA, **Killgore, WD**, Koehlmoos, TP, Ginsberg, JP, Krupnick, J, Rauch S, Rizzo, A, Engle, CC. DoD IRB delays: Do they really matter? And if so, why and for whom? Abstract presented at the AMSUS Annual Meeting, Washington DC, December 2-5, 2014.
289. **Killgore, WD**, Demers, LA, Olson, EA, Rosso, IM, Webb, CA, & Rauch, SL. Anterior cingulate gyrus and sulcus thickness: A potential predictor of remission following internet-based cognitive behavioral therapy for major depressive disorder. Abstract presented at the 53<sup>rd</sup> Annual Meeting of the American College of Neuropsychopharmacology, Phoenix, AZ, December 7-11, 2014.
290. Olson, EA, Buchholz, J, Rosso, IM, **Killgore, WD**, Webb, CA, Gogel, H, & Rauch, SL. Internet-based cognitive behavioral therapy effects on symptom severity in major depressive disorder: preliminary results from a randomized controlled trial. Abstract presented at the 53<sup>rd</sup> Annual

Meeting of the American College of Neuropsychopharmacology, Phoenix, AZ, December 7-11, 2014.

291. Brennan, B, Tkachenko, O, Schwab, Z, Ryan, E, Athey, A, Pope, H, Dougherty, D, Jenike, M, **Killgore, WD**, Hudson, J, Jensen, E, & Rauch SL. Abstract presented at the 53<sup>rd</sup> Annual Meeting of the American College of Neuropsychopharmacology, Phoenix, AZ, December 7-11, 2014.
292. Alkozei, A, Pisner, D, & **Killgore, WD**. Emotional intelligence is differentially correlated with prefrontal cortical responses to backward masked fearful and angry faces. Abstract presented at the 43<sup>rd</sup> Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.
293. Alkozei, A, Schwab, Z, & **Killgore, WD**. Looking for evil intent: Emotional intelligence and the use of socially relevant facial cues during an emotional decision making task. Abstract presented at the 43<sup>rd</sup> Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.
294. Shane, BR, Alkozei, A, & **Killgore, WD**. The contribution of general intelligence and emotional intelligence to the ability to appreciate humor. Abstract presented at the 43<sup>rd</sup> Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.
295. Markowski, SM, Alkozei, A, & **Killgore, WD**. Sleep onset latency and duration are associated with self-perceived invincibility. Abstract presented at the 43<sup>rd</sup> Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.
296. Pisner, D, Alkozei, A, & **Killgore, WD**. Visuospatial reasoning mediates the relationship between emotion recognition and emotional intelligence. Abstract presented at the 43<sup>rd</sup> Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.
297. Vanuk, JR, Fridman, A, Demers, LA, Divatia, S, & **Killgore, WD**. Engaging in meditation and internet based training as a means of enhancing emotional intelligence. Abstract presented at the 43<sup>rd</sup> Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.
298. Vanuk, JR, Divatia, S, Demers, LA, Markowski, SM, & **Killgore, WD**. Napping in conjunction with brief internet-based training as a means of enhancing emotional intelligence. Abstract presented at the 43<sup>rd</sup> Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.
299. Cui, J, Tkachenko, O, Gogel, H, Kipman, M, Preer, LA, Weber, M, Divatia, SC, Demers, LA, Olson, EA, Buchholz, JL, Bark, JS, Rosso, IM, Rauch, SL, & **Killgore, WD**. Fractional Anisotropy of frontoparietal connections predicts individual resistance to sleep deprivation. Abstract presented at the 43<sup>rd</sup> Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.
300. **Killgore, WD**, Olson, EA, Weber, M, Rauch, SL, & Nickerson, LD. Emotional intelligence is associated with coordinated resting state activity between emotion regulation and interoceptive

experience networks. Abstract presented at the 43<sup>rd</sup> Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.

301. **Killgore, WD**, Demers, LA, Divatia, S, Kipman, M, Tkachenko, O, Weber, M, Preer, LA, Gogel, H, Olson, EA, Vanuk, JR, & Rauch, SL. Enhancing emotional intelligence via brief internet-based training. Abstract presented at the 43<sup>rd</sup> Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.
302. Buchholz, JL, Rosso, IM, Olson, EA, **Killgore, WD**, Fukunaga, R, Webb, CA, & Rauch, SL. Internet-based cognitive behavioral therapy is associated with symptom reduction and cognitive restructuring in adults with major depressive disorder. Abstract presented at the Anxiety and Depression Conference, Miami, FL, April 9-12, 2015.
303. Alkozei, A, Pisner, D, Rauch, SL, & **Killgore, WD**. Emotional intelligence and subliminal presentations of social threat. Abstract presented at the 70<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.
304. Shane, BR, Alkozei, A, Vanuk, JR, Weber, M, & **Killgore, WD**. The effect of bright light therapy for improving sleep among individuals with mild traumatic brain injury. Abstract presented at the 70<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.
305. Vanuk, JR, Shane, BR, Alkozei, A, & **Killgore, WD**. Trait emotional intelligence is associated with greater resting state functional connectivity within the default mode and task positive networks. Abstract presented at the 70<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.
306. Vanuk, JR, Fridman, A, Demers, LA, & **Killgore, WD**. Engaging in meditation and internet-based training as a means of enhancing emotional intelligence. Abstract presented at the 70<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.
307. Pisner, D, Alkozei, A, & **Killgore, WD**. Trait emotional suppression is associated with decreased activation of the insula and thalamus in response to masked angry faces. Abstract presented at the 70<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.
308. Markowski, SM, Alkozei, A, & **Killgore, WD**. The trait of neuroticism predicts neurocognitive performance in healthy individuals. Abstract presented at the 70<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.
309. Buchholz, JL, Rosso, IM, **Killgore, WD**, Fukunaga, R, Olson, EA, Demers, LA, & Rauch, SL. Amygdala volume is associated with helplessness in adults with major depressive disorder (MDD). Abstract presented at the 70<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.
310. Sneider, JT, **Killgore, WD**, Rauch, SL, Jensen, JE, & Silveri, MM. Sex differences in the associations between prefrontal GABA and resistance to sleep deprivation. Abstract presented at the 70<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-

16, 2015.

311. **Killgore, WD**, Rosso, IM, Rauch, SL, & Nickerson, LD. Emotional intelligence correlates with coordinated resting state activity between brain networks involved in emotion regulation and interoceptive experience. Abstract presented at the 70<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.
312. **Killgore, WD**, Demers, LA, Divatia, S, Rosso, IM, & Rauch, SL. Boosting Emotional intelligence with a brief internet-based program. Abstract presented at the 70<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.
313. **Killgore, WD**, Vanuk, JR, Alkozei, A, Markowski, SM, Pisner, D, Shane, BR, Fridman, A, & Knight, SA. Greater daytime sleepiness correlates with altered thalamocortical connectivity. Abstract presented at the 70<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.
314. **Killgore, WD**, Tkachenko, O, Gogel, H, Kipman, M, Sonis, LA, Divatia, SC, Demers, LA, Olson, EA, Buchholz, JL, Rosso, IM, & Rauch, SL. Activation of the ventral striatum predicts overeating during subsequent sleep loss. Abstract presented at the 70<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.
315. Alkozei, A, Markowski, SM, Shane, BR, Rauch, SL, & **Killgore, WD**. Emotional resilience is not associated with increased emotional resistance to sleep deprivation. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.
316. Alkozei, A, Pisner, D, Markowski, SM, Rauch, SL, & **Killgore, WD**. The effect of emotional resilience on changes in appetite for high-sugary food during sleep loss. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.
317. Markowski, SM, Alkozei, A, Rauch, SL, & **Killgore, WD**. Self-perceived invincibility is associated with sleep onset latency and duration. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.
318. Markowski, SM, Alkozei, A, Rauch, SL, & **Killgore, WD**. Sex differences in the association between personality and resistance to sleep deprivation. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.
319. Shane, BR, Alkozei, A, & **Killgore, WD**. Physical exercise may contribute to vulnerability to sleep deprivation. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.
320. Cui, J, Tkachenko, O, Gogel, H, Kipman, M, Sonis, LA, Weber, M, Divatia, SC, Demers, LA, Olson, EA, Buchholz, JL, Rosso, IM, Rauch, SL, & **Killgore, WD**. Resistance to sleep deprivation involves greater functional activation and white matter connectivity within a fronto-parietal network. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.
321. Vanuk, JR, Rosso, IM, Rauch, SL, Alkozei, A, Markowski, SM, Pisner, D, Shane, BR, Fridman A, Knight, SA, & **Killgore, WD**. Daytime sleepiness is associated with altered thalamocortical connectivity. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.

322. Sneider, JT, Jensen JE, Silveri, MM, & **Killgore, WD**. Prefrontal GABA predicts resistance to sleep deprivation. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.
323. **Killgore, WD**, Tkachenko, O, Gogel, H, Kipman, M, Sonis, LA, Weber, M, Divatia, SC, Demers, LA, Olson, EA, Buchholz, JL, Rosso, IM, & Rauch, SL. Individual differences in rested activation of the ventral striatum predict overeating during sleep deprivation. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.
324. **Killgore, WD**, Tkachenko, O, Rosso, IM, Rauch, SL, & Nickerson, LA. Multimodal neuroimaging to predict resistance to sleep deprivation. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.
325. Nickerson, LD & **Killgore, WD**. Resting state brain circuits underpinning a neurobiological model of Theory of Mind and Mentalizing. Abstract presented at the Organization for Human Brain Mapping Annual Meeting, 2015, Honolulu, HI, June 14-18, 2015.
326. Rosso, IM, Olson, EA, **Killgore WD**, Fukunaga, R, Webb, CA, & Rauch SL. A randomized trial of internet-based cognitive behavioral therapy for major depressive disorder. Abstract presented at the 54<sup>th</sup> Annual Meeting of the American College of Neuropsychopharmacology, Hollywood, FL, December 6-10, 2015.
327. Alkozei, A & **Killgore, WD**. Exposure to blue wavelength light is associated with increased dorsolateral prefrontal cortex responses during a working memory task. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
328. Klimova, A, Pisner, D & **Killgore, WD**. Neural correlates of cognitive and emotional impairments in acute versus chronic mild traumatic brain injury: a diffusion tensor imaging study. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
329. Markowski, S, Alkozei, A, & **Killgore, WD**. Greater neuroticism predicts higher performance in immediate memory, language, and attention in healthy individuals. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
330. Alkozei, A & **Killgore, WD**. Exposure to blue wavelength light suppresses anterior cingulate cortex activation in response to uncertainty during anticipation of negative or positive stimuli. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
331. Smith, R, Alkozei, A, Bao, J, & **Killgore, WD**. Successful goal-directed memory suppression is associated with increased inter-hemispheric coordination between right and left fronto-parietal control networks. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
332. Singh, P, Fridman, A, Pisner, D, Singh, A, & **Killgore, WD**. A voxel based morphometric

analysis of ventromedial prefrontal cortex volume related with executive function task performance post mild traumatic injury. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

- 333. **Killgore, WD.** Baseline responsiveness of the ventral striatum predicts overeating during subsequent sleep deprivation. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
- 334. **Killgore, WD & Nickerson, LD.** Predicting resistance to sleep deprivation using multimodal neuroimaging. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
- 335. **Sneider, J, Jensen, JE, Silveri, MM, & Killgore, WD.** Prefrontal GABA correlates with the ability to sustain vigilance during sleep deprivation. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
- 336. **Buchholz, JL, Olson, EA, Fukunaga, R, Webb, CA, Killgore, WD, Rauch, SL, & Rosso, IM.** Expressive suppression is associated with greater lateral orbitofrontal cortex volume in adults with major depressive disorder. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
- 337. **Fridman, A, Pisner, D, Singh, P, & Killgore, WD.** Gray matter volume in left medial prefrontal cortex is related to life satisfaction in individuals with mild traumatic brain injury. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
- 338. **Singh, P, Pisner, D, Fridman, A, Roberts, S, & Killgore, WD.** Volumetric differences in gray matter in healthy versus overweight/obese individuals post mild traumatic brain injury: A voxel based morphometric study. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
- 339. **Killgore, WD & Weber, M.** Blue wavelength light therapy reduces daytime sleepiness following mild traumatic brain injury. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
- 340. **Killgore, WD, Weber, M, & Penetar, D.** Blue wavelength light therapy improves balance following mild traumatic brain injury. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
- 341. **Pisner, D, Smith, R, Alkozei, A, Klimova, A, & Killgore, WD.** Highways of the emotional intellect: White matter microstructural correlates of an ability-based measure of emotional intelligence. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
- 342. **Vanuk, JR, Smith, R, Knight, S, & Killgore, WD.** Resting RSA correlates with coordinated resting state activity between brain networks involved in emotion perception. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.



343. Vanuk, JR, Alkozei, A, Markowski, S, & **Killgore WD**. Greater resting state functional connectivity within the default mode and task positive networks is associated with trait emotional intelligence. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
344. Fukunaga, R, Webb, CA, Olson, EA, **Killgore, WD**, Rauch, SL, & Rosso, IM. Reduced rostral anterior cingulate volume is associated with greater frequency of negative automatic thoughts in adults with major depressive disorder. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
345. Olson, EA, Fukunaga, R., Webb, CA, Rosso, IM, **Killgore, WD**, & Rauch, SL. Delay discounting and anhedonia are independently associated with suicidal ideation in depression. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
346. Pisner, D, Singh, P, Fridman, A, & **Killgore, WD**. Resilience following mild traumatic brain injury is associated with gray matter volume in the left precentral gyrus. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
347. Sing, P, Fridman, A, Pisner, D, & **Killgore, WD**. Time dependent differences in gray matter volume in individuals post mild traumatic brain injury: A voxel based morphometric study. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
348. Smith, C, Smith, R, Sanova, A, & **Killgore, WD**. The neural basis of emotional working memory and its relation to adaptive emotional functioning. Abstract presented at the 44<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.
349. Quan, M, Gruber, SA, Lukas, SE, Hill, KP, **Killgore, WD**, & Nickerson, LD. Altered functional connectivity within large-scale brain networks during a cognitive task in chronic marijuana smokers. Abstract presented at the Harvard Psychiatry Research Day, Boston, MA, March 23, 2016. [*\*Semi Finalist Poster: Harvard Medical School Mysell Award*]
350. Fukunaga, R, Webb, CA, Olson, EA, **Killgore, WD**, Rauch, SL, & Rosso, IM. Improvement in negative automatic thoughts as a mediator of symptom improvement in internet-based cognitive behavioral therapy for major depressive disorder. Abstract presented at the 2016 Meeting of the Anxiety and Depression Association of America, Philadelphia, PA, March 31-April 3, 2016.
351. Bernstein, AS, Pisner, D, Klimova, A, Umapathy, L, Do, L, Squire, S, **Killgore, WD**, & Trouard, T. Effects of multiband acceleration on high angular resolution diffusion imaging data collection, processing, and analysis. Abstract presented at the 24<sup>th</sup> Annual Meeting of the International Society for Magnetic Resonance in Medicine (ISMRM), Singapore, May 7-8, 2016.
352. Alkozei, A, Markowski, SM, Pisner, D, Fridman, A, Shane, BR, Vanuk, JR, Knight, SA, & **Killgore, WD**. Exposure to blue wavelength light reduces activation within the anterior cingulate cortex during anticipation of certain reward stimuli. Abstract presented at the 71<sup>st</sup>

Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.

353. Alkozei, A., Pisner, D, Markowski, SM, Vanuk, JR, Fridman, A, Shane, BR, Knight SA, & **Killgore, WD**. Increases in prefrontal activation after exposure to blue versus amber wavelength light during cognitive load. Abstract presented at the 71<sup>st</sup> Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.
354. Pisner, DA, Smith, R, Alkozei, A, Klimova, A, Millan, M, & **Killgore, WD**. Highways of the emotional intellect: White matter microstructural correlates of an ability-based measure of emotional intelligence. Abstract presented at the 71<sup>st</sup> Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.
355. Singh, P, Pisner, D, Fridman, A, Singh A, Millan, M, & **Killgore, WD**. A voxel based morphometric analysis of ventromedial prefrontal cortex volume related with executive function task performance post mild traumatic brain injury. Abstract presented at the 71<sup>st</sup> Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.
356. Smith, R, Smith, C, Khodr, O, Nettles, M, Sanova, A, & **Killgore, WD**. Emotional working memory: A relatively unexplored aspect of emotional and cognitive ability. Abstract presented at the 71<sup>st</sup> Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.
357. Smith, R, Nettles, M, Khodr, O, Sanova, A, Smith, C, Alkozei, A, & **Killgore, WD**. Conflict-related dorsomedial frontal activation during healthy food decisions is associated with increased cravings for high-fat foods. Abstract presented at the 71<sup>st</sup> Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.
358. Smith, R, Sanova, A, Nettles, M, Khodr, O, Smith, C, Alkozei, A, Lane, RD, & **Killgore, WD**. Unwanted reminders: The effects of emotional memory suppression on later neuro-cognitive processing. Abstract presented at the 71<sup>st</sup> Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.
359. **Killgore, WD**, Weber, M, Palmer, W, & Penetar, D. Blue wavelength light therapy improves balance following mild traumatic brain injury. Abstract presented at the 71<sup>st</sup> Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.
360. **Killgore, WD**, Tkachenko, O, Palmer, W, & Rauch, SL. Default mode activation predicts vulnerability to sleep deprivation in domains of mood, sleepiness, and vigilance. Abstract presented at the 71<sup>st</sup> Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.
361. Alkozei, A, Markowski, SM, Pisner, D, Fridman, A, Shane, BR, Vanuk, JR, Knight, SA, Grandner, MA, & **Killgore, WD**. Exposure to blue wavelength light reduces activation within the anterior cingulate cortex during anticipation of certain reward stimuli. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

362. Alkozei, A, Pisner, D, Markowski, SM, Vanuk, JR, Fridman, A, Shane, BR, Knight, SA, Grandner, MA, & **Killgore, WD**. Exposure to blue wavelength light is associated with increased dorsolateral prefrontal cortex responses and increases in response times during a working memory task. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
363. Davis, B, Yang, R, **Killgore, WD**, Gallagher, RA, Carrazco, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Nightmares in a community sample: Prevalence and associations with daytime function independent of poor sleep quality and depression. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
364. Fisseha, E, Havens, C, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Sleep duration's important role in the relationship among difficulty concentrating, fatigue, stress, and depressed mood: Data from the SHADES study. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
365. Graham, PM, Goldstein, M, David, BM, Perlis, ML, Perfect, MM, Frye, S, **Killgore, WD**, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Longitudinal analysis of sleep duration using actigraphy and sleep diary: Stability and agreement over 8-11 months. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
366. Granados, K, Rojo-Wissar, DM, Chakravorty, S, Prather, A, Perfect, MM, Frye, S, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Adverse childhood exposures associated with adult insomnia symptoms. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
367. Grandner, MA, **Killgore, WD**, Khader, W, & Perlis, ML. Positive and negative mood ratings across 24-hours. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
368. Hall, C, Forbush, S, Youngstedt, S, **Killgore, WD**, Barilla, H, Gehrels, J, Alfonso-Miller, P, Palmer, W, Carrazco, N, & Grandner, MA. Habitual sleep duration and health: A possible role for exercise. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
369. Jackson, N, Patterson, F, Seixas, A, Jean-Louis, G, **Killgore, WD**, & Grandner, MA. Using big data to determine the social, behavioral, and environmental, determinants of sleep duration in the U.S. population: Application of a machine learning approach to data from approximately 700,000 Americans. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
370. **Killgore, WD**, Tkachenko, O, Grandner, MA, & Rauch, SL. Default mode activation predicts vulnerability to sleep deprivation in the domains of mood, sleepiness, and vigilance. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP

2016), Denver, CO, June 11-15, 2016.

371. **Killgore, WD**, Weber, M, Grandner, MA, & Penetar, DM. Blue wavelength light therapy improves balance following mild traumatic brain injury. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
372. Knight, SA & Killgore, WD. Typical sleep duration is associated with constructive thinking patterns. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
373. Kotzin, MD, Alkozei, A, Knight, SA, Grandner, MA, & **Killgore, WD**. The effects of trait gratitude on quality of sleep, intrusiveness, of pre-sleep cognitions, and daytime energy in healthy individuals. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
374. Markowski, SM, Alkozei, A, McIntosh, MB, Grandner, MA, & **Killgore, WD**. Chronotype and risk-taking propensity. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
375. McIntosh, MB, Markowski, SM, Grandner, MA, & **Killgore, WD**. Prior-night sleep duration is negatively associated with impulsivity in women. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
376. Ocano, D, Jean-Louis, G, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Sleep duration and decreased social support from family, friends, and significant other: Influence of insomnia and perceived stress level. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
377. Okuagu, A, Perlis, ML, Ellis, JA, Prather, AA, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Does thinking keep people awake? Or does it matter what they are thinking about? Self-directed cognitions associated with insomnia and insufficient sleep. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
378. Olivier, K, Gallagher, RA, **Killgore, WD**, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Development and initial validation of the Assessment of Sleep Environment: A novel inventory for describing and quantifying the impact of environmental factors on sleep. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
379. Paine, KN, Forbush, S, Ellis, J, Nowakowski, S, Newman-Smith, K, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Sleep duration and satisfaction with life, health, finances and relationship. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

380. Rhee, JU, Haynes, P, Chakravorty, S, Patterson, F, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Susceptibility to smoking during the day and its relationship with insomnia and sleep duration. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
381. Roberts, SE, Singh, P, Grandner, MA, & **Killgore, WD**. Later wake up time and impulsivity. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
382. Saccone, J, Davis, B, Chakravorty, S, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Habitual caffeine use and motivation to consume caffeine: Associations with sleep duration, sleepiness, fatigue, and insomnia severity. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
383. Singh, A, Fridman, A, Silveri, MM, Grandner, MA, & **Killgore, WD**. Medial prefrontal GABA predicts hunger ratings during sleep deprivation for men but not women. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
384. Vanuk, JR, Alkozei, A, Smith, R, Pisner, D, Markowski, SM, Shane, BR, Fridman, A, Knight, SA, Grandner, MA, & **Killgore, WD**. Changes in heart rate variability due to light exposure predict frontoparietal connectivity. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
385. Vanuk, JR, Alkozei, A, Knight, SA, Fridman, A, Markowski, SM, Pisner, D, Shane, BR, Grandner, MA, & **Killgore, WD**. The effects of light exposure on heart rate variability predict sleepiness and vigilance. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
386. Warlick, C, Chakravorty, S, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Timing of alcohol intake associated with insomnia symptoms. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
387. Waugaman, DL, Markowski, SM, Alkozei, A, Grandner, MA, & **Killgore, WD**. Chronotype and Emotional Intelligence. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
388. Weber, M, Grandner, MA, & **Killgore, WD**. Smaller gray matter volume of the visual cortex predicts vulnerability to sleep deprivation. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
389. Weber, M, Grandner, MA, & **Killgore, WD**. Blue wavelength light therapy reduces daytime sleepiness following mild traumatic brain injury. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.
390. Yang, R, Ocano, D, Chakravorty, S, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller,

P, Gehrels, J, & Grandner, MA. Relationship between insomnia and depression moderated by caffeine. Abstract presented at the 30<sup>th</sup> Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

391. **Killgore, WD**, Vanuk, JR, Pisner, D, Penetar, DM, & Weber, M. Short wavelength light therapy facilitates recovery from mild traumatic brain injury. Abstract presented at the 2016 Military Health System Research Symposium (MHSRS), Orlando, FL, August 15-18, 2016.
392. **Killgore, WD**, Alkozei, A, Smith, R, Divatia, S, & Demers, L. Enhancing emotional intelligence skills with a brief internet-based program: A pilot study. Abstract presented at the 2016 Military Health System Research Symposium (MHSRS), Orlando, FL, August 15-18, 2016.
393. **Killgore, WD**, Rosso, IM, Olson, EA, Webb, CA, Fukunaga, R, Gogel, H, Buchholz, JL, & Rauch, SL. Efficacy of an internet-based cognitive behavior therapy program for major depression. Abstract presented at the 2016 Military Health System Research Symposium (MHSRS), Orlando, FL, August 15-18, 2016.
394. **Killgore, WD**, & Nickerson, LA. Linked analysis of multimodal neuroimaging identifies neural systems associated with the ability to resist sleep deprivation. Abstract presented at the 2016 Military Health System Research Symposium (MHSRS), Orlando, FL, August 15-18, 2016.
395. Vanuk, JR, Allen, JJB, & **Killgore, WD**. Heart rate variability during light exposure and subsequent network connectivity patterns. Abstract presented at the Annual Meeting of the Society for Psychophysiological Research, Minneapolis, MN, September 21-25, 2016.
396. Haberman, JT, Olson, EA, Webb, CA, **Killgore, WD**, Rauch, SL, & Rosso, IM. The relation between treatment expectancies and outcome in internet-based cognitive behavioral therapy for major depressive disorder. Abstract presented at the Association for Behavioral and Cognitive Therapies, New York, NY, October 27-30, 2016.
397. Rosso, IM, Olson, EA, Thomas, MO, Webb, CA, **Killgore, WD**, & Rauch, SL. Anterior cingulate cortex morphology predicts remission from major depression following internet-based cognitive behavior therapy. Abstract presented at the 55<sup>th</sup> Annual Meeting of the American College of Neuropsychopharmacology, Hollywood, FL, December 4-8, 2016.
398. Shane, BR, Vanuk, JR, Bajaj, S, Millan, M, **Killgore, WD**. Multimodal brain imaging in patients receiving bright light therapy following a mild traumatic brain injury. Abstract presented at the Western Medical Research Conference, Carmel CA, January 26-28, 2017.
399. Franco, J, Millan, M, Shane, BR, Castellanos, A, **Killgore, WD**. Blue wavelength light therapy increases thalamic grey matter volume following mild traumatic brain injury. Abstract presented at the 45<sup>th</sup> Annual Meeting of the International Neuropsychological Society, New Orleans, LA, February 1-4, 2017.
400. Alkozei, A, Smith, R, Demers, LA, Divatia, S, Weber, M, Berryhill, SM, & **Killgore, WD**. Emotional intelligence can be trained via an online training program and is associated with better performance on the IGT. Abstract accepted for oral platform presentation at the 45<sup>th</sup> Annual Meeting of the International Neuropsychological Society, New Orleans, LA, February 1-4, 2017.

401. Li, H, Gruber, S, Lukas, S, Silveri, M, Hill, K, **Killgore, WD**, & Nickerson, LD. Data fusion to investigate the effect of chronic heavy marijuana use on brain structure. Abstract presented at the 2017 Harvard Psychiatry Research Day Poster Session, Boston, MA, April 12, 2017.
402. Challener, S, Alkozei, A, Fridman, A, Dormer A, & **Killgore, WD**. Higher depressive symptoms are associated with lower activation in the orbitofrontal cortex when anticipating negative stimuli in individuals with PTSD. Abstract presented at the 72<sup>nd</sup> Annual Convention of the Society for Biological Psychiatry, San Diego, CA, May 18-20, 2017.
403. Alkozei, A, Smith R, Fridman A, Dormer, A, Challener, S, & **Killgore, WD**. Neural responses to emotional stimuli in individuals with PTSD after daily morning blue light exposure. Abstract presented at the 72<sup>nd</sup> Annual Convention of the Society for Biological Psychiatry, San Diego, CA, May 18-20, 2017.
404. Alkozei, A, Smith R, Fridman, A, Dormer, A, Challener, S, & **Killgore, WD**. The role of trait gratitude on functional brain activation changes when anticipating negative events in individuals with PTSD. Abstract presented at the 72<sup>nd</sup> Annual Convention of the Society for Biological Psychiatry, San Diego, CA, May 18-20, 2017.
405. Fridman, AJ, Alkozei, A, Smith, R, Challener, S, Knight, SA, & **Killgore, WD**. Resiliency is associated with reduced activation within the retrosplenial cortex and secondary motor area for individuals with PTSD during anticipation of a negative event. Abstract presented at the 72<sup>nd</sup> Annual Convention of the Society for Biological Psychiatry, San Diego, CA, May 18-20, 2017.
406. Vanuk, JR, Millan, M, Shane, BR, Bajaj, S, & **Killgore, WD**. Blue light therapy following a mild traumatic brain injury improves MPFC-amygdala functional connectivity and mood. Abstract presented at the 72<sup>nd</sup> Annual Convention of the Society for Biological Psychiatry, San Diego, CA, May 18-20, 2017.
407. **Killgore, WD**, Shane, BR, Vanuk, JR, Franco, J, Castellanos, A, Millan, M, Grandner, MA, & Bajaj, S. Light therapy facilitates thalamo-cortical brain recovery from mild traumatic brain injury. Abstract presented at the 72<sup>nd</sup> Annual Convention of the Society for Biological Psychiatry, San Diego, CA, May 18-20, 2017.
408. Smith, R, Lane, RD, Alkozei, A, Bao J, Smith, C, Sanova, A, Nettles, M, & **Killgore, WD**. Common and unique neural systems underlying the maintenance of emotional vs. bodily reactions to affective stimuli: the moderating role of emotional awareness. Abstract presented at the 72<sup>nd</sup> Annual Convention of the Society for Biological Psychiatry, San Diego, CA, May 18-20, 2017.
409. Bajaj, S, Alkozei, A & **Killgore, WD**. Effect of bright light therapy on white matter abnormalities following a mild traumatic brain injury. Abstract presented at the 72<sup>nd</sup> Annual Convention of the Society for Biological Psychiatry, San Diego, CA, May 18-20, 2017.
410. Alkozei, A, Smith, R, Fridman, A, Dormer A, Challener, S, Grandner, MA, & **Killgore, WD**. Daily morning blue light exposure leads to changes in functional brain responses during emotional anticipation in individuals with PTSD. Abstract presented at the SLEEP Meeting,

Boston, MA, June 3-7, 2017.

411. Gottschlich, MK, Hyman, S, Millan M, Pisner, D, Singh, A, Knight, SA, Grandner, MA, & **Killgore, WD**. Post-concussion severity is associated with sleep problems and neuropsychological status. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.
412. Vanuk, JR, Shane, BR, Millan, M., Bajaj, S, Grandner, MA, & **Killgore, WD**. Short-wavelength light therapy as a way of improving sleep, cognition, and functional connectivity following mild traumatic brain injury. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.
413. **Killgore, WD**, Shane, BR, Vanuk, JR, Franco, J, Castellanos, A, Millan, M, Grandner, MA, & Bajaj, S. Short wavelength light therapy facilitates recovery from mild traumatic brain injury. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.
414. **Killgore, WD**, Capaldi, VF, Balkin, TJ, & Kamimori, GH. The trait of introversion-extraversion contributes to sustained performance on planning and sequencing abilities during sleep deprivation. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.
415. Bajaj, S, Alkozei, A, Grandner, MA, & **Killgore, WD**. Effect of bright light therapy on brain and behavioral abnormalities following a mild traumatic brain injury. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.
416. Oliver, K, Gallagher, R, Hale, L, Barrett, M, Branas, C, **Killgore, WD**, Parthasarathy, S, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Development and initial validation of a brief measure of control over sleep. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.
417. Grandner, MA, Athey, A, **Killgore WD**, Alfonso-Miller, P. Preliminary results of a sleep health intervention in student athletes: Changes in sleep, energy level, and mental well-being, and body weight. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.
418. Yang, R, Gallagher, R, Hale, L, Perlis, M, Barrett, M, Branas, C, **Killgore, WD**, Parthasarathy, S, Alfonso-Miller, P, Gehrels, J, Grandner, MA. Would you call yourself a short or long sleeper? Perceptions of sleep category associated with reported sleep duration, insomnia, and health. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.
419. Fisseha, E, Gallagher, R, Hale, L, Branas, C, Barrett, M, **Killgore, WD**, Alfonso-Miller, P, Jean-Louis, G, Seixas, A, Williams, N, Gehrels, J, & Grandner, MA. Habitual weekday sleep duration associated with multiple dimensions of socioeconomic status. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.
420. Poling, K, Gallagher, R, Hale, L, Branas, C, Seixas, A, Jean-Louis, G, **Killgore, WD**, Alfonso-Miller, P, Parthasarathy, S, Gehrels, J, & Grandner, MA. Sleep partially mediates the association between food insecurity and obesity: Roles of short sleep duration, insomnia, and socioeconomic factors. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.
421. Forbush, S, Fisseha, E, Gallagher, R, Hale, L, Malone, S, Patterson, F, Branas, C, Barrett, M,



**Killgore, WD**, Gehrels, J, Alfonso-Miller, P, & Grandner, MA. Sociodemographics, poor overall health, cardiovascular disease, depression, fatigue, and daytime sleepiness associated with social jetlag independent of sleep duration and insomnia. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

422. Till, K, Athey, A, Chakravorty, S, **Killgore, WD**, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Insomnia and daytime tiredness in student athletes associated with risky behaviors and poor decision making when under the influence of alcohol. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.
423. Warlick, C, Hall, C, Athey, A, Chakravorty, S, **Killgore, WD**, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Difficulty sleeping associated with substance use among student athletes. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.
424. Jaszewski, A, Athey, A, **Killgore, WD**, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Sleep duration and quality associated with mental well-being in student athletes. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.
425. Athey, A, Alfonso-Miller, P, **Killgore, WD**, & Grandner, MA. Preliminary results of a sleep health intervention in student athletes: Perceived changes to sleep, performance, and mental and physical wellbeing. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.
426. Goel, N, Taylor, DM, Abel, T, **Killgore, WD**, Pearson-Leary, J, & Bhatnagar, S. MicroRNAs are cross-species markers of sleep loss in humans and rats. Abstract presented at the Organization for Human Brain Mapping Conference, Boston, MA, June 3-7, 2017.
427. Meridew, C, Jaszewski, A, Athey, A, Alfonso-Miller, P, **Killgore, WD**, Gehrels, J, & Grandner, MA. Impact of time and activity demands on sleep of student athletes: It's not about reduced sleep opportunity. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.
428. Bajaj, S, Rosso, IM, Rauch, SL, & **Killgore WD**. Impact of bright light therapy on volume and cortical thickness of the brain following mild traumatic brain injury. Abstract presented at the Organization for Human Brain Mapping Conference, Vancouver, Canada, June 25-29, 2017.\*[selected for travel award]
429. Bajaj, S, Rosso, IM, Rauch, SL, & **Killgore, WD**. Effect of bright light therapy on white matter abnormalities following mild traumatic brain injury. Abstract presented at the Organization for Human Brain Mapping Conference, Vancouver, Canada, June 25-29, June 3-7, 2017.
430. Alkozei, A, Haack, M, Smith, R, Dailey, N, Bajaj, S, & **Killgore, WD**. Chronic sleep restriction increases negative implicit attitudes toward Arab Muslims. Abstract presented at the Military Health Systems Research Symposium, Kissimmee, FL, August 27-30, 2017.
431. **Killgore WD**, Vanuk, JR, Bajaj, S. Blue wavelength light therapy increases axonal myelination in mild traumatic brain injury. Abstract presented at the Military Health Systems Research Symposium, Kissimmee, FL, August 27-30, 2017.
432. **Killgore WD**. What makes a Super-Soldier: Identifying the neural correlates of individual

differences in resilience against sleep deprivation. Abstract presented at the Military Health Systems Research Symposium, Kissimmee, FL, August 27-30, 2017.

433. Dailey, NS, Bajaj, S, Alkozei, A, & **Killgore WD**. Neural correlates of aggression during chronic and subacute stages of recovery from mild traumatic brain injury. Abstract presented at the Military Health Systems Research Symposium, Kissimmee, FL, August 27-30, 2017.
434. Bajaj, S, Alkozei, A, & **Killgore WD**. Short wavelength light therapy following mild traumatic brain injury: Can we normalize the abnormal diffusion and quantity of water within the brain? Abstract presented at the Military Health Systems Research Symposium, Kissimmee, FL, August 27-30, 2017.
435. Goel, N, Taylor, DM, Abel, T, **Killgore, WD**, Pearson-Leary, J, & Bhatnagar, S. MicroRNAs are cross-species markers of sleep loss in humans and rats. Abstract presented at the Society for Neuroscience, Washington, DC, November 11-15, 2017.
436. Dailey, NS, Bajaj, S, Alkozei, A, Smith, R, Knight, SA, & **Killgore, WD**. Neural correlates of aggression in the chronic and post-acute stages of recovery from mild traumatic brain injury: A diffusion tensor imaging study. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.
437. Challener, S, Alkozei, A, Fridman, A, Dormer, A, & **Killgore, WD**. Higher depressive symptoms are associated with lower activation in the orbital frontal cortex when anticipating negative stimuli in individuals with PTSD. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.
438. Alkozei, A, Smith, R, Demers, L, Divatia, S, Weber, M, Berryhill, S, & **Killgore, WD**. Emotional intelligence can be trained via an online training program and is associated with better performance on the IGT. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.
439. Satterfield, B, Raikes, AC, & **Killgore, WD**. A voxel-based morphometric analysis of resilience to vigilant attention impairment during sleep deprivation. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.
440. Singh, A, Thurston, MD, Gottschlich, MK, Miller, MA, & **Killgore, WD**. Trait anxiety predicts hostile tendencies post-traumatic brain injury. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.
441. Raikes, AC, Satterfield, BC, Knight, SA, & **Killgore, WD**. Grey matter volumetric differences with increasing numbers of previous mild traumatic brain injuries: A voxel-based morphometric study. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.
442. Bajaj, S, Dailey, N, Alkozei, A, Vanuk, JR, & **Killgore, WD**. Preservation of limbic network structure in healthy young adults. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.

443. Alkozei, A, **Killgore, WD**, Smith, R, Dailey, NS, Bajaj, S, & Haack, M. Chronic sleep restriction increases negative implicit attitudes toward Arab Muslims. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.
444. Skalamera, J, Alkozei, A, Haack, M, & **Killgore, WD**. Chronic sleep restriction increases racial bias and affects actual decision-making about people. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.
445. Alkozei, A, Smith, R, & **Killgore, WD**. Increases in prefrontal activation after exposure to blue versus amber wavelength light during cognitive load. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.
446. Knight, SA, & **Killgore, WD**. Typical sleep duration is associated with constructive thinking patterns. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.
447. Nickerson, L, Li, H, Smith, S, Lukas, S, Silveri, M, Hill, K, **Killgore, WD**, & Gruber, S. Combining multi-site/study MRI data: A novel linked-ICA denoising method for removing scanner and site variability from multi-modal MRI data. Abstract presented at the American College of Neuropsychopharmacology (ACNP) 56<sup>th</sup> Annual Meeting, Palm Springs, CA, December 3-7, 2017.
448. Bajaj, S, Raikes, AC, Dailey, NS, Vanuk, JR, Weber, M, Rosso, IM, Rauch, SL, & **Killgore, WD**. Changes in cortical structure, sleep, and anxiety symptoms following blue-wavelength light therapy in individuals with mild traumatic brain injury. Abstract presented at the Big Sky Athletic Training Sports Medicine Conference, Big Sky, MT, February 4-8, 2018.
449. Dailey, NS, Raikes, AC, Smith, R, Alkozei, A, & **Killgore, WD**. The executive control network after mild traumatic brain injury: Associations between functional connectivity and aggression. Abstract presented at the Big Sky Athletic Training Sports Medicine Conference, Big Sky, MT, February 4-8, 2018.
450. Raikes, AC, Satterfield, BC, Dailey, NS, Bajaj, S, & **Killgore, WD**. Self-reported sleep quality is related to cerebellar grey matter volume after mild traumatic brain injury. Abstract presented at the Big Sky Athletic Training Sports Medicine Conference, Big Sky, MT, February 4-8, 2018.
451. Raikes, AC, Bajaj, S, Dailey, NS, Satterfield, BC, Alkozei, A, Smith, R, & **Killgore, WD**. White matter correlates of self-reported sleep quality after a mild traumatic brain injury: A DTI study. Abstract presented at the Big Sky Athletic Training Sports Medicine Conference, Big Sky, MT, February 4-8, 2018.
452. Satterfield, BC, Raikes, AC, & **Killgore, WD**. A voxel-based morphometric analysis of resilience to vigilant attention impairment during sleep deprivation. Abstract presented at the 46<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.
453. Alkozei, A, Smith, R, Dailey, NS, Bajaj, S, Knight SA, & **Killgore, WD**. Exposure to blue wavelength light during memory consolidation improves long-delay verbal memory performance.

Abstract presented at the 46<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.

- 454. Alkozei, A, Smith, R, Dailey, NS, Bajaj, S, Haack, M, & **Killgore, WD**. Men, but not Women, show a decrease in implicit preferences for low-calorie food after 3 weeks of chronic sleep restriction. Abstract presented at the 46<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.
- 455. Alkozei, A, Smith, R, & **Killgore, WD**. A positive cognitive style mediates the relationship between trait gratitude and depressive symptoms. Abstract presented at the 46<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.
- 456. Bajaj, S, Dailey, NS, Alkozei, A, Vanuk, JR, & **Killgore, WD**. Preservation of limbic network structure in healthy young adults. Abstract presented at the 46<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.
- 457. Alkozei, A, Smith, R, Demers, LA, Divatia, S, Weber, M, Berryhill, SM, & **Killgore, WD**. Emotional intelligence can be trained via an online training program and is associated with better performance on the IGT. Abstract presented at the 46<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.
- 458. Dailey, NS, Bajaj, S, Alkozei, A, Smith, R, Knight, SA, & **Killgore, WD**. Neural correlates of aggression in the chronic and post-acute stages of recovery from mild traumatic brain injury: A diffusion tensor imaging study. Abstract presented at the 46<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.
- 459. **Killgore, WD**, Shane, BR, Vanuk, JR, Millan, M, Knight, SA, & Bajaj, S. Blue light therapy accelerates brain and cognitive recovery from mild traumatic brain injury. Abstract presented at the 46<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.
- 460. **Killgore, WD**. Default mode activation and the ability to resist sleep deprivation. Abstract presented at the 46<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.
- 461. **Killgore, WD**, Capaldi, VF, Balkin, TJ, & Kamimori, GH. Personality traits predict the ability to sustain executive function abilities during sleep deprivation. Abstract presented at the 46<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.
- 462. Raikes, AC, & **Killgore, WD**. Increased cerebellar grey matter in the presence of decreased subjective sleep quality following mild traumatic brain injury. Abstract presented at the 46<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.
- 463. Raikes, AC, Satterfield, BC, Knight, SA, & **Killgore, WD**. Gray matter volumetric differences with increasing numbers of previous mild traumatic brain injuries: A voxel-based morphometric study. Abstract presented at the 46<sup>th</sup> Annual Meeting of the International Neuropsychological

Society, Washington, DC, February 14-17, 2018.

- 464. Skalamera, J, Alkozei, A, Haack, M, & **Killgore, WD**. Chronic sleep restriction increases implicit racial biases and affects actual decision-making about people. Abstract presented at the 46<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.
- 465. Huanjie, L, Silveri, M, Lukas, SE, Hill, K, **Killgore, WD**, Gruber, S, & Nickerson, LD. Data fusion to investigate multimodal MRI patterns associated with chronic heavy marijuana use. Abstract presented at the Harvard Psychiatry Day Poster Session, Boston, MA, April 4, 2018.
- 466. Bajaj, S, Dailey, NS, Vanuk, JR, Raikes, A, Weber, M, Rosso, IM, Rauch, SL, & **Killgore, WD**. Impact of blue light therapy on cortical volume, sleep and anxiety symptoms following mild traumatic brain injury. Abstract presented at the Anxiety and Depression Association of America (ADAA) Conference, Washington, DC, April 5-8, 2018.
- 467. Knight, SA, & **Killgore, WD**. Constructive thinking patterns correlate with typical sleep habits. Abstract presented at the Anxiety and Depression Association of America (ADAA) Conference, Washington, DC, April 5-8, 2018.
- 468. Raikes, AC, Dailey, NS, Bajaj, S, & **Killgore, WD**. White matter structure changes associated with depressive symptoms following recent mild traumatic brain injury. Abstract presented at the Anxiety and Depression Association of America (ADAA) Conference, Washington, DC, April 5-8, 2018.
- 469. Singh, A, Thurston, MD, Gottschlich, MK, Miller, MA, & **Killgore, WD**. Trait anxiety predicts hostile tendencies post-traumatic brain injury. Abstract presented at the Anxiety and Depression Association of America (ADAA) Conference, Washington, DC, April 5-8, 2018.
- 470. Bajaj, S, Raikes, AC, Alkozei, A, Dailey, NS, Satterfield, BC, Vanuk, JR, & **Killgore, WD**. Association between suicidal ideation and cortical volume in a sub-clinical sample of young individuals. Abstract presented at the Society of Biological Psychiatry 73<sup>rd</sup> Annual Meeting, New York, NY, May 10-12, 2018.
- 471. Challener, S, Alkozei, A, Young, A, Ozcan, M, Raikes, AC, & **Killgore, WD**. Sleep problems are associated with greater default mode network activation when anticipating negative stimuli in individuals with PTSD. Abstract presented at the Society of Biological Psychiatry 73<sup>rd</sup> Annual Meeting, New York, NY, May 10-12, 2018.
- 472. Dailey, NS, Smith, R, Raikes, AC, Alkozei, A, & **Killgore, WD**. Reduced functional connectivity in the executive control network following mild traumatic brain injury: Implications for emotional regulation. Abstract presented at the Society of Biological Psychiatry 73<sup>rd</sup> Annual Meeting, New York, NY, May 10-12, 2018.
- 473. **Killgore, WD**, Kent, HC, Knight, SA, & Alkozei, A. Changes in morning salivary melatonin correlate with prefrontal responses during working memory performance. Abstract presented at the Society of Biological Psychiatry 73<sup>rd</sup> Annual Meeting, New York, NY, May 10-12, 2018.

474. **Killgore, WD**, Alkozei, A, & Weber, M. Blue light therapy improves executive function following mild traumatic brain injury. Abstract presented at the Society of Biological Psychiatry 73<sup>rd</sup> Annual Meeting, New York, NY, May 10-12, 2018.
475. Ozcan, M, Challener, S, Yung, A, Alkozei, A, Raikes, AC, & **Killgore, WD**. Daytime sleepiness in individuals with PTSD is associated with greater activation in the right angular gyrus when viewing negative images. Abstract presented at the Society of Biological Psychiatry 73<sup>rd</sup> Annual Meeting, New York, NY, May 10-12, 2018.
476. Smith, R, Sanova, A, Lane, RD, & **Killgore, WD**. Graph-theoretic correlates of trait differences in emotional awareness. Abstract presented at the Society of Biological Psychiatry 73<sup>rd</sup> Annual Meeting, New York, NY, May 10-12, 2018.
477. Yung, A, Challener, S, Ozcan, M, Alkozei, A, Raikes, AC, & **Killgore, WD**. Improvements in PTSD symptom severity are associated with greater activation in the hippocampus during anticipation of negative stimuli. Abstract presented at the Society of Biological Psychiatry 73<sup>rd</sup> Annual Meeting, New York, NY, May 10-12, 2018.
478. Satterfield, BC, Silveri, M, Alkozei, A, Raikes, AC, & **Killgore, WD**. GABA: A neural marker of resilience to psychomotor vigilance impairment during sleep deprivation. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018. [\*Trainee Merit Award]
479. Satterfield, BC, Alkozei, A, Raikes, AC, & **Killgore, WD**. Habitual sleep duration predicts caloric and macronutrient intake during sleep deprivation. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.
480. Bajaj, S, Raikes, A, Dailey, NS, Vanuk, JR, Satterfield, BC, Alkozei, A, Weber, M, Rosso, IM, Rauch, SL, Grandner, MA, & **Killgore, WD**. Impact of blue light therapy on cortical structure, sleep, and anxiety symptoms following mild traumatic brain injury. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.
481. Challener, S, Alkozei, A, Yung, A, Ozcan, M, Raikes, AC, & **Killgore, WD**. Functional impairment due to excessive daytime sleepiness is associated with greater activation in the default mode network when anticipating negative stimuli in individuals with PTSD. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.
482. **Killgore, WD**, Alkozei, A, Knight, SA, Miller, MA, Grandner, MA, & Weber, M. Daily morning blue light exposure enhances executive functioning in individuals with mild traumatic brain injury. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.
483. **Killgore, WD**, & Nickerson, LA. Resistance to sleep deprivation is predicted by gray matter volume in the posterior brain stem. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.
484. Alkozei, A, Kent, HC, Knight, SA, & **Killgore, WD**. Changes in morning salivary melatonin correlate with prefrontal responses during working memory performance. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.

485. Ozcan, M, Alkozei, A, Raikes, A, & **Killgore, WD**. Pre-sleep cognitions partially mediate the relationship between depression and daytime energy. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.
486. Raikes, AC, Dailey, NS, Satterfield, BC, Bajaj, S, & **Killgore, WD**. Self-reported sleep quality is associated with reductions in white-matter integrity following recent mild traumatic brain injury. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.
487. Raikes, AC, Satterfield, BC, Dailey, NS, Bajaj, S, & **Killgore, WD**. Subjectively poor sleep quality is associated with increased cerebellar grey matter volume following mild traumatic brain injury. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.
488. Skalamera, J, Alkozei, A, Haack, M, & **Killgore, WD**. The effect of chronic sleep restriction on implicit racial biases and explicit judgmental decision-making. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.
489. Sanchez, C, Hale, L, Branas, C, Gallagher, R, **Killgore, WD**, Gehrels, J, Alfonso-Miller, P, & Grandner, MA. Relationships between dietary supplement intake and sleep duration, insomnia, and fatigue. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.
490. Tubbs, A, Perlis, M, Chakravorty, S, Basner, M, **Killgore, WD**, Gehrels, J, Alfonso-Miller, P, & Grandner, MA. Does increased risk of suicide at night favor one method of suicide over another? Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.
491. Huanjie, L, Gruber, S, Smith, SM, Lukas, SE, Silveri, M, Hill, KP, **Killgore, WD**, & Nickerson, LD. Combining multi-site/study MRI data: A novel linked-ICA denoising method for removing scanner and site variability from multi-modal MRI data. Abstract presented at the Joint Annual Meeting of ISMRM-ESMRMB, Paris, France, June 16-21, 2018. [\*Trainee Stipend Award]
492. Bajaj, S, Raikes, AC, Alkozei, A, Dailey, NS, Vanuk, J, Satterfield, BC, & **Killgore, WD**. Suicidal ideation is associated with diminished cortical volume in a sub-clinical population. Abstract presented at the Organization for Human Brain Mapping (OHBM) Annual Meeting, Singapore, June 17-21, 2018.
493. Bajaj, S, Raikes, AC, Dailey, NS, Vanuk, J, Alkozei, A, Satterfield, BC, Weber, M, Rosso, IM, Rauch, SL, & **Killgore, WD**. Effect of blue light therapy on cortical volume, sleep, and anxiety symptoms following mild traumatic brain injury. Abstract presented at the Organization for Human Brain Mapping (OHBM) Annual Meeting, Singapore, June 17-21, 2018.
494. Dailey, NS, Bajaj, S, Smith, R, Raikes, AC, Alkozei, A, & **Killgore, WD**. Disrupted functional connectivity and elevated aggression in young adults with mild traumatic brain injury. Abstract presented at the Organization for Human Brain Mapping (OHBM) Annual Meeting, Singapore, June 17-21, 2018.
495. Raikes, AC, Bajaj, S, Dailey, NS, Alkozei, A, Smith, R, & **Killgore, WD**. Post-mTBI white matter correlates of self-reported sleep quality: A DTI study. Abstract presented at the

Organization for Human Brain Mapping (OHBM) Annual Meeting, Singapore, June 17-21, 2018.

496. Nickerson, LD, Li, H, , Silveri, MM, Lukas, SE, Hill, KP, **Killgore, WD**, & Gruber, SA. Multimodal MRI data fusion reveals structure-function patterns associated with chronic heavy marijuana use. Abstract presented at the Organization for Human Brain Mapping (OHBM) Annual Meeting, Singapore, June 17-21, 2018.
497. Raikes, AC, Satterfield, BC, Alkozei, A, & **Killgore, WD**. Blue light therapy improves self-reported sleep quality in individuals with a recent mild traumatic brain injury. Abstract presented at the Military Health Systems Research Symposium, Orlando, FL, August 20-23, 2018.
498. **Killgore, WD**. Executive functioning in individuals with mild traumatic brain injury is enhanced by daily morning blue light therapy. Abstract presented at the Military Health Systems Research Symposium, Orlando, FL, August, 20-23, 2018.
499. **Killgore, WD, &** Nickerson, LA. Why can't you just stay awake? Resistance to sleep deprivation is associated with measureable differences in brainstem gray matter. Abstract presented at the Military Health Systems Research Symposium, Orlando, FL, August 20-23, 2018.
500. Dailey, NS, Smith, R, Satterfield, BC, Raikes, AC, & **Killgore, WD**. Verbal fluency following mild traumatic brain injury: The strength of switching. Abstract presented at the American Speech-Language-Hearing Association Annual Convention, Boston, MA, November 15-17, 2018.
501. Forbeck, B, Dailey, NS, Esbit, S, & **Killgore, WD**. Reduced information processing speed: A dynamic deficit in mild traumatic brain injury. Abstract presented at the American Speech-Language-Hearing Association Annual Convention, Boston, MA, November 15-17, 2018.
502. Raikes, AC, Dailey, NS, & **Killgore, WD**. Neural and neurocognitive correlates of responsiveness to blue light therapy following mild traumatic brain injury. Abstract presented at the American Speech-Language-Hearing Association Annual Convention, Boston, MA, November 15-17, 2018.
503. Burns, AI, Ozcan, M, Shepard, KC, Alkozei, A, & **Killgore, WD**. The association between PTSD severity and life satisfaction is mediated by trait gratitude. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.
504. Burns, AI, Shepard, KC, Ozcan, M, Alkozei, A, Vanuk, JR, & **Killgore, WD**. The association between morningness-eveningness and nightmares in PTSD. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.
505. Dailey, NS, Meinhausen, C, & **Killgore, WD**. Self-initiated recall strategies in mild traumatic brain injury: Identifying the neural correlates. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.



506. Esbit, S, Dailey, NS, & **Killgore, WD**. Making a list and checking it twice: Episodic verbal recall in mild traumatic brain injury. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.
507. Esbit, S, LaFollette, K, Botello, R, Satterfield, BC, Alkozei, A, & **Killgore, WD**. High self-perceived adroitness: An altered perception of reality during sleep deprivation. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.
508. **Killgore, WD**, Vanuk, JR, & Bajaj, S. Improving executive functioning in mild traumatic brain injury with daily morning blue light therapy. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.
509. **Killgore, WD**, & Nickerson, LA. Vulnerability and resistance to sleep deprivation are associated with measurable differences in brainstem gray matter. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.
510. LaFollette, K, Satterfield, BC, Lazar, M, & **Killgore, WD**. Predicting psychosocial stress reactivity from ability and trait-based emotional intelligence. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.
511. LaFollette, K, Satterfield, BC, Lazar, M, & **Killgore, WD**. Stay negative? Positive affect is associated with increased psychosocial stress reactivity. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.
512. Meinhausen, C, Dailey, NS, & **Killgore, WD**. Identifying memory retrieval strategies following a mild traumatic brain injury using the CVLT-II. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.
513. Ozcan, M, Shepard, KC, Burns, AI, Alkozei, A, & **Killgore, WD**. Trait gratitude and the impact of daytime sleepiness on daily functioning predict PTSD severity over time. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.
514. Raikes, AC, & **Killgore, WD**. Anterior cingulate gyrus volume predicts changes in post-mTBI daytime sleepiness following blue wavelength light therapy. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.
515. Satterfield, BC, LaFollette, K, Lazar, M, & **Killgore, WD**. Prolonged psychosocial stress impairs cognitive flexibility. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.
516. Shepard, KC, Burns, AI, Ozcan, M, Alkozei, A, & **Killgore, WD**. Racial differences regarding the effectiveness of blue light therapy in reducing PTSD severity. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY,

February 20-23, 2019.

- 517. Shepard, KC, Ozcan, M, Burns, AI, Alkozei, A, Vanuk, JR, & **Killgore, WD**. Differences in anxiety reduction between minority and majority racial groups participating in morning blue light exposure. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.
- 518. Vanuk, JR., Smith, R, Raikes, AC, Alkozei, A, Skalamera, J, & **Killgore, WD**. Ability based emotional intelligence is associated with greater cardiac vagal tone. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.
- 519. Vanuk, JR, Shields, S, Slavich, M, & **Killgore, WD**. Lifetime stress exposure during adulthood is associated with lower trait-based emotional intelligence. Abstract presented at the Annual Meeting of the American Psychosomatic Society, Vancouver, BC, March 6-9, 2019.
- 520. Raikes, AC, Satterfield, BC, Grandner, MA, & **Killgore, WD**. Daily blue light therapy reduces persistent post-mild traumatic brain injury daytime sleepiness and post-concussion. Abstract presented at the Rocky Mountain Athletic Trainer's Association Annual Meeting, Phoenix, AZ, April 12, 2019.
- 521. Bajaj, S, Dailey, NS, Raikes, AC, Vanuk, JR, Weber, M, Rosso, IM, Rauch, SL, & **Killgore, WD**. Effect of blue light therapy on cortical volume and reaction time following mild TBI. Abstract presented at the Organization for Human Brain Mapping Annual Meeting, June 9-13, 2019.
- 522. Bajaj, S, Raikes, AC, & **Killgore, WD**. Water anisotropy within the default mode network predicts mod shifts following sleep deprivation. Abstract presented at the Organization for Human Brain Mapping Annual Meeting, June 9-13, 2019.
- 523. Bajaj, S, Raikes, AC, Razi, A, & **Killgore, WD**. Blue-wavelength light strengthens default mode network following mild TBI: A DCM-DTI study. Abstract presented at the Organization for Human Brain Mapping Annual Meeting, June 9-13, 2019.
- 524. Bajaj, S, & **Killgore, WD**. Sex differences in limbic and risk-taking propensity in healthy individuals. Abstract presented at the Organization for Human Brain Mapping Annual Meeting, June 9-13, 2019.
- 525. Raikes, AC, Satterfield, BC, Grandner, MA, & **Killgore, WD**. Daily blue light therapy reduces persistent post-mild traumatic brain injury daytime sleepiness and post-concussion. Abstract presented at the Rocky Mountain Athletic Trainer's Association Annual Meeting, Phoenix, AZ, April 12, 2019.
- 526. Raikes, AC., Athey, A, Alfonso-Miller, P, **Killgore, WD**, & Grandner, MA. Self-reported insomnia and daytime sleepiness increase athletes' sports-related concussion risk. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

527. Raikes, AC, Satterfield, BC, Bajaj, S, Grandner, MA, & **Killgore, WD**. Daily blue light therapy reduces daytime sleepiness and post-concussion symptoms after mild traumatic brain injury. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
528. Burns, AI, Shepard, KC, Ozcan, M, LaFollette, K, Alkozei, A, Vanuk, JR, Raikes, AC, Grandner, MA, & **Killgore, WD**. Gratitude and frequency of naps predict resilience for individuals with PTSD. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
529. Burns, AI, Ozcan, M, Shepard, KC, LaFollette, K, Alkozei, A, Grandner, MA, & **Killgore, WD**. The association between PTSD severity and insomnia is mediated by nightmares. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
530. Bajaj, S, Dailey, NS, Raikes, AC, Vanuk, JR, Grandner, MA, Weber, M, Rosso, IM, Rauch, SL, & **Killgore, WD**. Impact of light therapy on brain structure and simple reaction time following mild traumatic brain injury. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
531. Bajaj, S, Raikes, AC, Grandner, MA, & **Killgore, WD**. Quantitative anisotropy within the default-mode network predicts mood degradation following sleep-deprivation. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
532. Dailey, NS, Satterfield, BC, Raikes, AC, Strong, MJ, Forbeck, B, Grandner, MA, & **Killgore, WD**. Disrupted thalamocortical connectivity following mild traumatic brain injury: Associations with daytime sleepiness. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
533. Shepard, KC, Ozcan, M, Burns, AI, Grandner, MA, & **Killgore, WD**. Use of anger words in trauma narratives is negatively associated with sleep quality for single individuals with PTSD. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
534. Shepard, KC, Ozcan, M, Burns, AI, Vanuk, JR, Grandner, MA, Alkozei, A, & **Killgore, WD**. The relationships between psychopathology and sleep problems differ between racial minority groups. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
535. **Killgore, WD**, & Kamimori, GH. Can caffeine sustain attention and vigilance under prolonged monotonous conditions during 77 hours of total sleep deprivation? Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
536. **Killgore, WD**, Pace-Schott, Ozcan, M, Shepard, KC, Burns, AI, Grandner, MA, Vanuk, JR, & Alkozei, A. Morning blue light exposure improves sleep and fear extinction recall in PTSD. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies

(SLEEP) Conference, San Antonio TX, June 8-12, 2019.

537. LaFollette, K, Satterfield, BC, Esbit, S, Lazar, M, Grandner, MA, & **Killgore, WD**. Negative mood and poor sleep are associated with altered moral reasoning under stress. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
538. LaFollette, KJ, Satterfield, BC, Esbit, S, Lazar, M, Grandner, MA, & **Killgore, WD**. The effects of prior at-home sleep duration on reversal-learning during a “shoot/no-shoot” task. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
539. Ozcan, M, Shepard, KC, Burns, AI, Raikes, AC, Dailey, NS, Alkozei, A, Grandner, MA, & **Killgore, WD**. Individuals with PTSD whose traumatic experiences occurred within the home have worse sleep outcomes. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
540. Ozcan, M, Shepard, KC., Burns, AI, Raikes, AC, Dailey, NS, Alkozei, A, Grandner, MA, & **Killgore, WD**. PTSD severity and use of negative emotion words in trauma narratives predict nightmares in individuals with PTSD. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
541. Satterfield, BC, Silveri, MM, Grandner, MA, & **Killgore, WD**. Baseline GABA levels predict time-on-task performance during sleep deprivation. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
542. Skalamera, J, Huang, YH, Chinkers, M, Richards, MM, & **Killgore, WDS**. The influence of habitual sleep duration on rational thinking ability. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
543. Bliznak, V, Perlis, ML, Ellis, J, Hale, L, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. What is the ideal bedtime? Data from a community sample. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
544. Lane, E, Ellis, J, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. Sociodemographic, socioeconomic, and behavioral correlates of nightmare frequency in a community sample. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
545. Jajoo, A, Taylor-Pilliaie, R, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. Types of habitual physical activity associated with habitual sleep duration, sleep quality, and daytime sleepiness. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
546. Khader, W, Fernandez, F, Seizas, A, Knowlden, A, Ellis, J, Williams, N, Hale, L, Perlis, M, Jean-

Louis, G, **Killgore, WD**, Alfonso-Miller, P, & Grandner, MA. What makes people want to make changes to their sleep? Assessment of perceived risks of insufficient sleep as a predictor of intent to improve sleep. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

547. Pham, B, Hale, L, St-Onge, M, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. Habitual dietary quality associated with habitual sleep duration, insomnia, daytime sleepiness, and fatigue in a community sample. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
548. Begay, T, Gooneratne, N, Williams, N, Seixas, A, Jean-Louis, G, Gilles, A, **Killgore, WD**, Alfonso-Miller, P, & Grandner, MA. Sleep disparities in the United States and the impact of poverty. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
549. Griffen, N, Hale, L, Jean-Louis, G, **Killgore, WD**, Warlick, C, Alfonso-Miller, & Grandner, MA. Aspects of disordered neighborhoods are associated with insomnia, sleepiness, fatigue and control over sleep. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
550. Liang, O, Seixas, A, Parthasarathy, S, Jean-Louis, G, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. Healthcare financial hardship and habitual sleep duration, impact on sleep disparities, and impact on the sleep-obesity relationship. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
551. Olivier, K, Perlis, ML, Troxel, W, Basner, M, Chakravorty, S, Tubbs, A, Owens, J, Jean-Louis, G, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. Influence of likely nocturnal wakefulness on 24-hour patterns of violent crime in adults and juveniles. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
552. Featherston, B, Perlis, ML, Ellis, J, Williams, N, Jean-Louis, G, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. The concept of “satisfaction with sleep: Associations with sleep continuity, sleep quality, daytime sleepiness, and related concepts of overall health, stress, depression, and anxiety. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
553. Fourte, DA, Patterson, F, Malhotra, A, Seixas, A, **Killgore, WD**, Alfonso-Miller, P, & Grandner, MA. Should habitual sleep duration be added to the American Heart Association’s “Life’s Simple 7?” Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
554. Wills, C, Athey, A, Robbins, R, Patterson, F, Turner, R, **Killgore, WD**, Tubbs, A, Warlick, C, Alfonso-Miller, P, & Grandner, MA. Chronotype and social support among student athletes: Impact on depressive symptoms. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

555. Ramsey, T, Athey, A, Ellis, J, Tubbs, A, Turner, R, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. Dose-response relationships between insufficient sleep and mental health symptoms I collegiate student athletes and non-athletes. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
556. Quiroz, H, Chakravorty, S, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. Sleep-related determinants of habitual cannabis use, desire to use, and problematic use: Data from a community sample. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
557. Warlick, C, Williams, N, Hale, L, **Killgore, WD**, Alfonso-Miller, P, & Grandner, MA. Is relationship satisfaction associated with habitual sleep? Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.
558. Ozcan, M, Burns, AI, Shepard, KC, & **Killgore, WD**. The relationship between combat and non-combat trauma and risk-taking propensity in individuals with PTSD. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.
559. Esbit, S, Satterfield, BC, & **Killgore, WD**. Exploration of emotional intelligence and self-perceived invincibility. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.
560. LaFollette, KJ, Satterfield, BC, & **Killgore, WD**. Self-perceived invincibility is associated with greater cognitive flexibility. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.
561. Strong, M, Esbit, S, LaFollette, KJ, Dailey, NS, & **Killgore, WD**. Big Five personality traits and how they relate to self-perceived invincibility. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.
562. Shepard, KC, Ozcan, M, Burn, AI, Alkozei, A, & **Killgore, WD**. Blue light therapy differences in sleep quality improvement in military and civilian populations. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.
563. Raikes, AC, Athey, A, Alfonso-Miller, P, **Killgore, WD**, & Grandner, MA. Moderate-to-severe self-reported insomnia and frequent daytime sleepiness increase athletes' risk for sustaining a sports-related concussion. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.
564. Bajaj, S, Dailey, NS, Raikes, AC, Vanuk, JR, Weber, M, Rosso, IM, Rauch, SL, & **Killgore, WD**. Impact of blue-wavelength light therapy on cortical volume and simple reaction time following mild TBI. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.
565. Raikes, AC, Satterfield, BC, Bajaj, S, Grandner, MA, & **Killgore, WD**. Daily administered blue light therapy reduces daytime sleepiness and improves somatic symptoms following mild

traumatic brain injury. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.

566. Burns, AI, Ozcan, M, Shepard, KC, Alkozei, A, Vanuk, JR, & **Killgore, WD**. The relationship between sleep onset latency and gratitude. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.
567. LaFollette, KJ, Satterfield, BC, Esbit, S, Lazar, M, & **Killgore, WD**. Inadequate sleep quality and duration predicts disinhibited shooting on a “shoot/no shoot” task. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.
568. Bajaj, S, & **Killgore, WD**. Sex differences in risk-taking behavior and brain morphometry in healthy individuals. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.
569. Satterfield, BC, Silveri, MM, & **Killgore, WD**. Baseline GABA levels are associated with time-on-task performance during sleep deprivation. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.
570. **Killgore, WD**, Ozcan, M, Shepard, KC, Burns, AI, Vanuk, JR, & Alkozei, A. Blue light exposure enhances sleep and fear extinction recall in PTSD. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.
571. LaFollette, K, Satterfield, BC, Lazar, M., **Killgore, WDS**. Disentangling the Effects of Subjective Task Load and Performance on Neuroendocrine Stress Response. Poster presented at the 49th Annual Society for Neuroscience Meeting, Chicago, IL, October, 2019.
572. Dailey, NS, & **Killgore, WD**. Disrupted thalamocortical connectivity following mild traumatic brain injury: Associations with daytime sleepiness. Oral presentation at the American Speech-Language Hearing Association Conference, Orlando, FL, November, 2019.
573. Dailey, NS, & **Killgore, WD**. Reading fluency in mild traumatic brain injury. Poster presented at the American Speech-Language Hearing Association Conference, Orlando, FL, November, 2019.
574. Raikes, AC, Alkozei, A, Vanuk, JR, Bajaj, S, Satterfield, BC, & **Killgore, WD**. Blue light therapy reduces daytime sleepiness as well as depressive and somatic post-concussive symptoms following mild traumatic brain injury. Abstract accepted for Oral presentation at the 48<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020. ***[\*Winner of Nelson Butters Research Award for Best Paper by a Post-Doctoral Fellow].***
575. Raikes, AC, Bajaj, S, Dailey, NS, Vanuk, JR, Alkozei, A, & **Killgore, WD**. Vestibular and emotional symptoms are associated with altered large-scale network resting stated functional connectivity after mild traumatic brain injury. Abstract accepted for Poster presentation at the 48<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.
576. Esbit, S, Satterfield, BC, LaFollette, K, Lazar, M, & **Killgore, WD**. Gender differences and

overriding misleading impulses. Abstract accepted for Poster presentation at the 48<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.

- 577. Esbit, S, Raygoza, D, Meinhausen, C, Dailey, NS, & **Killgore, WD**. Exploring verbal recall throughout mild traumatic brain injury recovery. Abstract accepted for Poster presentation at the 48<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.
- 578. Meinhausen, C, Esbit, S, Dailey, NS, & **Killgore, WD**. Self-initiated verbal recall strategies following mild traumatic brain injury. Abstract accepted for Poster presentation at the 48<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.
- 579. Anlap, I, Esbit, S, Alkozei, A, Satterfield, BC, & **Killgore, WD**. The effects of gratitude on wellbeing are mediated by social support. Abstract accepted for Poster presentation at the 48<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.
- 580. Dailey, NS, Raikes, AC, Bajaj, S, Alkozei, A, Sanasac, S, & **Killgore, WD**. Frontal cortical surface area is associated with lexical-semantic knowledge in adults with mild traumatic brain injury. Abstract accepted for Poster presentation at the 48<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.
- 581. **Killgore, WD**, Burns, AI, Shepard, KC, Vanuk, JR, & Alkozei, A. Enhancing fear extinction recall in PTSD using blue light therapy. Abstract accepted for Poster presentation at the 48<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.
- 582. **Killgore, WD**, & Kamimori, GH. The effects of caffeine under monotonous conditions during prolonged total sleep deprivation. Abstract accepted for Poster presentation at the 48<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.
- 583. **Killgore, WD**, & Kamimori, GH. Trait extraversion is associated with increased suicidal ideation during sleep deprivation. Abstract accepted for Poster presentation at the 48<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.
- 584. Bullock, A, Burns, AI, Shepard, KC, Alkozei, A, & **Killgore, WD**. Alterations in cognitive symptoms of PTSD are correlated with somatic symptoms. Abstract accepted for Poster presentation at the 48<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.
- 585. Taylor, E, & **Killgore, WD**. Caffeine and emotional control. Abstract accepted for Poster presentation at the 48<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.
- 586. Taylor, E, & **Killgore, WD**. Emotionally intelligent early birds. Abstract accepted for Poster presentation at the 48<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.



587. Alkozei, A, Dailey, NS, Bajaj, S, Vanuk, JR, Raikes, AC, & **Killgore, WD**. The effects of blue wavelength light on subsequent amygdala-DLPFC connectivity at rest. Abstract accepted for Poster presentation at the 48<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.
588. Vanuk, JR, Raikes, AC, Alkozei, A, Shields, GS, Slavich, GM, & **Killgore, WD**. Lifetime stress exposure during adulthood is associated with lower emotional intelligence. Abstract accepted for Poster presentation at the 48<sup>th</sup> Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.
589. LaFollette, K, Satterfield, BC, Lazar, M., **Killgore, WD**. (February, 2020) The propensity for model-based control is associated with individual differences in risk behavior. Abstract submitted for presentation at the Computational and Systems Neuroscience (Cosyne) 2020 Meeting, Denver, CO, February, 2020.
590. **Killgore, WD**, Burns, AI, Bullock, A, Vanuk, J, Taylor, E, Alkozei, A. Using blue light to consolidate fear extinction memory in PTSD. Abstract accepted for Poster presentation at the 40<sup>th</sup> Annual Conference of the Anxiety and Depression Association of America, San Antonio, TX, March 19-22, 2020.
591. **Killgore, WD**, & Kamimori, GH. Can caffeine sustain cognitive resilience during 77 hours of stressful total sleep deprivation? Abstract accepted for Poster presentation at the 40<sup>th</sup> Annual Conference of the Anxiety and Depression Association of America, San Antonio, TX, March 19-22, 2020.
592. **Killgore, WD**, Skalamera, J, Vanuk, J, Woods-Lubert, R, Cloonan, S, Alkozei, A, Dailey, N, Lane, R, Weihs, K, Allen, J, and Smith, R. Abstract accepted for Poster presentation at the 40<sup>th</sup> Annual Conference of the Anxiety and Depression Association of America, San Antonio, TX, March 19-22, 2020.
593. **Killgore, WD**, & Kamimori, GH. Extraverts show increased suicidal ideation during sleep deprivation. Abstract accepted for Poster presentation at the 40<sup>th</sup> Annual Conference of the Anxiety and Depression Association of America, San Antonio, TX, March 19-22, 2020.
594. **Killgore, WD**, Cloonan, S, Woods-Lubert, R, Taylor, E, & Skalamera, J. Political perspective is associated with differences in trait anxiety and depression. Abstract accepted for Poster presentation at the 40<sup>th</sup> Annual Conference of the Anxiety and Depression Association of America, San Antonio, TX, March 19-22, 2020.
595. Alkozei, A, Dailey, NS, Bajaj, S, Vanuk, JR, Raikes, AC, & **Killgore, WD**. Acute blue wavelength light exposure influences functional brain connectivity. Abstract accepted for Poster presentation at the 40<sup>th</sup> Annual Conference of the Anxiety and Depression Association of America, San Antonio, TX, March 19-22, 2020.

596. Burns, A, Shepard, KC, Bullock, A, Esbit, S, Alkozei, A, Satterfield, B, & **Killgore, WD**. The association between life history strategy and anxiety is mediated by trait gratitude. Abstract accepted for Poster presentation at the 40<sup>th</sup> Annual Conference of the Anxiety and Depression Association of America, San Antonio, TX, March 19-22, 2020.
597. Bullock, A, Shepard, KC, Burns, A, Raikes, A, Alkozei, A, & **Killgore, WD**. Use of family words in trauma narratives predicts a higher risk of insomnia in individuals with PTSD. Abstract accepted for Poster presentation at the 40<sup>th</sup> Annual Conference of the Anxiety and Depression Association of America, San Antonio, TX, March 19-22, 2020.
598. **Killgore, WD**. Blue light therapy enhances sleep and fear extinction recall in PTSD. Symposium abstract accepted for presentation at the 75<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, New York, NY, April 30-May 2, 2020.
599. **Killgore, WD**, & Kamimori, GH. Extraversion and caffeine intake relate to suicidal ideation during sleep deprivation. Abstract accepted for Poster presentation at the 75<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, New York, NY, April 30-May 2, 2020.
600. **Killgore, WD**, Burns, AI, Bullock, A, Vanuk, JR, Taylor, E, & Alkozei, A. Morning blue light improves consolidation of fear extinction memory in PTSD. Abstract accepted for Poster presentation at the 75<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, New York, NY, April 30-May 2, 2020.
601. **Killgore, WD**, & Kamimori, GH. Effects of repeated dosing of caffeine on cognitive performance during prolonged sleep deprivation. Abstract accepted for Poster presentation at the 75<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, New York, NY, April 30-May 2, 2020.
602. Alkozei, A, Dailey, NS, Bajaj, S, Vanuk, JR, Raikes, AC, & **Killgore, WD**. Blue wavelength light and its effects on functional brain connectivity. Abstract accepted for Poster presentation at the 75<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, New York, NY, April 30-May 2, 2020.
603. Lucas, DA, Dailey, NS, & **Killgore, WD**. Implications for targeted interventions following mild traumatic brain injury: Post-concussion symptom severity predicts cognitive flexibility. Abstract accepted for Poster presentation at the 75<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, New York, NY, April 30-May 2, 2020.
604. Jecmen, D, King, R, Gould, J, Mitchell, J, Ralston, K, Alkozei, A, & **Killgore, WD**. The effect of blue light therapy on functional brain responses to masked fearful stimuli in post-traumatic stress disorder. Abstract accepted for Poster presentation at the 75<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, New York, NY, April 30-May 2, 2020.
605. King, R, Jecmen, D, Mitchell, J, Ralston, K, Gould, J, Burns, A, Bullock, A, Alkozei, A, & **Killgore, WD**. Co-morbid depressive symptoms are associated with reduced functional brain

responses within the insula and visual cortex in response to masked happy faces in individuals with PTSD. Abstract accepted for Poster presentation at the 75<sup>th</sup> Annual Meeting of the Society of Biological Psychiatry, New York, NY, April 30-May 2, 2020.

606. Dailey, NS, Raikes, AC, Alkozei, A, Grandner, MA, & **Killgore WD**. Reduced cortical thickness as a biomarker of daytime sleepiness in mild traumatic brain injury. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
607. Dailey, NS, Raikes, AC, Wager, ME, Grandner, MA, Alkozei, WD. The compounding impact of daytime sleepiness and brain injury on sustained vigilance. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
608. Anlap, I, Taylor, E, Grandner, MA, & **Killgore, WD**. Gray matter volume of the rostral medial prefrontal cortex is associated with resilience to mood decline during overnight sleep deprivation. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
609. Raikes, AC, Dailey, NS, Alkozei, A, Vanuk, JR, Grandner, MA, & **Killgore, WD**. Daytime sleepiness, depression, and post-concussive symptoms improve following prescribed morning exposure to blue light. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
610. Raikes, AD, Dailey, NS, Vanuk, JR, Alkozei, A, Grandner, MA, **Killgore, WD**. Improved daytime sleepiness following daily morning blue light therapy is associated with altered resting-state network connectivity. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
611. Satterfield, BC, Anlap, I, Esbit, S, & **Killgore, WD**. Corticotropin-releasing hormone receptor 1 gene polymorphism modulates cognitive flexibility following acute stress and total sleep deprivation. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
612. Jecmen, D, King, R, Gould, J, Mitchell, J, Ralston, K, Burns, AI, Bullock, A, Grandner, MA, Alkozei, A, & **Killgore, WD**. The effects of morning blue light therapy on insomnia severity and PTSD symptoms in a clinical sample. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
613. Taylor, E, Grandner, MA, & **Killgore, WD**. Later bedtime is associated with differences in prefrontal gray matter volume and executive function deficit. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
614. Taylor, E, & **Killgore, WD**. Meta-analysis on the effects of caffeine on neurodegenerative cognitive decline. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP

Conference, Philadelphia, PA, June 13-17, 2020.

- 615. LaFollette, KJ, Satterfield, BC, Esbit, S, Lazar, M, Grandner, MA, & **Killgore, WD**. Emotion regulation during sleep deprivation and repeated physiological stress: Implications for motor skill learning and production. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
- 616. King, R, Jecmen, D, Mitchell, J, Ralston, K, Gould, J, Burns, AI, Bullock, A, Grandner, MA, Alkozei, A, & **Killgore, WD**. Habitual sleep duration is negatively correlated with emotional reactivity within the rostral anterior cingulate cortex in individuals with PTSD. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
- 617. King, R, Jecmen, D, Alkozei, A, Raikes, A, Grandner, MA, & **Killgore, WD**. Hippocampal gray matter volume in healthy adult population is associated with habitual sleep duration. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
- 618. Burns, AI, Bullock, A, Taylor, E, Grandner, MA, Alkozei, A, & **Killgore, WD**. The association between sleep problems and risk-taking behavior differs between racial majority and minority groups. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
- 619. Burns, AI, Bullock, A, Raikes, AC, Dailey, NS, Grandner, MA, & **Killgore, WD**. Daytime sleepiness correlates with increased gray matter volume in the right middle temporal gyrus in healthy young individuals. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
- 620. **Killgore, WD**, Dailey, NS, Raikes, AC, Vanuk, John R, Taylor, E, Grandner, MA, & Alkozei, A. Blue light exposure enhances neural efficiency of the task positive network during a cognitive interference task. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
- 621. **Killgore, WD**, Dailey, NS, Raikes, AC, Vanuk, JR, Taylor, E, Grandner, MA, & Alkozei, A. Resilience to inhibitory deficits during sleep deprivation is predicted by gray matter volume in the ventromedial and ventrolateral prefrontal cortex. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
- 622. Bullock, A, Burns, A, Taylor, E, Grandner, MA, Miller, MM, Alkozei, A, & **Killgore, WD**. Self-referential language in trauma narratives predicts shorter sleep duration in women with PTSD. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

623. Vanuk, JR, Raikes, AC, Dailey, NS, Grandner, MA, & **Killgore, WD**. Grey matter volumetric differences are predictive of attentional lapses during sleep deprivation. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
624. Meinhausen, CE, Vanuk, JR, Grandner, MA, & **Killgore, WD**. Gray matter volume correlates of psychomotor vigilance speed during sleep deprivation. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
625. Kapoor, A, Perlis, M, Bastien, C, Williams, N, Hale, L, Branas, C, Barrett, M, **Killgore, WD**, Wills, CC, & Grandner, MA. Disassembling Associations between Insomnia and Anxiety Symptoms: Which Elements of Insomnia are Associated with Which Elements of Anxiety? Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
626. Ramsey, T, Athey, A, Auerbach, A, Turner, R, Williams, N, Jean-Louis, G, **Killgore, WD**, Wills, CC, & Grandner, MA. Sleep Duration and Symptoms Associated with Race/Ethnicity in Elite Collegiate Athletes. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
627. Piro, B, Garland, S, Jean-Pierre, P, Gonzalez, B, Seixas, A, **Killgore, WD**, Wills, CC, & Grandner, MA. Sleep Duration and Sleep Timing Associated with History of Breast, Prostate, and Skin Cancer: Data from a Nationally-Representative Sample. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
628. Bombarda, A, St-Onge, M, Seixas, A, Williams, N, Jean-Louis, G, **Killgore, WD**, Wills, CC, & Grandner, MA. Sleep Duration and Timing Associated with Eating Behaviors: Data from NHANES 2015-2016. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
629. Abdi, H, Athey, A, Auerbach, A, Turner, R, **Killgore, WD**, Wills, CC, & Grandner, MA. College Football Players Compared to Other Collegiate Athletes: Symptoms of Insufficient Sleep Duration, Insomnia, and Sleep Apnea. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
630. Holbert, C, Bastien, C, Chakravorty, S, **Killgore, WD**, Wills, CC, & Grandner, MA. Hallucinogen Use Among College and University Students: Associations with Insufficient Sleep and Insomnia. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
631. Onyeonwu, C, Nowakowski, S, Hale, L, Branas, C, Barrett, M, **Killgore, WD**, Wills, CC, & Grandner, MA. Menstrual Regularity and Bleeding Associated with Sleep Duration, Sleep Quality, and Daytime Sleepiness in a Community Sample. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

632. Ghani, S, Delgadillo, ME, **Killgore, WD**, Wills, CC, & Grandner, MA. Culturally Consistent Diet Among Individuals of Mexican Descent at the US-Mexico Border Is Associated with Sleep Duration and Quality. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
633. Mason, B, Tubbs, A, Hale, L, Branäs, C, Barrett, M, **Killgore, WD**, Wills, CC, & Grandner, MA. Use of Mobile Devices at Night Associated with Mental Health in Young Adults. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
634. Gozar, A, Seixas, A, Hale, L, Branäs, C, Barrett, M, **Killgore, WD**, Wills, CC, Grandner, MA. Mobile Device Use in Bed and Relationships to Work Productivity: Impact of Anxiety. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
635. Barker, M, St-Onge, M, Seixas, A, **Killgore, WD**, Wills, CC, & Grandner, MA. Dietary Macronutrients and Sleep Duration, Sleep Disturbance, and Daytime Fatigue. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
636. Phan, S, Perlis, ML, Hale, L, Branäs, C, **Killgore, WD**, Wills, CC, & Grandner, MA. Reconsidering Stimulus Control: Activities in Bed Differentially Associated with Sleep-Related Outcomes. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
637. Grandner, MA, Tubbs, A, Jean-Louis, G, Seixas, A, Hale, L, Branäs, C, **Killgore, WD**, & Wills, CC. Daytime Sleepiness in the Community: Implications for Sleep Health, Circadian Health, and Overall Physical Health. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
638. Begay, T, Tubbs, A, Jean-Louis, G, Hale, L, Branäs, C, **Killgore, WD**, Wills, CC, & Grandner, MA. Demographic and Socioeconomic Implications of Excessive Daytime Sleepiness in the Community. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
639. Khader, WS, Tubbs, A, Fernandez, F, Chakravorty, S, Hale, L, Branäs, C, Barrett, M, **Killgore, WD**, Wills, CC, & Grandner, MA. Community-Level Daytime Sleepiness and Substance Use: Implications of Sleep Time and Mental Health. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
640. Jajoo, A, Tubbs, A, Perlis, ML, Chakravorty, S, Seixas, A, **Killgore, WD**, Wills, CC, & Grandner, MA. Population-Level Suicide Ideation: Impact of Combined Roles of Sleep Duration, Sleep Disturbance, and Daytime Sleepiness. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

641. Clay, MA, Athey, A, Charest, J, Auerbach, A, Turner, R, **Killgore, WD**, Wills, CC, & Grandner, MA. Team-Based Athletes Sleep Less than Individual Athletes, But Do Not Report More Insomnia or Fatigue. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
642. Grandner, MA, Fernandez, F, Khader, S, Jean-Louis, G, Seixas, A, Williams, N, **Killgore, WD**, & Wills, CC. Decline in Habitual Sleep Duration over 10 Years and Worsening Sleep Disparities: Data From NHIS 2006-2015. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.
643. Villalobos, KM, Seixas, A, Williams, N, Jean-Louis, G, **Killgore, WD**, Wills, CC, & Grandner, MA. Disparities in Sleep Timing in the US: Data from the National Health and Nutrition Examination Survey 2015-2016. Abstract submitted for Poster presentation at the 34<sup>th</sup> Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

## **AWARDED GRANTS AND CONTRACTS**

### ***Completed***

- 2001-2003 fMRI of Unconscious Affect Processing in Adolescence.  
NIH, 1R03HD41542-01  
PI: **Killgore** (\$79,000.)
- 2003-2006 The Effects of Sleep-Loss and Stimulant Countermeasures on Judgment and Decision Making.  
U.S. Army Medical Research and Materiel Command (USAMRMC) Competitive Medical Research Proposal Program (CMRP); Intramural Funding,  
PI: **Killgore** (Total Award: \$1,345,000.)
- 2004-2005 Sleep/wake Schedules in 3ID Aviation Brigade Soldiers.  
Defense Advanced Research Projects Agency (DARPA)  
PI: **Killgore** (Total Award: \$60,000.)
- 2005-2006 Functional Neuroimaging Studies of Neural Processing Changes with Sleep and Sleep Deprivation.  
U.S. Army Medical Research and Materiel Command (USAMRMC); Intramural Funding Task Area C (Warfighter Judgment and Decision Making) Program Funding  
PI: **Killgore** (Total Award: \$219,400.)
- 2006-2007 Establishing Normative Data Sets for a Series of Tasks to Measure the Cognitive Effects of Operationally Relevant Stressors.  
U.S. Army Medical Research and Materiel Command (USAMRMC); Intramural Funding Task Area C (Warfighter Judgment and Decision Making) Program Funding,

PI: **Killgore** (Total Award: \$154,000.)

- 2006-2007 Military Operational Medicine Research Program (MOM-RP), Development of the Sleep History and Readiness Predictor (SHARP).  
U.S. Army Medical Research and Materiel Command (USAMRMC); Intramural Funding  
PI: **Killgore** (Total Award:\$291,000.)
- 2009-2014 The Neurobiological Basis and Potential Modification of Emotional Intelligence through Affective Behavioral Training (W81XWH-09-1-0730).  
U.S. Army Medical Research and Materiel Command (USAMRMC),  
PI: **Killgore** (Total Award: \$551,961.)  
Major Goal: To identify the neurobiological basis of cognitive and emotional intelligence using functional and structural magnetic resonance imaging.
- 2011-2016 Effects of Bright Light Therapy on Sleep, Cognition, and Brain Function following Mild Traumatic Brain Injury (W81XWH-11-1-0056).  
U.S. Army Medical Research and Materiel Command (USAMRMC),  
PI: **Killgore** (Total Award: \$941,924)  
Major Goal: To evaluate the effectiveness of morning exposure to bright light as a treatment for improving in sleep patterns among individuals with post-concussive syndrome. Effects of improved sleep on recovery due to this treatment will be evaluated using neurocognitive testing as well as functional and structural neuroimaging.
- 2012-2014 Neural Mechanisms of Fear Extinction Across Anxiety Disorders  
NIH NIMH  
PI: Milad, M. Site Subcontract PI: **Killgore** (Subcontract Award: \$505,065)  
Major Goal: To examine the neurocircuitry involved in fear conditioning, extinction, and extinction recall across several major anxiety disorders.
- 2012-2014 Multimodal Neuroimaging to Predict Cognitive Resilience Against Sleep Loss  
Defense Advance Research Projects Agency (DARPA) Young Faculty Award in Neuroscience (D12AP00241)  
PI: **Killgore** (Total Award: \$445,531)  
Major Goal: To combine several neuroimaging techniques, including functional and structural magnetic resonance imaging, diffusion tensor imaging, and magnetic resonance spectroscopy to predict individual resilience to 24 hours of sleep deprivation.
- 2012-2015 Internet Based Cognitive Behavioral Therapy Effects on Depressive Cognitions and Brain function (W81XWH-12-1-0109).  
U.S. Army Medical Research and Materiel Command (USAMRMC),  
PI: Rauch, SL; Co-PI: **Killgore** (Total Award: \$1,646,045)  
Major Goal: To evaluate the effectiveness of an internet-based cognitive behavioral therapy treatment program on improving depressive symptoms, coping and resilience skills, cognitive processing and functional brain activation patterns within the prefrontal cortex.
- 2015 Effects of Blue Light on Melatonin Levels and EEG Power Density Spectrum  
Arizona Area Health Education Centers (AHEC) Program  
Co-PI: Alkozei, A.; Co-PI: **Killgore** (Total Award: \$4,373)



Percent Effort: 0%

Major Goal: Adjunctive intramural funding to add a melatonin collection to an ongoing study of the effects of blue wavelength light on alertness and brain function.

### **Current**

- 2012-2020 A Model for Predicting Cognitive and Emotional Health from Structural and Functional Neurocircuitry following Traumatic Brain Injury (W81WH-12-0386)  
Congressionally Directed Medical Research Program (CDMRP), Psychological Health/Traumatic Brain Injury (PH/TBI) Research Program: Applied Neurotrauma Research Award.  
PI: **Killgore** (Total Award: \$2,272,098)  
Percent Effort: 25%  
Major Goal: To evaluate the relation between axonal damage and neurocognitive performance in patients with traumatic brain injury at multiple points over the recovery trajectory, in order to predict recovery.
- 2014-2019 Bright Light Therapy for Treatment of Sleep Problems following Mild TBI (W81XWH-14-1-0571).  
Psychological Health and Traumatic Brain Injury Research Program (PH/TBI RP) Traumatic Brain Injury Research Award-Clinical Trial.  
PI: **Killgore** (Total Award: \$1,853,921)  
Percent Effort: 40%  
Major Goal: To verify the effectiveness of morning exposure to bright light as a treatment for improving in sleep patterns, neurocognitive performance, brain function, and brain structure among individuals with a recent mild traumatic brain injury.
- 2014-2020 A Non-pharmacologic Method for Enhancing Sleep in PTSD (W81XWH-14-1-0570)  
Military Operational Medicine Research Program (MOMRP) Joint Program Committee 5 (JPC-5), FY13 Basic and Applied Psychological Health Award (BAPHA)  
PI: **Killgore** (Total Award: \$3,821,415)  
Percent Effort: 35%  
Major Goal: To evaluate the effectiveness of blue light exposure to modify sleep in PTSD and its effects on fear conditioning/extinction, symptom expression, and brain functioning.
- 2016-2020 Refinement and Validation of a Military Emotional Intelligence Training Program (JW150005)  
Joint Warfighter Medical Research Program 2015  
PI: **Killgore** (Total Award: \$5,977,570)  
Percent Effort: 45%  
Major Goal: To develop and validate a new internet-based training program to enhance emotional intelligence capacities in military Service Members.

- 2017-2019 Emotional State and Personality: A Proof-of-Concept Model for Predicting Performance Under Stress (DM160347)  
 USAMRMC 2015  
 PI: **Killgore** (Total Award: \$1,247,290)  
 Percent Effort: 20%  
 Major Goal: To develop a statistical model to predict effective cognitive performance under stress using personality and state emotion metrics.
- 2018-2020 Understanding the Mechanisms of Blue Light Exposure on Cognitive Performance  
 USAMRDC  
 PI: Alkozei **Co-I: Killgore** (Total Award: \$306,903)  
 Percent Effort: 4%  
 Major Goal: To identify the subcortical systems responsible for acute cognitive improvement associated with blue light exposure in the scanner.
- 2020-2022 Transcranial Magnetic Stimulation of the Default Mode Network to Improve Sleep  
 USAMRDC  
 PI: **Killgore** (Total Award: \$TBD)  
 Percent Effort: 5%  
 Major Goal: Determine whether continuous theta burst stimulation of the default mode network can improve sleep among individuals with insomnia.
- 2020 Real-Time Caffeine Optimization during Total Sleep Deprivation  
 USAMRDC  
 Site PI: **Killgore** (Total Award: \$642,694)  
 Percent Effort: 40%  
 Major Goal: Determine the effectiveness of the 2B-Alert Caffeine Optimization Program during an in-laboratory sleep deprivation study.