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TITLE: Understanding The Mechanisms Of Blue Light Exposure On Cognitive Performance

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14. ABSTRACT Military personnel often face challenging situations, including being sleep deprived, having to remain focused and undistracted for long periods of time and having to respond quickly and precisely in response to different critical situations. Being able to sustain attention, even when one is sleep deprived, remain positive and calm, and being able to respond quickly, are all of crucial importance to mission success. Blue light exposure seems to be a safe and easily implemented tool to improve attention, increase cognitive functioning and enhance mood. However, the exact mechanism that explains these beneficial effects is currently unknown. Lack of knowledge makes it impossible to provide exact recommendations for how to best use blue light exposure. It is also unclear how quickly after blue light onset measurable changes in the brain are present and how they correlate with subjective and objective changes in alertness, cognitive functioning and mood. The results from this study will provide information on the exact mechanisms that underlie the positive effects of blue light exposure. Answers to these crucial questions will make it considerably easier to provide targeted and informed recommendations for how to best use blue light across a wide variety of settings in order to improve cognitive functioning.					
15. SUBJECT TERMS Cognitive performance; blue wavelength light; bright light; attention; mechanism;					
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TABLE OF CONTENTS

	<u>Page</u>
1. Introduction	4
2. Keywords	4
3. Accomplishments	4
4. Impact	11
5. Changes/Problems	11
6. Products	12
7. Participants & Other Collaborating Organizations	13
8. Special Reporting Requirements	14
9. Appendices	14

1. INTRODUCTION:

The aim of this study is to understand the mechanism by which blue wavelength light leads to improvements of several aspects of cognitive functioning during the daytime (e.g., alertness, working memory performance, mood) that are independent of the well-established effects of blue wavelength light on circadian functioning. Previous studies have shown that blue light exposure may lead to increased activation within the locus coeruleus (LC). The LC is a small nucleus in the brainstem which, when activated, is responsible for the secretion of the neuromodulator norepinephrine which is then broadly distributed throughout the cortex. Increased levels of norepinephrine have been shown to be associated with a number of cognitive processes, including working memory performance as well as changes in mood. The aim of this study is to establish whether norepinephrine is in fact released as a function of blue light exposure, using combined functional magnetic imagining techniques as well as continuous measures of pupillary responses, which have been shown to be an index of norepinephrine release. This study will also establish how quickly these changes are apparent, and how they correlate with cognitive performance as well as functional brain activation changes on two different types of learning tasks.

For this study, 27 healthy young adults undergo two testing and functional magnetic resonance imaging (fMRI) scan sessions; once being exposed to blue wavelength light and once to amber light (a non-blue placebo condition) separated by one week. The order of the two conditions will be counterbalanced between participants. All participants must adhere to a regular sleep schedule which is monitored by sending participants an Actiwatch that measures their sleep. Participants wear the watch for one week and then attend their first visit in the laboratory. Participants who adhered to a regular sleep schedule first undergo several demographic questionnaires and surveys as well as several neuropsychological assessments, such as intelligence and memory tests. Participants then undergo a 1.5 hour long fMRI scan. Participants complete a resting state scan and working memory task in darkness. Then, they are exposed to blue (or amber) light in 30 second intervals for 12 minutes. During this scan, their pupil dilation is also be measured and will be used as an index of norepinephrine release in response to light. After this scan, light is turned on continuously and participants complete another resting state scan with their eyes open while they let their thoughts wander. They then complete the working memory task again under light exposure as well as a different type of learning task where participants are required to learn from rewarding and punishing cues (i.e., monetary rewards or losses). Participants then return to the laboratory one week later and undergo the same procedure again but with the alternate light color. Participants will serve as their own comparison group, so that the observed effects can be attributed to the effects of blue light and not high-intensity light in general. Brain activation changes in response to the two light conditions as well as performance on the different tasks will be compared to better understand the mechanism of how blue light exposure impacts cognitive functioning during the day. This information can be used to better target blue light exposure to boost cognitive performance in a variety of situations.

2. KEYWORDS:

Blue wavelength light; functional magnetic resonance imagining; norepinephrine; melatonin; cognition; working memory; learning; locus coeruleus; alertness;

3. ACCOMPLISHMENTS:

What were the major goals of the project?

According to the Statement of Work (SOW), the following major tasks were proposed with projected and actual completion dates:

Specific Aim 1: Identify the mechanism by which blue light exposure during the day leads to increases in alertness, cognitive performance, and mood in healthy individuals.	Projected Timeline	Actual completion date
Major Task 1: Study Preparation	Months	
Development of MRI compatible blue light device	1-4	Achieved: June 2019
Submit documents for IRB and HRPO approval	2-4	Submitted IRB: 07/01/2019 Submitted HRPO: 08/16/2019
Place advertisements for participants recruitment	4-14	Started: 02/01/2020; currently on hold
<u>Milestone Achieved:</u> MRI compatible light devices created	4	Achieved: June 2019
<u>Milestone Achieved:</u> IRB and HRPO approval	4	Approval IRB: 08/15/2019 Approval HRPO: 01/30/2020
Major Task 2: Data Collection		
Collect data from participants	4-14	Started: 02/19/2020; currently on hold
<u>Milestone(s) Achieved:</u> Complete data collection	14	-
Major Task 3: Process and Analyze Data		
Process fMRI, melatonin and pupillometry data	14-16	-
Analyze data and submit publications	16-18	-
<u>Milestone Achieved:</u> Study complete and final report submitted	18	-

What was accomplished under these goals?

Major activities:

Major Tasks 1 and 2: Study Preparation and Data Collection

As outlined in the SOW, the major tasks for this reporting period were related to study preparation. Preparatory work involved hiring new research technicians and recruiting several undergraduate volunteer research assistants, and ensuring that all personnel were fully trained on all laboratory procedures and study specific procedures. All equipment required for use in the study was acquired early on in Year 1, including Actiwatchs, saliva collection kits, and assessments and scales. An online platform for data management, RedCap, was outfitted for the purposes of this study and extensively tested and refined to meet the study's needs after practice sessions were run and weaknesses identified. Further, fMRI scan sequences were built and tested multiple times in practice runs. Data obtained from each of these practice iterations was processed for use and sequences were continually refined until the resulting product was suited for the analyses planned.

Specific Objective: Obtain IRB and HRPO approval

As outlined in the SOW, one major objective for this reporting period was to obtain IRB and HRPO approval. We obtained IRB approval on 08/15/2019 and we obtained HRRP approval on 01/30/2020.

Specific Objective: Development of MRI-compatible light device

Our second main objective for this reporting period was to develop the MRI compatible bright light device. This was achieved in June 2019. This was done with the help of the University of Arizona's Instrumentation Specialist. The different parts to build the light device had to be researched and purchased. The PI consulted with other researchers who had built similar devices in the past and bought equipment that was recommended for safe and efficient use in the sensitive environment of the MRI scanner (i.e., could not contain any metal). In addition, a design to mount the light device to the MRI's headcoil had to be developed and 3D printed. The device also needed to go through several iterations in order to meet several requirements (e.g., material had to be strong enough not to break, design of the device had to be modified to fit with pre-existing devices in the scanner, etc.). The final system is detailed in Figure 1 (see below).

Figure 1. MRI-compatible bright light device.

The final system uses a bright (31,000 lux at light source) cold white LED light source (Edmund Optics SugarCUBE Model # 38000-M03-005) placed outside of the Faraday cage (Pic1). Light intensity is computer controlled. A 9.1 meter 25mm diameter non-metallic optical fiber (Dolan-Jenner Industries Dwg # 70-001424) (Pic2) runs from the light source/filter wheel that can switch between blue wavelength light ($\lambda = 470$ nm) and amber wavelength light ($\lambda = 580$ nm) (Pic3) to the head coil mounting assembly (Pic4) (BDPS 3D printed design). This assembly will be mounted to the headcoil that is part of the MRI scanner (Pic5). Monochromatic light is produced with narrow band filters (Edmund Optics stock #65-144 470nm; stock #65-161 580nm) mounted in a multi-position computer controlled filter wheel (Spectral Products AB-301T) that is mechanically attached to the LED light source.



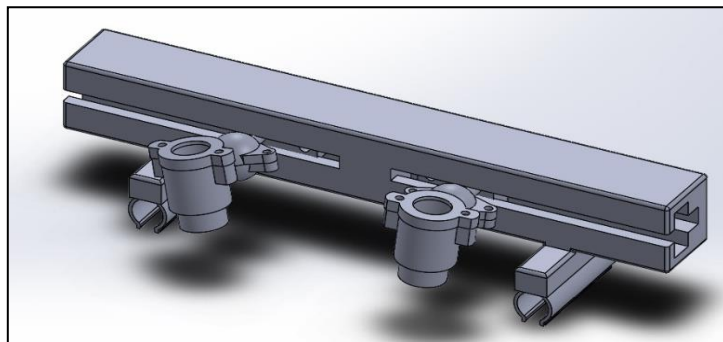
Picture 1. LED light source



Picture 2. Optical Fiber



Picture 3. Filter Wheel



Picture 4. Head coil mounting assembly



Picture 5. Headcoil assembly

Specific Objective: Complete Data Collection

We started data collection on 02/12/2020 and have therefore not met the goal of completing data collection yet. We have completed data collection for one participant and have completed the first visit for two more participants. We also started data collection for two more participants who dropped out of the study. Unfortunately, on 18th March 2020, we decided to pause data collection for this study in light of the COVID-19 outbreak.

Recruitment for this study, however, did not pose a challenge. Since recruitment started, 375 individuals filled out the online interest form and 48 individuals have been eligible. Our goal for this study is to collect data on 27 participants. We therefore have more than enough individuals who are eligible and willing to complete the study. Before the COVID-19 outbreak, we had scheduled 20 participants out until May 2020. We were therefore on track to complete data collection before the end of the study. We will pick up data collection as soon as it is safe to do so and are anticipating that we will be able to make up for the pause in data collection quickly (see more information under **5. Changes and Problems**).

Significant results and key outcomes

As we only have a full dataset for one participant, it was not possible to do a preliminary data analysis.

However, we plan to analyze the following key outcomes:

Key Outcome: Functional brain responses to blue light at rest

We are currently collecting data on functional brain responses to alternating 30 seconds of blue (versus amber) light and darkness. We will use a block design to assess changes in functional brain responses between blue light and darkness and amber light and darkness. We are expecting that blue light in comparison to amber light will activate, among other regions, a small area in the brainstem, the locus coeruleus (LC). We will use Keren et al.'s (2009) region of interest of the LC in our analysis (see Figure 2). Participants also complete two resting state scans where they are asked to rest with their eyes open and let their mind wander. Participants will complete the resting state scan one time in darkness and the other time with blue (or amber) light, each for 12 minutes. We will be able to investigate changes in functional brain connectivity at rest due to blue light exposure. This data, combined with the data from the previous task (30 seconds light on/off) will give us crucial information on how long it takes for blue light to have an effect on functional brain responses and what “path” that activation takes. We hypothesize that blue light will activate subcortical structures first and after several minutes of exposure will also lead to increased activation in prefrontal areas. This data will provide important information for how long blue wavelength light should be used and how quickly changes in brain function can be expected.

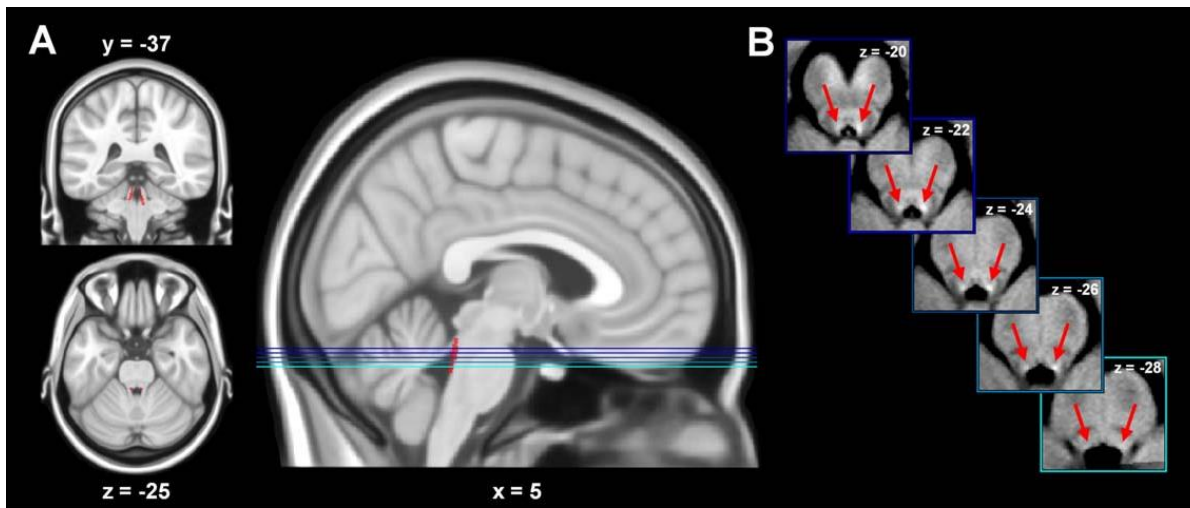


Figure 2- Region of interest - Locus Coerulus (Keren et al., 2009)

Key Outcome: Functional brain responses to cognitive tasks during blue light exposure.

Participants are completing two tasks inside the MRI scanner. One is a working memory task, the N-back task (see Appendix). We have shown previously that individuals who were exposed to blue light thirty minutes before they completed the N-back task, showed greater activation in two areas of the prefrontal cortex during task performance (Alkozei et al., 2016) (see Figure 3). We also showed that individuals performed faster at the task. In this study, we will be able to further elucidate whether blue light exposure *during* the task will lead to similar boosts in performance. We will use the regions of interest from our previous study to target our analyses. This data will give us important information on whether we can boost cognitive performance with blue light exposure during the day in a relatively short time frame.

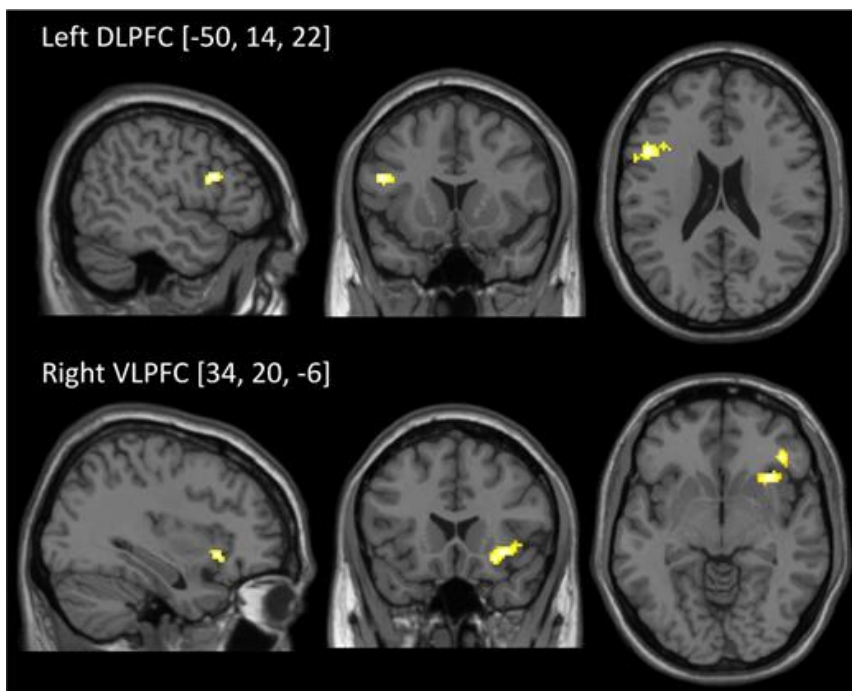


Figure 3 - Regions of interest for N-back task analysis (taken from Alkozei et al., 2016)

The second task participants are completing in the scanner is a reward learning/decision-making task. Participants are told that they will play a game where they have to choose between different “slot machines” where they can win extra money (see Appendix). Some of the machines will lead to them winning money (\$1), some machines will lead to them losing money (\$1) and some will remain the same. This task is unique however in that the likelihood of a machine leading to a win or a loss can change unexpectedly. Participants need to learn from the rewarding machines (i.e, the ones that will lead to more wins) as well as need to be flexible enough to change their decision-making strategy when they realize that a machine is no longer likely to lead to a win. The task was adapted from Payzan-LeNestour et al. (2013) and it was chosen as it has been shown to lead to increased activation in the LC. As we are expecting blue wavelength light to lead to greater activation of the LC, blue light may therefore also improve performance on this task (i.e., increase learning rate for favorable machines). As blue wavelength light has also been used as a treatment for mood disorders, and individuals with mood disorders do not learn from rewarding cues (e.g., money) as well as healthy controls, this data will help us better understand how blue light may impact mood and reward learning/decision-making. We will use the regions of interest from Payzan-LeNestour et al. (2013) to guide our analysis.

Key Outcome: Changes in pupil dilation in response to blue light exposure

During the resting state scan, we are simultaneously tracking participants’ right eye and will analyze data for changes in pupil dilation. Activation of the LC stimulates the release of norepinephrine (NE) which significantly impacts cognitive performance, learning and memory. Increased LC activation in response to blue light exposure may therefore stimulate increase NE release which could plausibly explain increases in cognitive performance during the MRI tasks. Norepinephrine release can be measured non-invasively by measuring changes in pupil dilation. Studies have shown that NE release correlates with LC activation as well as changes in pupil dilation (Murphy et al., 2014). Using participants’ pupillary responses to light as well as their functional brain responses, we will be able to better understand if blue light leads to increased NE release in the brain. This information can be used to better understand how blue light might lead to an increase in cognitive performance and how quickly such increases in performance can be expected.

Key Outcome: Changes in Melatonin concentration in response to blue light

We are testing participants during the “dead zone” – a time when blue light exposure is not expected to impact melatonin levels (i.e., 6-8 hours after awakening). We are testing all participants at exactly the same time and are collecting saliva samples at three time points during the morning. We will analyze whether there are changes in salivary melatonin levels in response to blue light exposure. However, we are not expecting to see a change in melatonin levels during the morning as a result of blue light exposure. Rather, we are collecting this data to confirm that the observed effects of blue light exposure cannot be attributed to changes in melatonin levels and can be attributed to other effects (e.g., LC activation).

What opportunities for training and professional development has the project provided?

The research assistants hired for this project were able to get trained in several areas to advance their professional skills and experience. In particular, research assistants were trained on administering two common neuropsychological assessments that will be used as part of the study. Research assistants were also trained in the appropriate way to collect saliva samples, how to use an eye tracking software, and how to collect and analyze functional neuroimaging data. These are important professional skills in the area of biopsychological research that will be useful for their future clinical or academic careers in the areas of (neuro-)psychology, medicine, or physiology.

How were the results disseminated to communities of interest?

Nothing to report.

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

The forthcoming reporting period will be utilized to further bolster recruitment efforts and to continue collecting data. Our goal was to complete data collection by August 1st 2020. However, due to COVID-19, on March 18th 2020, we had to put data collection on hold. We are hoping to be able to start data collection up again as soon as possible to finish data collection by the grant's end date.

4. IMPACT:

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

Nothing to report.

What was the impact on other disciplines?

Nothing to report.

What was the impact on technology transfer?

Nothing to report.

What was the impact on society beyond science and technology?

Nothing to report.

5. CHANGES/PROBLEMS:

Nothing to report.

Changes in approach and reasons for change

Nothing to report.

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

During this reporting period, we had a slight delay in the completion of the MRI compatible light device. We had anticipated to complete the design of the light device and submit IRB and HRPO documents by May 2019, but it took until the end of June 2019 to complete the light device. We therefore were slightly delayed in submitting the IRB application for this project, which we did on 07/01/2019. We received approval on 08/15/2019 and submitted our HRPO application, the next day, on 08/16/2019. However, it took much longer than we had anticipated to receive HRPO approval. On 01/30/2020, we received HRPO approval. We were therefore delayed in starting data collection. However, while we were waiting for HRPO approval we made sure that we would be able to start recruitment and data collection immediately and made sure study staff was trained, study materials were purchased, and several dry-runs of the study procedures were done. We also spent significant amount of time in preparing the data collection and analysis software (i.e., RedCap) to make sure data analysis will take less time later.

While we had anticipated to start data collection in June 2019, we were unable to start recruitment until 01/31/2020, the day after we received HRPO approval. We distributed flyers around the Tucson, AZ area. We

also posted some advertisements on social media (Facebook and Instagram) to reach a broader audience. Within the first month of recruitment, we had scheduled 20 participants (i.e., 40 visits). We faced some difficulty with scheduling, as the MRI scanner's availability limited us from being able to schedule participants every day of the week. As such, we scheduled participants out until May 2020 to ensure scanner availability. Between 02/01/2020 and 03/18/2020, we ran 5 visits. Unfortunately, we only obtained a full dataset for one participant. Two participants had to be excluded from the study during their first visit due to eligibility criteria that were not apparent over the phone, and two other participants completed their first visit but were unable to return for their second visit due to the COVID-19 outbreak.

On March 18th 2020, we had to make the decision to pause data collection due to the COVID-19 outbreak. The University of Arizona advised only to run research studies that were medically necessary, and the MRI scanner's availability was reduced to only 2 days a week. As we were also collecting biohazardous liquids (i.e., saliva samples), we decided to pause the study for the safety of the participants and research staff. We plan to resume data collection as soon as possible. We re-assess the situation every week and will lean on university guidelines when making our decision.

It should be noted that we did not have difficulty with participant recruitment and were able to schedule 20 participants (over 2/3 of the final sample) within the first several weeks of recruitment. As mentioned above, 375 individuals have completed our online interest form and 48 individuals have been eligible. We therefore do not anticipate any further delays once data collection resumes. We will work closely with the MRI Technicians to ensure that we will be able to run participants at least 4 times a week. By completing 4 visits each week, data collection for the remaining 26 participants should take approximately 12 weeks.

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

No significant changes in use or care of human subjects to report.

6. PRODUCTS:

Publications, conference papers, and presentations

Journal publications.

Nothing to report.

Books or other non-periodical, one-time publications.

Nothing to report.

Other publications, conference papers and presentations.

Nothing to report.

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:	Anna Alkozei, Ph.D.
Project Role:	Principal Investigator
Researcher Identifier:	n/a
Nearest person month worked:	5.8
Contribution to Project:	Dr. Alkozei oversaw all aspects of project progress.
Funding Support:	N/A

Name:	William D.S. Killgore, Ph.D.
Project Role:	Co-Investigator
Researcher Identifier:	n/a
Nearest person month worked:	0.1

Contribution to Project:	Dr. Killgore provided intellectual and study design expertise to this project.
Funding Support:	USAMRAA W81XWH-14-1-0570 USAMRAA W81XWH-14-1-0571 UAAMRAA W81XWH-12-1-0386 USAMRAA W81XWH-16-1-0062 USAMRAA W81XWH-17-C-0088 USAMRAA W81XWH-19-1-0074

Name:	Rylee King, B.S.
Project Role:	Research Technician
Researcher Identifier:	n/a
Nearest person month worked:	6
Contribution to Project:	Ms. King provided support with recruitment activities, data collection and data storage.
Funding Support:	USAMRAA W81XWH-16-1-0062

Name:	Delaney Jecmen
Project Role:	Student Worker
Researcher Identifier:	n/a
Nearest person month worked:	2.8
Contribution to Project:	Ms. Jecmen provided support with recruitment activities, data collection and data storage.
Funding Support:	N/A

Name:	Daniel Lucas
Project Role:	Student Worker
Researcher Identifier:	n/a
Nearest person month worked:	1.2
Contribution to Project:	Mr. Lucas provided support with design of functional neuroimaging tasks.
Funding Support:	N/A

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

Nothing to report.

9. APPENDICES

References

List of Assessments

Questionnaires & Examples of Computer-Administrated Tasks

Anna Alkozei, Ph.D. Curriculum Vita

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List of Assessments and Computer-Administered Tasks

Questionnaires and Surveys

Beck Anxiety Inventory (BAI)
Beck Depression Inventory (BDI-II)
Day of Scan Information Questionnaire Visit 1 (DSIQ-V1)
Day of Scan Information Questionnaire Visit 2 (DSIQ-V2)
Epworth Sleepiness Scale (ESS)
Gratitude Resentment and Appreciation Test – Revised (GRAT-R)
Karolinska Sleepiness Scale (KSS)
Positive and Negative Affect Schedule (PANAS)
Pittsburgh Sleep Quality Index (PSQI)
Sleep Diary
Sleep Quality Scale (SQS)
Social Support Questionnaire (SSQ)
State-Trait Anxiety Inventory (STAI)

Neuropsychological Assessments

California Verbal Learning Test (CVLT-II)
Wechsler Abbreviated Scale of Intelligence (WASI-II)

MRI Tasks

Emotional Reward/Decision-Making Task
N-Back Task

Beck Anxiety Inventory

Below is a list of common symptoms of anxiety. Please carefully read each item in the list. Indicate how much you have been bothered by that symptom during the past month, including today, by circling the number in the corresponding space in the column next to each symptom.

	Not At All	Mildly but it didn't bother me much.	Moderately - it wasn't pleasant at times	Severely – it bothered me a lot
Numbness or tingling	0	1	2	3
Feeling hot	0	1	2	3
Wobbliness in legs	0	1	2	3
Unable to relax	0	1	2	3
Fear of worst happening	0	1	2	3
Dizzy or lightheaded	0	1	2	3
Heart pounding/racing	0	1	2	3
Unsteady	0	1	2	3
Terrified or afraid	0	1	2	3
Nervous	0	1	2	3
Feeling of choking	0	1	2	3
Hands trembling	0	1	2	3
Shaky / unsteady	0	1	2	3
Fear of losing control	0	1	2	3
Difficulty in breathing	0	1	2	3
Fear of dying	0	1	2	3
Scared	0	1	2	3
Indigestion	0	1	2	3
Faint / lightheaded	0	1	2	3
Face flushed	0	1	2	3
Hot/cold sweats	0	1	2	3
Column Sum				

Scoring - Sum each column. Then sum the column totals to achieve a grand score. Write that score here _____ .

Interpretation

A grand sum between **0 – 21** indicates very low anxiety. That is usually a good thing. However, it is possible that you might be unrealistic in either your assessment which would be denial or that you have learned to “mask” the symptoms commonly associated with anxiety. Too little “anxiety” could indicate that you are detached from yourself, others, or your environment.

A grand sum between **22 – 35** indicates moderate anxiety. Your body is trying to tell you something. Look for patterns as to when and why you experience the symptoms described above. For example, if it occurs prior to public speaking and your job requires a lot of presentations you may want to find ways to calm yourself before speaking or let others do some of the presentations. You may have some conflict issues that need to be resolved. Clearly, it is not “panic” time but you want to find ways to manage the stress you feel.

A grand sum that **exceeds 36** is a potential cause for concern. Again, look for patterns or times when you tend to feel the symptoms you have circled. Persistent and high anxiety is not a sign of personal weakness or failure. It is, however, something that needs to be proactively treated or there could be significant impacts to you mentally and physically. You may want to consult a counselor if the feelings persist.

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.

DSIQ- V1

Day of Scan Information Questionnaire (DSIQ)

Date _____

Date of Birth _____
(in M-D-Y format)

Height _____
(Inches (4 feet = 48 inches, 5 feet = 60 inches, 6 feet = 72 inches))

Weight _____
(Pounds)

Sex

☐ Male

☐ Female

What is the highest grade or level of school that you have completed or the highest degree you have obtained?

- ☐ Less than 9th grade
- ☐ Some high school, no diploma
- ☐ High school graduate, or equivalent
- ☐ Some college, no degree
- ☐ Technical/Vocational degree
- ☐ Associate degree
- ☐ Bachelor's degree
- ☐ Master's degree
- ☐ Doctorate degree

With what ethnicity do you identify?

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

What is your eye color?

- ☐ Blue
- ☐ Brown
- ☐ Hazel
- ☐ Green
- ☐ Other: _____

Caffeine Use

Did you have any caffeine containing products today?

☐ Yes ☐ No

How many?

On average, how many cups of caffeinated coffee do you drink per day?

On average, how many cups of caffeinated tea do you drink per day?

On average, how many bottles/cans of caffeinated soda do you drink per day?

On average, how many energy drinks do you drink per day?

What brand(s) do you drink?

Do you use any other caffeinated products, such as Vivarin or NoDoz? ☐ Yes ☐ No

What product(s)?

How much?

((Designate mode of consumption in the next question))

Mode of consumption

((e.g. tablets))

How often?

☐ Day ☐ Week ☐ Month

☐

☐

Nicotine Use

Did you consume any nicotine products in the 12 hours prior to your visit?

☐ Yes ☐ No

Do you smoke cigarettes? ☐ Yes ☐ No

About how many cigarettes do you smoke per day?

How long have you been smoking?

(Years)

Have you tried to quit? ☐ Yes ☐ No

How many times?

Did you ever smoke cigarettes in the past? ☐ Yes ☐ No

How many cigarettes did you smoke per day?

How many years ago did you start smoking?

How many years ago did you quit?

Do you use smokeless tobacco, such as dip or chew? ☐ Yes ☐ No

About how much do you use per day?

((Designate mode of consumption in the next question))

Mode of consumption

((e.g. pouches))

Did you ever use smokeless tobacco in the past, but have since stopped?

☐ Yes ☐ No

How much did you use per day?

((Designate mode of consumption in the next question))

Mode of consumption

((e.g. pouches))

How many years ago did you start using smokeless tobacco?

How many years ago did you quit?

Do you use any other nicotine-containing products?

☐ Yes ☐ No

What product(s)?

How much?

((Designate mode of consumption in the next question))

Mode of consumption

((e.g. lozenges))

How often?

☐ Day ☐ Week ☐ Month

☐

☐

Other

Do you take diet pills?

☐ Yes ☐ No

What brand(s)?

How many?

How often?

☐ Day ☐ Week ☐ Month

☐

Did you consume any temporary medications such as Ibuprofen, Tylenol, Excedrin, or other types of over-the-counter medications 12 hours prior to your visit?

☐ Yes ☐ No

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

☐ Yes ☐ No

List medication

((e.g. Ibuprofen, 200 mg, Daily))

List all medications and dosages.

Did you consume any alcohol in the 12 hours prior to your visit?

☐ Yes ☐ No

How many times per month do you drink (alcohol)?

On those occasions, what is the average number of drinks you consume?

On those occasions, what is the largest number of drinks you consume?

How many times in the past year have you used marijuana?

Have you ever used marijuana at other times in your life? ☐ Yes ☐ No

At what age did you begin smoking marijuana?

On approximately how many occasions have you used marijuana?

When hungry, how much do you crave sweets?

Do you use any other street drugs currently or in the past year? ☐ Yes ☐ No

Which drug(s)?

How much?

((Designate mode of consumption in the next question))

Mode of consumption

((e.g. pills))

How often?

☐ Day ☐ Week ☐ Month

☐

☐

Physical Information

When was your last menstrual period (be as precise as possible)?

(Date of period: _____ or about _____ days ago)

Did you consume any pitted fruit, bananas or chocolate in the 24 hours prior to your visit?

Yes ☐ No ☐

Thinking about the past four weeks, on average, how many meals do you have per day?

1

2

3

4

5+

Thinking about the past four weeks, on average, how many times do you snack per day?

1

2

3

4

5+

How has your appetite been over the past four weeks on average?

1 Little to no appetite (feeling full/ satisfied most of the time)

2

3

4

5

6

7

8

9

10 Increased appetite (feeling hungry most of the time)

When hungry, how much do you crave sweets?

Do you feel that you eat more than you intend to?

Yes

No

When hungry, how much do you crave carbohydrates (e.g. rice, breads, pastas)?

1 Never

2

3

4

5

6

7

8

9

10 Always

When hungry, how much do you crave fats (e.g. fried food, red meats, cheese/cream, chips)?

1 Never

2

3

4

5

6

7

8

9

10 Always

When hungry, how much do you crave sweets?

1 Never

2

3

4

5

6

7

8

9

10 Always

Do you engage in regular exercise? ☐ Yes ☐ No

Thinking about the past four weeks, on average, how many days per week do you exercise?

- ☐ 1
☐ 2
☐ 3
☐ 4
☐ 5
☐ 6
☐ 7

Thinking about the past four weeks, on average, how many minutes is each exercise session?

(Minutes)

What percent of your exercise is cardio?

(Percent (%))

What percent of your exercise is strength training?

(Percent (%))

What percent of your exercise is light exercise (e.g. stretching, walking, and some types of yoga)?

(Percent (%))

Sleep Habits

How many hours of sleep did you get last night?

((e.g. 7.5 for 7 hours 30 minutes of sleep))

Keeping the past four weeks in mind, how many hours do you typically sleep on weeknights (Sun-Thurs)?

Keeping the past four weeks in mind, how many hours do you typically sleep on weekend nights (Fri-Sat)?

Keeping the past four weeks in mind, at what time do you normally go to bed at night on weeknights (Sun-Thurs)?

(In standard time HH:MM)

AM or PM?

- ☐ AM
☐ PM

Keeping the past four weeks in mind, at what time do you normally go to bed at night on weekends (Fri-Sat)?

(In standard time HH:MM)

AM or PM?

- ☐ AM
☐ PM

Keeping the past four weeks in mind, at what time do you typically awaken on weekdays (Mon-Fri)?

(In standard time HH:MM) AM or PM?

☐ AM ☐ PM

Keeping the past four weeks in mind, at what time do you typically awaken on weekends (Sat-Sun)?

(In standard time HH:MM)

AM or PM?

☐ AM

☐ PM

Keeping the past four weeks in mind, how many minutes does it typically take to fall asleep at night on weeknights (Sun-Thurs)?

((e.g. 15 for 15 minutes))

Keeping the past four weeks in mind, how many minutes does it typically take you to fall asleep at night on weekends (Fri-Sat)?

At what time of day do you feel sleepiest?

(In standard time HH:MM)

AM or PM?

☐ AM

☐ PM

At what time of day do you feel most alert?

(In standard time HH:MM)

AM or PM?

☐ AM ☐ PM

How many hours do you need to sleep per night to feel your best?

"If I get less than ____ hours of sleep, I notice an impairment in my ability to function at work."

"If I get more than ____ hours of sleep, I notice an impairment in my ability to function at work."

Is daytime sleepiness currently a problem for you? ☐ Yes ☐ No

Are you currently doing shift work, that is, working early morning, evening, or night shifts?

☐ Yes ☐ No

Do you ever have trouble falling asleep?

☐ Yes ☐ No

How often per week, month, or year?

((Designate time period in the next question))

Specify time period

☐ Week
☐ Month
☐ Year

Do you ever have trouble staying asleep? ☐ Yes ☐ No

How often per week, month, or year?

((Designate time period in the next question))

Specify time period

Week
 Month
☐ Year

☐

Do you take more than two daytime naps per month? ☐ Yes ☐ No

About how many times per week do you nap?

At what time of day do you normally begin your nap?

(HH:MM)

AM or PM?

☐
☐

AM PM

At what time of day do you normally wake up from your nap?

(HH:MM)

AM or PM?

☐
☐

AM PM

☐ Light ☐ Normal ☐ Heavy

☐

☒ Yawn often

☐ 1 (Never) ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8 ☐ 9 ☐ 10 (Always yawning) When I see or hear

someone else yawn, I will yawn too

☐ 1 (Never)

☐ 2
☐ 3
☐ 4
☐ 5
☐
☐

6
Do you consider yourself a light, normal, or heavy sleeper?
8
9
10 (Every time)

Tell your study administrator when you have reached the end. Do not continue until you are told to do so.

Day of Scan Information Questionnaire (DSIQ)

Date

Caffeine Use

Did you have any caffeine containing products today? ☐ Yes ☐ No

How many?

During the past week, on average, how many cups of caffeinated coffee do you drink per day?

During the past week, on average, how many cups of caffeinated tea do you drink per day?

During the past week, on average, how many bottles/cans of caffeinated soda do you drink per day?

During the past week, on average, how many energy drinks do you drink per day?

What brand(s) do you drink?

During the past week, did you use any other caffeinated products, such as Vivarin or NoDoz? ☐ Yes ☐ No

What product(s)?

How much?

((Designate mode of consumption in the next question))

Mode of consumption

((e.g. tablets))

How often?

☐ Day ☐ Week ☐ Month

☐

Did you consume any temporary medications such as Ibuprofen, Tylenol, Excedrin, or other types of over-the-counter medications 12 hours prior to your visit?

☐ Yes ☐ No

Nicotine Use

Did you consume any nicotine products in the 12 hours prior to your visit?

☐ Yes ☐ No

During the past week, did you smoke cigarettes? ☐ Yes ☐ No

About how many cigarettes did you smoke per day?

During the past week, did you use smokeless tobacco, such as dip or chew?

☐ Yes ☐ No

About how much do you use per day?

((Designate mode of consumption in the next question))

Mode of consumption

(e.g. pouches))

Did you ever use smokeless tobacco in the past, but have since stopped?

☐ Yes ☐ No

How much did you use per day?

((Designate mode of consumption in the next question))

Mode of consumption

(e.g. pouches))

During the past week, did you use any other nicotine-containing products? ☐ Yes ☐ No

What product(s)?

How much?

((Designate mode of consumption in the next question))

Mode of consumption

(e.g. lozenges))

Other

During the past week, did you take diet pills?

☐ Yes ☐ No

What brand(s)?

How many?

Did you consume any temporary medications such as Ibuprofen, Tylenol, Excedrin, or other types of over-the-counter medications 12 hours prior to your visit?

☐ Yes ☐ No

Did you consume any alcohol in the 12 hours prior to your visit?

☐ Yes ☐ No

How many times in the past week did you drink (alcohol)?

On those occasions, what is the average number of drinks you consumed?

On those occasions, what is the largest number of drinks you consumed?

How many times in the past week have you used marijuana?

Physical Information

When was your last menstrual period (be as precise as possible)?

(Date of period: _____ or about _____ days ago)

Did you consume any pitted fruit, bananas or chocolate in the 24 hours prior to your visit?

☐ Yes ☐ No

Thinking about the past week, on average, how many meals did you have per day?

1
2
3
4

5+

Thinking about the past week, on average, how many times did you snack per day?

- 1
- 2
- 3
- 4
- 5+

How has your appetite been over the past week on average?

- 1 Little to no appetite (feeling full/ satisfied most of the time)
- 2
- 3
- 4
- 5
- 6
- 7
- 8
- 9
- 10 Increased appetite (feeling hungry most of the time)

In the past week, did you engage in regular exercise?

- ☐ Yes ☐ No

Keeping the past four weeks in mind, at what time do you typically awaken on weekdays (Mon-Fri)?

- ☐ 1
☐ 2
☐ 3
☐ 4
☐ 5
☐ 6
☐ 7

Thinking about the past f week, on average, how many minutes is each exercise session?

(Minutes)

What percent of your exercise is cardio?

(Percent (%))

What percent of your exercise is strength training?

(Percent (%))

What percent of your exercise is light exercise (e.g. stretching, walking, and some types of yoga)?

(Percent (%))

Sleep Habits

How many hours of sleep did you get last night?

((e.g. 7.5 for 7 hours 30 minutes of sleep))

During the past week, was daytime sleepiness a problem for you? ☐ Yes ☐ No

☐ Yes ☐ No

During the psat week, did you ever have trouble falling asleep?

☐ Yes ☐ No

How many times?

Tell your study administrator when you have reached the end. Do not continue until you are told to do so.

Recent Risk of Dozing Off (ESS)

How likely are you to doze off or fall asleep in the following situations, in contrast to just feeling tired? This refers to your usual way of life in the last two weeks. 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

	Would never doze (0)	Slight chance of dozing (1)	Moderate chance of dozing (2)	High chance of dozing (3)
1. Sitting and reading	☐	☐	☐	☐
2. Watching TV	☐	☐	☐	☐
3. Sitting, inactive in a public place (e.g. a theater or meeting)	☐	☐	☐	☐
4. As a passenger in a car for an hour without a break	☐	☐	☐	☐
5. Lying down to rest in the afternoon when circumstances permit	☐	☐	☐	☐
6. Sitting and talking to someone	☐	☐	☐	☐
7. Sitting quietly after a lunch without alcohol	☐	☐	☐	☐
8. In a car, while stopped for a few minutes in traffic	☐	☐	☐	☐

Source: Johns MW. A new method for measuring daytime sleepiness: The Epworth Sleepiness Scale. Sleep 1991; 14(6): 540-5.

Participant ID _____

Date _____

GRAT -R

Please provide your honest feelings and beliefs about the following statements which relate to you. There are no right or wrong answers to these statements. We would like to know how much you feel these statements are true or not true of you. Please try to indicate your true feelings and beliefs, as opposed to what you would like to believe. Respond to the following statements by filling in the number that best represents your real feelings in the blank provided next to each statement. Please use the scale provided below, and please choose one number for each statement (i.e. don't circle the space between two numbers).

1	2	3	4	5	6	7	8	9
I strongly disagree		I disagree somewhat		I feel neutral about the statement		I mostly agree with the statement		I strongly agree with the statement

1. ____ I couldn't have gotten where I am today without the help of many people.
2. ____ I think that life has been unfair to me.
3. ____ It sure seems like others get a lot more benefits in life than I do.
4. ____ I never seem to get the breaks or chances that other people do.
5. ____ Often I'm just amazed at how beautiful the sunsets are.
6. ____ Life has been good to me.
7. ____ There never seems to be enough to go around and I never seem to get my share.
8. ____ Often I think, "What a privilege it is to be alive."
9. ____ Oftentimes I have been overwhelmed at the beauty of nature.
10. ____ I feel grateful for the education I have received.
11. ____ Many people have given me valuable wisdom throughout my life that has been important to my success.
12. ____ It seems like people have frequently tried to impede my progress.
13. ____ Although I think it's important to feel good about your accomplishments, I think that it's also important to remember how others have contributed to my success.
14. ____ I really don't think that I've gotten all the good things that I deserve in life.
15. ____ Every Fall I really enjoy watching the leaves change colors.
16. ____ Although I'm basically in control of my life, I can't help but think about all those who have supported me and helped me along the way.
17. ____ Part of really enjoying something good is being thankful for that thing.
18. ____ Sometimes I find myself overwhelmed by the beauty of a musical piece.
19. ____ I'm basically very thankful for the parenting that was provided to me.
20. ____ I've gotten where I am today because of my own hard work, despite the lack of any help or support.
21. ____ Over the December holidays, the presents I get aren't as good or as many as others seem to get.
22. ____ Sometimes I think, "Why am I so fortunate so as to be born into the family and culture I was born into?"
23. ____ One of my favorite times of the year is Thanksgiving.
24. ____ I believe that I am a very fortunate person.
25. ____ I think that it's important to "Stop and smell the roses."
26. ____ More bad things have happened to me in my life than I deserve.
27. ____ I really enjoy the changing seasons.

28. ____ Because of what I've gone through in my life, I really feel like the world owes me something.
29. ____ I believe that the things in life that are really enjoyable are just as available to me as they are to the very rich.
30. ____ I love to sit and watch the snow fall.
31. ____ I believe that I've had more than my share of bad things come my way.
32. ____ Although I think that I'm morally better than most, I haven't gotten my just reward in life.
33. ____ After eating I often pause and think, "What a wonderful meal."
34. ____ Every spring, I really enjoy seeing the flowers bloom.
35. ____ I think that it's important to pause often to "count my blessings."
36. ____ I think it's important to enjoy the simple things in life.
37. ____ I basically feel like life has ripped me off.
38. ____ I feel deeply appreciative for the things others have done for me in my life.
39. ____ I feel that God, or fate, or destiny, doesn't like me very well.
40. ____ The simple pleasures of life are the best pleasures of life.
41. ____ I love the green of spring.
42. ____ For some reason I never seem to get the advantages that others get.
43. ____ I think it's important to appreciate each day that you are alive.
44. ____ I'm really thankful for friends and family.

KAROLINSKA SLEEPINESS SCALE

Please, indicate your sleepiness during the 5 minutes before this rating through circling the appropriate description

1=extremely alert

2=very alert

3=alert

4=rather alert

5=neither alert nor sleepy

6=some signs of sleepiness

7=sleepy, but no effort to keep awake

8=sleepy, some effort to keep awake

9=very sleepy, great effort to keep awake,
fighting sleep

If used electronically, please make sure that the wording of the scale is presented at each rating for easy reference

References

Original study: Åkerstedt, T. and Gillberg, M. Subjective and objective sleepiness in the active individual. *International Journal of Neuroscience*, 1990, 52: 29-37.

Recent review: Åkerstedt, T., Anund, A., Axelsson, J. and Kecklund, G. Subjective sleepiness is a sensitive indicator of insufficient sleep and impaired waking function. *Journal of Sleep Research*, 2014, 23: 240-52.

PANAS

Subject: _____ Date: _____ Time: _____

This scale consists of a number of words that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you feel this way RIGHT NOW, that is, at the present moment.

1	2	3	4	5
very slightly or not at all	a little	moderately	quite a bit	extremely

_____ interested	_____ irritable
_____ distressed	_____ alert
_____ excited	_____ ashamed
_____ upset	_____ inspired
_____ strong	_____ nervous
_____ guilty	_____ determined
_____ scared	_____ attentive
_____ hostile	_____ jittery
_____ enthusiastic	_____ active
_____ proud	_____ afraid

Session _____ 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 past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

- b) Wake up in the middle of the night or early morning

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

- c) Have to get up to use the bathroom

Not during the past month _____	Less than once a week _____	Once or twice a week _____	Three or more times a week _____
------------------------------------	--------------------------------	-------------------------------	-------------------------------------

d) Cannot breathe comfortably

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
-----------------------------------	-------------------------------	------------------------------	------------------------------------

e) Cough or snore loudly

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
-----------------------------------	-------------------------------	------------------------------	------------------------------------

f) Feel too cold

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
-----------------------------------	-------------------------------	------------------------------	------------------------------------

g) Feel too hot

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
-----------------------------------	-------------------------------	------------------------------	------------------------------------

h) Had bad dreams

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
-----------------------------------	-------------------------------	------------------------------	------------------------------------

i) Have pain

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more 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 past month_____	Less than once a week_____	Once or twice a week_____	Three or more 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 past month_____	Less than once a week_____	Once or twice a week_____	Three or more 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 past month_____	Less than once a week_____	Once or twice a week_____	Three or more 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 past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
-----------------------------------	-------------------------------	------------------------------	------------------------------------

- b) Long pauses between breaths while asleep

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
-----------------------------------	-------------------------------	------------------------------	------------------------------------

- c) Legs twitching or jerking while you sleep

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
-----------------------------------	-------------------------------	------------------------------	------------------------------------

d) Episodes of disorientation or confusion during sleep

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
-----------------------------------	-------------------------------	------------------------------	------------------------------------

e) Other restlessness while you sleep; please describe_____

Not during the past month_____	Less than once a week_____	Once or twice a week_____	Three or more times a week_____
-----------------------------------	-------------------------------	------------------------------	------------------------------------

Sleep Diary

Reflecting on the previous day and this morning, please fill out all required and applicable questions on the diary below. We will send you an email on the last day of sleep diaries notifying you that all of the needed questionnaires are complete.

If you have any questions or have trouble loading the survey, please call us immediately at 520-428-5131

At times in this questionnaire, you will be required to write down a time in military time. To make this task easier, consult this chart:

<u>Military Time Conversion</u>			
12:00am	0:00	12:00pm	12:00
1:00am	1:00	1:00pm	13:00
2:00am	2:00	2:00pm	14:00
3:00am	3:00	3:00pm	15:00
4:00am	4:00	4:00pm	16:00
5:00am	5:00	5:00pm	17:00
6:00am	6:00	6:00pm	18:00
7:00am	7:00	7:00pm	19:00
8:00am	8:00	8:00pm	20:00
9:00am	9:00	9:00pm	21:00
10:00am	10:00	10:00pm	22:00
11:00am	11:00	11:00pm	23:00

Sleep Diary 1

Today's Date:

Bedtimes

What time did you wake up for the day?

Military Time (00:00 - 23:59)

What time did you get out of bed today? (Note: this may be different from the time you woke up)

Military Time (00:00 - 23:59)

What time did you get into bed last night?

Military Time (00:00 - 23:59)

What time did you try to go to sleep?

Military Time (00:00 - 23:59)

It took me ____ (hr): ____ (min) to fall asleep

(e.g. 00:15)

I woke up____times during the night (i.e. woke up, then fell asleep again afterward - DOES NOT include your final awakening for the day)

- ☐ 1
☐ 2
☐ 3
☐ 4
☐ 5 or more

My first awakening lasted____minutes

(e.g. 1.5 hours = 90)

My secondawakening lasted____minutes

(e.g. 1.5 hours = 90)

My third awakening lasted____minutes

(e.g. 1.5 hours = 90)

My fourth awakening lasted____minutes

(e.g. 1.5 hours = 90)

My fifth awakening, or subsequent awakenings, lasted
____minutes each (if applicable, separate each time
with a comma)

(e.g. 1.5 hours = 90)

Nightmares

Did you have a nightmare last night?

- ☐ Yes
☐ No

How distressing was the nightmare?

- ☐ 1 (Not at all)
☐ 2
☐ 3 (Distressing)
☐ 4
☐ 5 (Very distressing)

Napping

I took a nap yesterday

- ☐ Yes
☐ No

How many naps did you take?

- ☐ 1
☐ 2
☐ 3

Nap 1

I started napping at:

(Military Time 00:00 - 23:59)

AM or PM

- ☐ AM
☐ PM

I finished napping at:

Military Time 00:00 - 23:59)

AM or PM

- ☐ AM
☐ PM

Nap 2

I started napping at:

Military Time 00:00 - 23:59)

I finished napping at:

Military Time 00:00 - 23:59)

Nap 3

I started napping at:

Military Time 00:00 - 23:59)

I finished napping at:

(Military Time 00:00 - 23:59)

AM or PM

- ☐ AM
☐ PM

Caffeine

I consumed ____ caffeinated beverages yesterday

I consumed caffeine yesterday:

- ☐ Morning
☐ Afternoon
☐ Evening
☐ Not Applicable

General Questions

I woke up this morning feeling:

- ☐ Refreshed
☐ Somewhat refreshed
☐ Fatigued

For most of yesterday I felt:

- ☐ 1 (Very Sleepy)
☐ 2
☐ 3
☐ 4 (Neutral)
☐ 5
☐ 6
☐ 7 (Very Alert)

Yesterday my mood was:

- ☐ 1 (Very Poor)
☐ 2
☐ 3
☐ 4 (Neutral)
☐ 5
☐ 6
☐ 7 (Very Good)

Did you use any electronic media (e.g. computer, television, mobile phone) after 9:00 PM last night?

- ☐ Yes
☐ No

Actiwatch

Did you press the marker button on your actiwatch last night before going to bed?

- ☐ Yes
☐ No

Did you press the marker button on your actiwatch when you got out of bed for the day?

- ☐ Yes
☐ No

Purpose Consisting of 28 items, the SQS evaluates six domains of sleep quality: daytime symptoms, restoration after sleep, problems initiating and maintaining sleep, difficulty waking, and sleep satisfaction. Developers hoped to create a scale that could be used as an all-inclusive assessment tool – a general, efficient measure suitable for evaluating sleep quality in a variety of patient and research populations.

Population for Testing The scale has been validated in individuals aged 18–59 years.

Administration Requiring between 5 and 10 min for administration, the scale is a simple self-report, pencil-and-paper measure.

Reliability and Validity An initial psychometric evaluation conducted by Yi and colleagues [1] found an internal consistency of .92, a test-retest reliability of .81. The SQS is strongly correlated with results obtained on the Pittsburgh Sleep Quality Index (Chap. 67). Scores achieved by the insomnia sample were significantly higher than those of controls, indicating good construct validity.

Obtaining a Copy A list of the scale's 28 items can be found in the original article published by developers [1].

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Scoring Using a four-point, Likert-type scale, respondents indicate how frequently they exhibit certain sleep behaviors (0 = “few,” 1 = “sometimes,” 2 = “often,” and 3 = “almost always”). Scores on items belong to factors 2 and 5 (restoration after sleep and satisfaction with sleep) and are reversed before being tallied. Total scores can range from 0 to 84, with higher scores denoting more acute sleep problems.

Sleep Quality Scale

The following survey is to know the quality of sleep you had for the last one month. Read the questions and check the closest answer.

Examples

Rarely : None or 1-3 times a month

Sometimes : 1-2 times a week

Often : 3-5 times a week

Almost always : 6-7 times a week

		Rarely	Sometimes	Often	Almost always
1	I have difficulty falling asleep.				
2	I fall into a deep sleep.				
3	I wake up while sleeping.				
4	I have difficulty getting back to sleep once I wake up in middle of the night.				
5	I wake up easily because of noise.				
6	I toss and turn.				
7	I never go back to sleep after awakening during sleep.				
8	I feel refreshed after sleep.				
9	I feel unlikely to sleep after sleep.				
10	Poor sleep gives me headaches.				
11	Poor sleep makes me irritated.				
12	I would like to sleep more after waking up.				
13	My sleep hours are enough.				
14	Poor sleep makes me lose my appetite.				
15	Poor sleep makes hard for me to think.				
16	I feel vigorous after sleep.				
17	Poor sleep makes me lose interest in work or others.				
18	My fatigue is relieved after sleep.				

		Rarely	Sometimes	Often	Almost always
19	Poor sleep causes me to make mistakes at work.				
20	I am satisfied with my sleep.				
21	Poor sleep makes me forget things more easily.				
22	Poor sleep makes it hard to concentrate at work.				
23	Sleepiness interferes with my daily life.				
24	Poor sleep makes me lose desire in all things.				
25	I have difficulty getting out of bed.				
26	Poor sleep makes me easily tired at work.				
27	I have a clear head after sleep.				
28	Poor sleep makes my life painful.				

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SSQ

Instructions: This scale is made up of a list of statements each of which may or may not be true about you. For each statement circle "definitely true" if you are sure it is true about you and "probably true" if you think it is true but are not absolutely certain. Similarly, you should circle "definitely false" if you are sure the statement is false and "probably false" if you think it is false but are not absolutely certain.

1. If I wanted to go on a trip for a day (for example, to the country or mountains), I would have a hard time finding someone to go with me.

1. definitely false 2. probably false 3. probably true 4. definitely true

2. I feel that there is no one I can share my most private worries and fears with.

1. definitely false 2. probably false 3. probably true 4. definitely true

3. If I were sick, I could easily find someone to help me with my daily chores.

1. definitely false 2. probably false 3. probably true 4. definitely true

4. There is someone I can turn to for advice about handling problems with my family.

1. definitely false 2. probably false 3. probably true 4. definitely true

5. If I decide one afternoon that I would like to go to a movie that evening, I could easily find someone to go with me.

1. definitely false 2. probably false 3. probably true 4. definitely true

6. When I need suggestions on how to deal with a personal problem, I know someone I can turn to.

1. definitely false 2. probably false 3. probably true 4. definitely true

7. I don't often get invited to do things with others.

1. definitely false 2. probably false 3. probably true 4. definitely true

8. If I had to go out of town for a few weeks, it would be difficult to find someone who would look after my house or apartment (the plants, pets, garden, etc.).

1. definitely false 2. probably false 3. probably true 4. definitely true

9. If I wanted to have lunch with someone, I could easily find someone to join me.

1. definitely false 2. probably false 3. probably true 4. definitely true

10. If I was stranded 10 miles from home, there is someone I could call who could come and get me.

1. definitely false 2. probably false 3. probably true 4. definitely true

11. If a family crisis arose, it would be difficult to find someone who could give me good advice about how to handle it.

1. definitely false 2. probably false 3. probably true 4. definitely true

12. If I needed some help in moving to a new house or apartment, I would have a hard time finding someone to help me.

1. definitely false 2. probably false 3. probably true 4. definitely true

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State-Trait Anxiety Inventory for Adults™

Instrument and Scoring Key

Developed by Charles D. Spielberger

in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

Published by Mind Garden, Inc.

info@mindgarden.com

www.mindgarden.com

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SELF-EVALUATION QUESTIONNAIRE STAI Form Y-1

Please provide the following information:

Subject ID _____ Date _____ S _____
Age _____ Gender (Circle) M F T _____

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 strained | 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 satisfied..... | 1 | 2 | 3 | 4 |
| 9. I feel frightened..... | 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 indecisive..... | 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 confused..... | 1 | 2 | 3 | 4 |
| 19. I feel steady..... | 1 | 2 | 3 | 4 |
| 20. I feel pleasant..... | 1 | 2 | 3 | 4 |

SELF-EVALUATION QUESTIONNAIRE

STAI Form Y-2

Subject ID _____ 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.

ALMOST NEVER
SOMETIMES
OFTEN
ALMOST ALWAYS

- | | | | | |
|--|---|---|---|---|
| 21. I feel pleasant..... | 1 | 2 | 3 | 4 |
| 22. I feel nervous and restless..... | 1 | 2 | 3 | 4 |
| 23. I feel satisfied with myself..... | 1 | 2 | 3 | 4 |
| 24. I wish I could be as happy as others seem to be | 1 | 2 | 3 | 4 |
| 25. I feel like a failure..... | 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 have disturbing thoughts..... | 1 | 2 | 3 | 4 |
| 32. I lack self-confidence..... | 1 | 2 | 3 | 4 |
| 33. I feel secure..... | 1 | 2 | 3 | 4 |
| 34. I make decisions easily | 1 | 2 | 3 | 4 |
| 35. I feel inadequate..... | 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 |

**State-Trait Anxiety Inventory
for Adults™
Scoring Key**

Developed by Charles D. Spielberger

in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

Published by Mind Garden, Inc.

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State-Trait Anxiety Inventory for Adults Scoring Key (Form Y-1, Y-2)

Developed by **Charles D. Spielberger** in collaboration with R.L. Gorsuch, R. Lushene, P.R. Vagg, and G.A. Jacobs

To use this stencil, fold this sheet in half and line up with the appropriate test side, either Form Y-1 or Form Y-2. Simply total the scoring **weights** shown on the stencil for each response category. For example, for question # 1, if the respondent marked 3, then the **weight** would be **2**. Refer to the manual for appropriate normative data.

Form Y-1	MODERATELY SO VERY MUCH SO SOMEWHAT NOT AT ALL				Form Y-2	ALMOST ALWAYS OFTEN SOMETIMES ALMOST NEVER			
	4	3	2	1		4	3	2	1
1.	4	3	2	1	21.	4	3	2	1
2.	4	3	2	1	22.	1	2	3	4
3.	1	2	3	4	23.	4	3	2	1
4.	1	2	3	4	24.	1	2	3	4
5.	4	3	2	1	25.	1	2	3	4
6.	1	2	3	4	26.	4	3	2	1
7.	1	2	3	4	27.	4	3	2	1
8.	4	3	2	1	28.	1	2	3	4
9.	1	2	3	4	29.	1	2	3	4
10.	4	3	2	1	30.	4	3	2	1
11.	4	3	2	1	31.	1	2	3	4
12.	1	2	3	4	32.	1	2	3	4
13.	1	2	3	4	33.	4	3	2	1
14.	1	2	3	4	34.	4	3	2	1
15.	4	3	2	1	35.	1	2	3	4
16.	4	3	2	1	36.	4	3	2	1
17.	1	2	3	4	37.	1	2	3	4
18.	1	2	3	4	38.	1	2	3	4
19.	4	3	2	1	39.	4	3	2	1
20.	4	3	2	1	40.	1	2	3	4

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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 Correct			Long-Delay Free Recall Correct		
Trial 2 Free Recall Correct			Long-Delay Cued Recall Correct		
Trial 3 Free Recall Correct			Free-Recall Intrusions (Immediate & Delayed, All Types)		
Trial 4 Free Recall Correct			Cued-Recall Intrusions (All Types)		
Trial 5 Free Recall Correct			Total Intrusions (All Recall Trials, All Types)		
Trials 1–5 Free Recall Total Correct		(T score)	Total Repetitions (All Recall Trials)		
List B Free Recall Correct			Long-Delay Yes/No Recognition Hits		
Short-Delay Free Recall Correct			Long-Delay Yes/No Recognition False-Positives		
Short-Delay Cued Recall Correct			Long-Delay Forced-Choice Recognition Accuracy (# 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	Total Correct	C	Total Correct	C	Total Correct	C	Total Correct	C
Total Repetitions	R	Total Repetitions	R	Total Repetitions	R	Total Repetitions	R	Total Repetitions	R
Total Intrusions	I	Total Intrusions	I	Total Intrusions	I	Total Intrusions	I	Total Intrusions	I

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	Resp Type
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	Resp Type
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	Resp Type	Vegetables	Resp Type
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	

Ways of Traveling	Resp Type	Animals	Resp Type
1		1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	

Total Correct C		Total Repetitions R	
Total Intrusions I			

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	Resp Type
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

Total Repetitions R

Total Intrusions I

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	corn	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 = List B Shared; BN = List B 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

Earlier, I read some lists of words to you, remember? Now I am going to read some words two at a time. After I read both words, say which of the words was from the *first* list, the one I read to you several times. It may be difficult to remember which one to pick, but even if it's hard for you, just try your best. Ready?

Was _____ or _____ on the first list?

If the examinee says "I don't know," say, "I know it may be difficult, but just take your best guess."

Distractor types: C = concrete; A = abstract	Total Hits	
--	------------	--

[illegible]



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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		
Vocabulary		
Matrix Reasoning		
Similarities		

Sum of T Scores

Verbal
Comp.

Perc.
Rsng.

Full
Scale-4

Full
Scale-2

Examinee Visual/Hearing Aids During Testing

Check type of aid examinee needed:	Used	Not Used
☐ Glasses	☐	☐
☐ Prescription Lenses	☐	☐
☐ Assisted Listening Device	☐	☐
☐ Other:	☐	☐

Sum of T Scores to Composite Score Conversion

Scale	Sum of T Scores	Composite Score	Percentile Rank	Confidence Interval 90% or 95%
Verbal Comp.		VCI		
Perc. Rsng.		PRI		
Full Scale-4		FSIQ-4		
Full Scale-2		FSIQ-2		

Ranges of Expected Scores

Scores:	Confidence Level	
	90%	68%
FSIQ-4		
WISC-IV FSIQ		
WAIS-IV FSIQ		

Subtest T Score Profile

	Verbal Comprehension		Perceptual Reasoning	
	VC	SI	BD	MR
80-				
75-				
70-				
65-				
60-				
55-				
50-				
45-				
40-				
35-				
30-				
25-				
20-				

Composite Score Profile

	VCI	PRI	FSIQ
160-			
155-			
150-			
145-			
140-			
135-			
130-			
125-			
120-			
115-			
110-			
105-			
100-			
95-			
90-			
85-			
80-			
75-			
70-			
65-			
60-			
55-			
50-			
45-			
40-			

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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				
6-8	1. Examiner	Model and Picture	30"					0	1	2	
	2. Examiner	Model and Picture	30"					0	1	2	
9-90	3. Examiner	Model and Picture	45"					0	1	2	
	4. Examiner	Model and Picture	45"					0	1	2	
	5. Examiner	Picture	60"					0			21-60 16-20 11-15 1-10
	6. Examiner	Picture	60"					0			21-60 16-20 11-15 1-10
	7. Examiner	Picture	60"					0			21-60 16-20 11-15 1-10
	8. Examiner	Picture	60"					0			21-60 16-20 11-15 1-10
	9. Examiner	Picture	120"					0			71-120 46-70 31-45 1-30
	10. Examiner	Picture	120"					0			61-120 46-60 36-45 1-35
	11. Examiner	Picture	120"					0			61-120 46-60 36-45 1-35
6-8 STOP	12. Examiner	Picture	120"					0			61-120 46-60 36-45 1-35
	13. Examiner	Picture	120"					0			101-120 81-100 56-80 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

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. Ruminare		0 1 2
7-11	 26. Mollify		0 1 2
	27. Extirpate		0 1 2
	28. Panacea		0 1 2
12-14			

continue 

2. Vocabulary (continued)

Discontinue after 3 consecutive scores of 0.

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
Ages 6–8:
After Item 24.



Record & Score
Score 0 or 1 point.
Correct responses are in **color**.

	Item	Response					Score	
6–90	SA	1	2	3	4	5		
	SB	1	2	3	4	5		
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
9–90	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
6–8 STOP	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
6–8	1. 1 2 3 4 5 0 1	

Picture Item	Response	Score
2.	1 2 3 4 5 0 1	

Picture Item	Response	Score
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
6-8  23. Time—Progress		0 1 2
24. Memory—Practice		0 1 2

Maximum Raw Score
Ages 6–8: 41
Ages 9–90: 45

Similarities
Total Raw Score



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)

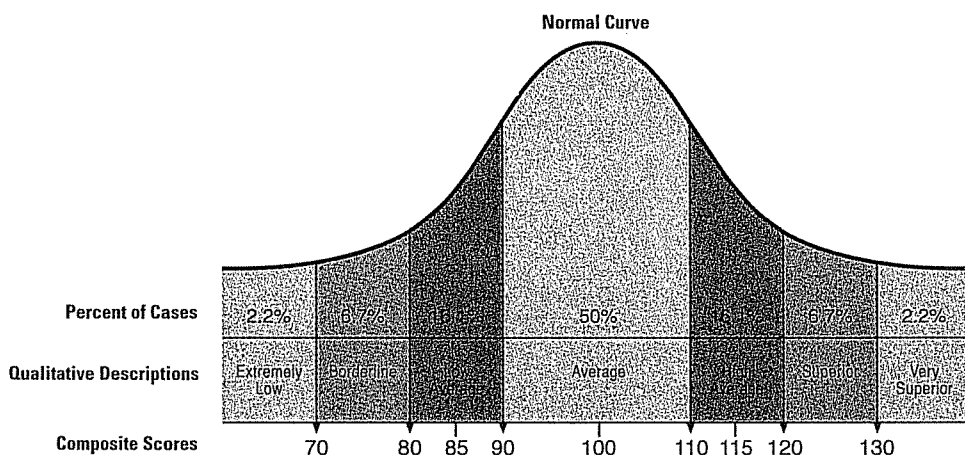
Attention and concentration

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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Emotional Reward task

Each of the below slot machines are unique and different from each other.

For each trial, you can choose one slot machine.



Each time you select a slot machine, it will return with one of these three possible outcomes:

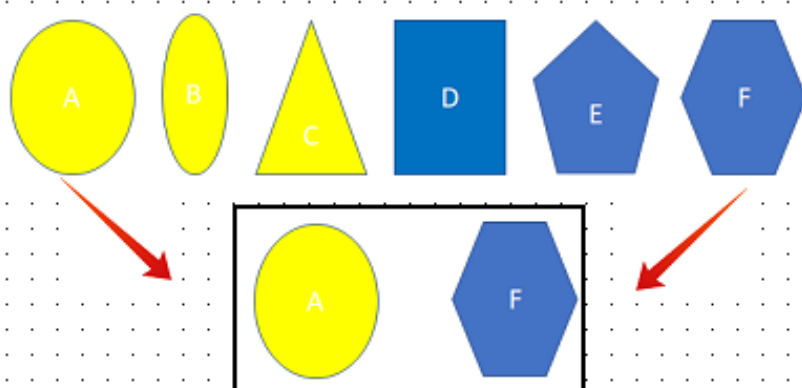
Win 1
dollar

Lose 1
dollar

No change

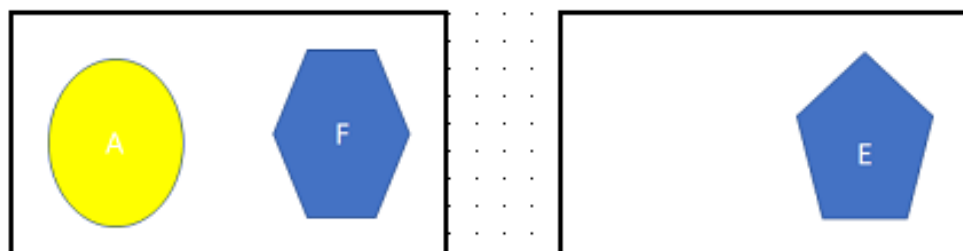
You will play with all 6 different machines throughout the game, but only with a maximum of 2 at one time.

The game will randomly select 2 machines for you to play with at a time, and you will be able to select from these two machines which to play.

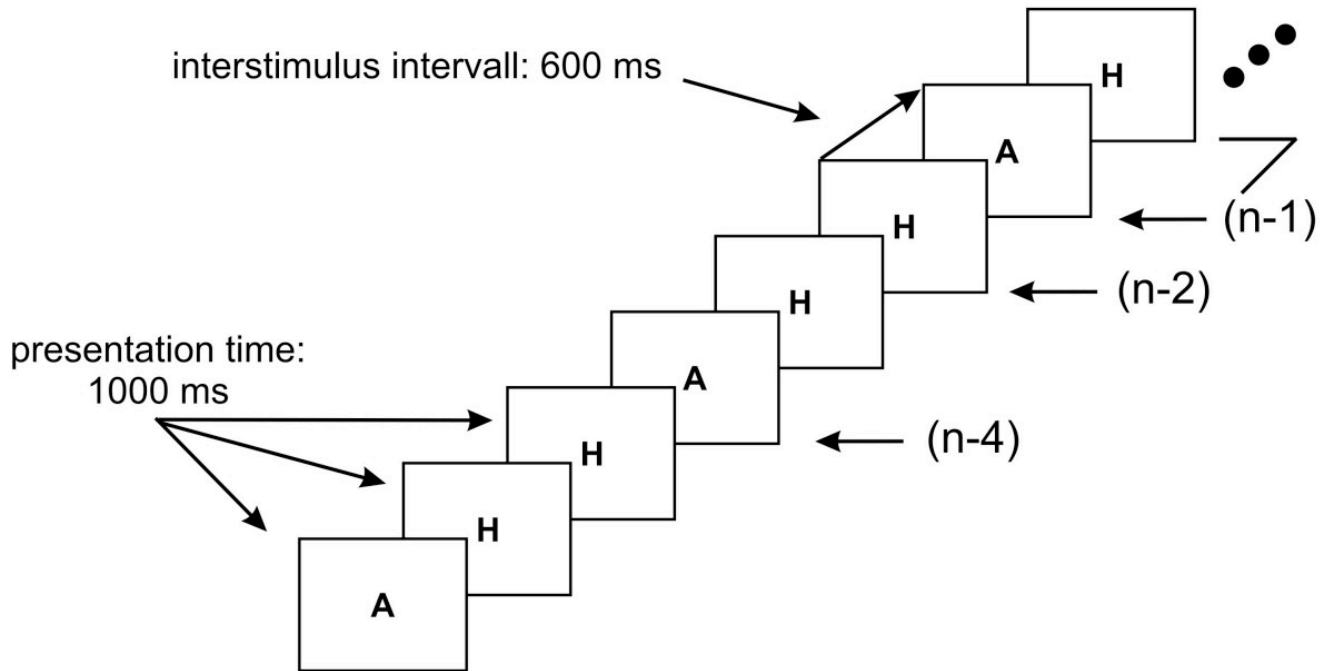


You will usually be presented with two machines to choose between.

Sometimes, you will only be presented with one machine.



N-back task



EDUCATION

2013 **University of Reading, Reading, United Kingdom**

Ph.D. in Psychology with a focus on Developmental Psychopathology under the supervision of Dr Creswell and Prof Cooper

Thesis Title: Autonomic Arousal and Interpretation of Physical Symptoms in Childhood Anxiety Disorders

2010 **University of Reading, Reading, United Kingdom**

BSc. Psychology (First Class – equivalent to a GPA: 4.0)

PROFESSIONAL EXPERIENCES

03/2019- present **University of Arizona, Department of Psychiatry, Tucson, AZ, USA**

Research Assistant Professor

2019-2020 **Pima Community College, Tucson, AZ, USA**

Adjunct Faculty

2014-2019 **University of Arizona, Department of Psychiatry, Social, Cognitive and Affective Neuroscience (SCAN) Laboratory, Tucson, AZ, USA**

Postdoctoral Research Associate (Social, Cognitive and Affective Neuroscience)

2013-2014 **Harvard Medical School, Brigham and Women's Hospital, Department of Pediatric and Newborn Medicine, Boston, MA, USA**

Postdoctoral Research Associate (Developmental Psychopathology)

GRANTS

AWARDED

2019 **U.S. Department of Defense**

“Understanding the Mechanisms of Blue Light Exposure on Cognitive Processes”
Principal Investigator (Total Award: \$306, 902).

COMPLETED

2015 **The Arizona Area Health Education Centers (AHEC) Program Award**

“The Effects of Blue Light on Melatonin and EEG Power Density Spectrum”
Principal Investigator (Total Award: \$4373.00)

POSTDOCTORAL RESEARCH TRAINING

2014-2019 **University of Arizona, Department of Psychiatry, Tucson, AZ, USA**

Postdoctoral Research Fellow

- Responsible for data collection and analysis, manuscript preparation of functional magnetic brain imaging data (fMRI) and (neuro-) psychological outcomes in individuals with posttraumatic stress disorder (PTSD)
- Conduct structured diagnostic interviews with individuals with posttraumatic stress disorder using the Structured Clinical Interview for DSM5 (SCID-5)
- Train and supervise research assistants on data analysis, conference abstract preparation, and academic writing

2013-2014 **Harvard Medical School, Brigham and Women's Hospital, Department of Pediatrics and Newborn Medicine, Boston, MA, USA**

Postdoctoral Research Fellow

- Responsible for data collection and analysis of physiological and psychological outcomes of premature infants and their mothers enrolled in an intervention aimed at improving premature infants' brain growth and development

PRE-DOCTORAL RESEARCH TRAINING

2012-2013 **University of Arizona, Department of Psychology, Tucson, AZ, USA**

Short Term Scholar

- Developing in-depth knowledge on how to derive measures of cardiac vagal control in the Psychophysiology Laboratory under the supervision of Dr John J.B. Allen

07/2009-09/2009 **University of Reading, Department of Psychology, Reading, United Kingdom**

Research Assistant

- Wellcome Trust funded summer research placement
- Responsible for recruitment of participants, and data collection, including the measurement of heart rate and skin conductance response, in younger and older (60 and above) adults

2009-2010 **Berkshire Child Anxiety Clinic, Reading, United Kingdom**

Research Assistant

- Responsible for various administrative and research tasks including extensive work with SPSS, Excel and transcription of mother-child narratives

AWARDS

2012 **Psychology Postgraduate Affairs Group (PsychPag) Conference Travel Award**

EDITORIAL ROLES

SCIENCE MENTOR/REVIEW EDITOR

2018- present Frontiers for Young Minds

AD HOC REVIEWER

Frontiers in Psychology (2018)

Personality and Individual Differences (2018, 2016)

Journal of Child Psychology and Psychiatry (2017)

Biological Psychology (2017)

Psychiatry Research: Neuroimaging (2017)

Scientific Reports (2017)

Journal of Traumatic Stress (2017)

Parenting: Science and Practice (2017)

European Child & Adolescent Psychiatry (2016)

Journal of Happiness Studies (2018, 2016, 2016, 2015, 2015)

Cognition and Emotion (2016)

Psychological Reports (2016)

GRANT REVIEWER

2015 *The Pac-12 Student-Athlete Health and Well-Being Grant Program*

TEACHING EXPERIENCE

08/2019-present **Pima Community College**

Adjunct Instructor

Responsibilities: Teaching an Introduction to Psychology course to undergraduate students using a hybrid format that includes online and in-person teaching

PUBLICATIONS

- Raikes, A., Bajaj, S., Dailey, N.S., Vanuk, J.R., **Alkozei, A.**, Killgore, W.D.S. (in press). Altered large scale resting-state functional connectivity is associated with symptom presentation following mild traumatic brain injury. *Journal of Neurotrauma*.
- Alkozei, A.**, Smith, R., Waugaman, D., Kotzin, M., Bajaj, S. & Killgore, W.D.S. (2019). The mediating role of interpretation bias on the relationship between trait gratitude and depressive symptoms. *International Journal of Applied Positive Psychology*.
- Smith, R., **Alkozei, A.**, & Killgore, W.D.S (2019). Parameters as Trait Indicators: Exploring a Complementary Neurocomputational Approach to Conceptualizing and Measuring Trait Differences in Emotional Intelligence. *Frontiers in Psychology*.
- Vanuk, J.R., **Alkozei, A.**, Raikes, A., Allen, J.J.B., & Killgore, W.D.S. (2019). Ability-Based Emotional Intelligence Is Associated With Greater Cardiac Vagal Control and Reactivity. *Frontiers in Human Neuroscience*.
- Smith, R., Weihs, K.L., **Alkozei, A.**, Killgore, W.D.S., & Lane, R.D. (2018). An embodied neurocomputational framework for organically integrating biopsychosocial processes: An application to the role of social support in health and disease. *Psychosomatic Medicine*.
- Smith, R., Killgore, **Alkozei, A.**, & Lane, R. (2018). A Neuro-Cognitive Process Model of Emotional Intelligence. *Biological Psychology*.
- Alkozei, A.**, Killgore, W.D.S., Smith, R., Dailey, N.S., Bajaj, S., Raikes, A., & Haack, M. (2018). Chronic Sleep Restriction Differentially Affects Implicit Biases Toward Food Among Men and Women: Preliminary Evidence. *Journal of Sleep Research*. 27(4), 1-4.
- Smith, R., Lane, R., Sanova, A., **Alkozei, A.**, Smith, C., & Killgore, W.D.S. (2018). 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).
- Bajaj, S., Raikes, A., Smith, R., Dailey, N.S., **Alkozei, A.**, Vanuk, J.R., & Killgore, W.D.S.(2018). The relationship between general intelligence and cortical structure in healthy individuals. *Neuroscience*, 388, 36-44.
- Alkozei, A.**, Haack, M., Skalamera, J., Smith, R., Satterfield, B.C., Raikes, A., & Killgore, W.D.S (2018). Chronic sleep restriction affects the association between implicit bias and explicit social decision-making. *Sleep Health*, 4(5), 456-472.
- Alkozei, A.**, Smith, R., & Killgore, W.D.S.(2018). Implicit self-esteem is associated with higher levels of trait gratitude in women but not men. *Journal of Positive Psychology*.

- Smith, R., Sanova, A., **Alkozei, A.**, Lane, R., Killgore, W.D.S (2018). 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*.
- Dailey, N.S., Smith, R., Bajaj, S., **Alkozei, A.**, Gottschlitch, M., Raikes, A., Satterfield, B., & Killgore, W.D.S. (2018). Elevated Aggression and Reduced White Matter Integrity in Mild Traumatic Brain Injury: A DTI Study. *Frontiers in Behavioral Neuroscience*, 12.
- Raikes, A., Bajaj, S., Dailey, N.S., Smith, R., **Alkozei, A.**, Satterfield, B., & Killgore, W.D.S. (2018). Diffusion Tensor Imaging (DTI) Correlates of Self-Reported Sleep Quality and Depression Following Mild Traumatic Brain Injury. *Frontiers in Neurology*.
- Alkozei, A.**, Smith, R., Weber, M., Demers, L., Berryhill, S., & Killgore, W.D.S (2018). Increases in Emotional Intelligence after an Online Training Program are Associated with Better Decision-Making on the Iowa Gambling Task. *Psychological Reports*.
- Smith, R., Lane, R., **Alkozei, A.**, Bao, J., Smith, C., Sanova, A., Nettles, M., & Killgore, W.D.S. (2018). The role of medial prefrontal cortex in the working memory maintenance of one's own emotional responses. *Scientific Reports*, 8(1), 2460.
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- Killgore, W.D.S., Vanuk, J.R., Knight, S.A., Markowski, S., Pisner, D., Shane, B., Fridman, A., & **Alkozei, A.** (2015). Daytime Sleepiness is Associated with Altered Resting Thalamocortical Connectivity. *Neuroreport*, 26 (13), 779-784.
- Alkozei, A.**, McMahon, E., & Lahav, A. (2014). Stress levels and depressive symptoms in NICU mothers in the early postpartum period. *Journal of Maternal-Fetal and Neonatal Medicine*, 27 (17), 1738-1743.
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MANUSCRIPTS SUBMITTED FOR PUBLICATION

- Alkozei, A.**, Dailey, N.S., Bajaj, S., Vanuk, J.R., Raikes, A., & Killgore, W.D.S. (under review). Exposure to blue wavelength light is associated with increases in bidirectional amygdala-DLPFC connectivity at rest. *Psychiatry Research: Neuroimaging*.
- Lawrence, A., **Alkozei, A.**, Irgens, M., Acevedo-Molina, M., Brener, S., Chandler, A., Chau, R., Doyle, C., McKinney A., Price, S., Shanholtz, C., Van Etten, E., Ver Hoeve, E., Sbarra, D., & O'Connor, M. (under review). Think Again: Adaptive Repetitive Thought as a Transdiagnostic Treatment for Individuals Predisposed to Repetitive Thinking Styles. *Clinical Psychology & Psychotherapy*.

PRESENTATIONS

ORAL PRESENTATIONS

Invited Grand Rounds Presentations

- 2017 Alkozei, A.** (2017). “*Gratitude and Subjective Wellbeing: A Proposal of Two Causal Models*”. 2017-2018 The University of Arizona Department of Psychiatry Grand Rounds Lecture Series

Conference Presentations

- 2020** **Alkozei, A.**, Dailey, N.S., Bajaj, S., Vanuk, J., Raikes, A., & Killgore, W.D.S. (2020). *The effects of blue wavelength light on subsequent amygdala-DLFC connectivity at rest*. 48th International Neuropsychological Society Meeting, Denver CO.
- 2018** **Alkozei, A.**, Smith, R., Dailey, N.S., Bajaj, S., Knight, S., & Killgore, W.D.S. (2018). *Exposure to Blue Wavelength Light During Memory Consolidation Improves Long-Delay Verbal Memory Performance*. 46th International Neuropsychological Society Meeting, Washington, D.C.
- 2016** **Alkozei, A.**, Smith, R., Derek, P., Markowski, S., Vanuk, J., Fridman, A., Shane, B., Knight, A., Grandner, M., & Killgore, W.D.S. *Exposure to Blue Wavelength Light is Associated with Increased Dorsolateral Prefrontal Cortex Responses, and Increases in Response Times During a Working Memory Task*. 70th Annual Meeting of the American Academy of Sleep Medicine and the Sleep Research Society, Denver, CO.
- 2012** **Alkozei, A.**, Creswell, C. & Cooper, P. J. *Do anxious and non-anxious children differ in their perception of bodily symptoms?* 7th International Conference on Child and Adolescent Psychopathology, London, United Kingdom.
- 2012** **Alkozei, A.**, Creswell, C. & Cooper, P.J. *Do anxious and non-anxious children differ in their physiological arousal?* 1st Nordic Conference on Childhood Anxiety Disorders, Copenhagen, Denmark.

POSTER PRESENTATIONS

- *Burns, A., Ozcan, M., Shephard, C., **Alkozei, A.**, & Killgore, W.D.S. (2019). The Association Between PTSD Severity and Life Satisfaction is Mediated by Trait Gratitude 47th International Neuropsychological Society Meeting, New York, N.Y.
- *Shephard, C., Burns, A., Ozcan, M., **Alkozei, A.**, & Killgore, W.D.S. (2019). Racial Differences Regarding the Effectiveness of Blue Light Therapy in Reducing PTSD Severity. 47th International Neuropsychological Society Meeting, New York, N.Y.
- *Ozcan, M., Shephard, C., Burns, A., **Alkozei, A.**, & Killgore, W.D.S. (2019). Trait gratitude and the impact of excessive daytime sleepiness on daily functioning predict PTSD severity over time. 47th International Neuropsychological Society Meeting, New York, N.Y.
- Alkozei, A.**, Smith, R., Killgore, W.D.S (2018). A Positive Cognitive Style Mediates the Relationship Between Trait Gratitude and Depressive Symptoms. 46th International Neuropsychological Society Meeting, Washington, D.C.
- Alkozei, A.**, Smith, R., Dailey, N.S., Bajaj, S., Haack, M., & Killgore, W.D.S. (2018). Men, but not Women, Show a Decrease in Implicit Preferences for Low-Calorie Food After 3 Weeks of Chronic Sleep Restriction. 46th International Neuropsychological Society Meeting, Washington, D.C.

- *Ozcan, M., **Alkozei, A.**, Raikes, A., & Killgore, W.D.S. (2018). Pre-Sleep Cognitions Partially Mediate the Relationship Between Depression and Daytime Energy. 72nd Annual Meeting of the American Academy of Sleep Medicine and the Sleep Research Society, Baltimore, MD.
- *Challener, S., **Alkozei, A.**, Yung, A., Ozcan, M., Raikes, A., & Killgore, W.D.S. (2018). 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. 72nd Annual Meeting of the American Academy of Sleep Medicine and the Sleep Research Society, Baltimore, MD.
- Alkozei, A.**, Haack, M., Smith, R., Dailey, N., Bajaj, S., & Killgore, W.D.S (2017). Chronic Sleep Restriction Increases Negative Implicit Attitudes Towards Arab Muslims. Military Health System Research Symposium. Kissimmee, FL.
- *Skalamera, J. **Alkozei, A.**, Haack, M., Killgore, W.D.S. (2017). Chronic Sleep Restriction Increases Implicit Racial Biases and Affects Actual Decision-Making About People. 45th International Neuropsychological Society Meeting, Washington, D.C.
- Alkozei, A.**, Smith, R., Demers, L., Divatia, S., Weber, M., Berryhill, M., & Killgore, W.D.S (2017). Emotional Intelligence Can Be trained via an Online Training Program and Is Associated with Better Performance on the IGT. 45th International Neuropsychological Society Meeting, New Orleans, LA.
- Alkozei, A.**, Smith, R., Fridman, A., Dormer, A., Challener, S., & Killgore, W.D.S (2017). Daily morning blue light exposure leads to changes in functional brain responses during emotional anticipation in individuals with PTSD. 71st Annual Meeting of the American Academy of Sleep Medicine and the Sleep Research Society, Boston, MA.
- *Challener, S., **Alkozei, A.**, Fridman, A., Dormer, A., & Killgore, W.D.S. (2017). Higher Depression Index is Associated with Lower Activation in the Orbital Frontal Superior Gyrus When Anticipating Negative Stimuli in Individuals with PTSD. Society for Biological Psychiatry 72nd Annual Meeting, San Diego, CA.
- *Fridman, A., **Alkozei, A.**, Smith, R., Challener, S., Knight, S.A., & Killgore, W.D.S. (2017). Resiliency Is Associated with Reduced Activation within the Retrosplenial Cortex and Secondary Motor Area for Individuals with PTSD During Anticipation of a Negative Event. Society for Biological Psychiatry 72nd Annual Meeting, San Diego, CA.
- Alkozei, A.**, Smith, R., Markowski, S., Pisner, D., Fridman, A., Shane, B., Vanuk, J., Knight, S., Killgore, W.D.S. (2016) Exposure to blue wavelength light reduces activation within the anterior cingulate cortex during anticipation of certain reward stimuli. Society for Biological Psychiatry 71st Annual Meeting, Atlanta, GA.
- *Kotzin, M., **Alkozei, A.**, Knight, S., Grandner, M., Killgore, W.D.S. (2016). The effects of trait gratitude on quality of sleep, intrusiveness of pre-sleep cognitions, and daytime energy in healthy individuals.

70th Annual Meeting of the American Academy of Sleep Medicine and the Sleep Research Society, Denver, CO.

*Waugaman, D., Markowski, S., **Alkozei, A.**, Grandner, M., Killgore, W.D.S. (2016). Chronotype and Emotional Intelligence. 70th Annual Meeting of the American Academy of Sleep Medicine and the Sleep Research Society, Denver, CO

*Markowski, S., **Alkozei, A.**, McIntosh, M., Grandner, M., Killgore, W.D.S. (2016). Chronotype and Risk-Taking Propensity. 70th Annual Meeting of the American Academy of Sleep Medicine and the Sleep Research Society, Denver, CO

Alkozei, A., Markowski, S., Shane, B., & Killgore, W.D.S. (2015). Emotional Resilience is Not Associated with Increased Resistance to Sleep Loss. 69th Annual Meeting of the American Academy of Sleep Medicine and the Sleep Research Society, Seattle, WA.

Alkozei, A., Markowski, S., Shane, B., & Killgore, W.D.S. (2015). The Effect of Emotional Resilience on Changes in Appetite for High-Sugary Food During Sleep Loss. 69th Annual Meeting of the American Academy of Sleep Medicine and the Sleep Research Society, Seattle, WA.

Alkozei, A., Pisner, D., Killgore, W.D.S. (2015). Emotional Intelligence and Subliminal Presentations of Social Threat. Society for Biological Psychiatry 70th Annual Meeting, Toronto, Canada.

*Markowski, S.M., **Alkozei, A.**, & Killgore, W.D.S. Sleep Onset Latency and Duration are Associated with Self-Perceived Invincibility. 69th Annual Meeting of the American Academy of Sleep Medicine and the Sleep Research Society, Seattle, WA.

*Markowski, S., **Alkozei, A.**, Rauch, S., Killgore, W.D.S. (2015). Sex Differences in the Association Between Personality and Resistance to Sleep Deprivation. 69th Annual Meeting of the American Academy of Sleep Medicine and the Sleep Research Society, Seattle, WA.

*Shane, B., **Alkozei, A.**, & Killgore, W.D.S. (2015). Physical Exercise May Contribute to Vulnerability to Sleep Deprivation. 69th Annual Meeting of the American Academy of Sleep Medicine and the Sleep Research Society, Seattle, WA.

*Pisner, D., **Alkozei, A.**, Killgore, W.D.S. (2015). Trait Emotional Suppression is Associated with Decreased Activation of the Insula and Thalamus in Response to Masked Angry Faces. Society for Biological Psychiatry 70th Annual Meeting, Toronto, Canada.

*Shane, B., **Alkozei, A.**, Vanuk, J.R., Weber, M., Killgore, W.D.S. (2015). The Effect of Bright Light Therapy on Improving Sleep Among Individuals with Mild Traumatic Brain Injury. Society for Biological Psychiatry 70th Annual Meeting, Toronto, Canada.

*Markowski, S., **Alkozei, A.**, Killgore, W.D.S. (2015). Neuroticism Predicts Neurocognitive Performance in Healthy Individuals. Society for Biological Psychiatry 70th Annual Meeting, Toronto, Canada.

Alkozei, A., Schwab, Z. & Killgore, W.D.S. (2015). Looking for Evil Intent: Emotional Intelligence and the Use of Socially Relevant Facial Cues during an Emotional Decision Making Task. International Neuropsychology Society 43rd Annual Meeting, Denver, CO.

*Shane, B.S., **Alkozei, A.,** & Killgore, W.D.S. (2015). The Contribution of General Intelligence and Emotional Intelligence to the Ability to Appreciate Humour. International Neuropsychology Society 43rd Annual Meeting, Denver, CO.

*Pisner, D., **Alkozei, A.,** & Killgore, W.D.S. Visuospatial Reasoning Mediates the Relationship Between Emotion Recognition and Emotional Intelligence. International Neuropsychology Society 43rd Annual Meeting, Denver, CO.

*Vanuk, J.R., Divatia, S., Demers, L.A., Markowski, S.M., **Alkozei, A.,** & Killgore, W.D.S. Napping in Conjunction with Brief Internet-Based Training as a Means of Enhancing Emotional Intelligence. International Neuropsychology Society 43rd Annual Meeting, Denver, CO.

Alkozei, A., Creswell, C., Cooper, P.J., & Allen, J.J.B (2013). Autonomic Flexibility in Childhood Anxiety Disorders. Society for Psychophysiological Research Annual Meeting, Florence, Italy.

Alkozei, A., Creswell, C. & Cooper, P. J. (2011). Childhood Anxiety Disorders: Associations with Heart Rate Variability and Heart Rate. 39th British Association for Behavioural & Cognitive Psychotherapies Conference, Guilford, United Kingdom.

* Mentored students' presentations
