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14. ABSTRACT

The goal of the proposed project is to provide the Army with a brief, well-validated, internet-based training program for enhancing Emotional Intelligence (EI) and resilience skills. Addressing this need is crucial, as military personnel are often required to serve under dangerous and emotionally stressful conditions. Prolonged stress or exposure to very intense life-threatening experiences, such as those encountered in combat or other hazardous duty deployments, can increase the risk of developing mental health problems including depression, anxiety, or post-traumatic stress disorder (PTSD). One possible way to minimize the effects of these stressful experiences on Service members is to strengthen their emotional flexibility, adaptability, and capacity to cope with adversity before they find themselves faced with such situations. To fill this need, we propose to provide the military with a web-based program that focuses on enhancing Emotional Intelligence (EI), a core set of trainable emotional skills that collectively include the capacity to understand, perceive, control, and use emotions effectively.

15. SUBJECT TERMS
Emotional intelligence, affect, training, web-based, resilience, neuroimaging

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1. INTRODUCTION:

The goal of this project is to provide the Army with a brief, well-validated, internet-based training program for enhancing Emotional Intelligence (EI) and resilience skills. Addressing this need is crucial, as military personnel are often required to serve under dangerous and emotionally stressful conditions, oftentimes with limited support from friends and family for prolonged periods of time. Prolonged stress or exposure to intense life-threatening experiences, such as those encountered in combat or other hazardous duty deployments, can increase the risk of developing mental health problems including depression, anxiety, or post-traumatic stress disorder (PTSD). Service members need resilience skills to cope effectively with these stresses. We propose that a critical component to emotional resilience can be built by building strong emotional reasoning skills, also known as Emotional Intelligence (EI). This involves strengthening their emotional flexibility, adaptability, and capacity to cope with adversity before they find themselves faced with such situations. The present investigation aims to provide the military with a web-based program focused on enhancing EI, a core set of trainable emotional skills that collectively include the capacity to understand, perceive, control, and use emotions effectively to solve problems and reach long-term goals.

The present study is designed into 6 sequential Task Projects that will lead to the accomplishment of this goal, providing a fully developed and validated program for enhancing EI skills (see Figure 1). Task 1 involved fleshing out the details of the proposed EI Training (EIT) program with a group of experts in emotional theory and clinical intervention; Task 2 involved web-based design, programming, development, and iterative refinement of the program. These two tasks have already been completd. Task 3 involves an efficacy study to determine the overall effects of the program and attempt to determine the optimal training schedule for use with the program; Task 4 will

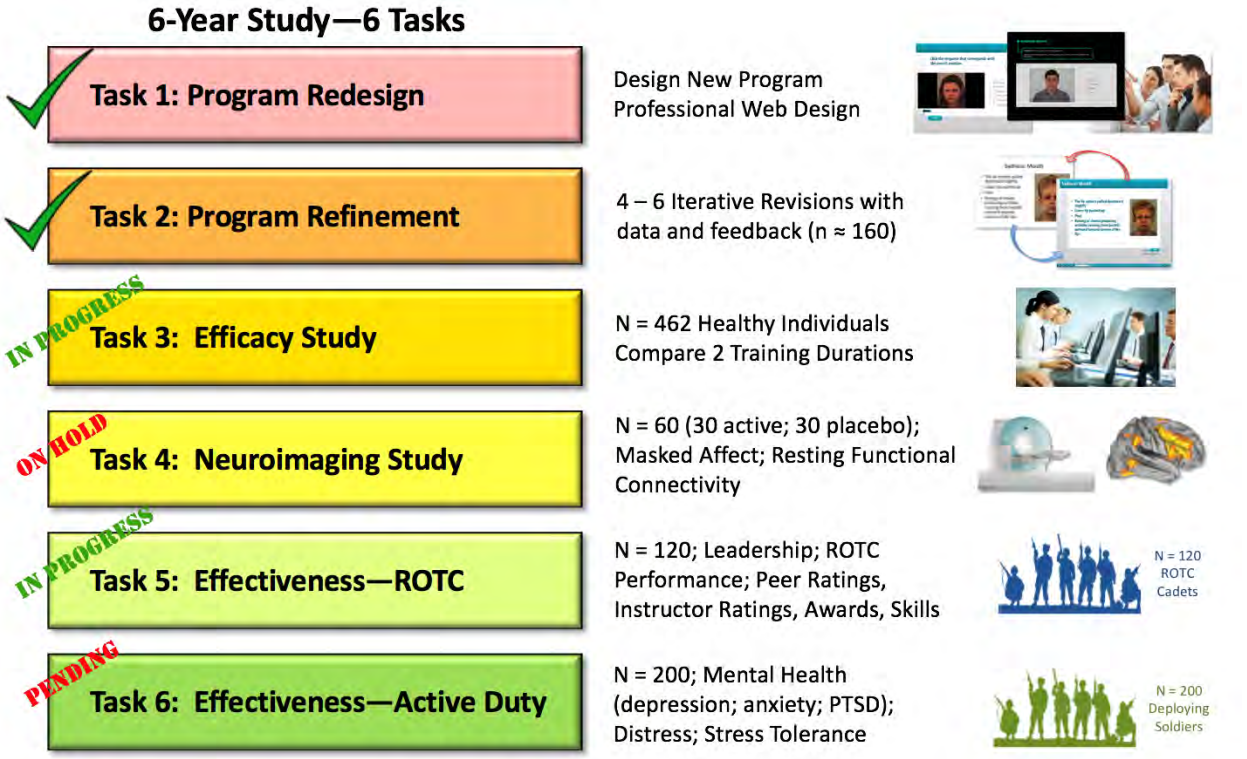
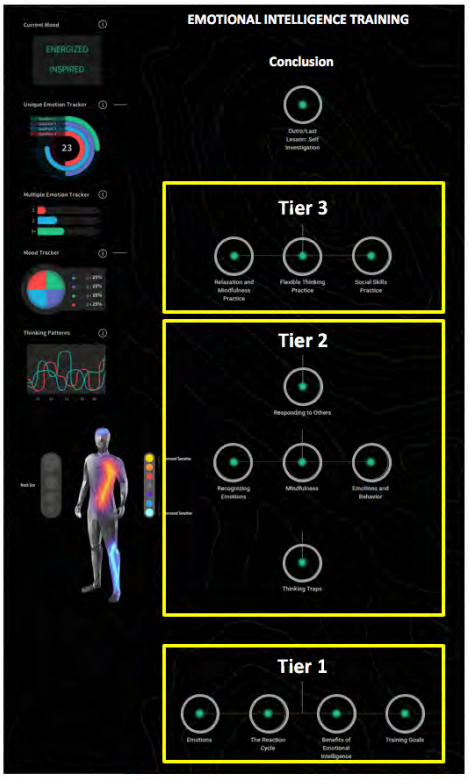


Figure 1. The project will develop and validate a web-based Emotional Intelligence Training (EIT) program. The project will be completed over 6 years and will involve 6 major tasks for development and validation.

involve identifying the neural brain changes that occur when participants undergo the optimal version of the program; Task 5 will involve testing the effectiveness of the program for enhancing leadership and emotional skills in ROTC cadets; Task 6 will involve testing the effectiveness of the program for minimizing mental health issues in a sample of active duty military personnel during deployment or other stressful training exercise.

The program has been completely designed, refined, and programmed into a web-based platform for presentation. As shown in Figure 2 below, the program is designed in three tiers and includes approximately 10-12 hours of content. Each tier builds upon the foundations developed during the previous tier. Thus, with the EIT program (described to subjects as "Internal Awareness") fully developed, and an accompanying matched placebo program (described to participants as "External Awareness"), we have now been able to make substantial progress on the data collection phases of the project.



Approximately 12 Hours of Training Content

Tier 3: Putting EI into Practice
- Practical Exercises of Tools Learned in Tier 2
- Examining Self-Patterns
  - Situational Triggers
  - Thoughts that lead to emotions
  - Common problematic thoughts
  - Emotions that lead to behaviors
  - Harmful emotional habits

Tier 2: Tools to Change Emotions & Behavior
- Recognizing Emotions (self and other)
- Communication Skills
- Reappraisal
- Mindfulness
- Relaxation Techniques
- Goal-Directed Decision-Making

Tier 1: Introduction to EI Concepts
- Emotions & EI
- The Emotion Reaction Cycle
- Helpful vs. Not-Helpful Emotions
- Goal Setting

Figure 2. The Emotional Intelligence Training (EIT) program comprises three tiers of training, each building on the fundamental skills in the previous tier. The left panel shows a representative screenshot of the major components of the EIT program, while the right panel provides a simple outline of the major content domains of the program.

2. KEYWORDS:

Emotional intelligence, affect, training, web-based, resilience, neuroimaging

3. ACCOMPLISHMENTS:

What were the major goals of the project?

Major Task 1: Retooling of Preliminary EI Training Program (Y1: Q1-3)
***Completed**:* Reconceptualization of the program has been completed.

Major Task 2: Iterative Refinement of EI Training Program (Y1: Q3-4, Y2: Q1)
***Completed**:* Programing and refinement of the modules has been completed.

Major Task 3: Efficacy/Training Duration (Y2, Y3, Y4)
***In progress**:* Data collection underway currently.

Major Task 4: Identify Neuromechanisms (Y2, Y3, Y4)
***Completed**:* Preparing fMRI tasks for data collection, training study staff, and receiving IRB approval for protocol.
Pending: Awaiting orders to return to normal work protocol due to the COVID-19 pandemic in order to begin data collection.

Major Task 5: ROTC Leader Development and Assessment Course (Y2, Y3, Y4)
***In progress**:* Concurrent progress alongside Task 3, by the writing of this report, the third semester of participants has been completed.

Major Task 6: Military Unit Training/Deployment (Y2, Y3, Y4)
***In progress**:* Finalizing protocol for data collection to begin.

Major Task 7: Process and Analyze Data
***Pending**:* Awaiting data collection completion of Tasks 2-6.

What was accomplished under these goals?

1) <u>Major Activities</u>:

Tasks 1 and 2 are complete. At the end of last year, we initiated the efficacy testing portion of the computerized EIT program (Task 3). Work completed in this past year (Year 4) has focused on two major goals: 1) completing Task 3, which aims to test the efficacy of the program in a large sample, and 2) preparing and starting Tasks 4, 5, and 6 to be run concurrently with Task 3.

As discussed in the previous Annual Report, our ability to initiate Tasks 3 through 6 was hindered by the slow pace of our contracted computer programming company. The company was delayed by more than a year in providing us with the agreed upon final program, which delayed our ability to start collecting data. This past year, we have accelerated the data collection process to make up for those delays.

In order to maintain our increased pace of recruitment and enrollment across all phases of the study, we have brought on two study coordinators, three additional technicians, and a number of undergraduate research assistants. This increase in study staff has allowed us to plan upcoming phases of the study while allows scheduling a greater

number of participants per day. We anticipate that this increased study staff will allow us to accomplish data collection for all phases of the study by the end of Year 5.

COVID-19 Pandemic: During the past quarter, the development of the COVID-19 pandemic has become the primary roadblock to successful completion of the project. The pandemic and resulting governmental lockdown procedures have significantly altered normal laboratory operations. Since the middle of March, 2020, all laboratory personnel have been required to work from home and in-person data-collection has been prohibited by the University of Arizona until further notice. Once it became apparent that the pandemic was going to affect normal laboratory operations, we moved quickly to develop mitigation plans and discussed these in depth with our Science Officer, Ms. Inna Williams. To the extent possible, we have worked to transition most data collection activities for the project to remote/online administration. This has required some major modifications to our normal procedures, including amendments to the IRB protocol. While causing some delays, these efforts are being implemented successfully. Where appropriate, these mitigation strategies will be described briefly in the sections that follow.

Task 3: Over the past year, we have focused extensively on increasing recruitment and data collection in order to make up for the delay in progress that occurred during the programming phase of the project. Progress on Task 3 has significantly increased during the past year due to increases in study staff, including additional full-time research technicians and a large number of undergraduate student research assistants. This increase in study staff, along with expanded options of weekend visits and delayed start options for participants, has allowed us to substantially increase our participant flow over the past year. Before the restrictions placed due to the COVID-19 outbreak, we were projected to complete the pre- and post-treatment study visits Task 3 by the end of Year 4. This, of course, has been substantially delayed due to the pandemic shutdown. We plan to resume data collection once daily operations return to normal.

In regard to the six-month follow-up visits for Task 3, we have modified our plans to allow us to administer those assessments to participants 100% remotely. Additionally, we have slightly modified the outcome measures to also emphasize mental health and resilience outcomes to investigate whether the training program has helped participants cope with the current COVID-19 situation. As of the writing of this report, we have successfully collected 326 participants who have undergone the EIT program and fully completed pre- and post-training assessments for Task 3. The goal is to have a total of 462 participants for this portion of the study.

One of the primary goals of Task 3 is to determine the optimal training duration for the program. It was important to determine whether the training was best if spaced out (i.e., over three weeks) or if the same benefits could be obtained even if the training was compressed (i.e., over 1-week). Therefore, participants were randomly assigned to either a 1-Week condition of 3-Week condition at enrollment. Based on data collected during this reporting period, it is clear that there is no meaningful difference between the two training durations and that both lead to similar improvement in EI. This suggests

that the training duration for the program is flexible and that the program can be completed in shorter or longer amounts of time and still result in improvement.

Task 4: The goal of this part of the study is to identify brain regions that show functional changes as a result of completing the EIT program and that correlate with potential improvements in emotional capacities. This portion of the study will co-occur as part of the data collection for Task 3. During the past quarter, we completed the selection of neuroimaging tasks and preparing them for data collection. We have trained study all staff on fMRI task administration and the scanner safety protocol. We have been recruiting participants for Task 4 concurrently with Task 3 so that once we receive the necessary IRB approval and it is deemed safe for in-person study visits to occur again, we will begin enrolling participants and initiate data collection for Task 4. Based on the aforementioned outcomes comparing the 1-week and 3-week outcomes, we have selected the 3-Week training duration for Task 4 (neuroimaging study). We believe this training duration will be best for scheduling the MRI scanner and thus optimize participant enrollment for Task 4.

Task 5: For the ROTC portion of the project, we faced a number of challenges produced by the change of faculty leadership in the local ROTC program this past year. The change in leadership led to reduced interest in participation in the study by the new faculty and we were not able to generate enough momentum to collect data from cadets and midshipmen during the Fall semester. We, therefore, dedicated additional effort toward establishing and building new relationships with the program during this past Fall. We were able to obtain agreements to allow us to continue to recruit data from cadets during the Spring semester. This past semester, we successfully collected data from 20 additional cadets/midshipmen who completed the program and all pre- and post-training assessments. Additionally, we reached out to ROTC programs at other institutions such as Arizona State University in an attempt to establish a relationship with them and collect data. We have established a relationship with Arizona State University and we plan to begin recruiting and enrolling participants at both the University of Arizona and Arizona State University concurrently this upcoming Fall semester.

Task 6: The original goal of Task 6 was to test the effectiveness of the program at sustaining mental health of active duty Service members during a deployment or other stressful training experience. We have encountered some difficulty finding military units willing to allow us to collect data with them. This past year, we have been working closely with leadership from the Davis-Monthan Air Force Base in Tucson, AZ. Over a several month period, the leadership has indicated strong interest in allowing us to recruit Airmen from the base for this project. Nonetheless, there have been a number of administrative and legal hurdles to obtain full approval, and this negotiation is still in progress. Meanwhile, we also have been coordinating with individuals at the Naval Postgraduate School in California, who have expressed strong interest in working with us on Task 6. As of this time, we have an agreement set up with NPS to allow us to recruit and collect date remotely from students enrolled at the school. We have an NPS graduate student who will be the primary point-of-contact and will facilitate the

recruitment efforts. This has been discussed with our Science Officer, Ms. Inna Williams and we have modified the SOW to reflect these changes. We anticipate that data collection should start within the coming quarter. Between the efforts with the NPS and the Air Force, we believe that we should be able to meet our recruitment and data collection goals by the end of the year.

2) Specific Objectives:

The primary objectives for Year 4 were to complete the efficacy testing phase of Task 3, to continue data collection for Task 5, the ROTC cadet phase, and to initiate other Tasks (i.e., Task 4, Neuroimaging data collection; Task 6, Active Duty data collection) to be run in parallel to Tasks 3 and 5. While we have not been able to start data collection on Tasks 4 and 6 due to the COVID-19 pandemic and the need to shift to online data collections, we have made significant progress in planning and making the necessary preparations for efficient and effective data collection for these Tasks so that they will be completed within the next year. Additionally, we have made substantial progress on data collection for Task 3 and have made plans to increase data collection for Task 5.

3) Significant Results/Key Outcomes:

While the project is still ongoing, we have collected a large amount of data over the past year. To ensure that the program is having the intended effects, we have planned yearly data analyses on major outcome variables. These are summarized below:

Training Program Efficacy Testing:

One of the primary goals of the EIT program is to build capacities in the four primary domains of emotional intelligence (EI), including the ability to 1) accurately perceive emotions in self and others, 2) understand emotions, 3) facilitate performance through the effective use of emotions, and 4) manage emotions in self and others effectively. We have been enrolling participants in Task 3, and have completed data collection for 326 volunteers (i.e., 71% of the planned sample). Consequently, we have been able to analyze preliminary data to ensure that the EIT program (EIT program) is yielding results consistent with hypothesized expectations and the goals of the project. We have conducted preliminary analyses comparing the EIT program (described as the “internal awareness” program to participants) versus the Placebo training program (described as the “external awareness program to participants”). Some of these preliminary findings are summarized below:

i) Emotional Intelligence (EI) Metrics:

For this project, the overarching objective is to enhance EI abilities in military personnel. Therefore, primary outcome metrics for Task 3 include well-validated and established tests of EI. While some metrics are not yet available for analysis due to scoring requirements from the publishing companies, we have conducted preliminary analyses of those that are available. Preliminary findings are presented below:

Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT). The MSCEIT is considered to be the current "gold-standard" for measuring the Ability construct of EI[1]. The scale includes a total score and four subscale branch scores assess the ability to perceive, understand, manage, and facilitate emotion and emotional thought. Here we find that the EIT Program was more effective at improving Total MSCEIT EI scores from baseline than the Placebo Program, F(1,319) = 6.65, p = .01 (see Figure 3). This suggests that the EIT program is successful at enhancing the emotinal skills hypothesized to be improved by such training and provides strong validation of the program.

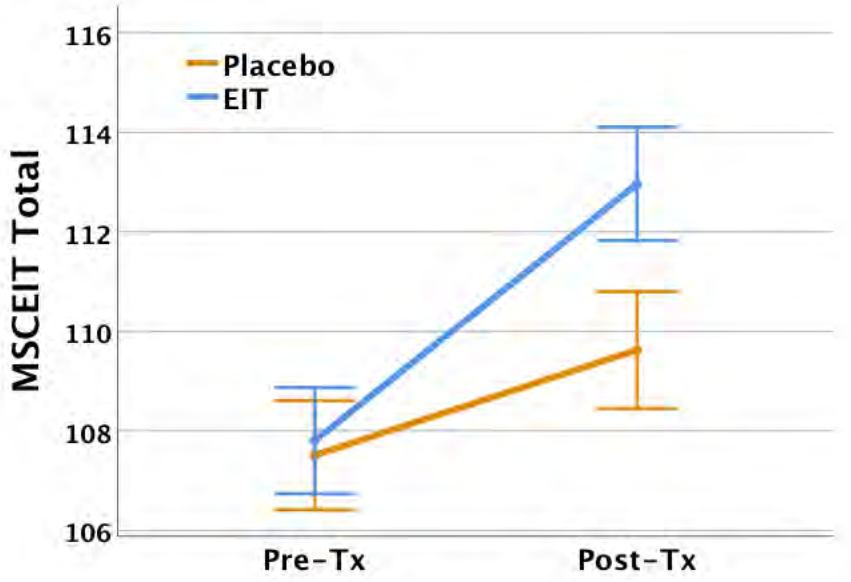


Figure 3. The EIT Program (internal program) yielded significant improvement in scores on the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) relative to the placebo (external) condition.

Self-Rated Emotional Intelligence Scale (SREIS). The SREIS is a self-report scale designed to assess the same model of EI measured by the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) [1], but is completely based on self-report [2]. The scale includes a total score and several subscale scores that are analogous to those from the MSCEIT. Here we find that the EIT Program was more effective at improving

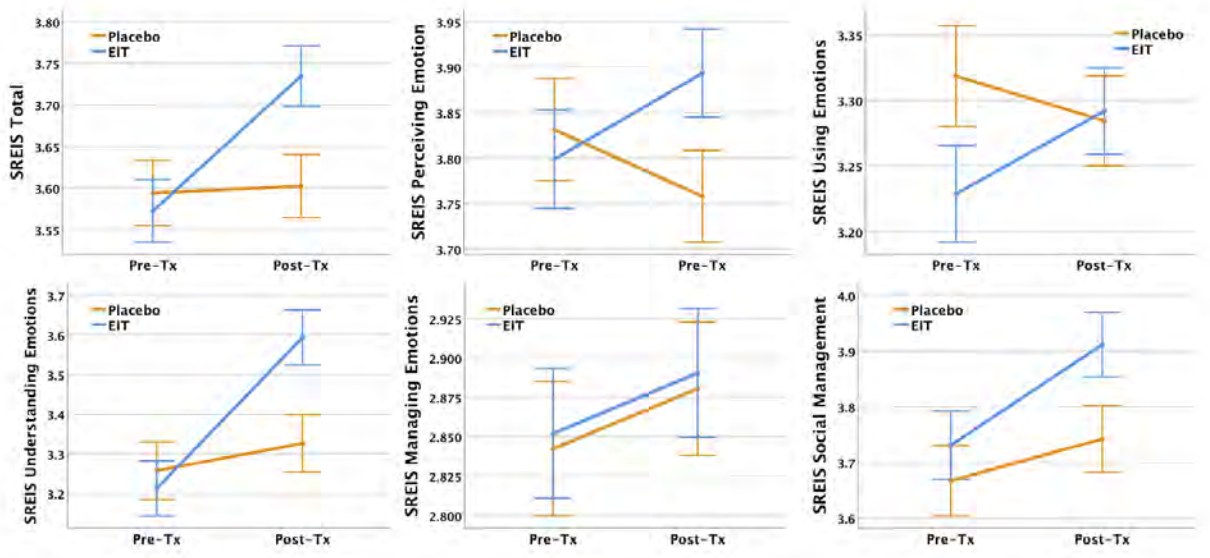


Figure 4. The EIT Program (internal program) yielded significant improvement in Self-Rated Emotional Intelligence Scale (SREIS) scores relative to the placebo (external) condition. Significant improvements were found for Total EI scores, Understanding Emotions, Managing Emotions, and Social Management abilities.

Total SREIS EI scores from baseline than the Placebo Program, $F(1,324) = 10.62$, $p = .001$ (see Figure 4). To further understand which components of EI that are being most improved by the EIT Program, we also conducted within-subject ANOVAs on each of the subscales of th SREIS. As evident in Figure 4 below, the program showed a significant training effect for Perceiving Emotions on the SREIS, $F(1,324) = 6.88$, $p = .009$, and shows a clear trend toward improving the abilty to use emotions to facilitate thought, $F(1,324) = 2.56$, $p = .11$. On the other hand, the EIT Program shows a highly significant effect for improving scores on the SREIS Understanding Emotions subscale, $F(1,324), = 15.64$, $p < .0001$. However, there was no improvement on the SREIS Managing Emotions subscale, $F(1,324) = 0.00$, $p = .996$. Finally, there was no improvement for the SREIS Social Management subscale, $F(1,324) = 2.34$, $p = .13$ (see Figure 4). Overall, these preliminary findings are showing meaningful improvement in several self-reported emotional intelligence abilities following the EIT program compared to placebo, particularly in the areas of total EI, perceiving emotions, and understainding emotions. This provides preliminary support for the efficacy of using the EIT program for enhancing self-perceived EI.

ii) Managing Emotions:

Interpersonal Affect Regulation Task (IPART)

Although this is a key element of the Ability model of EI, there are few, if any, currently available valid metrics of this capacity. Therefore, we have recently developed an ability-based assessment task to measure the quality of an individual's ability to select responses that are productive in managing the emotions of others. This task is referred to as the Interpersonal Affect Regulation Test (IPART). This test is a performance-based task designed by Dr. William D. Killgore to measure the ability of an individual to effectively regulate the emotions of another person (i.e. calm them down when angry, cheer them up when saddened). The test does this by presenting a series of hypothetical scenarios in which the examinee is engaged in a conversation with another person who is experiencing an emotionally upsetting situation. The examinee is provided with a series of responses to choose from, which each address various levels of the interpersonal context and emotional state. The examinee is asked to identify two types of responses, including 1) the objectively "Best Choice" to help the other person's emotional state, and 2) as well as their "Personal Choice" (i.e., what they would personally do if they were actually in that situation).

For both the "Best Choice" and "Personal Choice" questions in each scenario, the participant may choose among four responses that address theoretically different levels of the interpersonal context. One of the responses is defined as an "Improve" response, which is theoretically the most emotionally intelligent answer because it directly addresses the emotions of the other person while also providing constructive feedback or proactive suggestions to help the individual improve their situation. Two of the four available responses are classified as "Diversion" responses, which are responses that seek to distract the target individual from the situation that is affecting them, or responses that fail to provide meaningful feedback or proactively helpful solutions. Finally, the fourth potential response is classified as a "Worsen" response, which is a response that fails to validate the emotions of the target individual and does not provide

any meaningful feedback. This response is theoretically the least emotionally intelligent response. Each response is scored in terms of its theoretical effectiveness in the scenario. Specifically, each Improve response is scored as 2 points, a Diversion response as 1 point, and a Worsen response is scored as 0.

The IPART yields several summary scores for both their "Best Choice" and "Personal Choice" responses across the 34 scenarios, including: a Total score (total points earned), an Improve score (total number of 2-point answers given), a Diversion score (total number of 1-point answer given), and a Worsen score (total number of 0-point answers given). It should be noted that while conventional wisdom might lead one to believe that participants would try and pick the "Personal Choice" response that matches their "Best Choice" response, we have found that this is not necessarily the case. When comparing scores between participant's Total scores for their "Best Choice" and "Personal Choice", scores on average differed by 9.1 and 7.9 points in the pre- and post-training visits, respectively, showing that participants recognize that while there is an objectively best response for a particular situation, they would not always personally select that response if actually in that situation.

To determine the effectiveness of the EIT program for enhancing the types of emotional skills measured by the IPART, we administered the IPART at baseline and again following completion of the EIT program. Figures A through H below are initial results from Task 3 participants in performance on the IPART from their baseline visit to their post-training visit:

Figure 5 below shows that although participants in both Program Conditions started around the same average ability on the IPART "Best Choice" Total score, by the post-training visit participants assigned to the EIT program had shown marked improvement compared to participants that had received the Placebo program treatment ($F(1,324) = 7.26$, $p = .007$). These findings suggest that the EIT program was associated with significant improvement in the overall ability to identify the best response options for managing the emotions of others. This is a critical skill for military personnel, whether operating in stressful deployed environments, in garrison, or at home with family. These preliminary findings are encouraging.

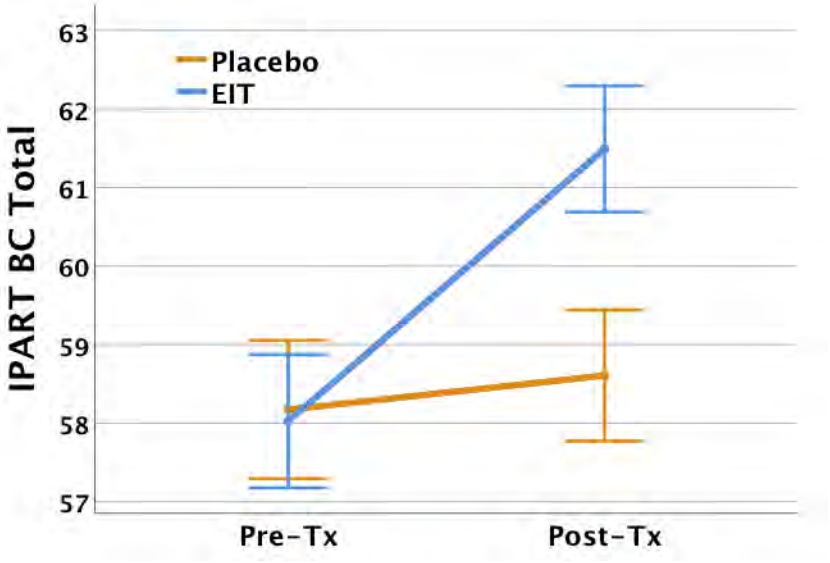


Figure 5. The EIT Program was associated with significant improvement in the ability to regulate the emotions of others on the Interpersonal Affect Regulation Test (IPART) Best Choice selections relative to the placebo training program.

Similarly, Figure 6 shows that Total score also improved for the “Personal Choice” responses in the EIT program relative to the placebo program ($F(1,324) = 24.30$, $p = .000001$). This suggests that not only are individuals able to identify the most effective “Best” responses after training, but are also more willing to implement those in interpersonal situations to manage the emotions of others.

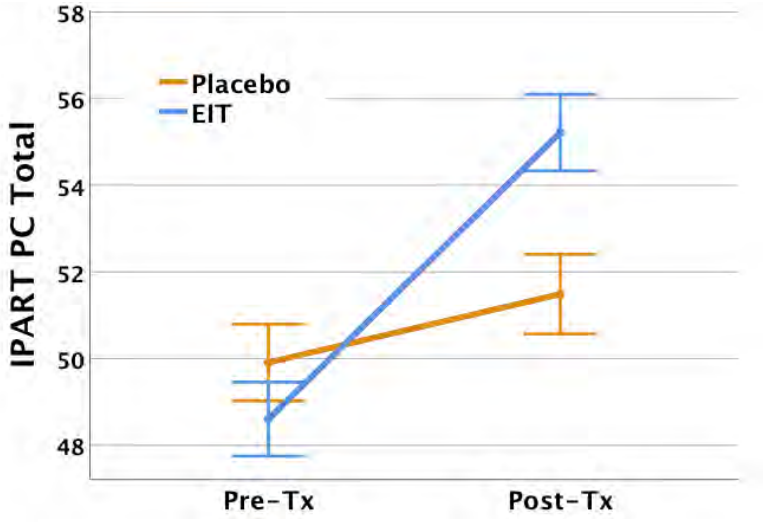


Figure 6. The EIT Program was associated with significant improvement in the ability to regulate the emotions of others on the Interpersonal Affect Regulation Test (IPART) Personal Choice selections relative to the placebo training program.

We explored the underlying factors contributing to this effect by examining the sub scores as well. Figures 7 below illustrate that the increased Total scores are due, in part, to an increase in the average number of “Improve” responses provided by participants, for both the “Best Choice” ($F(1,324) = 19.54$, $p < .0001$) and “Personal Choice” ($F(1,324) = 48.96$, $p < .0001$) conditions. These findings suggest that most of the effects of the EIT program appear to be due to a greater likelihood of identifying and selecting the 2-point responses that are most productive and likely to lead to a long-term sustainable improvement in the emotional state of another.

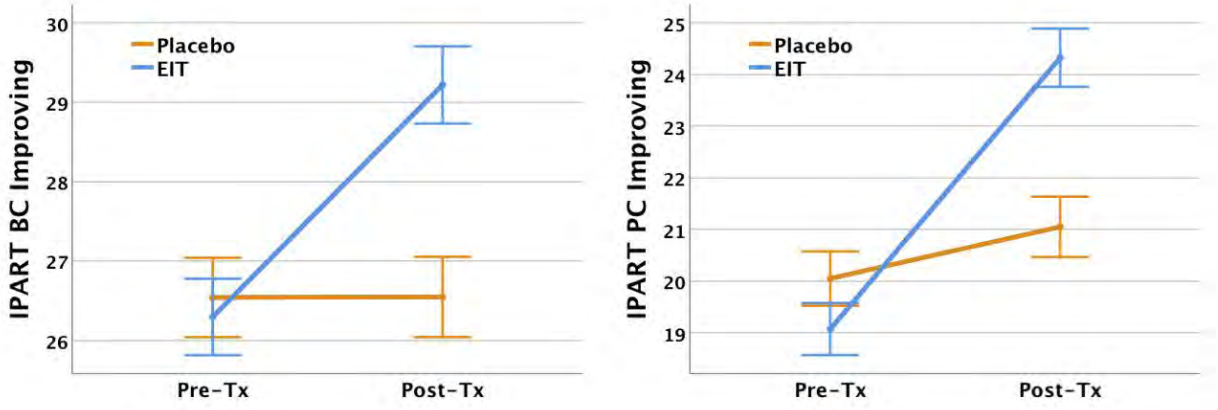


Figure 7. The EIT Program was associated with significant increase in the number of improving responses that would be helpful in regulating the emotions of others on the Interpersonal Affect Regulation Test (IPART) Best Choice and Personal Choice selections relative to the placebo training program.

Similarly, the EIT program also led to a greater reduction in the tendency to select “Diversion” responses for the “Best Choice” ($F(1,324) = 25.49$, $p < .0001$) and “Personal

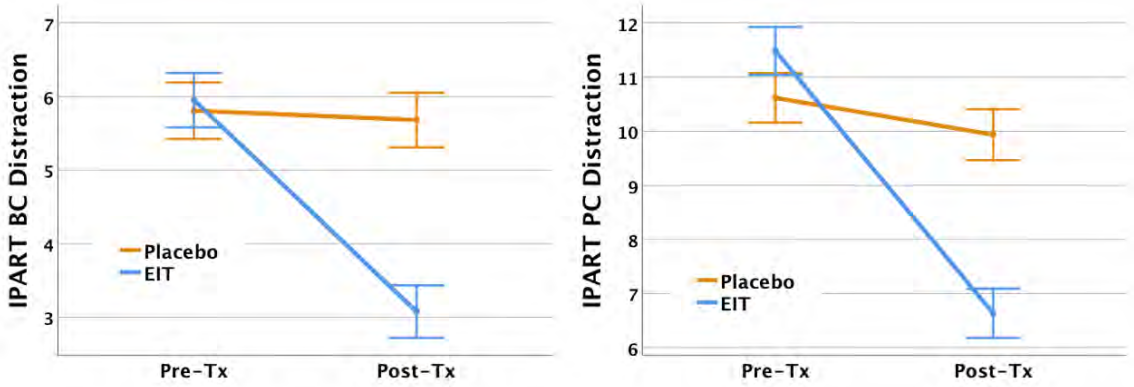


Figure 8. The EIT Program was associated with significant reduction in the number of distraction responses that would be unhelpful in regulating the emotions of others on the Interpersonal Affect Regulation Test (IPART) Best Choice and Personal Choice selections relative to the placebo training program.

Choice" ($F(1,324) = 48.33$, $p < .0001$) selections, whereas the Placebo program did not change (Figure 8).

In a parallel manner, the number of Worsen responses for those in the EIT program also declined for the "Best Choice" ($F(1,324) = 5.77$, $p = .017$) and "Personal Choice" ($F(1,324) = 12.57$, $p < .0005$ conditions, as depicted in Figure 9.

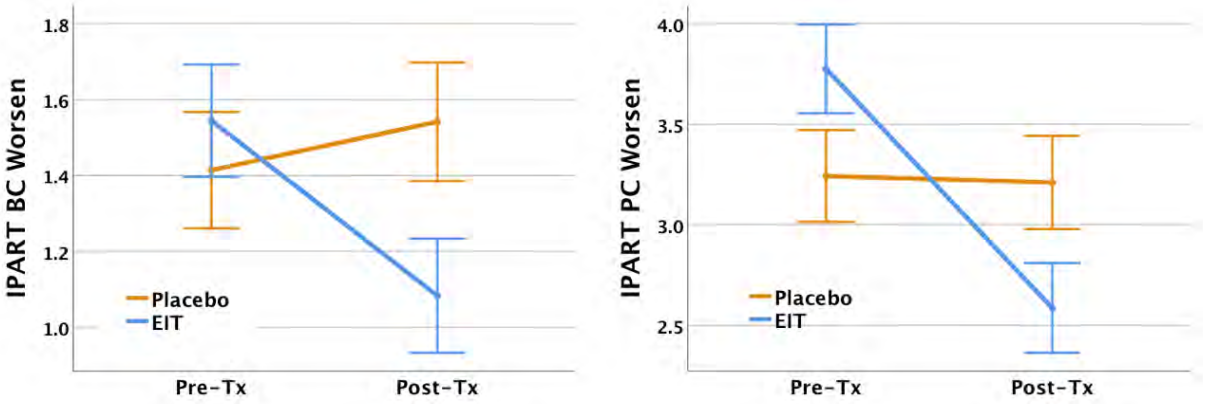


Figure 9. The EIT Program was associated with significant reduction in the number of worsening responses that would normally be detrimental regulating the emotions of others on the Interpersonal Affect Regulation Test (IPART) Best Choice and Personal Choice selections relative to the placebo training program.

iii) Understanding Emotions (Verbal Descriptions):

The EIT program devotes considerable effort toward enhancing the trainee's emotional vocabulary. To assess whether this is effective, we administered several metrics of emotional understanding:

Toronto Alexithymia Scale (TAS-20)

The TAS-20 assesses the extent to which an individual has difficulties effectively identifying and describing feelings using a rich vocabulary of emotion words, a construct

known as alexithymia. As shown in Figure 10, our preliminary results show that participants in the EIT program showed a significant reduction in alexithymia scores after completion compared to participants in the Placebo training program, F(1,324) = 4.43, p = .036.

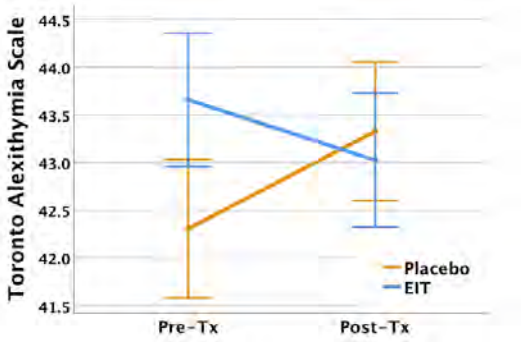


Figure 10. The EIT Program (internal program) yielded significant reductions in Total alexithymia scores on the TAS-20 relative to the placebo (external) condition.

iv) Understanding Emotions (Interoceptive Awareness):

Part of the EIT program is focused on building awareness of emotional sensations within the body to facilitate greater understanding of emotional reactions and to be better able to proactively regulate emotions when necessary. To that end, we have also included assessments of interoceptive sensory awareness:

Multidimensional Assessment of Interoceptive Awareness (MAIA)

The MAIA is a self-report instrument designed to quantify an individual's interoceptive awareness of bodily sensations. The MAIA assesses eight dimensions of interoceptive awareness, including: 1) noticing sensations, 2) not-distracting self from sensations, 3) not-worrying about sensations, 4) attention regulation (i.e., the ability to shift attentional awareness to bodily sensations at will), 5) emotional awareness, 6) self-regulation, 7) body listening, and 8) trusting bodily sensations. We compared scores on this scale at baseline and post-treatment. Overall, we found no significant effect of the EIT program on noticing bodily sensations, F(1,324) = .54, p = .464. However, the EIT program led to a significant improvement in "not-distracting the self from bodily sensations" compared to the Placebo program, F(1,324) = 4.37, p = .037, suggesting that the program aided participants in remaining focused on interoceptive sensations (see Figure 11). On the other hand, there was no effect of the EIT program on "not-worrying about physical sensations", F(1,324) = 0.008, p = .931, or "attention regulation", F(1,232) = 1.41, p = .235. There was an effect of EIT on the subscale for "emotional awareness", F(1,324) = 6.87, p = .01; "self-regulation", F(1,324) = 4.50, p = .035 (see Figure 12 below). However, the EIT program did not lead to significant improvement in "body trusting", F(1,324) = 2.18, p = .14, or "body listening" compared to the Placebo program, F(1,324) = 1.36, p = .243, suggesting participants assigned to the EIT program used greater intentional focus toward bodily cues to aid in emotional functioning post-training.

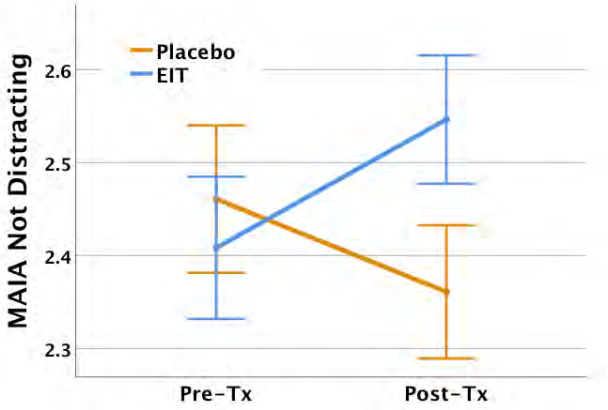


Figure 11. The EIT Program (internal program) yielded significant improvement in Not-Distracting scores on the Multidimensional Assessment of Interoceptive Awareness (MAIA) relative to the placebo (external) condition.

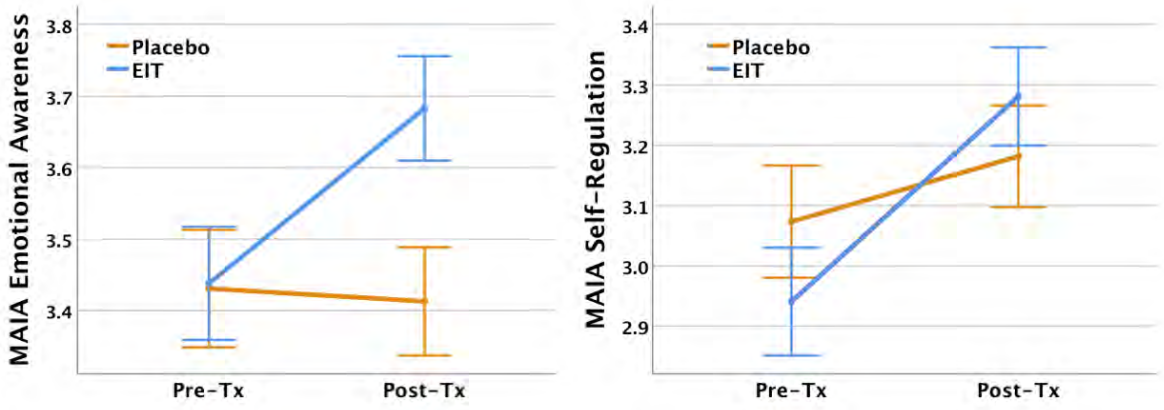


Figure 12. The EIT Program (internal program) yielded significant improvement in Emotional Awareness and Self-Regulation scores on the Multidimensional Assessment of Interoceptive Awareness (MAIA) relative to the placebo (external) condition.

v) Understanding Emotions (Emotional Awareness):

A theoretical construct that is closely related to EI is known as Emotional Awareness (EA) [4-7]. Emotional awareness is a construct that describes individual differences in the capacity to experience emotion at varied levels of complexity and differentiation. We believe that EA is an important component of EI. Therefore, we assessed EA using the Levels of Emotional Awareness Scale (LEAS) [6]:

Levels of Emotional Awareness Scale (LEAS)

We compared changes in LEAS scores from pre- to post-training for the active EIT program versus the Placebo training program. As shown in Figure 13, participants who underwent the EIT program showed a significant improvement in their LEAS scores relative to the Placebo group, $F(1,243) = 6.63$, $p = .011$, suggesting that the EIT program was effective at developing a richer, more complex, and differentiated level of understanding and experience of emotion (see Figure 13). This provides further cross-validation of the efficacy of the program using conceptually linked metrics of emotional understanding that are not explicitly based on the Mayer-Salovey-Caruso model of EI.

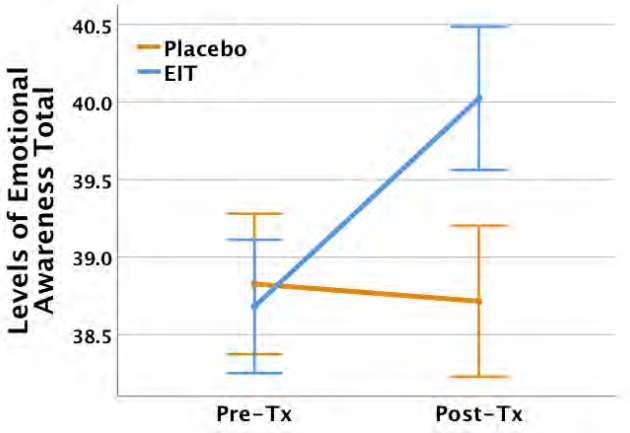


Figure 13. The EIT Program (internal program) yielded significant improvement on the Levels of Emotional Awareness Scale (LEAS) relative to the placebo (external) condition.

vii) Acceptability of Training: We were interested in how the active EIT program fared relative to the Placebo version in terms of general acceptability.

Upon completion of each training program run, we asked participants to complete a subjective experience rating questionnaire (see Figure 14). The first question asked participants how "helpful" they felt the training was for them personally. Scores were rated on a 7-point scale, from "extremely unhelpful" to "extremely helpful". For those receving the EIT program 69.4% found it to be helpful to extremely helpful, while for

those receiving the placebo program, only 29.6% reported any helpfulness to the program. A direct comparison of mean scores clearly showed that the EIT program was perceived as significantly more helpful than the placebo program, $F(1,300) = 69.43$, $p < .0000001$. We also asked participants to rate how much they felt the program improved their Emotional Intelligence skills. For the EIT program, 88.5% reported that they felt it improved their EI skills, while only 44.1% said the same for the placebo program. As evident in Figure 15, we found that the EI program was rated significantly higher on that scale as well, $F(1,300) = 93.83$, $p < .0000001$. These findings suggest that the EIT program was perceived as being useful to the participants. Additionally, we also asked participants to rate how engaging the program was. For those who took the EIT program, 57.3% reported that it was engaging to extremely engaging, while 52.6% of those taking the placebo program reported the same, suggesting the two programs were perceived as similarly engaging. This is reinforced by Figure 15, which shows that the mean engagement scores for the two programs were not significantly different, $F(1,300) = 0.35$, $p = .55$. However, when asked how well the program held their attention, we found that 70.7% of participants said that it held their attention well to extremely well, while only 53.1% of those taking the placebo program said the same. Furthermore, mean attention holding scores for the EIT

Figure 14. Subjective rating questions about the EIT program assessed upon completion of the study.

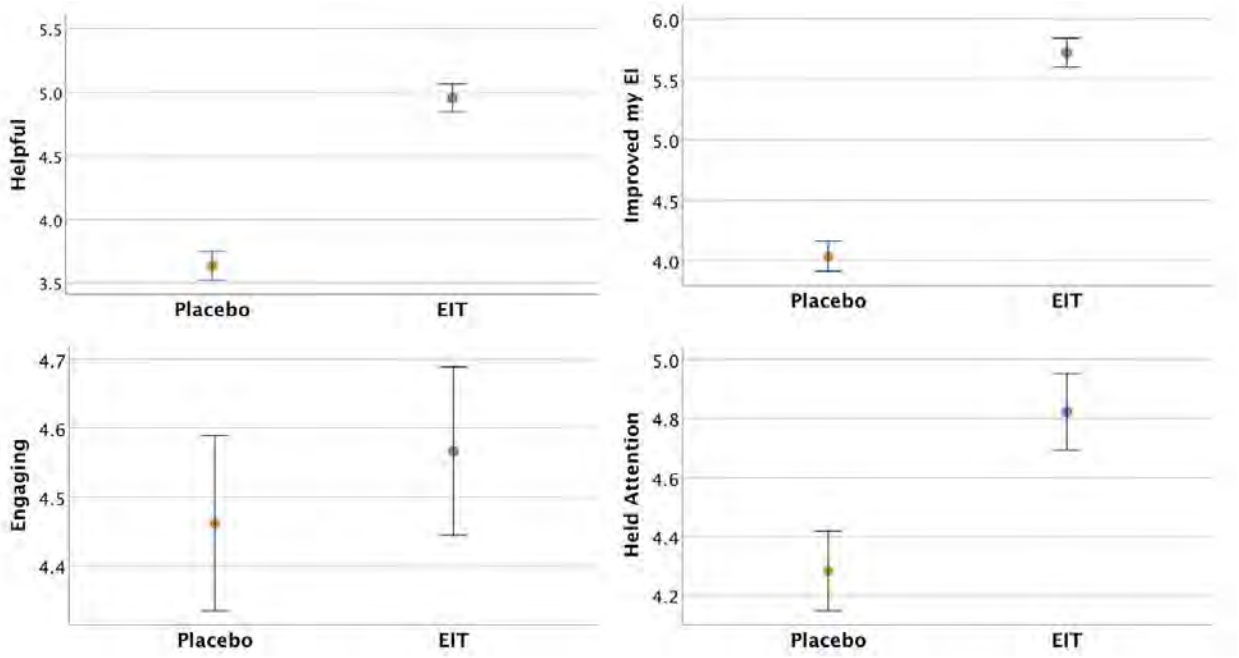


Figure 15. Mean ratings on the 7-point acceptability scales for the Placebo and EIT programs.

program were significantly higher rated than for the placebo program, F(1,300) = 8.31, p = .004 (see Figure 15). These data corroborate what we found in our initial Task 2 outcomes, which also suggested that participants found the program helpful.

viii) Training Duration:

The duration of training was also of interest in this project. During Task 3, we randomly assigned participants to one of two groups: 1) 1-week training (compressed training), or 2) 3-week training (standard training). The goal was to determine whether similar outcomes would be observed if the training was compressed from the recommended 3-week version to only 1-week. This would be critical to know, as a program that can be administered in a shorter timeframe would be particularly useful for the military.

Subjective Preferences for 1-week versus 3-week EI Training

Upon completion of each training program run, we asked participants to complete a subjective experience rating questionnaire (see Figure 14). The first question asked participants how "helpful" they felt the training was for them personally. Scores were rated on a 7-point scale. As evident in Table 1 below, there were no differences between the 1-week and 3-week versions in how "helpful" they were perceived, t(155) = 0.28, p = .78. Similarly, Table 1 shows that there were no differences between the 1-week and 3-week versions in how "engaging" they were, t(155) = 0.74, p = .46. We also asked how well the program held the participant's attention, and found that the 3-week version was not scored significantly higher than the 1-week version, t(155) = .17, p = .54. When asked about whether the participant believed the program improved their emotional intelligence, responses from those taking the 3-week program did not differ significantly from those undergoing the 1-week program, t(152.1) = 1.16, p = .23. Thus, preference ratings do not differ between the two durations of the program.

Group Statistics

	WeekCondition_1	N	Mean	Std. Deviation	Std. Error Mean
Helpful	1	86	4.93	1.335	.144
	3	71	4.99	1.102	.131
Engaging	1	86	4.49	1.570	.169
	3	71	4.66	1.309	.155
Held Attention	1	86	4.76	1.571	.169
	3	71	4.90	1.364	.162
Improved my EI	1	86	5.62	1.390	.150
	3	71	5.85	.995	.118

Table 1. Mean ratings for 1-week and 3-week versions of the EIT Training Program.

Overall, these findings suggest that participants find the EIT program useful, and equally as engaging as the placebo condition, but that there are no significant or meaningful differences in subjective ratings between the 1-week and 3-week conditions. Therefore, we can safely conclude that the two training durations can be considered interchangeable in terms of participant preferences.

Objective Differences Between 1-week versus 3-week EIT Program

We also compared several objective outcome measures between the 1-week and 3-week versions of the EIT program to determine if one duration was emerging as superior to the other.

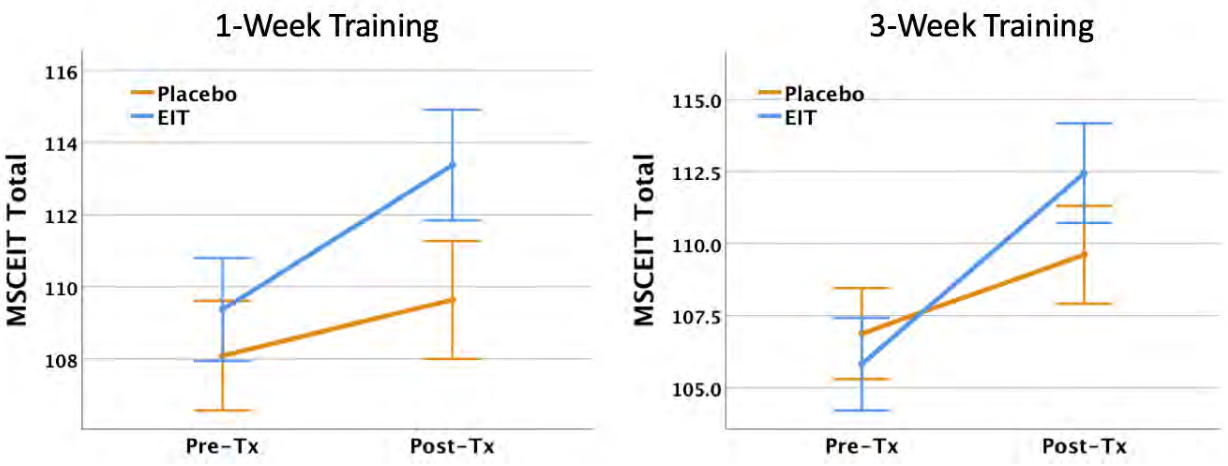


Figure 16. Comparison between 1-week and 3-week training durations.

To assess differences between the duration conditions, we compared the scores on the MSCEIT (described earlier) for the two duration groups. As evident in Figure 16, we did not find a significant effect of duration condition, $F(1,317) = 0.94$, $p = .33$, and no interaction between duration condition and changes in pre- to post-training outcome, $F(1,317) = 0.36$, $p = .55$ on MSCEIT scores. Similarly, for the LEAS (described earlier) for the two duration groups, we did not find a significant main effect of duration condition, $F(1,241) = 0.16$, $p = .70$, and no interaction between duration condition and changes in pre- to post-training outcome, $F(1,241) = 0.86$, $p = .35$. For the SREIS, we found no main effect for duration condition, $F(1,322) = 0.02$, $p = .89$, and no interaction between duration condition and training group, $F(1,322) = 0.003$, $p = .96$. For the IPART "Best Choice" score, there was no significant main effect of duration, $F(1,322) = 0.008$, $p = .93$, and no interaction between duration condition and program condition, $F(1,322) = 0.32$, $p = .57$. Similarly, for the IPART "Personal Choice score, duration condition did not have a significant main effect, $F(1,322) = 1.18$, $p = .28$, and no interaction between duration condition and program condition, $F(1,322)$, $= 0.01$, $p = .91$. Overall, we found that duration condition did not matter for any of the scales assessed.

Therefore, we conclude that extending or contracting training duration from one to three weeks does not have a meaningful effect on outcome. This suggests that it is possible to obtain similar effects even when the training is taken in a very short time frame. These data will be used to make a final decision regarding which version of the program will be utilized for the remainder of the study.

ix) Study Progress:

Recruitment: We continue to recruit from high-yield sources, or electronic online sources. Historically, our best sources have come from posting paper flyers around the greater Tucson area, using departmental listservs for study advertisement through the University of Arizona, and general word-of-mouth as participants have spread the word about the study to their friends. We have evaluated participants during each initial screening to ensure that if they were referred by a friend that they are unaware of the

dual conditions of the study. As shown in Figure 17, recruitment efforts over the past year have been vigorous and extensive. During the past year we have conducted 571 telephone interviews to screen potentially interested volunteers for Task 3. As shown below, nearly 78% of interested volunteers have been deemed eligible. 247 individuals have either completed both study visits and 59 are currently scheduled for their initial assessment visit.

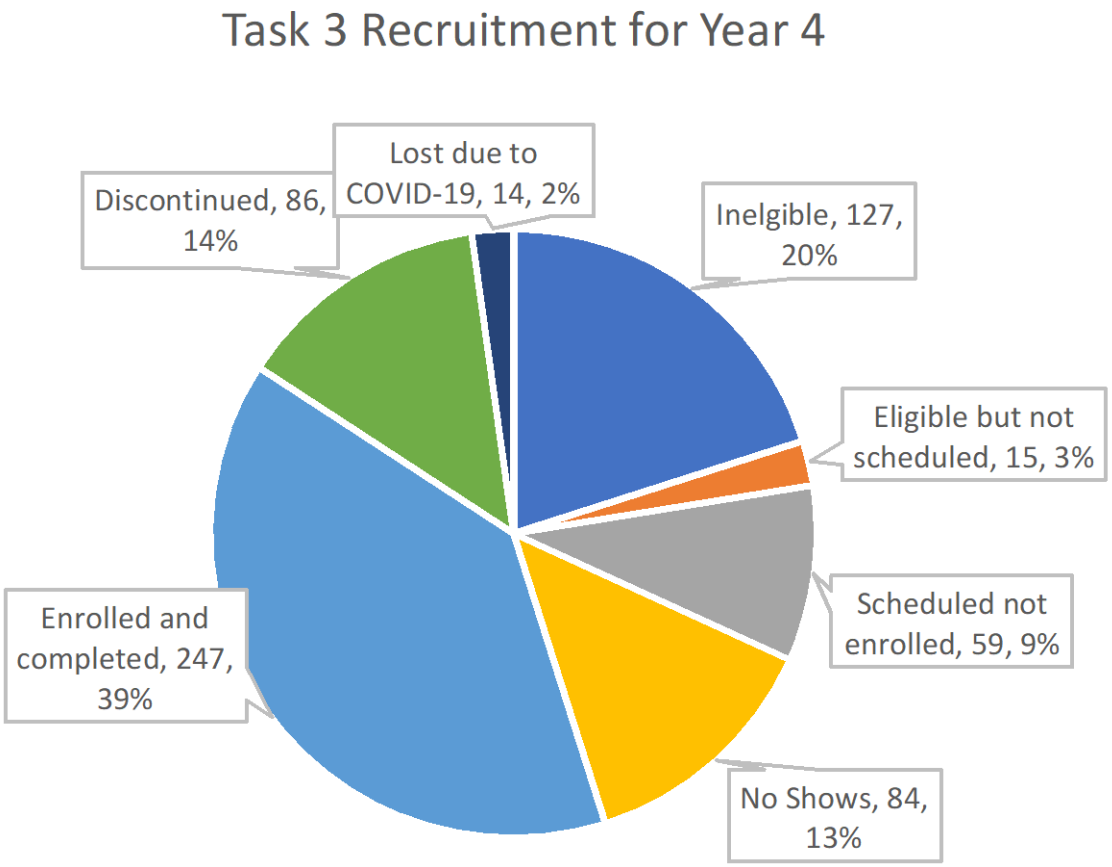


Figure 17. Task 3 Recruitment for Year 4.

This year, 22% of interested volunteers were deemed ineligible after a phone screening. Among the 127 ineligible volunteers the primary exclusionary criterion was medication (see Figure 18). This screening criterion is in place to ensure data quality, and we do not anticipate it becoming an impediment to participant intake. Other screening criteria resulting in immediate exclusion included: previous participation in a study with similar measures and scales, current mental disorder, and scoring below an 8th grade reading level on a reading task conducted during the phone screen (see Figure 18). People listed as having other reasons for ineligibility were those individuals who had more than one reason for ineligibility or smaller categories such as alcohol use or involvement with the SCAN lab in a professional capacity. All exclusionary criteria are necessary to maintain the fidelity and interpretability of the data.

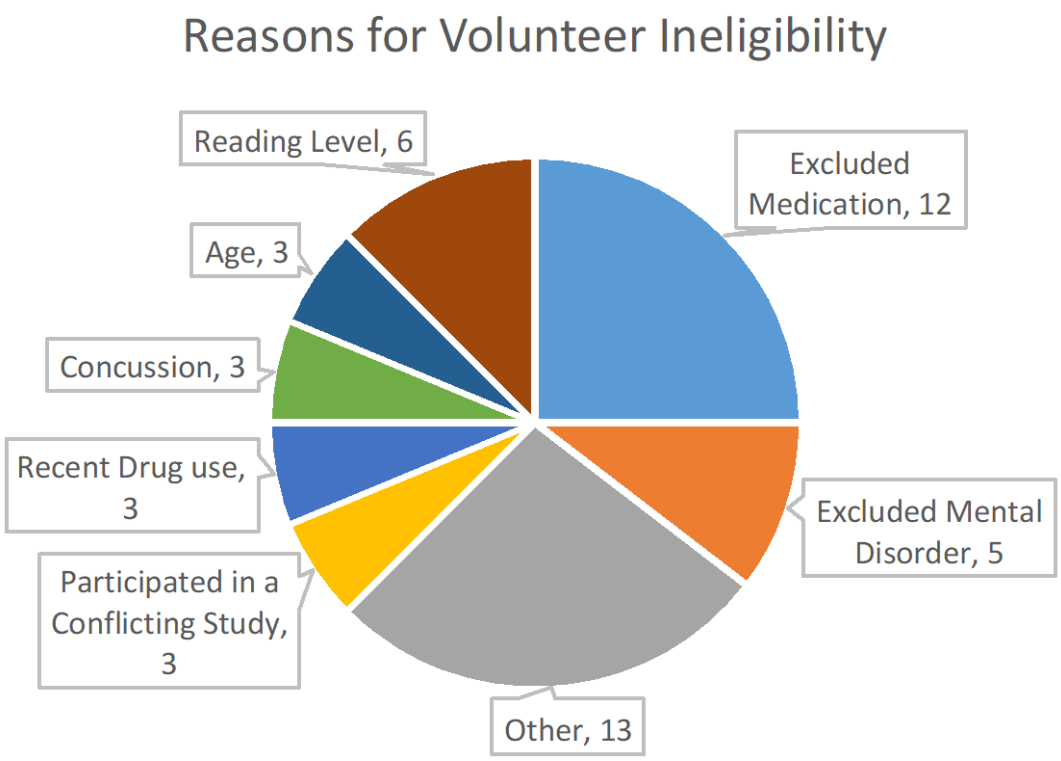


Figure 18. Task 3 Reasons for Ineligibility in Year 4.

While we experienced a delay in Task 5 data collection in Fall 2019, we were able to begin recruitment for Spring 2020 nearly 6 months earlier. We found this additional time was beneficial for connecting with the cadets and yielded more successful recruitment results. We sent out multiple emails through their listservs, posted flyers in their main building on campus, and spoke to them in person. The extended amount of time for recruitment also promoted the word of mouth dissemination of information about the study. We had quite a few cadets reach out to us via phone and email to express interest and ask questions about the study. Due to the delay during Fall 2019 we adjusted our eligibility to include second semester first year students. The Air Force ROTC and Navy ROTC have given us access to listservs for their cadets which has allowed us smoother contact with those groups.

Additionally, we have reached out to the ROTC at Arizona State University and they are interested in working with us for the upcoming Fall 2020 semester. As of the writing of this report, over 40 students in the Arizona State University ROTC have expressed interest in participating in the study. We plan to begin recruitment for both the University of Arizona and Arizona State University in August 2020.

As of the writing of this report we have been able to complete 74 ROTC cadet participants for Task 5. As in the Spring 2019 semester, the Army ROTC leadership, again, declined to participate in the Fall 2019 and Spring 2020 semesters. Due to a delay in IRB approval of adding the MSCEIT to the assessment battery, we did not run any participants through the program in the Fall 2019 semester. As a result of these

factors, our enrollment experienced a bit of a lag. Despite these delays we were able to complete 20 participants in Spring 2020. Moving forward, we will be reaching out to all three branches of the ROTC at the University of Arizona as well as Arizona State University. We expect that branching out to ASU will enable us to complete this portion of our study by the end of the Fall 2020 semester.

Advertising/Recruitment Success: While Task 5 is fairly straightforward regarding the funneling of ROTC participants to our study, Task 3 requires more nuance in our approach.

In an attempt to better understand the effectiveness of our advertising efforts, we have continued to conduct extensive analysis of the source of recruitment and whether these sources yielded success in recruitment of participants. To accomplish this task, we asked each individual who contacted us for a telephone screening interview to indicate where they heard about our study. Figures 19 and 20 below show the breakdown of data for the number of interested callers who found out about the study from each outlet. However, it should be noted that calls received do not necessarily translate evenly into successfully enrolled participants. Therefore, we present data on the number of "eligible" participants that have resulted from each advertising venue, which provides a more accurate reflection of the quality of each recruitment source.

As evidenced Figure 19, a total of 120 callers learned of our study from a friend, coworker, or associate in a category we have labeled "Word-of-Mouth". For this category, we are careful to evaluate whether the potential participant learned about the study from a current participant, and therefore could have been exposed to information that would compromise any data collected. Fortunately, that was not a concern for the word-of-mouth callers, with around 84% of them ending up being eligible for our study. This year we continued our high-yield recruitment methods, such as posting of flyers in local Tucson businesses and university campus locations, and the University of Arizona listservs. We also purchased advertising on Facebook and Instagram which resulted in around 1000 interested individuals. As evident in Figure 20, Facebook and Instagram make up a considerable number of our eligible population (40%).

The consort diagram in Figure 21 below shows the total participant flow for Task 3 (general population for the efficacy study). Over the past annual reporting period, we have assessed 571 individuals for eligibility and have successfully enrolled 330 and completed 247 participants for Task 3.

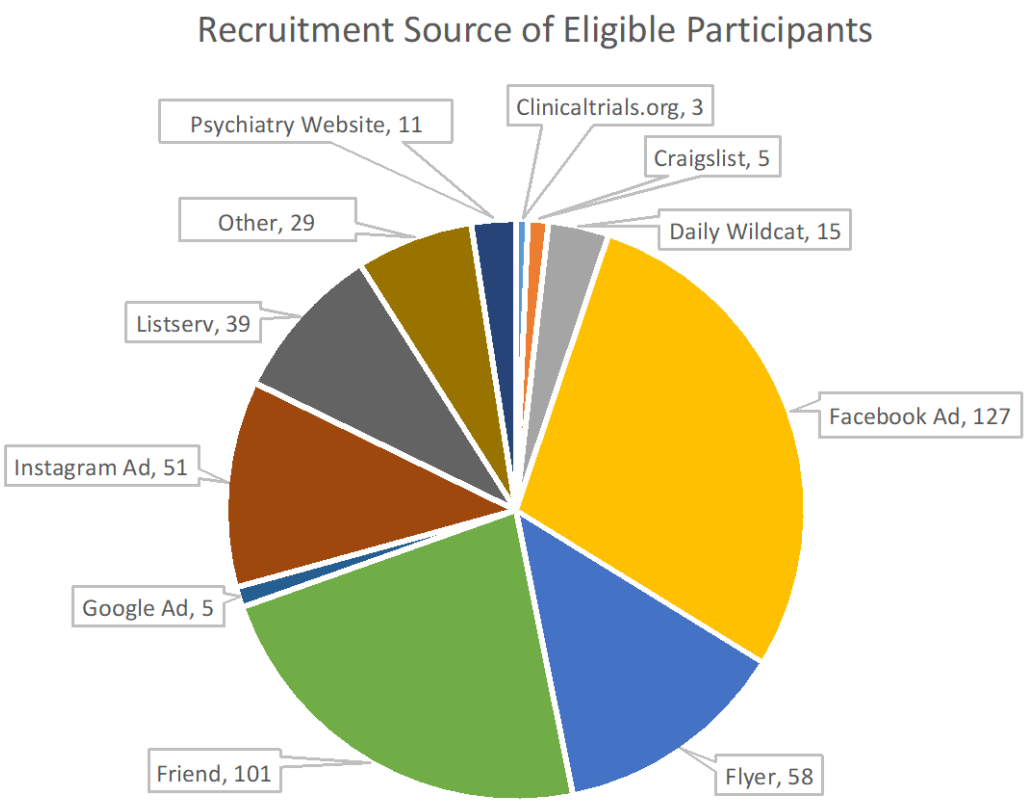


Figure 19. Breakdown of Phone-Screened Participants by Recruitment Source

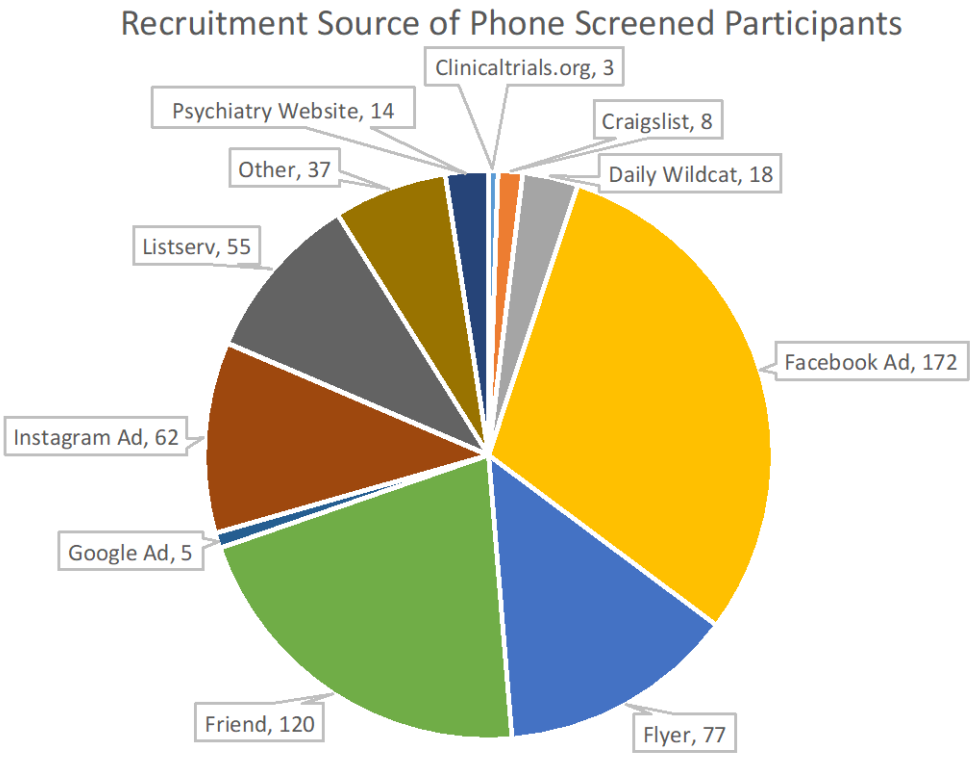


Figure 20. Breakdown of Eligible Participants by Recruitment Source

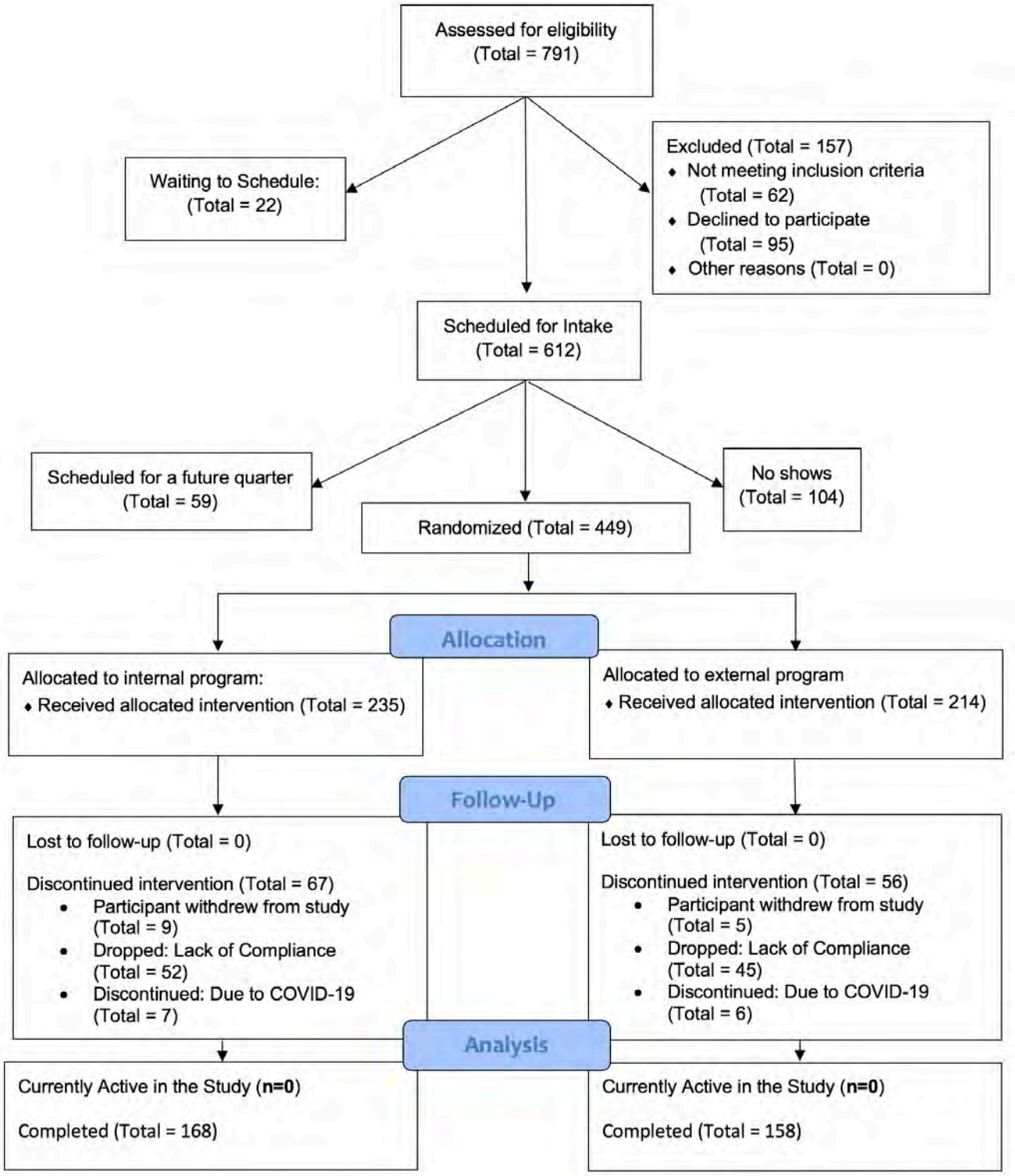


Figure 21. Consort Diagram for Task 3 in Year 4

The consort diagram in Figure 22 shows the total participant flow for Task 5 (ROTC cadet effectiveness study). As shown in the figure, we have currently assessed 112 cadets for eligibility and have completed full study runs with 74 cadets for Task 5. In this

past year we assessed 33 individuals and enrolled and completed 13. As of the writing of this report we have completed an additional 20 individuals for Year 5.

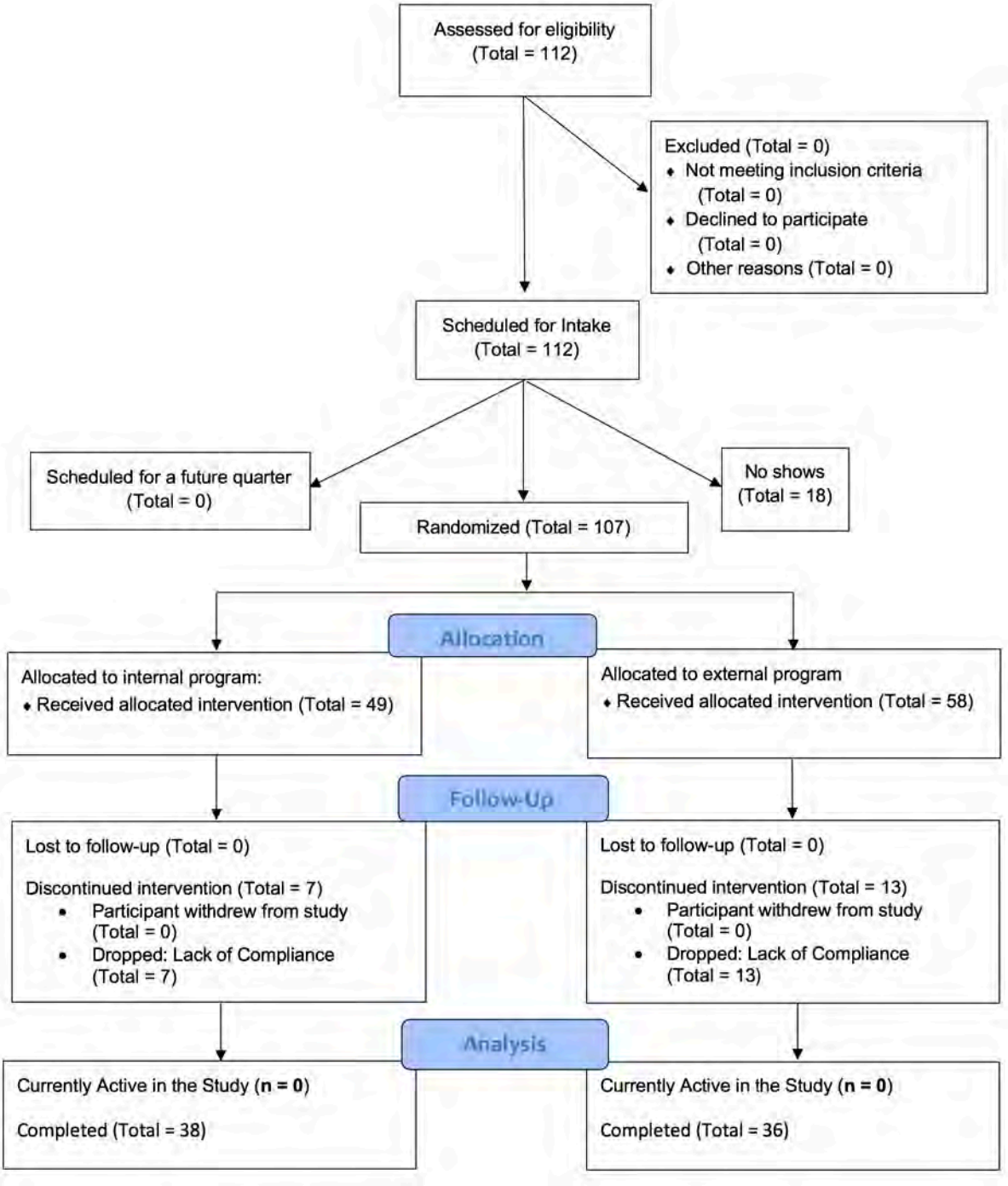


Figure 22. Consort Diagram for Task 5

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

While the primary goal of this project is not to provide training and professional development, many such experiences have occurred for our team members. The present project has supported:

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

5 members of our lab presented research findings and attended lectures at The International Neuropsychological Society; Denver, Co, February 5-8, 2020.

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

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

All members of the lab received basic first aid and CPR training or re-certification, in compliance with University of Arizona Medical Imaging Policies.

5 college undergraduate students obtained training in research methods during a summer training program in our lab this year, 2 who were sponsored by the University of Arizona and the other by the National Institutes of Health MARC Undergraduate Student Training in Academic Research (U-STAR) Award.

5 undergraduate students were supervised for their Senior Honors Theses in our lab this year.

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

Over 10 members of our lab have undergone regular in-house training in the use of various brain-imaging software, including SPM12, Matlab, FSL, Freesurfer, TracVis, and MRIcron.

How were the results disseminated to communities of interest?
Results were disseminated to communities of interest through presentations at research meetings, journal articles, community forums and tabling events, and poster presentations including the following:

- We demonstrated the EIT program and discussed current findings with a multidisciplinary Human Performance Initiative comprised of University of Arizona
- USAF, 355th Wing, Davis-Monthan Air Force Base.
    - 19 FEB 20

- We gave a presentation on emotional intelligence and the developing EIT program to groups from WRAIR and BSAI
    - 3 DEC 19

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

Task 3 data collection is in its final stages and was on track to be completed on by the time of this report. However, the COVID-19 pandemic has significantly altered the initial planned completion times. Specifically, due to the state-wide closure of all activities and stay-at-home orders, we needed to temporarily halt data collection until it is safe for both participants and study staff to run in-person study visits. During this time, our lab has been developing new strategies to allow us to continue with remote data collection when possible. In the meantime, we plan to contact participants who have completed the training program to complete online "follow-up" visits that will assess whether the training program is helping participants preserve their mental health and help them cope more effectively in this time of global crisis. This will allow us to continue some aspects of Task 3 data collection despite not being able to conduct in-person study visits. Moreover, this would be an excellent opportunity to assess the effectiveness of the EIT program for building and sustaining resilience through a crisis. Therefore, we are re-designing our Task 3 six-month follow-up data collections to be completely online and remote data collections with an emphasis on resilience and mental health issues. We have brought on additional study staff, both research technicians and undergraduate students, to allow us to run multiple research participants a day for multiple Tasks, while also working diligently on recruitment efforts for multiple Tasks.

Task 4 involves in-person collection of MRI scans. Therefore, this Task is currently on-hold until the state government and the University administration indicate that it is safe to continue with in-person data collection. We will begin recruitment and enrollment efforts once we obtain authorization from the University of Arizona Institutional Review Board and University administration, and it is deemed safe for both participants and study staff to conduct in-person study visits. We plan to utilize the larger study staff to be able to engage in rigorous recruitment and enrollment efforts and complete Task 4, hopefully during the next reporting period.

Task 5 will continue in recruitment and enrollment efforts. We have reached out to other institutions such as Arizona State University to establish plans to recruit ROTC cadets from those sites in addition to the University of Arizona. This will allow us to increase data collection and complete Task 5 more efficiently. Unfortunately, with the COVID-19 outbreak, classes were cancelled, which means that the opportunity to assess leadership via peer and cadre ratings will not be possible. We are therefore, shifting to focus on emotional and mental health metrics to the extent possible.

Task 6 is a major focus of lab efforts. We have established relationships with several officials at Davis-Monthan Air Force Base and they have tentatively agreed to allow us to conduct recruitment efforts on base. There are still several administrative and command hurdles that need to be cleared, but we have submitted IRB amendments to

allow data collection at this site. Once we receive command authorization, we will initate data collection with the Air Force. We also have had successful negotiations with the Naval Postgraduate School (NPS). We have an agreement established with collaborators at NPS who will assist in recruitment and data collection at that site in the coming months. We have modified the protocol and submitted an amendment to allow NPS to be a data collection site as well. We have worked with USAMRDC to obtain additional funds that will be directed to NPS to support their effort in the data collection process. This modification is pending approval by the University of Arizona Institutional Review Board.

4. IMPACT:

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

While data collection is still ongoing, the initial findings have already led to significant interest from the research community regarding the potential for training Emotional Intelligence skills. Last year, we published an initial paper on the preliminary version of the EIT program during, which has already been cited 9 times this past year. Our team has also recently published several theoretical papers about our revised models of emotional intelligence and emotional awareness, which have garnered considerable interest from the affective neuroscience community.

What was the impact on other disciplines?

The EIT program continues to generate considerable interest within the military community. The PI has been contacted by several groups within the military, including the Navy, who are interested in moving the EIT Program forward. Given the current COVID-19 pandemic and its effects on mental health, there has been interest in potentially using the program as a method for preventing depression, anxiety, and suicidal ideation.

What was the impact on technology transfer?

We had discussed the possibility of obtaining a patent on the EIT program with Tech Launch Arizona, but they have determined that the current state of the program, as run in the Smart Sparrow platform would not constitute a patentable technology. Because Smart Sparrow was recently purchased and the company will be dissolving at the end of 2020, we are currently seeking funding to transfer the program to a more flexible platform for widespread dissemination. We submitted a grant to the Peer Reviewed Medical Research Program (PRMRP) to allow this last year, but were not awarded funding. We will be submitting another application this year, as we believe that it will be critical to move this technology forward to a new platform so that it can be disseminated widely to the military and dependent family members.

What was the impact on society beyond science and technology?

Nothing to report.

5. CHANGES/PROBLEMS:

Changes in approach and reasons for change

This past reporting period has come with many new challenges due to the COVID-19 pandemic and associated nationwide shutdown of most activities. This has led to a number of critical changes to the research protocol. As a result of the COVID-19 pandemic and social distancing policies enacted, we had to temporarily halt data collection for pre- and post-treatment of Task 3. We plan to start enrolling participants again one the current situation is resolved, and it is safe for participants and study staff to complete in-person study visits. However, we did make some protocol changes in regard to the Task 3 six-month follow-up visits as well as Task 5 in order to continue data collection for those portions of the study. As of the writing of this report, we have submitted protocol to the IRB to start remote testing Task 3 six-month follow up visits, using this opportunity to investigate how the training program has allowed individuals to better cope with the current pandemic crisis and its impact on individual's economic situation and social lives. These remote follow up visits will primarily focus on mental health and coping, as well as continuing to assess various aspects of emotional intelligence. In addition to remote testing Task 3 six-month follow up visits, we have implemented protocol to allow us to administer remote testing to Task 5 subjects for their post-treatment assessment. This protocol change allowed us to complete more participants this semester for Task 5 instead of losing critical data and further delaying the completion of the project.

Additionally, our collaborators at NPS have asked for the collection of additional biometric data. This was done to facilitate a Master's student Thesis that will also emerge from this project. The student has agreed to assist in recruitment and data collection at NPS in exchange for the additional data collection. The additional data will come from an unobtrusive biometric sensor in a novel device known as the Oura Ring. This ring includes sensors for activity, sleep, and temperature, which would be useful metrics to correlate with EI and resilience. Additionally, since students at NPS are not allowed to receive financial compensation, we will provide the rings to the participants to keep as their compensation for participation.

The move to remote testing for Task 3 six-month follow-up and Task 5 visits led us to consider running Task 6 remotely at the sites listed earlier in this report. Remote testing would also allow for more flexibility with enrolling participants and collecting data. For example, interested participants could complete pre- and post-treatment visits on their own time instead of reporting to a specific testing site at a specific time. This may make it easier to recruit subjects and thus collect data for this Task at a faster pace.

In addition to remote testing for Tasks 3, 5, and 6, we have made the necessary protocol changes to Task 4 to allow us to run participants during a single day session instead of the originally planned 2-day study visits. During these one-day study visits,

participants will complete a battery of assessments to assess their emotional intelligence and related constructs, similar to those administered in Task 3. Participants will also undergo fMRI scanning while completing tasks to assess emotional regulation and emotion perception abilities. Consolidating Task 4 study visits into one day will make scheduling significantly easier for participants and study staff, allowing us to collect data at a more efficient pace. We have already been recruiting participants for Task 4 concurrently with Task 3, so we plan to start scheduling and enrolling participants once it is safe for both participants and study staff to resume normal in-person study visits.

During the last reporting period, we faced a number of challenges while trying to recruit ROTC cadets for Task 5, mostly due to lack of interest/time by the cadre of the programs. To address this, we have explored recruiting ROTC cadets from additional institutions across Arizona's major metropolitan areas in order to expand the pool of participants we may recruit from and thus collect data at a more optimal pace. We have already established a relationship with Arizona State University's ROTC program and plan to begin enrolling subjects in the Fall of 2020.

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

During the last reporting period, we were only able to collect one semester of Task 5 ROTC cadet data. In addition to significant IRB delays that prevented us from collecting data during the Fall 2019 semester, we faced a number of difficulties while trying to recruit from the ROTC population at the University of Arizona. The Army ROTC unit declined to participate, citing lack of student time availability. However, we were able to coordinate with the Navy and Air Force ROTC programs at the University of Arizona to collect data this past Spring 2020 semester, collecting data for an additional 20 participants, bringing the total participants to 74 of our anticipated sample of 120. To collect data from the remaining 46 participants, we plan to recruit from other ROTC programs in Arizona such as, but not limited to, Arizona State University. We have reached out to ROTC leaders at ASU and have established a relationship with them to start recruiting and enrolling ROTC cadets from their university starting in the Fall 2020. With this new relationship, we will be able to recruit and enroll participants from both ASU and the University of Arizona concurrently, thus allowing us to collect data at an optimal pace and complete data collection during the next reporting period.

As already described above, the outbreak of COVID-19 and implementation of social distancing guidelines resulted in a temporary halt for pre- and post-treatment data collection for Task 3. According to our calculations, we were on track to complete Task 3 pre- and post-treatment data collection by the time of this report as a result of increase study staff and scheduling flexibility for participants. The COVID-19 situation has significantly impacted this goal, as we needed to stop in-person study visits for the safety of participants and study staff. Due to the length and the rigor of the in-person visits, we felt that remote testing would significantly impact the quality of the data, so we made the decision to put data collection on hold until it is deemed safe for in-person visits. We fully anticipate completing Task 3 during the next reporting period, as we only

have 136 more participants to complete for this task. We plan to continue to collect data for six-month follow-up visits, just via remote online testing.

The COVID-19 situation has also delayed the start of Task 4, the neuroimaging portion of the study. These study visits must be completed in-person, so we cannot transition them to remote testing. The COVID-19 situation has also delayed IRB approval for Task 4, as COVID-19 specific protocols have been prioritized over in-person protocol. Once social distancing guidelines have been relaxed and IRB approval has been given, we plan to start scheduling and enrolling participants. We have designed Task 4 so that we can run two participants a day, one with a fMRI scan in the morning and one in the afternoon. While weekend fMRI scans are not available, we will be able to run participants 5 days a week, with a maximum of 10 participants per week. Even if we experience attrition issues like we have faced in Task 3, we still fully anticipate being able to complete Task 4 within the next reporting period.

As mentioned above, we were recently contacted by our computer programming company, Smart Sparrow, who notified us that the current Smart Sparrow platform was bought out by Pearson Assessments and will cease to exist as of December 31, 2020. This would mean we no longer have access to the current training program platform. To address this critical issue, we have been in contact with Smart Sparrow about obtaining the code to the program that would allow us to transfer the program to a different platform or develop a new platform to run the program on. To further address this issue, we have been developing plans to accelerate data collection. Specifically, we plan on enrolling and having all participants for remaining tasks complete the program by the end of the year. We also intend to use this opportunity to address some of the technical issues our participants have experienced while using the program, thus creating a better program to present at the end of the study. While this is an actual problem we are facing, we do not anticipate it significantly delaying the completion of the study by the next reporting period.

Given that the program is showing excellent success in building EI skills, we plan to apply for additional funding to complete this technology transfer, thus allowing easy dissemination of the program to military personnel.

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

- **Significant changes in use or care of human subjects**
  Nothing to report.

- **Significant changes in use or care of vertebrate animals.**

Nothing to report. (No use of vertebrate animals is required for completing the project)

- **Significant changes in use of biohazards and/or select agents**
  Nothing to report. (No use of biohazards and/or select agents is required for completing the project)

6. PRODUCTS

- **Publications, conference papers, and presentations**
  - **Journal publications:**

Skalamera, J, Huang, Y.H, Chinkers, M., Richards, M.M., & Killgore, WDS. The influence of habitual sleep duration on rational thinking ability. Poster presented at the Annual SLEEP Meeting, San Antonio, TX, June 8-12, 2019.

Vanuk, J. (September, 2019). *Lifetime stress exposure during adulthood is associated with lower emotional intelligence.* Abstract submitted to the 2020 Meeting of the International Neuropsychological Society, Denver, CO.

Killgore, W.D.S., (October, 2019). *Preliminary validation of a web-based emotional intelligence training program for enhancing emotional resilience.* Abstract submitted to the 40th meeting of the Anxiety and Depression Conference, San Antonio, TX.

Killgore, W.D.S. (October, 2019). *Political perspective is associated with differences in trait anxiety and depression.* Abstract submitted to the 40th meeting of the Anxiety and Depression Conference, San Antonio, TX.

Vanuk, JR, Alkozei, A, Raikes, AC, Allen, JJB, and Killgore, WDS. (2019). Ability-based emotional intelligence is associated with greater cardiac vagal control and reactivity. Frontiers in Human Neuroscience, 13, Article 181, doi: 10.3389/fnhum.2019.00181

  - **Books or other non-periodical, one-time publications.**
    Nothing to report.

  - **Other publications, conference papers, and presentations**.

- **Website(s) or other Internet site(s)**
  Nothing to report.

- **Technologies or techniques**
  Nothing to report.

- **Inventions, patent applications, and/or licenses**
  We are working with Tech Launch Arizona, the technology transfer office of the University of Arizona to discuss patent applications.

- **Other Products**
  Nothing to report.

7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

What individuals have worked on the project?
Name: William D. “Scott” Killgore, Ph.D.
Project Role: PI
Nearest person month worked: 5
Contribution to Project: Dr. Killgore oversees all aspects of project progress and orchestrates data analysis and publication efforts.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: John Allen, Ph.D.
Project Role: Co-PI
Nearest person month worked: 1
Contribution to Project: Dr. Allen assists in program module development.
Funding Support: no change

Name: Ted Trouard, Ph.D.
Project Role: Co-PI
Nearest person month worked: 1
Contribution to Project: Dr. Trouard assists in program module development.
Funding Support: no change

Name: Richard Lane, M.D., Ph.D.
Project Role: Co-PI
Nearest person month worked: 1
Contribution to Project: Dr. Lane assists in program module development.
Funding Support: no change

Name: Karen Weihs, M.D.
Project Role: Co-PI
Nearest person month worked: 1
Contribution to Project: Dr. Weihs assists in program module development.

Funding Support: no change

Name: Sahil Bajaj, Ph.D.
Project Role: Postdoctoral Fellow
Nearest person month worked: 2
Contribution to Project: Dr. Bajaj performs data analysis and processing for the project.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Natalie Dailey, Ph.D.
Project Role: Postdoctoral Fellow
Nearest person month worked: 2
Contribution to Project: Dr. Dailey performs data analysis and processing for the project.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Adam Raikes, Ph.D.
Project Role: Postdoctoral Fellow
Nearest person month worked: 4
Contribution to Project: Dr. Raikes performs data analysis and processing for the project.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Brieann Satterfield, Ph.D.
Project Role: Postdoctoral Fellow
Nearest person month worked: 3
Contribution to Project: Dr. Satterfield performs data analysis and processing for the project.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Emily Taylor
Project Role: Lab Manager
Nearest person month worked: 6
Contribution to Project: Ms. Taylor oversees the administrative needs of the study and study staff, in addition to providing regulatory support and performing periodic quality control checks.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Matthew Allbright
Project Role: Research Technician
Nearest person month worked: 5
Contribution to Project: Mr. Allbright oversees the technical aspects of the project and assists in database export, storage, backup, and management.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Ron Ian Victor Anlap
Project Role: Research Technician
Nearest person month worked: 6
Contribution to Project: Mr. Anlap provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Cameron Akira Barnes
Project Role: Research Technician
Nearest person month worked: 6
Contribution to Project: Ms. Barnes provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Madison Louise Brown
Project Role: Research Technician
Nearest person month worked: 1
Contribution to Project: Ms. Brown provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Leah Nadia Bruun
Project Role: Research Technician
Nearest person month worked: 1
Contribution to Project: Ms. Bruun provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Ayla Bullock

Project Role: Research Technician
Nearest person month worked: 3
Contribution to Project: Ms. Bullock provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Anna Burns
Project Role: Research Technician
Nearest person month worked: 2
Contribution to Project: Ms. Burns provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Marissa Chaves
Project Role: Research Technician
Nearest person month worked: 1
Contribution to Project: Ms. Chaves provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Sara Cloonan
Project Role: Research Technician
Nearest person month worked: 7
Contribution to Project: Ms. Cloonan oversees project progress and manages the day-to-day needs of the project.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Simon Louis Esbit
Project Role: Student Employee
Nearest person month worked: 2
Contribution to Project: Mr. Esbit provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Brittany Elizabeth Forbeck
Project Role: Research Technician

Nearest person month worked: 3
Contribution to Project: Ms. Forbeck provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Cyrena Lynette Gibson
Project Role: Research Technician
Nearest person month worked: 1
Contribution to Project: Ms. Gibson provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Paige Lynn Grafton
Project Role: Research Technician
Nearest person month worked: 1
Contribution to Project: Ms. Grafton provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Yinya Huang
Project Role: Research Technician
Nearest person month worked: 2
Contribution to Project: Ms. Huang provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Jason Ryan Johnson
Project Role: Research Technician
Nearest person month worked: 1
Contribution to Project: Mr. Johnson provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Rylee Joanne King
Project Role: Research Technician
Nearest person month worked: 6

Contribution to Project: Ms. King provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Haley Deveine Mlnarik
Project Role: Research Technician
Nearest person month worked: 1
Contribution to Project: Ms. Mlnarik provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Emily Nicole Morris
Project Role: Research Technician
Nearest person month worked: 1
Contribution to Project: Ms. Morris provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Meltem Ozcan
Project Role: Research Technician
Nearest person month worked: 1
Contribution to Project: Ms. Ozcan provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Michael A Miller
Project Role: Assistant Lab Manager
Nearest person month worked: 5
Contribution to Project: Mr. Miller provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Daisy Alana Raygoza
Project Role: Research Technician
Nearest person month worked: 7

Contribution to Project: Ms. Raygoza provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Molly-Marie Richards
Project Role: Research Technician
Nearest person month worked: 1
Contribution to Project: Ms. Richards provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Kristin Caleigh Shepard
Project Role: Research Technician
Nearest person month worked: 1
Contribution to Project: Ms. Shepard provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Alan Gerald Shoemaker
Project Role: Research Technician
Nearest person month worked: 1
Contribution to Project: Mr. Shoemaker provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Jeffrey Skalamera
Project Role: Research Technician
Nearest person month worked: 2
Contribution to Project: Mr. Skalamera oversees project progress and manages the day-to-day needs of the project.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Aaron Daniel Stone
Project Role: Research Technician
Nearest person month worked: 1

Contribution to Project: Mr. Stone provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Michael James Strong
Project Role: Research Technician
Nearest person month worked: 7
Contribution to Project: Mr. Strong provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Nathan Swift
Project Role: Research Technician
Nearest person month worked: 1
Contribution to Project: Mr. Swift provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Sierra Michelle Taylor
Project Role: Research Technician
Nearest person month worked: 2
Contribution to Project: Ms. Taylor provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Lynette Regine Valencia
Project Role: Research Technician
Nearest person month worked: 1
Contribution to Project: Ms. Valencia provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Mark Eugene Wager
Project Role: Research Technician
Nearest person month worked: 1

Contribution to Project: Mr. Wager provides support with data collection and recruitment activities.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: Rebecca Ann Woods-Lubbert
Project Role: Research Technician
Nearest person month worked: 7
Contribution to Project: Ms. Woods-Lubbert oversees project progress and manages the day-to-day needs of the project.
Funding Support: W81XWH-12-1-0386
W81XWH-14-1-0570
W81XWH-14-1-0571

Name: John R Vanuk
Project Role: Graduate Student
Nearest person month worked: 6
Contribution to Project: Mr. Vanuk provides support with data collection, recruitment activities, and performs data analysis and processing for the project.
Funding Support: no change

Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?
Name:William D. “Scott” Killgore, Ph.D.
Project Role: PI
Changes in funding support:

- Closure of DoD sponsored project W81XWH-11-1-005: 31 DEC 2016

What other organizations were involved as partners?
Smart Sparrow, LLC
375 Alabama St., Suite 490
San Francisco, CA 94110

- Software developers hired to engineer and program the Emotional Intelligence Training Program.

8. SPECIAL REPORTING REQUIREMENTS

Please see updated Quad Chart attached in Appendix.

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6. Lane, R. D., Quinlan, D. M., Schwartz, G. E., Walker, P. A. & Zeitlin, S. B. The Levels of Emotional Awareness Scale: a cognitive-developmental measure of emotion. *J. Pers. Assess.* **55**, 124-134; doi:10.1080/00223891.1990.9674052 (1990).
7. Lane, R. D. *et al.* Neural correlates of levels of emotional awareness. Evidence of an interaction between emotion and attention in the anterior cingulate cortex. *J. Cogn. Neurosci.* **10**, 525-535 (1998).

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Multidimensional Experiential Avoidance Questionnaire
Grit Scale
Moral Foundations Questionnaire
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CART – Scientific Reasoning
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MEPS

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Psychosocial Assessment Tool
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CRA Task

Task 4
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Beck Depression Inventory – II
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Multidimensional Experiential Avoidance Questionnaire
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Moral Foundations Questionnaire
Connor-Davidson Resilience Questionnaire
Toronto Alexithymia Scale – 20
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Self-Rated Emotional Intelligence Scale
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Emotion Regulation of Others and Self Scale
Multidimensional Assessment of Interoceptive Awareness
Managing Emotions of Others Scale
Emotion Regulation Questionnaire
Difficulties in Emotion Regulation Scale
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Task 5
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COPE and Emotional Approach Coping Scale
Syllogisms
CART – Actively Open-Minded Thinking
Emotion Regulation of Others Scale
Self Rated Emotional Intelligence Scale
Positive and Negative Affect Scale
Cognitive Reflection Task
Situational Test of Emotion Management – Brief
eLEAS

Subject Number_____ Date_____

Time (Input Military) _____:_____

Please put an **X** next to the statement that best describes how you feel:

Right now I am:

- ☐ Feeling active, vital, alert or wide awake
- ☐ Functioning at high levels, but not at peak; able to concentrate
- ☐ Awake, but relaxed; responsive but not fully alert
- ☐ Somewhat foggy, let down
- ☐ Foggy; losing interest in remaining awake; slowed down
- ☐ Sleepy, woozy, fighting sleep; prefer to lie down
- ☐ No longer fighting sleep, sleep onset soon; having dream-like thoughts
- ❖ Asleep

Participant #:_____

Date:_____

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 bests 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 that 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.

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 don't feel I am worthless.

1 I do not 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.

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

SELF-EVALUATION QUESTIONNAIRE STAI Form Y-1

Please provide the following information:

Name_____ 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

Name_____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

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Scoring Key

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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

	NOT AT ALL	SOMEWHAT	MODERATELY SO	VERY MUCH SO
1.	**4**	**3**	**2**	**1**
2.	**4**	**3**	**2**	**1**
3.	**1**	**2**	**3**	**4**
4.	**1**	**2**	**3**	**4**
5.	**4**	**3**	**2**	**1**
6.	**1**	**2**	**3**	**4**
7.	**1**	**2**	**3**	**4**
8.	**4**	**3**	**2**	**1**
9.	**1**	**2**	**3**	**4**
10.	**4**	**3**	**2**	**1**
11.	**4**	**3**	**2**	**1**
12.	**1**	**2**	**3**	**4**
13.	**1**	**2**	**3**	**4**
14.	**1**	**2**	**3**	**4**
15.	**4**	**3**	**2**	**1**
16.	**4**	**3**	**2**	**1**
17.	**1**	**2**	**3**	**4**
18.	**1**	**2**	**3**	**4**
19.	**4**	**3**	**2**	**1**
20.	**4**	**3**	**2**	**1**

Form Y-2

	ALMOST NEVER	SOMETIMES	OFTEN	ALMOST ALWAYS
21.	**4**	**3**	**2**	**1**
22.	**1**	**2**	**3**	**4**
23.	**4**	**3**	**2**	**1**
24.	**1**	**2**	**3**	**4**
25.	**1**	**2**	**3**	**4**
26.	**4**	**3**	**2**	**1**
27.	**4**	**3**	**2**	**1**
28.	**1**	**2**	**3**	**4**
29.	**1**	**2**	**3**	**4**
30.	**4**	**3**	**2**	**1**
31.	**1**	**2**	**3**	**4**
32.	**1**	**2**	**3**	**4**
33.	**4**	**3**	**2**	**1**
34.	**4**	**3**	**2**	**1**
35.	**1**	**2**	**3**	**4**
36.	**4**	**3**	**2**	**1**
37.	**1**	**2**	**3**	**4**
38.	**1**	**2**	**3**	**4**
39.	**4**	**3**	**2**	**1**
40.	**1**	**2**	**3**	**4**

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Instrument: ***State-Trait Anxiety Inventory for Adults***

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

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Sincerely,

Robert Most
Mind Garden, Inc.
www.mindgarden.com

Below is a list of traumatic events or situations. If you have experienced one of these events, please select the event or situation that you have experienced. **If you have experienced more than one of these events or situations, select the event or situation that has bothered you the most in the past month.**

- ○ I have not experienced any of these events or situations
- ○ Serious accident, fire or explosion
- ○ Natural disaster (tornado, flood, hurricane, major earthquake
- ○ Non-sexual assault by someone you know (physically attacked/injured)
- ○ Non-sexual assault by a stranger
- ○ Sexual assault by a family member or someone you know
- ○ Sexual assault by a stranger
- ○ Military combat or a war zone
- ○ Sexual contact before you were age 18 with someone who was 5 or more years older than you
- ○ Imprisonment
- ○ Torture
- ○ Life-threatening illness

→

Below is a list of problems that people sometimes have in response to a very stressful experience. Please read each problem carefully and then select one of the numbers to the right to indicate how much you have been bothered by that problem in the past month.

	"In the past month, how much were you bothered by..."				
	Not at all	A little bit	Moderately	Quite a bit	Extremely
Repeated, disturbing, and unwanted memories of the stressful experience?	○	○	○	○	○
Repeated, disturbing dreams of the stressful experience?	○	○	○	○	○
Suddenly feeling or acting as if the stressful experience were actually happening again (as if you were actually back there reliving it)?	○	○	○	○	○
Feeling very upset when something reminded you of the stressful experience?	○	○	○	○	○
Having strong physical reactions when something reminded you of the stressful experience (for example, heart pounding, trouble breathing, or sweating)?	○	○	○	○	○

Avoiding memories, thoughts, or feelings related to the stressful experience?	○	○	○	○	○
Avoiding external reminders of the stressful experience (for example, people, places, conversations, activities, objects, or situations)?	○	○	○	○	○
Trouble remembering important parts of the stressful experience?	○	○	○	○	○
Having strong negative beliefs about yourself, other people, or the world (for example, having thoughts such as: I am bad, there is something seriously wrong with me, no one can be trusted, the world is completely dangerous)?	○	○	○	○	○
Blaming yourself or someone else for the stressful experience or what happened after it?	○	○	○	○	○
Having strong negative feelings such as fear, horror, anger, guilt, or shame?	○	○	○	○	○
Loss of interest in activities you used to enjoy?	○	○	○	○	○
Feeling distant or cut off	○	○	○	○	○

from other people?

Trouble experiencing positive feelings (for example, being unable to feel happiness or having loving feelings for people close to you)?	○	○	○	○	○
Irritable behavior, angry outbursts, or acting aggressively?	○	○	○	○	○
Taking too many risks or doing things that could cause you harm?	○	○	○	○	○
Being "super alert" or watchful or on guard?	○	○	○	○	○
Feeling jumpy or easily startled?	○	○	○	○	○
Having difficulty concentrating?	○	○	○	○	○
Trouble falling or staying asleep?	○	○	○	○	○

→

SUBJECT #: _____ DATE: ____/____/____

In years, how old are you? (Please specify using numbers) _____

What is your biological sex?
- Male
- Female
- Prefer not to answer

To which gender identity do you most identify?
- Male
- Female
- Transgender male
- Transgender female
- Gender variant/non-conforming
- Not listed
  - **IF NOT LISTED,** please input the gender identity that you most identify with: _____
- Prefer not to answer

Please select the option that best describes your ethnicity:
- White
- Black or African American
- Native American or Alaska Native
- Asian
- Native Hawaiian or Pacific Islander
- Latino or Hispanic
- Mixed
  - **IF MIXED,** please input your identified ethnicity: _____
- Other
  - **IF OTHER,** please input your identified ethnicity: _____
- Prefer not to answer

Do you have any problems with reading?
- Yes
  - **IF YES,** please describe your problem(s) with reading: _____
- No

How many years of education do you have? (Please indicate using numbers.) Answer using the following time points as markers:

12 years = High school degree
14 years = Associates degree (2-year college degree)
16 years = Bachelors degree (4-year college degree)
18 years = Masters degree
22 years = Doctoral degree

Years of education: _____

Are you currently a student pursuing a higher degree?

Yes
No

Do you currently have a job?

Yes
- **IF YES,** how many hours per week do you work for your job? (Please specify using numbers) _____

No

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

Yes
No

What is your approximate annual income from your job? (Please specify using numbers of dollars) _____

Select the response that best describes your political identity:

Strong Democrat
Weak Democrat
Independent
Weak Republican
Strong Republican

Select the response that best describes your political ideology:

Strongly liberal
Moderately liberal
Slightly liberal
Neutral
Slightly conservative
Moderately conservative
Strongly conservative

What is your current romantic relationship status?

Single
- **IF YES,** how long have you been single? (Please specify using numbers)
  _____ Years
  _____ Months
- **IF YES,** have you previously been in a romantic relationship?
  Yes
  No

In a relationship
- **IF YES,** how long have you been in your current relationship? (Please specify using numbers)
  _____ Years
  _____ Months
- **IF YES,** are you currently married?
  Yes
  No
- **IF YES,** is your current relationship the longest romantic relationship that you have been involved in?
  Yes
  No
  - **IF NO**, how long was your longest romantic relationship? (Please specify using numbers)
    _____ Years
    _____ Months

How many romantic relationships (i.e. boyfriends, girlfriends, spouses) have you been involved in throughout your life? (Please specify using numbers) _____

How many of those relationships were serious, long-term relationships? (~12 or more months) (Please specify using numbers) _____

On average, how long have your serious, long-term romantic relationships been? (Please specify using numbers)
_____ Years
_____ Months
Not applicable

Do you engage in aerobic exercise (e.g. swimming, jogging, biking, etc.)?
Yes

- **IF YES**, on average, how many days per week do you engage in aerobic exercise?
  - 1
  - 2
  - 3
  - 4
  - 5
  - 6
  - 7
- **IF YES**, how many minutes per exercise session (on average)? _____

No

What **caffeinated** beverages do you consume on a regular basis? Select all that apply:

Caffeinated tea
- **IF YES**, on average, how many cups (=8oz) of caffeinated tea do you drink per day? _____

Coffee
- **IF YES,** on average, how many cups (=8oz) of caffeinated coffee do you drink per day? _____

Caffeinated energy drinks (including 5-Hour Energy)
- **IF YES,** what are the brands of the caffeinated sports or energy drinks you drink? _____
- **IF YES,** on average, how many caffeinated sports or energy drinks do you drink per day? _____

Soda
- **IF YES,** on average, how many cans (=12oz) of caffeinated soda do you drink per day?

Caffeinated sports drinks
- **IF YES,** what are the brands of the caffeinated sport or energy drinks you drink? _____
- **IF YES,** on average, how many caffeinated sports or energy drinks do you drink per day? _____

I don't drink caffeinated beverages

Did you drink any **caffeinated** beverages before this visit?

Yes

No

IF YES, what did you drink?

Caffeinated tea

- **IF YES**, how many cups (=8oz) did you drink? (please answer using numbers) _____

Coffee

- **IF YES**, how many cups (=8oz) did you drink? (please answer using numbers) _____

Caffeinated energy drink (including 5-Hour Energy)

- **IF YES**, which brand of energy drink or sport drink did you drink?

Soda

- **IF YES**, what was the brand of soda that you drank? _____
- **IF YES**, how many cans (=12oz) did you drink? (please answer using numbers) _____

Caffeinated sports drink

- **IF YES**, which brand of energy drink or sport drink did you drink? _____

Do you currently use any nicotine products?

No

- **IF NO**, have you ever used nicotine products regularly throughout your life?

  No

  Yes

  - **IF YES,** when you did use nicotine products, how many times did you try to quit before you were successful? (Please answer using numbers) _____

Yes

- **IF YES**, on average, how many days a month do you use nicotine products? (numbers continued on following page)

  1
  2
  3
  4
  5
  6
  7
  8
  9
  10
  11
  12
  13
  14
  15

16
17
18
19
20
21
22
23
24
25
26
27
28
29
30

- **IF YES**, how many times have you tried to quit? (Please indicate using numbers) _____

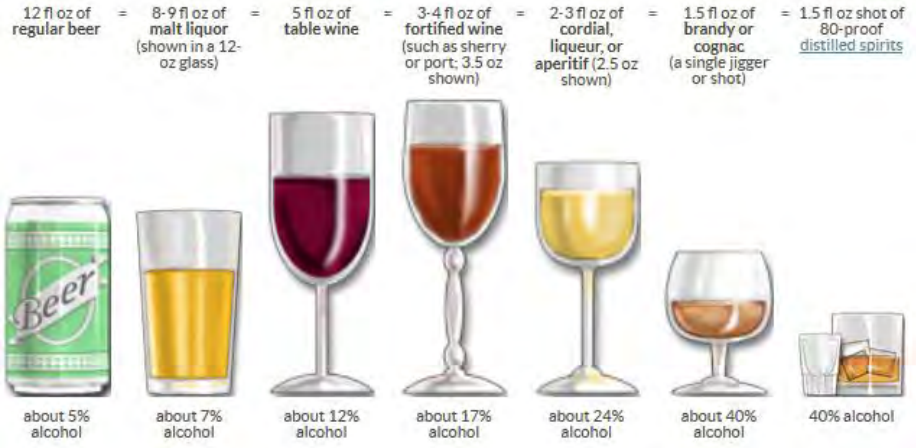
    - If applicable, when trying to quit, how many times were you unsuccessful? (Please indicate using numbers) _____

Do you drink alcohol?

Yes

No

- **IF NO,** skip to page 8.



IF YES, how many of the drinks from the above chart do you drink each month?

Regular beer

- **IF YES,** what is the average number of beers that you drink each month? (Please answer using numbers) _____

Malt liquor

- **IF YES,** on average, how many glasses of malt liquor do you drink each month? (Please answer using numbers) _____

Table wine

- **IF YES,** on average, how many glasses of table wine do you drink each month? (Please answer using numbers) _____

Fortified wine

- **IF YES,** on average, how many glasses of fortified wine do you drink each month? (Please answer using numbers) _____

Cordial, liqueur, or aperitif

- **IF YES,** on average, how many glasses of cordial, liqueur, or aperitif do you drink each month? (Please answer using numbers) _____

Brandy

- **IF YES,** on average, how many glasses of brandy do you drink each month? (Please answer using numbers) _____

Spirits (“hard liquor”)

- **IF YES,** on average, how many shots of spirits ("hard liquor") do you drink each month? (Please answer using numbers) _____

How many **hours** of sleep did you get **last night**? Please answer using numbers.

_____

At what time of day do you feel sleepiest? Please give your answer in military time and in the following format: **HH:MM**

_____

At what time of day do you feel most alert? Please give your answer in military time and in the following format: **HH:MM**

_____

How many hours of sleep do you need to feel your best? Please answer using numbers.

_____

If you get less than _____ hours of sleep, you notice impairment in your ability to function at work. Please answer using numbers.
Number of hours: _____

If you get more than _____ hours of sleep, you notice impairment in your ability to function at work. Please answer using numbers.
Number of hours: _____

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

Light
Normal
Heavy

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

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

Session (1 or 2) _____ 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_____

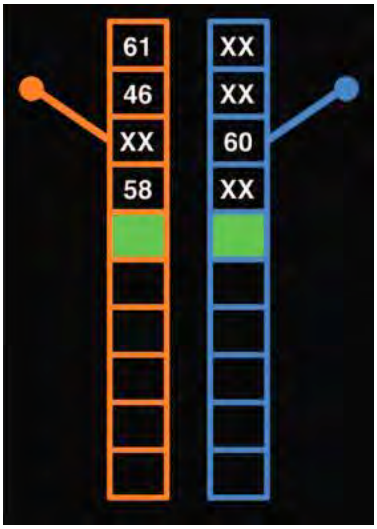
e) Other restlessness while you sleep; please describe_____

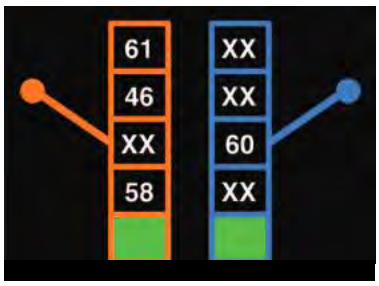
_____

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

Horizon Task

The Horizon Task is a computerized task that involves participants being presented with 80 trials of two slot machines on the screen, as seen below. Half of the trials are with 10 slots (below, left) and half are with 5 slots (below, right).





Each row of the blue and orange boxes are winnings, with the number being the amount won in cents and the "XX" symbol representing no money won. The participant is shown the first 4 rows already filled in, and then will decided for the next 6 rows (or 1 row in the 5-slot trials) which column they would like to choose for a potential reward.

So in the examples above, if the participant thinks the right column would give them a better chance at a reward, they would select the right column. The right column would reveal a number for winnings, and the left column would become the "XX" symbol. Once all of the rows are filled in, the participant is taken to a new trial with the first four trials filled in again.

Participants are told in the beginning of the task that the money they earn in this task will be added to their earnings at the end of the study to instill a sense of risk to making the most profitable selections. Provided they finish this task and all tasks in the 8-hour visit, we actually will be paying all subjects the full amount for the completion of the visit. Subjects will receive a debriefing form upon their completion of the study informing them about the deception.

Instructions

- Please complete this questionnaire on your own and in quiet conditions.
- Please answer each statement below by putting a circle around the number that best reflects your degree of agreement or disagreement with that statement. *There are no right or wrong answers*.
- Work quickly, and don't think too long about the exact meaning of the statements.
- Try to answer as accurately as possible.
- You have seven possible responses, ranging from 1=Completely Disagree to 7=Completely Agree
- Many thanks for your time and interest

		DISAGREE COMPLETELY						AGREE COMPLETELY
1.	I'm usually able to control other people	1	2	3	4	5	6	7
2.	Generally, I don't take notice of other people's emotions	1	2	3	4	5	6	7
3.	When I receive wonderful news, I find it difficult to calm down quickly	1	2	3	4	5	6	7
4.	I tend to see difficulties in every opportunity rather than opportunities in every difficulty	1	2	3	4	5	6	7
5.	On the whole, I have a gloomy perspective on most things	1	2	3	4	5	6	7
6.	I don't have a lot of happy memories	1	2	3	4	5	6	7
7.	Understanding the needs and desires of others is not a problem for me	1	2	3	4	5	6	7
8.	I generally believe that things will work out fine in my life	1	2	3	4	5	6	7
9.	I often find it difficult to recognise what emotion I'm feeling	1	2	3	4	5	6	7
10.	I'm not socially skilled	1	2	3	4	5	6	7
11.	I find it difficult to tell others that I love them even when I want to	1	2	3	4	5	6	7
12.	Others admire me for being relaxed	1	2	3	4	5	6	7
13.	I rarely think about old friends from the past	1	2	3	4	5	6	7
14.	Generally, I find it easy to tell others how much they really mean to me	1	2	3	4	5	6	7
15.	Generally, I must be under pressure to really work hard	1	2	3	4	5	6	7
16.	I tend to get involved in things I later wish I could get out of	1	2	3	4	5	6	7
17.	I'm able to "read" most people's feelings like an open book	1	2	3	4	5	6	7
18.	I'm usually able to influence the way other people feel	1	2	3	4	5	6	7
19.	I normally find it difficult to calm angry people down	1	2	3	4	5	6	7
20.	I find it difficult to take control of situations at home	1	2	3	4	5	6	7
21.	I generally hope for the best	1	2	3	4	5	6	7
22.	Others tell me that they admire me for my integrity	1	2	3	4	5	6	7
23.	I really don't like listening to my friends' problems	1	2	3	4	5	6	7
24.	I'm normally able to "get into someone's shoes" and experience their emotions	1	2	3	4	5	6	7
25.	I believe I'm full of personal weaknesses	1	2	3	4	5	6	7
26.	I find it difficult to give up things I know and like	1	2	3	4	5	6	7
27.	I always find ways to express my affection to others when I want to	1	2	3	4	5	6	7
28.	I feel that I have a number of good qualities	1	2	3	4	5	6	7
29.	I tend to rush into things without much planning	1	2	3	4	5	6	7
30.	I find it difficult to speak about my intimate feelings even to my closest friends	1	2	3	4	5	6	7
31.	I'm not able to do things as well as most people	1	2	3	4	5	6	7
32.	I'm never really sure what I'm feeling	1	2	3	4	5	6	7
33.	I'm usually able to express my emotions when I want to	1	2	3	4	5	6	7
34.	When I disagree with someone, I usually find it easy to say so	1	2	3	4	5	6	7
35.	I normally find it difficult to keep myself motivated	1	2	3	4	5	6	7
36.	I know how to snap out of my negative moods	1	2	3	4	5	6	7
37.	On the whole, I find it difficult to describe my feelings	1	2	3	4	5	6	7
38.	I find it difficult not to feel sad when someone tells me about something bad that happened to them	1	2	3	4	5	6	7
39.	When something surprises me, I find it difficult to get it out of my mind	1	2	3	4	5	6	7
40.	I often pause and think about my feelings	1	2	3	4	5	6	7
41.	I tend to see the glass as half-empty rather than as half-full	1	2	3	4	5	6	7
42.	I often find it difficult to see things from another person's viewpoint	1	2	3	4	5	6	7

		DISAGREE COMPLETELY						AGREE COMPLETELY
43.	I'm a follower, not a leader	1	2	3	4	5	6	7
44.	Those close to me often complain that I don't treat them right	1	2	3	4	5	6	7
45.	Many times, I can't figure out what emotion I'm feeling	1	2	3	4	5	6	7
46.	I couldn't affect other people's feelings even if I wanted to	1	2	3	4	5	6	7
47.	If I'm jealous of someone, I find it difficult not to behave badly towards them	1	2	3	4	5	6	7
48.	I get stressed by situations that others find comfortable	1	2	3	4	5	6	7
49.	I find it difficult to sympathize with other people's plights	1	2	3	4	5	6	7
50.	In the past, I have taken credit for someone else's input	1	2	3	4	5	6	7
51.	On the whole, I can cope with change effectively	1	2	3	4	5	6	7
52.	I don't seem to have any power at all over other people's feelings	1	2	3	4	5	6	7
53.	I have many reasons for not giving up easily	1	2	3	4	5	6	7
54.	I like putting effort even into things that are not really important	1	2	3	4	5	6	7
55.	I always take responsibility when I do something wrong	1	2	3	4	5	6	7
56.	I tend to change my mind frequently	1	2	3	4	5	6	7
57.	When I argue with someone, I can only see my point of view	1	2	3	4	5	6	7
58.	Things tend to turn out right in the end	1	2	3	4	5	6	7
59.	When I disagree with someone, I generally prefer to remain silent rather than make a scene	1	2	3	4	5	6	7
60.	If I wanted to, it would be easy for me to make someone feel bad	1	2	3	4	5	6	7
61.	I would describe myself as a calm person	1	2	3	4	5	6	7
62.	I often find it difficult to show my affection to those close to me	1	2	3	4	5	6	7
63.	There are many reasons to expect the worst in life	1	2	3	4	5	6	7
64.	I usually find it difficult to express myself clearly	1	2	3	4	5	6	7
65.	I don't mind frequently changing my daily routine	1	2	3	4	5	6	7
66.	Most people are better liked than I am	1	2	3	4	5	6	7
67.	Those close to me rarely complain about how I behave toward them	1	2	3	4	5	6	7
68.	I usually find it difficult to express my emotions the way I would like to	1	2	3	4	5	6	7
69.	Generally, I'm able to adapt to new environments	1	2	3	4	5	6	7
70.	I often find it difficult to adjust my life according to the circumstances	1	2	3	4	5	6	7
71.	I would describe myself as a good negotiator	1	2	3	4	5	6	7
72.	I can deal effectively with people	1	2	3	4	5	6	7
73.	On the whole, I'm a highly motivated person	1	2	3	4	5	6	7
74.	I have stolen things as a child	1	2	3	4	5	6	7
75.	On the whole, I'm pleased with my life	1	2	3	4	5	6	7
76.	I find it difficult to control myself when I'm extremely happy	1	2	3	4	5	6	7
77.	Sometimes, it feels like I'm producing a lot of good work effortlessly	1	2	3	4	5	6	7
78.	When I take a decision, I'm always sure it is the right one	1	2	3	4	5	6	7
79.	If I went on a blind date, the other person would be disappointed with my looks	1	2	3	4	5	6	7
80.	I normally find it difficult to adjust my behaviour according to the people I'm with	1	2	3	4	5	6	7
81.	On the whole, I'm able to identify myself with others	1	2	3	4	5	6	7
82.	I try to regulate pressures in order to control my stress levels	1	2	3	4	5	6	7
83.	I don't think I'm a useless person	1	2	3	4	5	6	7
84.	I usually find it difficult to regulate my emotions	1	2	3	4	5	6	7
85.	I can handle most difficulties in my life in a cool and composed manner	1	2	3	4	5	6	7
86.	If I wanted to, it would be easy for me to make someone angry	1	2	3	4	5	6	7
87.	On the whole, I like myself	1	2	3	4	5	6	7
88.	I believe I'm full of personal strengths	1	2	3	4	5	6	7
89.	I generally don't find life enjoyable	1	2	3	4	5	6	7
90.	I'm usually able to calm down quickly after I've got mad at someone	1	2	3	4	5	6	7
91.	I can remain calm even when I'm extremely happy	1	2	3	4	5	6	7
92.	Generally, I'm not good at consoling others when they feel bad	1	2	3	4	5	6	7
93.	I'm usually able to settle disputes	1	2	3	4	5	6	7
94.	I never put pleasure before business	1	2	3	4	5	6	7
95.	Imagining myself in someone else's position is not a problem for me	1	2	3	4	5	6	7
96.	I need a lot of self-control to keep myself out of trouble	1	2	3	4	5	6	7
97.	It is easy for me to find the right words to describe my feelings	1	2	3	4	5	6	7

		DISAGREE COMPLETELY						AGREE COMPLETELY
98.	I expect that most of my life will be enjoyable	1	2	3	4	5	6	7
99.	I am an ordinary person	1	2	3	4	5	6	7
100.	I tend to get “carried away” easily	1	2	3	4	5	6	7
101.	I usually try to resist negative thoughts and think of positive alternatives	1	2	3	4	5	6	7
102.	I don’t like planning ahead	1	2	3	4	5	6	7
103.	Just by looking at somebody, I can understand what he or she feels	1	2	3	4	5	6	7
104.	Life is beautiful	1	2	3	4	5	6	7
105.	I normally find it easy to calm down after I have been scared	1	2	3	4	5	6	7
106.	I want to be in command of things	1	2	3	4	5	6	7
107.	I usually find it difficult to change other people’s opinions	1	2	3	4	5	6	7
108.	I’m generally good at social chit-chat	1	2	3	4	5	6	7
109.	Controlling my urges is not a big problem for me	1	2	3	4	5	6	7
110.	I really don’t like my physical appearance	1	2	3	4	5	6	7
111.	I tend to speak well and clearly	1	2	3	4	5	6	7
112.	On the whole, I’m not satisfied with how I tackle stress	1	2	3	4	5	6	7
113.	Most of the time, I know exactly why I feel the way I do	1	2	3	4	5	6	7
114.	I find it difficult to calm down after I have been strongly surprised	1	2	3	4	5	6	7
115.	On the whole, I would describe myself as assertive	1	2	3	4	5	6	7
116.	On the whole, I’m not a happy person	1	2	3	4	5	6	7
117.	When someone offends me, I’m usually able to remain calm	1	2	3	4	5	6	7
118.	Most of the things I manage to do well seem to require a lot of effort	1	2	3	4	5	6	7
119.	I have never lied to spare someone else’s feelings	1	2	3	4	5	6	7
120.	I find it difficult to bond well even with those close to me	1	2	3	4	5	6	7
121.	I consider all the advantages and disadvantages before making up my mind	1	2	3	4	5	6	7
122.	I don’t know how to make others feel better when they need it	1	2	3	4	5	6	7
123.	I usually find it difficult to change my attitudes and views	1	2	3	4	5	6	7
124.	Others tell me that I rarely speak about how I feel	1	2	3	4	5	6	7
125.	On the whole, I’m satisfied with my close relationships	1	2	3	4	5	6	7
126.	I can identify an emotion from the moment it starts to develop in me	1	2	3	4	5	6	7
127.	On the whole, I like to put other people’s interests above mine	1	2	3	4	5	6	7
128.	Most days, I feel great to be alive	1	2	3	4	5	6	7
129.	I tend to get a lot of pleasure just from doing something well	1	2	3	4	5	6	7
130.	It is very important to me to get along with all my close friends and family	1	2	3	4	5	6	7
131.	I frequently have happy thoughts	1	2	3	4	5	6	7
132.	I have many fierce arguments with those close to me	1	2	3	4	5	6	7
133.	Expressing my emotions with words is not a problem for me	1	2	3	4	5	6	7
134.	I find it difficult to take pleasure in life	1	2	3	4	5	6	7
135.	I’m usually able to influence other people	1	2	3	4	5	6	7
136.	When I’m under pressure, I tend to lose my cool	1	2	3	4	5	6	7
137.	I usually find it difficult to change my behaviour	1	2	3	4	5	6	7
138.	Others look up to me	1	2	3	4	5	6	7
139.	Others tell me that I get stressed very easily	1	2	3	4	5	6	7
140.	I’m usually able to find ways to control my emotions when I want to	1	2	3	4	5	6	7
141.	I believe that I would make a good salesperson	1	2	3	4	5	6	7
142.	I lose interest in what I do quite easily	1	2	3	4	5	6	7
143.	On the whole, I’m a creature of habit	1	2	3	4	5	6	7
144.	I would normally defend my opinions even if it meant arguing with important people	1	2	3	4	5	6	7
145.	I would describe myself as a flexible person	1	2	3	4	5	6	7
146.	Generally, I need a lot of incentives in order to do my best	1	2	3	4	5	6	7
147.	Even when I’m arguing with someone, I’m usually able to take their perspective	1	2	3	4	5	6	7
148.	On the whole, I’m able to deal with stress	1	2	3	4	5	6	7
149.	I try to avoid people who may stress me out	1	2	3	4	5	6	7
150.	I often indulge without considering all the consequences	1	2	3	4	5	6	7
151.	I tend to “back down” even if I know I’m right	1	2	3	4	5	6	7
152.	I find it difficult to take control of situations at work	1	2	3	4	5	6	7
153.	Some of my responses on this questionnaire are not 100% honest	1	2	3	4	5	6	7

QUESTION SECTION 2 About you

Please note that in this section you are occasionally asked to ✍ write in your answer.

What is your gender?
☐ MALE ☐ FEMALE

What is your natural hand for writing?
☐ RIGHT ☐ LEFT

Your marital status?
☐ Single
☐ Living together
☐ Married, no children in education
☐ Married with children in education
☐ Divorced/ Separated
☐ Widowed
☐ Other

What is your year of birth?
✍ 19…

Your birth order? (e.g. 1st, 2nd child)
☐ 1st ☐ 2nd ☐ 3rd ☐ 4
☐ 5th ☐ 6th

Your current occupation?
☐ Private sector, manufacturer
☐ Private sector, service company
☐ Armed forces
☐ Health Service
☐ Other public sector
☐ Voluntary sector/charities
☐ Academic/teaching
☐ Self-employed
☐ Not employed
☐ Other

Was your upbringing mainly in
☐ Large City ☐ Town ☐ Village ☐ Other

How many children have you had?
☐ None ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 5+

Your highest educational qualification?
☐ GCSE/O Level or similar
☐ A Level or similar
☐ BA/BSc or similar
☐ MA/MSc or similar
☐ MBA
☐ PhD
☐ Other

If you are currently in higher education, what subject are you studying?
✍

How would you describe yourself ethnically?
☐ White – UK heritage
☐ White - other
☐ Pakistani
☐ Bangladeshi
☐ Indian
☐ Black – African heritage
☐ Black – Caribbean heritage
☐ Chinese
☐ Other

What sort of family religious background do you have?
☐ Christian – Protestant
☐ Christian – Roman Catholic
☐ Christian – Other
☐ Muslim
☐ Hindu
☐ Jewish
☐ Buddhist
☐ Other belief system
☐ None at all

And with which religion would you say you most closely identify now?
☐ Christian – Protestant
☐ Christian – Catholic
☐ Christian – Other
☐ Muslim
☐ Hindu
☐ Jewish
☐ Buddhist
☐ Other belief system
☐ None at all

What is your total pre-tax annual income?
☐ Below £5000
☐ £5001-10000
☐ £10001-£15000
☐ £15001-£20,000
☐ £20001-£25000
☐ £25001-£30000
☐ £30001-£35000
☐ £35001-£40000
☐ £41001-£45000
☐ £45001-£50000
☐ Over £50000

How religious are you?
On a scale of 1-7, where
1=Not Religious At All
4=Average
7=Very Religious
Please write in your score ✍

What are your political convictions?
On a scale of 1-7, where
1=Strongly Left Wing
4=Neither
7=Strongly Right wing
Please write in your score ✍

How happy in your job are you?
On a scale of 1-7, where
1=Not at All Happy
4=Average
7=Very Happy
Please write in your score ✍

How good are you at your line of work?
On a scale of 1-7, where
1=Poor
4=Average
7=Very Good
Please write in your score ✍

How many hours a month do you dedicate to voluntary public or civic work?
✍

Is English your native language?
☐ YES ☐ NO

What is your job title?
✍

Please note that, at present, the scoring of the TEIQue has to be done at our end (there is no charge for this). Directions for submitting TEIQue files for scoring:

- We can only handle SPSS files at present.
- Download and use the SPSS template from www.psychometriclab.com
- Correct all data entry errors before you submit your file
- Allow three working days for scoring.
- Email your file to k.petrides@ucl.ac.uk

MEAQ

Please indicate the extent to which you agree or disagree with each of the following statements

1	2	3	4	5	6
strongly disagree	moderately disagree	slightly disagree	slightly agree	moderately agree	strongly agree

1.	I won't do something if I think it will make me uncomfortable ……...	1	2	3	4	5	6
2.	If I could magically remove all of my painful memories, I would ……...	1	2	3	4	5	6
3.	When something upsetting comes up, I try very hard to stop thinking about it ……...	1	2	3	4	5	6
4.	I sometimes have difficulty identifying how I feel ……...	1	2	3	4	5	6
5.	I tend to put off unpleasant things that need to get done ……..	1	2	3	4	5	6
6.	People should face their fears ……...	1	2	3	4	5	6
7.	Happiness means never feeling any pain or disappointment ……	1	2	3	4	5	6
8.	I avoid activities if there is even a small possibility of getting hurt …….	1	2	3	4	5	6
9.	When negative thoughts come up, I try to fill my head with something else ……...	1	2	3	4	5	6
10.	At times, people have told me I'm in denial …….	1	2	3	4	5	6
11.	I sometimes procrastinate to avoid facing challenges ……..……..	1	2	3	4	5	6
12.	Even when I feel uncomfortable, I don't give up working toward things I value …….....	1	2	3	4	5	6
13.	When I am hurting, I would do anything to feel better ...…...……..	1	2	3	4	5	6
14.	I rarely do something if there is a chance that it will upset me ……	1	2	3	4	5	6
15.	I usually try to distract myself when I feel something painful …….	1	2	3	4	5	6
16.	I am able to "turn off" my emotions when I don't want to feel ……	1	2	3	4	5	6
17.	When I have something important to do I find myself doing a lot of other things instead...	1	2	3	4	5	6
18.	I am willing to put up with pain and discomfort to get what I want …….	1	2	3	4	5	6
19.	Happiness involves getting rid of negative thoughts ……	1	2	3	4	5	6
20.	I work hard to avoid situations that might bring up unpleasant thoughts and feelings in me	1	2	3	4	5	6
21.	I don't realize I'm anxious until other people tell me ……..	1	2	3	4	5	6
22.	When upsetting memories come up, I try to focus on other things ……..	1	2	3	4	5	6
23.	I am in touch with my emotions ……...	1	2	3	4	5	6
24.	I am willing to suffer for the things that matter to me ……..	1	2	3	4	5	6
25.	One of my big goals is to be free from painful emotions …….	1	2	3	4	5	6
26.	I prefer to stick to what I am comfortable with, rather than try new activities ……	1	2	3	4	5	6
27.	I work hard to keep out upsetting feelings ……...	1	2	3	4	5	6
28.	People have said that I don't own up to my problems …….	1	2	3	4	5	6
29.	Fear or anxiety won't stop me from doing something important …….	1	2	3	4	5	6
30.	I try to deal with problems right away ……..	1	2	3	4	5	6

- PLEASE TURN PAGE OVER -

1	2	3	4	5	6
strongly disagree	moderately disagree	slightly disagree	slightly agree	moderately agree	strongly agree

31.	I'd do anything to feel less stressed …….	1	2	3	4	5	6
32.	If I have any doubts about doing something, I just won't do it ……...	1	2	3	4	5	6
33.	When unpleasant memories come to me, I try to put them out of my mind ……	1	2	3	4	5	6
34.	In this day and age people should not have to suffer ……...	1	2	3	4	5	6
35.	Others have told me that I suppress my feelings …….	1	2	3	4	5	6
36.	I try to put off unpleasant tasks for as long as possible ……...	1	2	3	4	5	6
37.	When I am hurting, I still do what needs to be done ……...	1	2	3	4	5	6
38.	My life would be great if I never felt anxious …….	1	2	3	4	5	6
39.	If I am starting to feel trapped, I leave the situation immediately ……...	1	2	3	4	5	6
40.	When a negative thought comes up, I immediately try to think of something else …….	1	2	3	4	5	6
41.	It's hard for me to know what I'm feeling ……...	1	2	3	4	5	6
42.	I won't do something until I absolutely have to ……..	1	2	3	4	5	6
43.	I don't let pain and discomfort stop me from getting what I want ……..	1	2	3	4	5	6
44.	I would give up a lot not to feel bad ……	1	2	3	4	5	6
45.	I go out of my way to avoid uncomfortable situations ……	1	2	3	4	5	6
46.	I can numb my feelings when they are too intense ……..	1	2	3	4	5	6
47.	Why do today what you can put off until tomorrow ……	1	2	3	4	5	6
48.	I am willing to put up with sadness to get what I want ……	1	2	3	4	5	6
49.	Some people have told me that I "hide my head in the sand" …….	1	2	3	4	5	6
50.	Pain always leads to suffering ……..	1	2	3	4	5	6
51.	If I am in a slightly uncomfortable situation, I try to leave right away ……	1	2	3	4	5	6
52.	It takes me awhile to realize when I'm feeling bad …….	1	2	3	4	5	6
53.	I continue working toward my goals even if I have doubts …….	1	2	3	4	5	6
54.	I wish I could get rid of all of my negative emotions ……..	1	2	3	4	5	6
55.	I avoid situations if there is a chance that I'll feel nervous……..	1	2	3	4	5	6
56.	I feel disconnected from my emotions …….	1	2	3	4	5	6
57.	I don't let gloomy thoughts stop me from doing what I want …….	1	2	3	4	5	6
58.	The key to a good life is never feeling any pain ……..	1	2	3	4	5	6
59.	I'm quick to leave any situation that makes me feel uneasy ……	1	2	3	4	5	6
60.	People have told me that I'm not aware of my problems ……	1	2	3	4	5	6
61.	I hope to live without any sadness and disappointment ……...	1	2	3	4	5	6
62.	When working on something important, I won't quit even if things get difficult ……	1	2	3	4	5	6

MULTIDIMENSIONAL EXPERIENTIAL AVOIDANCE QUESTIONNAIRE

- SCORING -

BEHAVIORAL AVOIDANCE	Total items 1, 8, 14, 20, 26, 32, 39, 45, 51, 55, 59
DISTRESS AVERSION	Total items 2, 7, 13, 19, 25, 31, 34, 38, 44, 50, 54, 58, 61
PROCRASTINATION	Total items 5, 11, 17, 30 (r), 36, 42, 47
DISTRACTION & SUPPRESSION	Total items 3, 9, 15, 22, 27, 33, 40
REPRESSION & DENIAL	Total items 4, 10, 16, 21, 23 (r), 28, 35, 41, 46, 49, 52, 56, 60
DISTRESS ENDURANCE	Total items 6, 12, 18, 24, 29, 37, 43, 48, 53, 57, 62

(r) indicates reverse-key item; to reverse-key, subtract item from " 7 "

TOTAL SCORE

Behavioral Avoidance + Distress Aversion + Procrastination + Distraction & Suppression + Repression & Denial + (77 - Distress Endurance)

- NORMATIVE DATA -

	COMMUNITY ADULTS (N = 201)				COLLEGE STUDENTS (N = 677)				PSYCHIATRIC PATIENTS (N = 466)			
	Mean	SD	+1.0	+1.5	Mean	SD	+1.0	+1.5	Mean	SD	+1.0	+1.5
BEHAV. AVOID	34.40	10.41	44.81	50.01	36.26	8.70	44.96	49.31	42.36	11.13	53.49	59.06
DISTRESS AVER.	41.65	11.97	53.62	59.60	43.24	11.46	54.70	60.43	50.47	12.63	63.10	69.42
PROCRASTINAT.	22.41	7.45	29.86	33.58	25.04	6.61	31.65	34.96	26.62	7.00	33.62	37.12
DIST./SUPPRESS.	25.64	6.58	32.22	35.51	26.02	6.35	32.37	35.55	28.79	7.55	36.34	40.12
REPRESS./DENIAL.	31.31	10.77	42.08	47.46	34.02	10.60	44.62	49.92	37.82	12.33	50.15	56.32
DISTRESS ENDUR.	47.12	7.93	39.19-	35.23-	46.51	7.66	38.85-	35.02-	43.21	9.57	33.64-	28.86-
TOTAL SCORE	185.29	39.95	225.24	245.21	195.08	34.46	229.54	246.77	224.61	39.94	264.55	284.52

Gamez, W., Chmielewski, M., Kotov, R., Ruggero, C., & Watson, D. (in press). Development of a measure of experiential avoidance: The Multidimensional Experiential Avoidance Questionnaire (MEAQ). *Psychological Assessment*.

12- Item Grit Scale

Directions for taking the Grit Scale: Here are a number of statements that may or may not apply to you. For the most accurate score, when responding, think of how you compare to most people -- not just the people you know well, but most people in the world. There are no right or wrong answers, so just answer honestly!

1. I have overcome setbacks to conquer an important challenge.
   - Very much like me
   - Mostly like me
   - Somewhat like me
   - Not much like me
   - Not like me at all

2. New ideas and projects sometimes distract me from previous ones.*
   - Very much like me
   - Mostly like me
   - Somewhat like me
   - Not much like me
   - Not like me at all

3. My interests change from year to year.*
   - Very much like me
   - Mostly like me
   - Somewhat like me
   - Not much like me
   - Not like me at all

4. Setbacks don't discourage me.
   - Very much like me
   - Mostly like me
   - Somewhat like me
   - Not much like me
   - Not like me at all

5. I have been obsessed with a certain idea or project for a short time but later lost interest.*
   - Very much like me
   - Mostly like me
   - Somewhat like me
   - Not much like me
   - Not like me at all

6. I am a hard worker.
   - Very much like me
   - Mostly like me
   - Somewhat like me
   - Not much like me
   - Not like me at all

7. I often set a goal but later choose to pursue a different one.*

Very much like me
Mostly like me
Somewhat like me
Not much like me
Not like me at all

8. I have difficulty maintaining my focus on projects that take more than a few months to complete.*

Very much like me
Mostly like me
Somewhat like me
Not much like me
Not like me at all

9. I finish whatever I begin.

Very much like me
Mostly like me
Somewhat like me
Not much like me
Not like me at all

10. I have achieved a goal that took years of work.

Very much like me
Mostly like me
Somewhat like me
Not much like me
Not like me at all

11. I become interested in new pursuits every few months.*

Very much like me
Mostly like me
Somewhat like me
Not much like me
Not like me at all

12. I am diligent.

Very much like me
Mostly like me
Somewhat like me
Not much like me
Not like me at all

Scoring:

1. For questions 1, 4, 6, 9, 10 and 12 assign the following points:
   5 = Very much like me
   4 = Mostly like me
   3 = Somewhat like me
   2 = Not much like me
   1 = Not like me at all

2. For questions 2, 3, 5, 7, 8 and 11 assign the following points:
   1 = Very much like me
   2 = Mostly like me
   3 = Somewhat like me
   4 = Not much like me
   5 = Not like me at all

Add up all the points and divide by 12. The maximum score on this scale is 5 (extremely gritty), and the lowest score on this scale is 1 (not at all gritty).

Duckworth, A.L., Peterson, C., Matthews, M.D., & Kelly, D.R. (2007). Grit: Perseverance and passion for long-term goals. *Journal of Personality and Social Psychology, 9*, 1087-1101.

MFQ

Part 1. When you decide whether something is right or wrong, to what extent are the following considerations relevant to your thinking? Please rate each statement using this scale:

[0] = not at all relevant (This consideration has nothing to do with my judgments of right and wrong)
[1] = not very relevant
[2] = slightly relevant
[3] = somewhat relevant
[4] = very relevant
[5] = extremely relevant (This is one of the most important factors when I judge right and wrong)

_____Whether or not someone suffered emotionally

_____Whether or not some people were treated differently than others

_____Whether or not someone's action showed love for his or her country

_____Whether or not someone showed a lack of respect for authority

_____Whether or not someone violated standards of purity and decency

_____Whether or not someone was good at math

_____Whether or not someone cared for someone weak or vulnerable

_____Whether or not someone acted unfairly

_____Whether or not someone did something to betray his or her group

_____Whether or not someone conformed to the traditions of society

_____Whether or not someone did something disgusting

_____Whether or not someone was cruel

_____Whether or not someone was denied his or her rights

_____Whether or not someone showed a lack of loyalty

_____Whether or not an action caused chaos or disorder

_____Whether or not someone acted in a way that God would approve of

Part 2. Please read the following sentences and indicate your agreement or disagreement:

[0]	[1]	[2]	[3]	[4]	[5]
Strongly disagree	Moderately disagree	Slightly disagree	Slightly agree	Moderately agree	Strongly agree

_____Compassion for those who are suffering is the most crucial virtue.

_____When the government makes laws, the number one principle should be ensuring that everyone is treated fairly.

_____I am proud of my country's history.

_____Respect for authority is something all children need to learn.

_____People should not do things that are disgusting, even if no one is harmed.

_____It is better to do good than to do bad.

_____One of the worst things a person could do is hurt a defenseless animal.

_____Justice is the most important requirement for a society.

_____People should be loyal to their family members, even when they have done something wrong.

_____Men and women each have different roles to play in society.

_____I would call some acts wrong on the grounds that they are unnatural.

_____It can never be right to kill a human being.

_____ I think it's morally wrong that rich children inherit a lot of money while poor children inherit nothing.

_____ It is more important to be a team player than to express oneself.

_____ If I were a soldier and disagreed with my commanding officer's orders, I would obey anyway because that is my duty.

_____ Chastity is an important and valuable virtue.

Connor-Davidson Resilience Scale 25 (CD-RISC-25)

initials ☐☐☐ ***ID#*** ☐☐☐☐☐☐☐ ***date*** ☐☐/☐☐/☐☐☐☐ ***visit*** ☐☐ ***age*** ☐☐

*For each item, please mark an "**x**" in the box below that best indicates how much you agree with the following statements as they apply to you over the last **month**. If a particular situation has not occurred recently, answer according to how you think you would have felt.*

		not true at all (0)	rarely true (1)	sometimes true (2)	often true (3)	true nearly all the time (4)
1.	I am able to adapt when changes occur.	☐	☐	☐	☐	☐
2.	I have at least one close and secure relationship that helps me when I am stressed.	☐	☐	☐	☐	☐
3.	When there are no clear solutions to my problems, sometimes fate or God can help.	☐	☐	☐	☐	☐
4.	I can deal with whatever comes my way.	☐	☐	☐	☐	☐
5.	Past successes give me confidence in dealing with new challenges and difficulties.	☐	☐	☐	☐	☐
6.	I try to see the humorous side of things when I am faced with problems.	☐	☐	☐	☐	☐
7.	Having to cope with stress can make me stronger.	☐	☐	☐	☐	☐
8.	I tend to bounce back after illness, injury, or other hardships.	☐	☐	☐	☐	☐
9.	Good or bad, I believe that most things happen for a reason.	☐	☐	☐	☐	☐
10.	I give my best effort no matter what the outcome may be.	☐	☐	☐	☐	☐
11.	I believe I can achieve my goals, even if there are obstacles.	☐	☐	☐	☐	☐
12.	Even when things look hopeless, I don't give up.	☐	☐	☐	☐	☐
13.	During times of stress/crisis, I know where to turn for help.	☐	☐	☐	☐	☐
14.	Under pressure, I stay focused and think clearly.	☐	☐	☐	☐	☐
15.	I prefer to take the lead in solving problems rather than letting others make all the decisions.	☐	☐	☐	☐	☐
16.	I am not easily discouraged by failure.	☐	☐	☐	☐	☐
17.	I think of myself as a strong person when dealing with life's challenges and difficulties.	☐	☐	☐	☐	☐
18.	I can make unpopular or difficult decisions that affect other people, if it is necessary.	☐	☐	☐	☐	☐
19.	I am able to handle unpleasant or painful feelings like sadness, fear, and anger.	☐	☐	☐	☐	☐
20.	In dealing with life's problems, sometimes you have to act on a hunch without knowing why.	☐	☐	☐	☐	☐
21.	I have a strong sense of purpose in life.	☐	☐	☐	☐	☐
22.	I feel in control of my life.	☐	☐	☐	☐	☐
23.	I like challenges.	☐	☐	☐	☐	☐
24.	I work to attain my goals no matter what roadblocks I encounter along the way.	☐	☐	☐	☐	☐
25.	I take pride in my achievements.	☐	☐	☐	☐	☐

Actively Open-Minded Thinking Scale

These items are intermixed with the items on the other three thinking dispositions scales (and the Superstitious Thinking and Dysfunctional Beliefs subtests).

This questionnaire lists a series of statements about various topics. Read each statement and decide whether you agree or disagree with each statement. Mark the alternative that best describes your opinion. There are no right or wrong answers, so do not spend too much time deciding on an answer. The first thing that comes to mind is probably the best response.

Response scale:
1) Disagree strongly
2) Disagree moderately
3) Disagree slightly
4) Agree slightly
5) Agree moderately
6) Agree strongly

1. Changing your mind is a sign of weakness. (R)
2. What beliefs you hold have more to do with your own personal character than the experiences that may have given rise to them. (R)
3. If a belief suits me then I am comfortable, it really doesn't matter if the belief is true. (R)
4. A person should always consider new possibilities.
5. It is a noble thing when someone holds the same beliefs as their parents. (R)
6. My beliefs would not have been very different if I had been raised by a different set of parents. (R)
7. One should disregard evidence that conflicts with your established beliefs. (R)
8. If I think longer about a problem I will be more likely to solve it.

9. Someone who attacks my beliefs is not insulting me personally.

10. Basically, I know everything I need to know about the important things in life. (R)

11. Even if my environment (family, neighborhood, schools) had been different, I probably would have the same religious views. (R)

12. Considering too many different opinions often leads to bad decisions. (R)

13. It is important to persevere in your beliefs even when evidence is brought to bear against them. (R)

14. People should always take into consideration evidence that goes against their beliefs.

15. Difficulties can usually be overcome by thinking about the problem, rather than through waiting for good fortune.

16. Certain beliefs are just too important to abandon no matter how good a case can be made against them. (R)

17. I think I would vote more intelligently if I had more knowledge of social and political issues.

18. There is nothing wrong with being undecided about many issues.

19. Abandoning a previous belief is a sign of strong character.

20. When reading a book on history I like knowing that I am reading something that actually happened.

21. Coming to decisions quickly is a sign of wisdom. (R)

22. Beliefs should always be revised in response to new information or evidence.

23. People who hold contradictory ideas without being bothered at all by it really frustrate me.

24. It makes me happy and proud when someone famous holds the same beliefs that I do. (R)

25. It doesn't really matter if I get some facts wrong because the facts are always changing anyway. (R)
26. I like to gather many different types of evidence before I decide what to do.
27. I don't feel I have to have reasons for what I do. (R)
28. I like to think that my actions are motivated by sound reasons.
29. I like to have reasons for what I do.
30. I don't like to have to justify my actions. (R)

(R) indicates items that are reverse scored.

Scientific Reasoning Subtest

FALSIFIABILITY TENDENCIES - SELECTION TASK

These items are interspersed throughout the subtest, but are in this order.

1. Each of the boxes below represents a card with a behavior on one side and an age on the other side. Here is a rule: "**If a person is drinking beer then the person must be over 21 years of age.**" Your task is to decide which cards you would need to turn over in order to find out whether or not the rule is being violated.

Age: **22**		Age: **18**		Drink **Beer**		Drink: **Coke**	
Turn	Do not Turn	Turn	Do not Turn	Turn	Do not Turn	Turn	Do not Turn
O	O	O	O	O	O	O	O

Calculate Pollard and Evans (1987) Logic Index.
Number of correct cards turned minus number of incorrect turns:
P + NQ - NP - Q

P (beer); NP (Coke); Q (22); NQ (18)

Logic index > 0 scored as 1
Logic index ≤ 0 scored as 0

2. Suppose that you are the assistant manager at Macy's, and it is your job to check sales receipts to make sure they are properly filled out according to a rule. The rule is: **Any sale over $30 must be approved by the section manager, Mr. Jones**. Below are four sales receipts. The amount of the sale is on one side of each receipt, and the space for the approval signature is on the other side. Which of the sales receipts shown below would you need to turn over in order to find out whether or not the rule is being violated?

$70	$22	Approval: ***Mr. Jones***	Approval: _____
Turn O	Do not Turn O	Turn O	Do not Turn O	Turn O	Do not Turn O	Turn O	Do not Turn O

Calculate Pollard and Evans (1987) Logic Index.
Number of correct cards turned minus number of incorrect turns:
P + NQ - NP - Q

P ($70); NP ($22); Q (Mr. Jones); NQ (___)

Logic index > 0 scored as 1
Logic index ≤ 0 scored as 0

3. Each of the boxes below represents a card lying on a table. Each one of the cards has a letter on one side and a number on the other side. Here is a rule: If a card has a vowel on its letter side, then it has an even number on its number side. As you can see, two of the cards are letter-side up, and two of the cards are number-side up. Your task is to decide which card or cards must be turned over in order to find out whether the rule is true or false. Indicate which cards must be turned over.

K	A	8	5
Turn O	Do not Turn O	Turn O	Do not Turn O	Turn O	Do not Turn O	Turn O	Do not Turn O

Calculate Pollard and Evans (1987) Logic Index.
Number of correct cards turned minus number of incorrect turns:
P + NQ - NP - Q

P (A); NP (K); Q (8); NQ (5)

Logic index > 0 scored as 1
Logic index ≤ 0 scored as 0

4. Each of the tickets below has a destination on one side and a mode of travel on the other side. Here is a rule: "**If 'Baltimore' is on one side of the ticket, then 'plane' is on the other side of the ticket.**" Your task is to decide which tickets you would need to turn over in order to find out whether the rule is being violated.

Destination: **Baltimore**		Destination: **Washington, D.C.**		Mode of Travel: **Train**		Mode of Travel: **Plane**	
Turn	Do not Turn	Turn	Do not Turn	Turn	Do not Turn	Turn	Do not Turn
O	O	O	O	O	O	O	O

Calculate Pollard and Evans (1987) Logic Index.
Number of correct cards turned minus number of incorrect turns:
P + NQ - NP - Q

P (Baltimore); NP (Washington); NQ (train); Q (plane)

Logic index > 0 scored as 1
Logic index ≤ 0 scored as 0

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CONVERGING EVIDENCE

5. Alice had been experiencing unpleasant digestive problems. She hypothesized that she had developed an allergy to either milk, eggs, wheat, nuts, or shellfish, because she never experienced any digestive problems on days when she did not eat any of these items.

In an effort to determine which one of these foods was the source of her digestive problems, Alice conducted two tests. Each test started with a day

in which Alice drank water but ate no food, and was followed by a day in which she ate only a single meal that varied in which of the suspected food items it contained.

Here is what Alice ate during her meal on the second day of each test:

	milk	eggs	wheat	nuts	shellfish	Digestive Problems
Test 1	yes	yes	yes	no	no	yes
Test 2	no	no	yes	yes	yes	yes

How likely is it that Alice's digestive problems resulted from eating:
milk _____ percent likely
eggs _____ percent likely
wheat _____ percent likely
nuts _____ percent likely
shellfish _____ percent likely
[percentages must add to 100]

Scoring:
estimates for wheat $\geq 80 = 1$
estimates for wheat $< 80 = 0$

6. James also had been experiencing the same unpleasant digestive problems. He also hypothesized that he had developed an allergy to one of these food additives: either additive alpha, beta, eta, gamma, or zeta, because he never experienced any digestive problems on days when he did not eat food that contained any of these additives.

In an effort to determine which one of these food additives was the source of his digestive problems, he conducted two tests. Each test started with a day in which he drank water but ate no food, and was followed by a day in which he ate only a single meal that varied in which of the suspected food additives it contained.

Here is what James ate during his meal on the second day of each test:

	alpha	beta	eta	gamma	zeta	Digestive Problems

Test 1	no	yes	yes	no	yes	no
Test 2	yes	yes	no	yes	no	yes

How likely is it that James' digestive problems resulted from eating:

alpha _____ percent likely
beta _____ percent likely
eta _____ percent likely
gamma _____ percent likely
zeta _____ percent likely
[percentages must add to 100]

Scoring:
score 1 point if
estimate for alpha ≥ 40 and ≤ 50
and
estimate for gamma ≥ 40 and ≤ 50
otherwise score 0

==========

LIMITS OF CORRELATIONAL RELATIONSHIPS

These items are interspersed throughout the subtest, but are in this order.

7. Researchers have found that teenagers who smoke cigarettes tend to have lower IQ scores than teenagers who do not smoke cigarettes.
This finding means that preventing teenagers from smoking would tend to raise their IQ scores:
a. Yes
*b. No
*c. You cannot tell

8. Researchers have found that children who play violent video games tend to get into more fights at school than children who do not play violent video games.
This finding means that there would tend to be less fighting at school if children were prevented from playing violent video games:
a. Yes
*b. No

*c. You cannot tell

9. Researchers have found that people who eat meat with lots of preservatives are more likely to have high blood pressure than people who do not eat meat that has preservatives.
This finding means that if fewer people ate meat with lots of preservatives there would tend to be fewer people with high blood pressure.
a. Yes
*b. No
*c. You cannot tell

==========

DIAGNOSTIC HYPOTHESIS TESTING:
PROCESSING P(D/~H) OF THE LIKELIHOOD RATIO

10. Imagine you are a special education teacher. Talia, a student of yours, has clubbing of her fingers (significant thickening of the end of her fingers). What information would you want in order to estimate the probability that Talia has "Fustis Digitus Syndrome"? Below are 4 pieces of information that may or may not be relevant to determining the probability. Please indicate all of the pieces of information that are necessary to determine the probability, but only those pieces of information that are necessary to do so.

a. % of people without Fustis Digitus Syndrome who have clubbing of their fingers
b. % of people with Fustis Digitus Syndrome
c. % of people without Fustis Digitus Syndrome
d. % of people with Fustis Digitus Syndrome who have clubbing of their fingers

a = [DNH]; b = [H]; c = [NH]; d = [DH]

1 point for choosing both parts of the likelihood ratio (a and d) only *or* in addition to any other cards
0 otherwise

11. Imagine yourself meeting Calvin Dean. Your task is to assess the probability that he is an accountant based on some information that you will be given. This will be done in two steps. At each step you will get some information that you may or may not find useful in making your assessment. After each piece of information you will be asked to assess the probability that Calvin Dean is an accountant. In doing so, consider all the information you have received to that point if you consider it to be relevant.
Your probability assessments should be numbers between 0 and 1 that express your degree of belief. 1 means "I am absolutely certain that he is an accountant. 0 means "I am absolutely certain he is not an accountant." .65 means "The chances are 65 out of 100 that he is an accountant," and so forth. You can use any number between 0 and 1, for example, .15, .95, etc.

Step 1: You are told that Calvin Dean attended a party in which 30 male accountants and 70 male doctors took part, 100 people all together.
Question: What do you think the probability is that Calvin Dean is an accountant? ____

Step 2: You are told that Calvin Dean is a member of the Kiwanis Club. 75% of the male accountants at the above mentioned party were members of the Kiwanis Club. 95% of the male doctors at the party were members of the Kiwanis Club.
Question: What do you think the probability is that Calvin Dean is an accountant? ____

Step 1 correct answer (.30) is not scored. The Bayesian posterior after Step 2 is .253.

Step 1 – Step 2 difference ≤ 0 scored as 0
Step 1 – Step 2 difference > 0 scored as 1
Step 2 answers of zero are *also* scored as 0

12. This time, imagine yourself meeting Jordan Sibley at the party. Your task is to assess the probability that he is an accountant based on some information that you will be given.

Step 1: You are told that Jordan Sibley attended a party in which 80 male accountants and 20 male doctors took part, 100 people all together.

Question: What do you think the probability is that Jordan Sibley is an accountant? ____

Step 2: You are told that Jordan Sibley is a member of the Kiwanis Club. 35% of the male accountants at the above mentioned party were members of the Kiwanis Club. 10% of the male doctors at the party were members of the Kiwanis Club.
Question: What do you think the probability is that Jordan Sibley is an accountant? ____

Step 1 correct answer (.80) is not scored. The Bayesian posterior after Step 2 is .933.

Step 1 – Step 2 difference ≥ 0 scored as 0

Step 1 – Step 2 difference < 0 scored as 1

Step 1 answers of zero are *also* scored as 0

13.-14. A doctor has been working on a cure for a mysterious disease. He has created a drug that he thinks will cure people of the disease. Before he can begin to use it regularly he has to test the drug. He selected 400 people at random who had the disease. Of the 400 he randomly assigned 300 to the treatment group and gave them the drug to see what happened. The remaining 100 people were assigned to the no treatment group and given a placebo (a sugar pill manufactured to look like the treatment drug) to see what happened.

The table below indicates the outcome:

	Were Cured	Were Not Cured
Treatment present (drug)	200	100
Treatment absent (no drug)	75	25

13. Does the drug work? Choose the statement that best summarizes the table results.

1. The evidence indicates that the drug was effective
2. The evidence is inconclusive
3. *The evidence indicates that the drug was not effective

14. Please judge the extent to which this treatment was positively or negatively associated with the cure for this disease.

Indicate the number that best reflects your judgment:

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association neutral strong positive association

-10 through and including 0 scored as 1
> 0 scored as 0

==========

CONTROL GROUP REASONING

15. Centerville High School has had an unpopular principal for the past 2 years. She is a friend of the superintendent and had no previous experience as a school administrator when she was appointed. The superintendent has recently defended the principal in public by announcing that in the time since she became principal, truancy rates at the high school have decreased by 12%.

Which of the following pieces of evidence would most refute the superintendent's claim and instead show that the principal may not be doing a good job? Choose the *best answer*:

a. An independent survey of the teachers in the state where Centerville High School is located shows that 40% more truants are reported by survey respondents than is reported in official school records.
b. Common sense indicates that there is little a principal can do to lower truancy rates. These are for the most part due to social and economic conditions beyond the control of the schools.

*c. The truancy rates of the 2 cities closest to Centerville in location and size have decreased by 18% in the same period.
d. The superintendent has been discovered to have business contacts with people who are known to be involved in providing security services to the school district.

16.-17. In this task, we are interested in how people go about solving problems in everyday life. You will be reading several stories about people involved in everyday situations.

In each story, the story character changes three elements in a situation to produce some outcome. He (or she) then develops a hypothesis about one of the three elements as the reason for the outcome. Your task is to help the story character prove his (or her) hypothesis.

Pick the answer that will prove the point the story character wishes to make. Remember that the instruction to "prove" means to show that something is really true or is really false.

16. **Liz wanted her pet dog, who was obese, to lose some weight.**
- She changed his brand of dog food to FidoFood.
- She took control of his feeding from her son.
- She exercised him in the morning rather than at night.

After four weeks, the dog had actually gained four pounds.

Liz thought that the reason that he gained weight was because she was the one doing the feeding rather than her son and that the brand of food and the exercise time had made no difference.

What should she do to prove her point?
*a. She should go back to having her son feed the dog, but continue with the FidoFood and morning exercise schedule
b. She should go back to having her son feed the dog, using the old brand of dog food, and night exercise schedule
*c. She should continue feeding the dog, but go back to using the old brand of food and night exercise schedule

a = vary one strategy; b = change all strategy; c = hold one constant strategy

Scoring:
a or c = 1 point
b = 0 points

17. **After Julio received a poor evaluation from his boss (3.5 on a 10-point scale), he wanted to improve his management style with his employees and wanted to try something different. So**
-He wrote memos instead of giving oral instructions
-He held staff meetings weekly instead of every other week
-He wore casual attire to work instead of a business suit

On Julio's next evaluation, his rating did not improve. His rating was only 3.4. Julio thought that the reason his evaluation did not improve was because his staff did not respect him when he wore his casual attire.

What should he do to prove his point?
*a. He should go back to wearing his business suit, but continue writing memos and holding weekly staff meetings
*b. He should stick to his casual attire, but go back to giving oral instructions and holding meetings every other week
c. He should go back to wearing his business suit, giving oral instructions, and holding meetings every other week

a = vary one strategy; b = hold one constant strategy; c = change all strategy

Scoring:
a or b = 1 point
c = 0 points

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COVARIATION DETECTION – 25 items
Scoring system follows the 25 items.

1. A researcher is interested in the relationship between self-esteem and leadership qualities. Imagine that this researcher sampled 450 individuals and found that:
[delta p = .333]
100 people with high self-esteem were high in leadership qualities A
50 people with high self-esteem were low in leadership qualities B
100 people with low self-esteem were high in leadership qualities C
200 people with low self-esteem were low in leadership qualities D

You could classify the data in the following way:

	High in leadership qualities	Low in leadership qualities
High self-esteem	100	50
Low self-esteem	100	200

Please judge the nature and extent of the relationship between self-esteem and leadership qualities in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

2. A researcher is interested in the relationship between secondary smoke and lung problems. Imagine that this researcher sampled 150 children's homes and found that:
[delta p = -.333]
25 children exposed to secondary smoke did develop lung problems A
50 children exposed to secondary smoke did not develop lung problems B
50 children not exposed to secondary smoke did develop lung problems C
25 children not exposed to secondary smoke did not develop lung problems D

You could classify the data in the following way:

	Lung problems	No lung problems
Secondary smoke	25	50
No secondary smoke	50	25

Please judge the nature and extent of the relationship between secondary smoke and lung problems in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

3. A researcher is interested in the relationship between having siblings and sociability. Imagine that this researcher sampled 675 children and found that:
[delta p = -.300]
150 children had siblings and were sociable A
150 children had siblings and were not sociable B
300 children did not have siblings and were sociable C
75 children did not have siblings and were not sociable D

You could classify the data in the following way:

	Were sociable	Were not sociable
Had siblings	150	150
Did not have siblings	300	75

Please judge the nature and extent of the relationship between having siblings and sociability in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

4. A researcher is interested in the relationship between exercise and a sense of well-being. Imagine that this researcher sampled 175 people and found that:
[delta p = .167]
50 people exercised and had a sense of well-being A
50 people exercised and felt depressed B
25 people did not exercise and had a sense of well-being C
50 people did not exercise and felt depressed D

You could classify the data in the following way:

	Had a sense of well-being	Felt depressed
Exercised	50	50
Did not exercise	25	50

Please judge the nature and extent of the relationship between exercise and sense of well-being in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

5. A researcher is interested in the relationship between eating spicy foods and stomach problems. Imagine that this researcher sampled 500 people and found that:
[delta p = .167]
100 people ate spicy foods and did have stomach problems A
100 people ate spicy foods and did not have stomach problems B
100 people did not eat spicy foods and did have stomach problems C
200 people did not eat spicy foods and did not have stomach problems D

You could classify the data in the following way:

	Stomach problems	No stomach problems
Ate spicy foods	100	100
Did not eat spicy foods	100	200

Please judge the nature and extent of the relationship between eating spicy foods and stomach problems in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

6. A researcher is interested in the relationship between sibling birth order and achievement (specifically, the researcher believes that first-born children are high achievers). Imagine that this researcher sampled 675 individuals and found that:

[delta p = -.300]
75 people who were first born were high achievers A
300 people who were first born were low achievers B
150 people who were not first born were high achievers C
150 people who were not first born were low achievers D

You could classify the data in the following way:

	High achiever	Low achiever
First born	75	300
Not first born	150	150

Please judge the nature and extent of the relationship between being first born and high achievement in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

7. A researcher is interested in the relationship between fraternity membership and cheating on tests. Imagine that this researcher sampled 350 students and found that:
[delta p = .167]
100 students who were in fraternities did cheat on exams A
50 students who were in fraternities did not cheat on exams B
100 students who were not in fraternities did cheat on exams C
100 students who were not in fraternities did not cheat on exams D

You could classify the data in the following way:

	Cheated on exams	Did not cheat on exams
In fraternities	100	50
Not in fraternities	100	100

Please judge the nature and extent of the relationship between being in fraternities and cheating on exams in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

8. A researcher is interested in the relationship between the use of airbags and surviving car accidents. Imagine that this researcher sampled 600 accidents and found that:
[delta p = .467]
300 involved cars with airbags in which everyone survived A
75 involved cars with airbags in which someone died B
75 involved cars without airbags in which everyone survived C
150 involved cars without airbags in which someone died D

You could classify the data in the following way:

	Everyone survived	Someone died
Cars with airbags	300	75
Cars without airbags	75	150

Please judge the nature and extent of the relationship between airbags and accident survival in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

9. A researcher is interested in the relationship between getting chilled and catching a cold. Imagine that this researcher sampled 175 people and found that:
[delta p = -.167]
50 people did get chilled and did catch a cold A
50 people did get chilled and did not catch a cold B
50 people did not get chilled and did catch a cold C
25 people did not get chilled and did not catch a cold D

You could classify the data in the following way:

	Caught cold	Did not catch cold
Chilled	50	50
Not chilled	50	25

Please judge the nature and extent of the relationship between getting chilled and catching colds in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

10. A researcher is interested in the relationship between acupuncture and relieving arthritis pain. Imagine that this researcher sampled 675 people and found that:
[delta p = -.333]
150 did receive acupuncture and their arthritis pain was relieved A
300 did receive acupuncture and their arthritis pain was not relieved B
150 did not receive acupuncture and their arthritis pain was relieved C
75 did not receive acupuncture and their arthritis pain was not relieved D

You could classify the data in the following way:

	Pain relieved	Pain not relieved
Received acupuncture	150	300
Not receive acupuncture	150	75

Please judge the nature and extent of the relationship between acupuncture treatment and relief from arthritis pain in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

11. A researcher is interested in the relationship between police employment of psychics and solving crimes. Imagine that this researcher sampled 250 different police forces solving 250 different crimes and found that:
[delta p = -.600]
25 did employ psychics and did solve the crime A
100 did employ psychics and did not solve the crime B
100 did not employ psychics and did solve the crime C
25 did not employ psychics and did not solve the crime D

You could classify the data in the following way:

	Solved crime	Did not solve crime
Employed psychics	25	100
Did not employ psychics	100	25

Please judge the nature and extent of the relationship between using psychics and solving crimes in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

12. A researcher is interested in the relationship between taking study skills courses and grades. Imagine that this researcher sampled 400 students and found that:
[delta p = .000]
100 did take a study skills course and then got higher grades A
100 did take a study skills course and then got lower grades B
100 did not take a study skills course and then got higher grades C
100 did not take a study skills course and then got lower grades D

You could classify the data in the following way:

	Got higher grades	Got lower grades
Study skills course	100	100
No study skills course	100	100

Please judge the nature and extent of the relationship between taking a study skills course and higher grades in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

13. A researcher is interested in the relationship between the time a mother dedicates to homemaking and children's school adjustment. Imagine that this researcher sampled 450 children and found that:
[delta p = .300]
200 did have mothers who were full-time homemakers and had well adjusted children A
50 did have mothers who were full-time homemakers and had poorly adjusted children B
100 did not have mothers who were full-time homemakers and had well adjusted children C
100 did not have mothers who were full-time homemakers and had poorly adjusted children D

You could classify the data in the following way:

	Well adjusted children	Poorly adjusted children
Full-time homemakers	200	50
Not full-time homemakers	100	100

Please judge the nature and extent of the relationship between children's school adjustment and mothers who are full-time homemakers in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

14. A researcher is interested in the relationship between partying or studying the night before an exam and subsequent exam grade. Imagine that this researcher sampled 250 students and found that:
[delta p = .167]
100 partied the night before the exam and got good grades A
50 partied the night before the exam and got poor grades B
50 studied the night before the exam and got good grades C
50 studied the night before the exam and got poor grades D

You could classify the data in the following way:

	Got good grades	Got poor grades

Partied night before	100	50
Studied night before	50	50

Please judge the nature and extent of the relationship between partying the night before the exam and getting good grades in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

15. A researcher is interested in the relationship between underage drinking and alcoholism. Imagine that this researcher sampled 600 subjects and found that:
[delta p = .467]
150 people did drink when underage and did become alcoholics A
75 people did drink when underage and did not become alcoholics B
75 people did not drink when underage and did become alcoholics C
300 people did not drink when underage and did not become alcoholics D

You could classify the data in the following way:

	Became alcoholics	Did not become alcoholics
Drank when underage	150	75
Did not drink when underage	75	300

Please judge the nature and extent of the relationship between underage drinking and alcoholism in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

16. A researcher is interested in the relationship between couples living together prior to marriage and having successful marriages later. Imagine that this researcher sampled 225 couples and found that:
[delta p = .333]
100 couples did live together and had successful marriages A
50 couples did live together and were divorced B

25 couples did not live together and had successful marriages C
50 couples did not live together and were divorced D

You could classify the data in the following way:

	Successful marriages	Divorced
Lived together	100	50
Did not live together	25	50

Please judge the nature and extent of the relationship between living together before marriage and successful marriages in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

17. A researcher is interested in the relationship between holding a job while in school and grades. Imagine that this researcher sampled 400 high school students and found that:
[delta p = -.467]
50 students did have jobs and had good grades A
100 students did have jobs and had poor grades B
200 students did not have jobs and had good grades C
50 students did not have jobs and had poor grades D

You could classify the data in the following way:

	Good grades	Poor grades
Had jobs	50	100
Did not have jobs	200	50

Please judge the nature and extent of the relationship between having a job in high school and high school grades in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

18. A researcher is interested in the relationship between blindness and hearing sensitivity. Imagine that this researcher sampled 675 people and found that:
[delta p = -.333]
75 people who were blind did have sensitive hearing A
150 people who were blind did not have sensitive hearing B
300 people who were not blind did have sensitive hearing C
150 people who were not blind did not have sensitive hearing D

You could classify the data in the following way:

	Had sensitive hearing	Did not have sensitive hearing
Blind	75	150
Not blind	300	150

Please judge the nature and extent of the relationship between being blind and sensitive hearing in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

19. A researcher is interested in the relationship between television violence and children's aggression. Imagine that this researcher tested 500 children and found:
[delta p = .600]
200 children watched a lot of violent television and were high in aggression A
50 children watched a lot of violent television and were low in aggression B
50 children watched little violent television and were high in aggression C
200 children watched little violent television and were low in aggression D

You could classify the data in the following way:

	High in aggression	Not high in aggression
Lot of violent television	200	50
Little violent television	50	200

Please judge the nature and extent of the relationship between watching violent television and violent behavior in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

20. A researcher is interested in the relationship between optimism and longevity. Imagine that this researcher took 750 case histories and found that:
[delta p = -.167]
150 optimistic people lived to an old age A
300 optimistic people died at an early age B
150 pessimistic people lived to an old age C
150 pessimistic people died at an early age D

You could classify the data in the following way:

	Live to an old age	Died at an early age
Optimistic people	150	300
Pessimistic people	150	150

Please judge the nature and extent of the relationship between optimism and lifespan in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

21. A researcher is interested in the relationship between psychological stress and blood pressure. Imagine that this researcher tested 250 people and found that:
[delta p = -.167]
50 people under psychological high stress had high blood pressure A
50 people under psychological high stress had low blood pressure B
100 people under psychological low stress had high blood pressure C
50 people under psychological low stress had low blood pressure D

You could classify the data in the following way:

	High blood pressure	Low blood pressure
Under high stress	50	50
Under low stress	100	50

Please judge the nature and extent of the relationship between psychological stress and high blood pressure in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

22. A researcher is interested in the relationship between eating chocolate and acne. Imagine that this researcher tested 525 people and found that: [delta p = -.167]
75 people did eat chocolate and did get acne A
150 people did eat chocolate and did not get acne B
150 people did not eat chocolate and did get acne C
150 people did not eat chocolate and did not get acne D

You could classify the data in the following way:

	Got acne	Did not get acne
Ate chocolate	75	150
Did not eat chocolate	150	150

Please judge the nature and extent of the relationship between eating chocolate and acne in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

23. A researcher is interested in the relationship between religiosity and altruism. Imagine that this researcher tested 200 people and found that: [delta p = -.467]
25 people were religious and were very altruistic A
100 people were religious and were not very altruistic B

50 people were nonreligious and were very altruistic C
25 people were nonreligious and were not very altruistic D

You could classify the data in the following way:

	Very altruistic	Not very altruistic
Religious	25	100
Nonreligious	50	25

Please judge the nature and extent of the relationship between being religious and altruism in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

24. A researcher is interested in the relationship between school sex education and teenage pregnancy. Imagine that this researcher sampled 225 girls and found that:
[delta p = .300]
50 teenagers did have a sex education course and did have a pregnancy as teenagers A
50 teenagers did have a sex education course and did not have a pregnancy as teenagers B
25 teenagers had not had a sex education course and did have a pregnancy as teenagers C
100 teenagers had not had a sex education course and did not have a pregnancy as teenagers D

You could classify the data in the following way:

	Pregnancy as teenager	No pregnancy as teenager
Sex education course	50	50
No sex education course	25	100

Please judge the nature and extent of the relationship between sex education and pregnancy reduction in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

25. A researcher is interested in the relationship between couples financial problems and divorce. Imagine that this researcher sampled 450 couples and found that:
[delta p = .333]
150 couples had financial problems and got divorced A
75 couples had financial problems and did not get divorced B
75 couples did not have financial problems and got divorced C
150 couples did not have financial problems and did not get divorced D

You could classify the data in the following way:

	Divorced	Not divorced
Financial problems	150	75
No financial problems	75	150

Please judge the nature and extent of the relationship between financial problems and divorce in these data.

-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0 +1 +2 +3 +4 +5 +6 +7 +8 +9 +10
strong negative association — no association — strong positive association

CAUTION: You are reminded that the data that you have been presented with are *fictitious* and do NOT represent the actual degree of relationship between the variables in the various items.

This task has a maximum of 3 points, scored as follows:
correlation of evaluation with Δp:
< .10 scored as 0
≥ .10 and < .45 scored as 1
≥ .45 and < .75 scored as 2
≥ .75 scored as 3

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CART Scoring:

The initial 17 items listed above, plus the maximum 3 points for the 25-item covariation detection section, result in a maximum score of 20 on this subtest.

The CART score on this task is equal to the raw score (number of points out of 20).

Probabilistic and Statistical Reasoning Subtest

This subtest is presented as a block, but within the block all the types of items are intermixed except for the conjunction problems.

PROBABILITY MATCHING

1. Imagine a die with 4 blue sides and 2 yellow sides will be rolled 30 times. Before each roll you will be asked to predict which color (blue or yellow) will show up once the die has been rolled. Imagine that you will be given one dollar for each correct prediction. Your goal is to make as much money as possible by making the most correct predictions. What strategy would you use in order to make as much money as possible?

Strategy A: Go by intuition, switching when there has been too many of one color or the other.
Strategy B: Predict the more likely color (blue) on most of the rolls but occasionally, after a long run of blues, predict a yellow.
Strategy C: Make predictions according to the frequency of occurrence (4 of 6 for blue and 2 of 6 for yellow). That is, predict twice as many blues as yellows.
*Strategy D: Predict the more likely color (blue) on all of the 30 rolls.
Strategy E: Predict more blue than yellow, but switching back and forth depending upon "runs" of one color or the other.
Which Strategy is best? ___

2. "After considering your choice of the best strategy, how much do you agree or disagree with the following statements?"
agree strongly (scored as 6), agree moderately (5), agree slightly (4), disagree slightly (3), disagree moderately (2), disagree strongly (scored as 1)

a. My method is best because it leaves more room for intuition to help me.
b. After a long run of blue, yellow is more likely, so after a long run of blue I should switch my prediction to yellow.
c. Because in the long run 2/3 of the rolls will come out blue, I should predict blue on 2/3 of the 30 rolls.

d. Blue is more likely to come up on any one roll, given that there are more blue sides on the die than yellow.
e. I should predict blue on most rolls, but randomly predict yellow on a few others.
f. I thought that the outcome of any one roll of the die is unrelated to the previous rolls.

Scoring:
Form a composite of the non-normative statements (a, b, c, e) minus the normative statements (d, f)

Composite ≤ 0 scored as 1
> 0 is scored 0

3. Consider the following hypothetical situation: A deck with 10 cards is randomly shuffled 10 separate times. The 10 cards are composed of 7 cards with the letter "A" on the down side and 3 cards with the letter "B" on the down side. Each time the 10 cards are reshuffled, your task is to predict the letter on the down side of the top card. Imagine that you will receive $100 for each downside letter you correctly predict, and that you want to earn as much money as possible. Indicate your predictions for each of the 10 shuffles:

I would predict _____ for Shuffle #1 A or B?
I would predict _____ for Shuffle #2 A or B?
I would predict _____ for Shuffle #3 A or B?
I would predict _____ for Shuffle #4 A or B?
I would predict _____ for Shuffle #5 A or B?
I would predict _____ for Shuffle #6 A or B?
I would predict _____ for Shuffle #7 A or B?
I would predict _____ for Shuffle #8 A or B?
I would predict _____ for Shuffle #9 A or B?
I would predict _____ for Shuffle #10 A or B?

scored 1 for 10 choices of A
scored 0 for < 10 choices of A

4. Imagine that a large bowl contains 100 balls that are each wrapped up in foil. Although the foil prevents you from seeing each ball's color, you know that there are:
60 black balls and 40 white balls

Your task is to randomly select 10 wrapped balls from the large bowl and place them in either a cup labeled "black balls" or a cup labeled "white balls."

Once all 10 wrapped balls have been selected and placed in a cup, they will be unwrapped, and $1 will donated to your favorite charity for each of the balls that you placed in the correct cup.

How many balls would you place in the cup labeled "black balls" and in the cup labeled "white balls"?

_____ in the cup labeled "black balls"

_____ in the cup labeled "white balls"

scored 1 for 10 black balls
scored 0 for < 10 black balls

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GAMBLER'S FALLACY

5. Imagine that you are tossing a *fair* coin (a coin that has a 50/50 chance of coming up heads or tails) and it has just come up heads 5 times in a row. Which outcome is most likely on the 6th trial?

a. It is more likely that tails will come up than heads on the sixth toss.
b. It is more likely that heads will come up than tails on the sixth toss.
*c. Heads and tails are equally probable on the sixth toss.

6. When playing slot machines, people win something about 1 in every 10 times. Nancy, however, has just won on her first three plays. What are her chances of winning the next time she plays?

a. She has better than 1 chance in 10 of winning on her next play.
b. She has less than 1 chance in 10 of winning on her next play.
*c. She has a 1 chance in 10 that she will win on her next play.

7. Roland has four daughters. He is hoping for a son. What are the chances that his next child will be a son?

a. There is a higher chance that his next child will be a son.
b. There is a higher chance that his next child will be a daughter.
*c. There is an equal chance that his next child will be a son or a daughter.

8. Dice game: Even numbers win and odd numbers lose on a die throw. The fair die has six sides, with three even and three odd numbers. Jan has thrown seven odd numbers in a row. What are her chances of throwing an even number on her next throw?

a. She has better than 3 chances in 6 of an even number on her next throw.
b. She has less than 3 chances in 6 of an even number on her next throw.
*c. She has 3 chances in 6 of an even number on her next throw.

9. The State's "Cash 5" lottery involves choosing five numbers from 1 through 34. If you wager $1 and your five numbers match the numbers randomly drawn, you win $100,000. The previous winning numbers are shown on the lottery's website, and you notice that the number "21" appeared in each of the last five drawings. How likely is it that "21" will be one of the five numbers in the next lottery drawing?

a. Much more likely than the other 33 numbers.
b. Slightly more likely than the other 33 numbers.
*c. Equally likely as the other 33 numbers.
d. Slightly less likely than the other 33 numbers.
e. Much less likely than the other 33 numbers.

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REGRESSION TO THE MEAN

10. After the first three weeks of the Little League baseball season in Wichita, Kansas, the adult managers begin to post the top batting averages. Typically, after the first three weeks, several batters often have averages over .500 (i.e., they have gotten hits in over 50% of their at bats). However, no batter in Wichita Little League history has ever averaged over .500 at the end of the season. Why do you think this is?

a. When a batter is hot early in the season, the pitchers know it and concentrate on getting him out more later in the season.
b. Pitchers tend to get better over the course of a season, so every batter's average goes down.
*c. A player's high average at the beginning of the season may be just luck. The longer season provides a more realistic test of a batter's skill.
d. A batter who has such a hot streak at the beginning of the season is under a lot of stress to maintain his performance record. Such stress adversely affects his playing.
e. Over the season, opposing coaches devise strategies to get the best hitters out.

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SAMPLE SIZE

11. Ping-pong games at a city's recreation center can be played to either 15 or 21 points. If player A is a better ping-pong player than B, which game would give A the better chance of winning?

a. Player A will have a better chance of winning a 15-point game
*b. Player A will have a better chance of winning a 21-point game
c. Player A has the same chance of winning the 15-point game as the 21-point game

==========

NONCAUSAL BASE RATE

12. One out of every 1000 Americans has disease X. A test has been developed to detect when a person has disease X. Every time the test is given to a person who has the disease, the test comes out positive. But

sometimes the test also comes out positive when it is given to a person who is completely healthy. Specifically, out of every 100 people who are perfectly healthy, 4 of them test positive for the disease (the false positive rate is 4%). Imagine that we have given this test to a random sample of Americans. They were selected by a lottery. Those who conducted the lottery had no information about the health status of any of these people. What is the chance (expressed as a percentage ranging from 0% to 100%) that a person who is found to have a positive result actually has the disease?____% [2.5%]

any answer < than 4 scored as 1
≥ 4 scored as 0

==========

CAUSAL BASE RATES

13. Mr. Ortega inherited a large sum of money from his father and was interested in putting the money in the stock market for his retirement. He read an article in *Money* magazine that described a great deal of research about effective investment strategies. The data strongly supported a buy-and-hold strategy using mutual funds and that is what Mr. Ortega decided to do. However, before opening his account he thought he would check with his brother, who had inherited the same amount of money from their father. Mr. Ortega's brother said he was definitely going to be day-trading his money (buying and selling every day) because that's what his boss had done, and his boss's investment portfolio had increased by 20% in just one year. What do you think Mr. Ortega should do?

*a. He should definitely use a buy-and-hold strategy with mutual funds.
*b. He should probably use a buy-and-hold strategy with mutual funds.
c. He should probably try day-trading with his money.
d. He should definitely try day-trading with his money.

Scoring: one point for either a or b

14. Professor Kellan, the director of a teacher preparation program, was designing a new course in human development and needed to select a

textbook for the new course. She had narrowed her decision down to one of two textbooks: one published by Pearson and the other published by McGraw. Professor Kellan belonged to several professional organizations that provided web-based forums for its members to share information about curricular issues. Each of the forums had a textbook evaluation section, and the websites unanimously rated the McGraw textbook as the better choice in every category rated. Categories evaluated included quality of the writing, among others. Just before Professor Kellan was about to place the order for the McGraw book, however, she asked an experienced colleague for her opinion about the textbooks. Her colleague reported that she preferred the Pearson book. What do you think Professor Kellan should do?

a. She should definitely use the Pearson textbook.
b. She should probably use the Pearson textbook.
*c. She should probably use the McGraw textbook.
*d. She should definitely use the McGraw textbook.

Scoring: one point for either c or d

==========

CONJUNCTION EFFECTS

15-16. A survey of a random sample of 1000 high school seniors in Columbus, Ohio was conducted. Please give your best estimate of the following values:

How many of the 1000 students were planning on attending a university or community college? ____ (CC)
How many of the 1000 students had smoked marijuana and had had intercourse? ____
How many of the 1000 students participated on interscholastic sports teams? ____
How many of the 1000 students had at least a B average and were planning on attending a university or community college? ____ (B & CC)
How many of the 1000 students had a full time job lined up after graduation? ____
How many of the 1000 students had at least a B average? ____ (B)

Scoring:
15.
CC minus B&CC > 0 scored as 1
CC minus B&CC ≤ 0 scored as 0

16.
B minus B&CC > 0 scored as 1
B minus B&CC ≤ 0 scored as 0

17-18.

a. What is the probability that you will ***not*** have root canal surgery on one tooth in the ***next year***? (percent)

enter value between 0 and 100

b. What is the probability that you will have root canal surgery on one tooth in the ***next five years***? (percent)

enter value between 0 and 100

c. What is the probability that you will have root canal surgery on one tooth and another tooth extracted in the ***next five years***? (percent)

enter value between 0 and 100

d. What is the probability that you will have root canal surgery on one tooth in the ***next year***? (percent)

enter value between 0 and 100

e. What is the probability that you will ***not*** have root canal surgery on one tooth in the ***next five years***? (percent)

enter value between 0 and 100

f. What is the probability that you will ***not*** be hospitalized for an injury in the ***next year***? (percent)

enter value between 0 and 100

g. What is the probability that you will be hospitalized for an injury in the ***next five years***? (percent)

enter value between 0 and 100

h. What is the probability that you will be hit by a car and hospitalized for an injury in the ***next five years***? (percent)

enter value between 0 and 100

i. What is the probability that you will be hospitalized for an injury in the ***next year***? (percent)

enter value between 0 and 100

j. What is the probability that you will not be hospitalized for an injury in the ***next five years***? (percent)

enter value between 0 and 100

Scoring:
17.
root canal in five years (b) *minus* root canal surgery on one tooth and another tooth extracted in five years (c) > 0 scored as 1

18.
hospitalized for an injury in the next five years (g) *minus* hit by a car and hospitalized for an injury in the next five years (h) > 0 scored as 1

CART Scoring:

The CART score on this task is equal to the number of items answered correctly.

Subject #:_____ Study:_____ Date:_____

TAS - 20

Using the scale provided as a guide, indicate how much you agree or disagree with each of the following statements by circling the corresponding number. Give only one answer for each statement.

Circle 1 if you STRONGLY DISAGREE
Circle 2 if you MODERATELY DISAGREE
Circle 3 if you NEITHER DISAGREE NOR AGREE
Circle 4 if you MODERATELY AGREE
Circle 5 if you STRONGLY AGREE

		Strongly Disagree	Moderately Disagree	Neither Disagree Nor Agree	Moderately Agree	Strongly Agree
1.	I am often confused about what emotion I am feeling.	1	2	3	4	5
2.	It is difficult for me to find the right words for my feelings.	1	2	3	4	5
3.	I have physical sensations that even doctors don't understand.	1	2	3	4	5
4.	I am able to describe my feelings easily.	1	2	3	4	5
5.	I prefer to analyze problems rather than just describe them.	1	2	3	4	5
6.	When I am upset, I don't know if I am sad, frightened, or angry.	1	2	3	4	5
7.	I am often puzzled by sensations in my body.	1	2	3	4	5
8.	I prefer to just let things happen rather than to understand why they turned out that way.	1	2	3	4	5
9.	I have feelings that I can't quite identify.	1	2	3	4	5
10.	Being in touch with emotions is essential.	1	2	3	4	5
11.	I find it hard to describe how I feel about people.	1	2	3	4	5

		Strongly Disagree	Moderately Disagree	Neither Disagree Nor Agree	Moderately Agree	Strongly Agree
12.	People tell me to describe my feelings more.	1	2	3	4	5
13.	I don't know what's going on inside me.	1	2	3	4	5
14.	I often don't know why I am angry.	1	2	3	4	5
15.	I prefer talking to people about their daily activities rather than their feelings.	1	2	3	4	5
16.	I prefer to watch "light" entertainment shows rather than psychological dramas.	1	2	3	4	5
17.	It is difficult for me to reveal my innermost feelings, even to close friends.	1	2	3	4	5
18.	I can feel close to someone, even in moments of silence.	1	2	3	4	5
19.	I find examination of my feelings useful in solving personal problems.	1	2	3	4	5
20.	Looking for hidden meanings in movies and plays distracts from their enjoyment.	1	2	3	4	5

DRS-15 (v3.2)

Below are statements about life that people often feel differently about. Check the box to show how much you think each one is true. Give your own honest opinions . . . There are no right or wrong answers.

	Not at all true	A little true	Quite true	Completely true
1. Most of my life gets spent doing things that are meaningful	☐	☐	☐	☐
2. By working hard you can nearly always achieve your goals	☐	☐	☐	☐
3. I don't like to make changes in my regular activities	☐	☐	☐	☐
4. I feel that my life is somewhat empty of meaning	☐	☐	☐	☐
5. Changes in routine are interesting to me	☐	☐	☐	☐
6. How things go in my life depends on my own actions	☐	☐	☐	☐
7. I really look forward to my daily activities	☐	☐	☐	☐
8. I don't think there is much I can do to influence my own future	☐	☐	☐	☐
9. I enjoy the challenge when I have to do more than one thing at a time	☐	☐	☐	☐
10. Most days, life is really interesting and exciting for me	☐	☐	☐	☐
11. It bothers me when my daily routine gets interrupted	☐	☐	☐	☐
12. It is up to me to decide how the rest of my life will be	☐	☐	☐	☐
13. Life in general is boring for me	☐	☐	☐	☐
14. I like having a daily schedule that doesn't change very much	☐	☐	☐	☐
15. My choices make a real difference in how things turn out in the end	☐	☐	☐	☐

MINI-K

Please indicate how strongly you agree or disagree with the following statements. Use the scale below. For any item that does not apply to you, please select "0."

	Disagree Strongly	Disagree Somewhat	Disagree Slightly	Don't Know / Not Applicable	Agree Slightly	Agree Somewhat	Agree Strongly
	-3	-2	-1	0	+1	+2	+3
I can often tell how things will turn out.	○	○	○	○	○	○	○
I try to understand how I got into a situation to figure out how to handle it.	○	○	○	○	○	○	○
I often find the bright side to a bad situation.	○	○	○	○	○	○	○
I don't give up until I solve my problems.	○	○	○	○	○	○	○
I often make plans in advance.	○	○	○	○	○	○	○
I avoid taking risks.	○	○	○	○	○	○	○
While growing up, I had a close and warm relationship with my biological mother.	○	○	○	○	○	○	○
While growing up, I had a close and warm relationship with my biological father.	○	○	○	○	○	○	○
I have a close and warm relationship with my own children.	○	○	○	○	○	○	○
I have a close and warm romantic relationship with my sexual partner.	○	○	○	○	○	○	○

I would rather have one than several sexual relationships at a time.	○	○	○	○	○	○	○
I have to be closely attached to someone before I am comfortable having sex with them.	○	○	○	○	○	○	○
I am often in social contact with my blood relatives.	○	○	○	○	○	○	○
I often get emotional support and practical help from my blood relatives.	○	○	○	○	○	○	○
I often give emotional support and practical help to my blood relatives.	○	○	○	○	○	○	○
I am often in social contact with my friends.	○	○	○	○	○	○	○
I often get emotional support and practical help from my friends.	○	○	○	○	○	○	○
I often give emotional support and practical help to my friends.	○	○	○	○	○	○	○
I am closely connected to and involved in my community.	○	○	○	○	○	○	○
I am closely connected to and involved in my religion.	○	○	○	○	○	○	○

COPE

We are interested in how people respond when they confront difficult or stressful events in their lives. There are lots of ways to try to deal with stress. This questionnaire asks you to indicate what you generally do and feel, when you experience stressful events. Obviously, different events bring out somewhat different responses, but think about what you usually do when you are under a lot of stress.

Then respond to each of the following items by blackening one number on your answer sheet for each, using the response choices listed just below. Please try to respond to each item separately in your mind from each other item. Choose your answers thoughtfully, and make your answers as true FOR YOU as you can. Please answer every item. There are no "right" or "wrong" answers, so choose the most accurate answer for YOU--not what you think "most people" would say or do. Indicate what YOU usually do when YOU experience a stressful event.

1 = I usually don't do this at all
2 = I usually do this a little bit
3 = I usually do this a medium amount
4 = I usually do this a lot

1. I try to grow as a person as a result of the experience.
2. I turn to work or other substitute activities to take my mind off things.
3. I get upset and let my emotions out.
4. I try to get advice from someone about what to do.
5. I concentrate my efforts on doing something about it.
6. I say to myself "this isn't real."
7. I put my trust in God.
8. I laugh about the situation.
9. I admit to myself that I can't deal with it, and quit trying.
10. I restrain myself from doing anything too quickly.

11. I discuss my feelings with someone.
12. I use alcohol or drugs to make myself feel better.
13. I get used to the idea that it happened.
14. I talk to someone to find out more about the situation.
15. I keep myself from getting distracted by other thoughts or activities.
16. I daydream about things other than this.
17. I get upset, and am really aware of it.
18. I seek God's help.
19. I make a plan of action.
20. I make jokes about it.

21. I accept that this has happened and that it can't be changed.
22. I hold off doing anything about it until the situation permits.
23. I try to get emotional support from friends or relatives.
24. I just give up trying to reach my goal.
25. I take additional action to try to get rid of the problem.
26. I try to lose myself for a while by drinking alcohol or taking drugs.
27. I refuse to believe that it has happened.
28. I let my feelings out.
29. I try to see it in a different light, to make it seem more positive.
30. I talk to someone who could do something concrete about the problem.

31. I sleep more than usual.
32. I try to come up with a strategy about what to do.
33. I focus on dealing with this problem, and if necessary let other things slide a little.
34. I get sympathy and understanding from someone.
35. I drink alcohol or take drugs, in order to think about it less.
36. I kid around about it.
37. I give up the attempt to get what I want.
38. I look for something good in what is happening.
39. I think about how I might best handle the problem.
40. I pretend that it hasn't really happened.

41. I make sure not to make matters worse by acting too soon.
42. I try hard to prevent other things from interfering with my efforts at dealing with this.
43. I go to movies or watch TV, to think about it less.
44. I accept the reality of the fact that it happened.
45. I ask people who have had similar experiences what they did.
46. I feel a lot of emotional distress and I find myself expressing those feelings a lot.
47. I take direct action to get around the problem.
48. I try to find comfort in my religion.
49. I force myself to wait for the right time to do something.
50. I make fun of the situation.

51. I reduce the amount of effort I'm putting into solving the problem.
52. I talk to someone about how I feel.
53. I use alcohol or drugs to help me get through it.
54. I learn to live with it.
55. I put aside other activities in order to concentrate on this.
56. I think hard about what steps to take.
57. I act as though it hasn't even happened.
58. I do what has to be done, one step at a time.
59. I learn something from the experience.
60. I pray more than usual.

STANTON ADDED STATEMENTS

1. I take time to figure out what I'm really feeling.
2. I delve into my feelings to get a thorough understanding of them.
3. I realize that my feelings are valid and important.
4. I acknowledge my emotions.

5. I let my feelings come out freely.
6. I take time to express my emotions.
7. I allow myself to express my emotions.
8. I feel free to express my emotions.

Scales (sum items listed, with no reversals of coding):

Positive reinterpretation and growth: 1, 29, 38, 59
Mental disengagement: 2, 16, 31, 43
Focus on and venting of emotions: 3, 17, 28, 46
Use of instrumental social support: 4, 14, 30, 45
Active coping: 5, 25, 47, 58
Denial: 6, 27, 40, 57
Religious coping: 7, 18, 48, 60
Humor: 8, 20, 36, 50
Behavioral disengagement: 9, 24, 37, 51
Restraint: 10, 22, 41, 49
Use of emotional social support: 11, 23, 34, 52
Substance use: 12, 26, 35, 53
Acceptance: 13, 21, 44, 54
Suppression of competing activities: 15, 33, 42, 55
Planning: 19, 32, 39, 56

Emotion Processing: 1, 2, 3, 4

Emotional Expression: 5, 6, 7, 8

WASI-II Record Form

WECHSLER ABBREVIATED SCALE OF INTELLIGENCE® — SECOND EDITION

Calculation of Examinee's Age	Year	Month	Day
Test Date			
Test Age			

ID:

Sex: ☐ F ☐ M Handedness: ☐ R ☐ L

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			

PEARSON

PsychCorp

3 4 5 6 7 8 9 10 11 12 A B C D E 282563-1 3

Product Number 0158981596

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				
6–8	1. Examinee / Examiner	Model and Picture	30"	Trial 1	Trial 2	Trial 1	Trial 2	0	1	2		
	2.	Model and Picture	30"	Trial 1	Trial 2	Trial 1	Trial 2	0	1	2		
9–90	3.	Model and Picture	45"	Trial 1	Trial 2	Trial 1	Trial 2	0	1	2		
	4.	Model and Picture	45"	Trial 1	Trial 2	Trial 1	Trial 2	0	1	2		
	5.	Picture	60"					0	21–60: 4	16–20: 5	11–15: 6	1–10: 7
	6.	Picture	60"					0	21–60: 4	16–20: 5	11–15: 6	1–10: 7
	7.	Picture	60"					0	21–60: 4	16–20: 5	11–15: 6	1–10: 7
	8.	Picture	60"					0	21–60: 4	16–20: 5	11–15: 6	1–10: 7
	9.	Picture	120"					0	71–120: 4	46–70: 5	31–45: 6	1–30: 7
	10.	Picture	120"					0	61–120: 4	46–60: 5	36–45: 6	1–35: 7
	11.	Picture	120"					0	61–120: 4	46–60: 5	36–45: 6	1–35: 7
6–8 STOP	12.	Picture	120"					0	61–120: 4	46–60: 5	36–45: 6	1–35: 7
	13.	Picture	120"					0	101–120: 4	81–100: 5	56–80: 6	1–55: 7

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
6–90	†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 STOP	23. Trend		0 1 2
	24. Impulse		0 1 2
	25. Ruminate		0 1 2
7–11 STOP	26. Mollify		0 1 2
	27. Extirpate		0 1 2
	28. Panacea		0 1 2
12–14 STOP			

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
6–8 STOP	15.	1	**2**	3	4	5	0	1
	16.	1	2	3	4	**5**	0	1
	17.	1	2	3	**4**	5	0	1
	18.	1	**2**	3	4	5	0	1
	19.	1	2	3	**4**	5	0	1
	20.	1	**2**	3	4	5	0	1
	21.	1	2	**3**	4	5	0	1
	22.	1	2	**3**	4	5	0	1
	23.	**1**	2	3	4	5	0	1
	24.	1	2	3	**4**	5	0	1
	25.	1	2	3	**4**	5	0	1
	26.	1	**2**	3	4	5	0	1
	27.	1	2	3	4	**5**	0	1
	28.	1	2	3	4	**5**	0	1
	29.	**1**	2	3	4	5	0	1
	30.	1	**2**	3	4	5	0	1

Maximum Raw Score
Ages 6–8: 24
Ages 9–90: 30

Matrix Reasoning Total Raw Score ____

4. Similarities

Start
Ages 6–8: Item 1
Ages 9–90: Item 4

Reverse
Ages 9–90: Does not obtain a perfect score on *either* Item 4 or Item 5, administer the preceding items in **reverse** order until two consecutive perfect scores are obtained.

Discontinue
After **3** consecutive scores of 0.

Stop
Ages 6–8: After Item 22.

Record & Score
Items 1–3: Score **0** or **1** point. Correct responses are in **color**.
Items 4–5: Score **0** or **2** points.
Items 6–24: Score **0**, **1**, or **2** points. See Manual for sample responses.

	Picture Item	Response	Score
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.

continue

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 STOP 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 ____

WASI®-II

WECHSLER ABBREVIATED SCALE OF INTELLIGENCE®— SECOND EDITION

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)

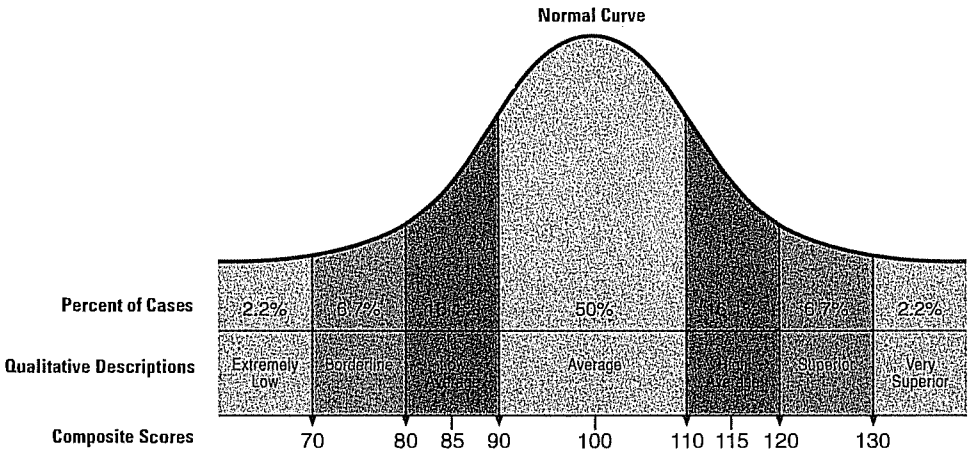
Attention and concentration

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



PEARSON

Pearson Executive Office 5601 Green Valley Drive Bloomington, MN 55437

800.627.7271 www.PsychCorp.com

SREIS

Subject ID: _____ Date: _____

The following set of items pertains to your insight into emotions. Please use the rating scale to describe how accurately each statement describes *you*. Describe yourself as you generally are now, not as you wish to be in the future. Describe yourself as you honestly see yourself, in relation to other people you know of the same sex as you are, and roughly your same age. Please read each statement carefully, and then circle the response that corresponds to how inaccurately or accurately each statement describes you.

1. By looking at people's facial expressions, I recognize the emotions they are experiencing

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

2. I am a rational person and I rarely, if ever, consult my feelings to make a decision

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

3. I have a rich vocabulary to describe my emotions

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

4. I have problems dealing with my feelings of anger

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

5. When someone I know is in a bad mood, I can help the person calm down and feel better quickly

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

6. I am aware of the nonverbal messages other people send

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

7. When making decisions, I listen to my feelings to see if the decision feels right

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

8. I could easily write a lot of synonyms for emotion words like happiness or sadness

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

9. I can handle stressful situations without getting too nervous

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

10. I know the strategies to make or improve other people's moods

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

11. I can tell when a person is lying to me by looking at his or her facial expression

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

12. I am a rational person and don't like to rely on my feelings to make decisions

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

13. I have the vocabulary to describe how most emotions progress from simple to complex feelings

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

14. I am able to handle most upsetting problems

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

15. I am not very good at helping others to feel better when they are feeling down or angry

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

16. My quick impressions of what people are feeling are usually wrong

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

17. My "feelings" vocabulary is probably better than most other persons' "feeling" vocabularies

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

18. I know how to keep calm in difficult or stressful situations

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

19. I am the type of person to whom others go when they need help with a difficult situation

Very inaccurate	*Moderately inaccurate*	*Neither nor*	*Moderately accurate*	*Very accurate*
1	*2*	*3*	*4*	*5*

Five Facet Mindfulness Questionnaire

This instrument is based on a factor analytic study of five independently developed mindfulness questionnaires. The analysis yielded five factors that appear to represent elements of mindfulness as it is currently conceptualized. The five facets are observing, describing, acting with awareness, non-judging of inner experience, and non-reactivity to inner experience. More information is available in:

Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*, 27-45.

Please rate each of the following statements using the scale provided. Write the number in the blank that best describes <u>your own opinion</u> of what is <u>generally true for you</u>.

1	2	3	4	5
never or very rarely true	rarely true	sometimes true	often true	very often or always true

_____ 1. When I'm walking, I deliberately notice the sensations of my body moving.
_____ 2. I'm good at finding words to describe my feelings.
_____ 3. I criticize myself for having irrational or inappropriate emotions.
_____ 4. I perceive my feelings and emotions without having to react to them.
_____ 5. When I do things, my mind wanders off and I'm easily distracted.
_____ 6. When I take a shower or bath, I stay alert to the sensations of water on my body.
_____ 7. I can easily put my beliefs, opinions, and expectations into words.
_____ 8. I don't pay attention to what I'm doing because I'm daydreaming, worrying, or otherwise distracted.
_____ 9. I watch my feelings without getting lost in them.
_____ 10. I tell myself I shouldn't be feeling the way I'm feeling.
_____ 11. I notice how foods and drinks affect my thoughts, bodily sensations, and emotions.
_____ 12. It's hard for me to find the words to describe what I'm thinking.
_____ 13. I am easily distracted.
_____ 14. I believe some of my thoughts are abnormal or bad and I shouldn't think that way.
_____ 15. I pay attention to sensations, such as the wind in my hair or sun on my face.
_____ 16. I have trouble thinking of the right words to express how I feel about things
_____ 17. I make judgments about whether my thoughts are good or bad.
_____ 18. I find it difficult to stay focused on what's happening in the present.
_____ 19. When I have distressing thoughts or images, I "step back" and am aware of the thought or image without getting taken over by it.
_____ 20. I pay attention to sounds, such as clocks ticking, birds chirping, or cars passing.
_____ 21. In difficult situations, I can pause without immediately reacting.
_____ 22. When I have a sensation in my body, it's difficult for me to describe it because I can't find the right words.
_____ 23. It seems I am "running on automatic" without much awareness of what I'm doing.
_____ 24. When I have distressing thoughts or images, I feel calm soon after.
_____ 25. I tell myself that I shouldn't be thinking the way I'm thinking.
_____ 26. I notice the smells and aromas of things.

_____ 27. Even when I'm feeling terribly upset, I can find a way to put it into words.
_____ 28. I rush through activities without being really attentive to them.
_____ 29. When I have distressing thoughts or images I am able just to notice them without reacting.
_____ 30. I think some of my emotions are bad or inappropriate and I shouldn't feel them.
_____ 31. I notice visual elements in art or nature, such as colors, shapes, textures, or patterns of light and shadow.
_____ 32. My natural tendency is to put my experiences into words.
_____ 33. When I have distressing thoughts or images, I just notice them and let them go.
_____ 34. I do jobs or tasks automatically without being aware of what I'm doing.
_____ 35. When I have distressing thoughts or images, I judge myself as good or bad, depending what the thought/image is about.
_____ 36. I pay attention to how my emotions affect my thoughts and behavior.
_____ 37. I can usually describe how I feel at the moment in considerable detail.
_____ 38. I find myself doing things without paying attention.
_____ 39. I disapprove of myself when I have irrational ideas.

Scoring:
Observe items:
1, 6, 11, 15, 20, 26, 31, 36
Describe items:
2, 7, 12R, 16R, 22R, 27, 32, 37
Act with Awareness items:
5R, 8R, 13R, 18R, 23R, 28R, 34R, 38R
Nonjudge items:
3R, 10R, 14R, 17R, 25R, 30R, 35R, 39R
Nonreact items:
4, 9, 19, 21, 24, 29, 33

Emotion Regulation of Others and Self

Extrinsic subscale

How You Handle Other People's Feelings

There are occasions when people try to make others feel better (e.g., happier, calmer, less anxious, less angry) and occasions when they try to make others feel worse (e.g. less cheerful, less excited, more angry, more worried).

To what extent have you used the following strategies to influence the way someone else feels over the past two weeks. It does not matter whether the strategies worked or not, just the extent to which you used them.

		Not at all	Just a little	Moderate amount	Quite a lot	A great deal
1.	I gave someone helpful advice to try to improve how they felt	☐	☐	☐	☐	☐
2.	I told someone about their shortcomings to try to make them feel worse	☐	☐	☐	☐	☐
3.	I did something nice with someone to try to make them feel better	☐	☐	☐	☐	☐
4.	I acted annoyed towards someone to try to make them feel worse	☐	☐	☐	☐	☐
5.	I explained to someone how they had hurt myself or others, to try to make the person feel worse	☐	☐	☐	☐	☐
6.	I discussed someone's positive characteristics to try to improve how they felt	☐	☐	☐	☐	☐
7.	I made someone laugh to try to make them feel better	☐	☐	☐	☐	☐
8.	I listened to someone's problems to try to improve how they felt	☐	☐	☐	☐	☐
9.	I spent time with someone to try to improve how they felt	☐	☐	☐	☐	☐

Extrinsic affect-improving: Mean score of items 1, 3, 6, 7, 8, and 9
Extrinsic affect-worsening: Mean score of items 2, 4, and 5

Intrinsic subscale

How You Handle Your Own Feelings

There are occasions when people try to make themselves feel better (e.g., happier, calmer, less anxious, less angry) and occasions when they try to make themselves feel worse (e.g. less cheerful, less excited, more angry, more worried).

To what extent have you used the following strategies to influence the way you feel over the past two weeks. It does not matter whether the strategies worked or not, just the extent to which you used them.

		Not at all	Just a little	Moderate amount	Quite a lot	A great deal
1.	I looked for problems in my current situation to make myself feel worse	☐	☐	☐	☐	☐
2.	I thought about my positive characteristics to make myself feel better	☐	☐	☐	☐	☐
3.	I laughed to try to improve how I felt	☐	☐	☐	☐	☐
4.	I expressed cynicism to try to make myself feel worse	☐	☐	☐	☐	☐
5.	I think about my shortcomings to make myself feel worse	☐	☐	☐	☐	☐
6.	I did something I enjoy to try to improve how I felt	☐	☐	☐	☐	☐
7.	I sought support from others to try to make myself feel better	☐	☐	☐	☐	☐
8.	I thought about negative experiences to try to make myself feel worse	☐	☐	☐	☐	☐
9.	I thought about something nice to try to make myself feel better	☐	☐	☐	☐	☐
10.	I thought of positive aspects of my situation to try to improve how I felt	☐	☐	☐	☐	☐

Intrinsic affect-improving: Mean score of items 2, 3, 6, 7, 9, and 10
Intrinsic affect-worsening: Mean score of items 1, 4, 5, and 8

Multidimensional Assessment of Interoceptive Awareness (MAIA)

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Multidimensional Assessment of Interoceptive Awareness

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- Please refer to the survey using its complete name – Multidimensional Assessment of Interoceptive Awareness - and provide the appropriate citation.
- Modifications may be made without our written permission. However, please clearly identify any modifications in any publications as having been made by the users. If you modify the survey, please let us know for our records.
- We recommend including entire subscales when selecting items from the MAIA to retain the psychometric features of these subscales (rather than selecting items from subscales).
- If you translate the MAIA into another language, please send us a copy for our records.
- If other investigators are interested in obtaining the survey, please refer them to the source document (PLoS-ONE 2012, and www.osher.ucsf.edu/maia/) to assure they obtain the most recent version and scoring instructions.

Scoring Instructions

Take the average of the items on each scale.
Note: Reverse-score items 5, 6, and 7 on Not-Distracting, and items 8 and 9 on Not-Worrying.

1. **Noticing:** Awareness of uncomfortable, comfortable, and neutral body sensations

   Q1_____ + Q2_____ + Q3_____ + Q4_____ / 4 = _____

2. **Not-Distracting:** Tendency not to ignore or distract oneself from sensations of pain or discomfort

   Q5(**reverse**)_____ + Q6(**reverse**)_____ + Q7(**reverse**)_____ / 3 = _____

3. **Not-Worrying:** Tendency not to worry or experience emotional distress with sensations of pain or discomfort

   Q8(**reverse**)_____ + Q9(**reverse**)_____ + Q10_____ / 3 = _____

4. **Attention Regulation:** Ability to sustain and control attention to body sensations

   Q11_____ + Q12_____ + Q13_____ + Q14_____ + Q15_____ + Q16_____ + Q17_____ / 7 = _____

5. **Emotional Awareness:** Awareness of the connection between body sensations and emotional states

   Q18_____ + Q19_____ + Q20_____ + Q21_____ + Q22_____ / 5 = _____

6. **Self-Regulation:** Ability to regulate distress by attention to body sensations

   Q23_____ + Q24_____ + Q25_____ + Q26_____ / 4= _____

7. **Body Listening:** Active listening to the body for insight

   Q27_____ + Q28_____ + Q29_____ / 3= _____

8. **Trusting:** Experience of one's body as safe and trustworthy

   Q30_____ + Q31_____ + Q32_____ / 3= _____

Below you will find a list of statements. Please indicate how often each statement applies to you generally in daily life.

.	Circle one number on each line					
	Never					Always
1. When I am tense I notice where the tension is located in my body.	0	1	2	3	4	5
2. I notice when I am uncomfortable in my body.	0	1	2	3	4	5
3. I notice where in my body I am comfortable.	0	1	2	3	4	5
4. I notice changes in my breathing, such as whether it slows down or speeds up.	0	1	2	3	4	5
5. I do not notice (I ignore) physical tension or discomfort until they become more severe.	0	1	2	3	4	5
6. I distract myself from sensations of discomfort.	0	1	2	3	4	5
7. When I feel pain or discomfort, I try to power through it.	0	1	2	3	4	5
8. When I feel physical pain, I become upset.	0	1	2	3	4	5
9. I start to worry that something is wrong if I feel any discomfort.	0	1	2	3	4	5
10. I can notice an unpleasant body sensation without worrying about it.	0	1	2	3	4	5
11. I can pay attention to my breath without being distracted by things happening around me.	0	1	2	3	4	5
12. I can maintain awareness of my inner bodily sensations even when there is a lot going on around me.	0	1	2	3	4	5
13. When I am in conversation with someone, I can pay attention to my posture.	0	1	2	3	4	5
14. I can return awareness to my body if I am distracted.	0	1	2	3	4	5
15. I can refocus my attention from thinking to sensing my body.	0	1	2	3	4	5
16. I can maintain awareness of my whole body even when a part of me is in pain or discomfort.	0	1	2	3	4	5

Please indicate how often each statement applies to you generally in daily life.

	Circle one number on each line					
	Never					**Always**
17. I am able to consciously focus on my body as a whole.	0	1	2	3	4	5
18. I notice how my body changes when I am angry.	0	1	2	3	4	5
19. When something is wrong in my life I can feel it in my body.	0	1	2	3	4	5
20. I notice that my body feels different after a peaceful experience.	0	1	2	3	4	5
21. I notice that my breathing becomes free and easy when I feel comfortable.	0	1	2	3	4	5
22. I notice how my body changes when I feel happy / joyful.	0	1	2	3	4	5
23. When I feel overwhelmed I can find a calm place inside.	0	1	2	3	4	5
24. When I bring awareness to my body I feel a sense of calm.	0	1	2	3	4	5
25. I can use my breath to reduce tension.	0	1	2	3	4	5
26. When I am caught up in thoughts, I can calm my mind by focusing on my body/breathing.	0	1	2	3	4	5
27. I listen for information from my body about my emotional state.	0	1	2	3	4	5
28. When I am upset, I take time to explore how my body feels.	0	1	2	3	4	5
29. I listen to my body to inform me about what to do.	0	1	2	3	4	5
30. I am at home in my body.	0	1	2	3	4	5
31. I feel my body is a safe place.	0	1	2	3	4	5
32. I trust my body sensations.	0	1	2	3	4	5

MEOS

Please answer each statement below by selecting the answer that best reflects your degree of agreement or disagreement with that statement. Try to answer as accurately as possible, without spending too much time on each question. There are no right or wrong answers. There are five possible responses to each statement ranging from 'Strongly Disagree' (number 1) to 'Strongly Agree' (number 5)

	1 - Strongly disagree	2 - Disagree	3 - Neither agree nor disagree	4 -Agree	5 -Strongly agree
When someone is unhappy I try to cheer them up by arranging an enjoyable activity	○	○	○	○	○
If I want someone to do something for me, I am especially nice to them before asking	○	○	○	○	○
I sometimes use humor to try to lift another person's mood	○	○	○	○	○
I sometimes sulk to make someone feel guilty	○	○	○	○	○
If someone's behavior has caused me distress, I try to make them feel guilty about it	○	○	○	○	○
If someone is unhappy I make it clear that they have my support	○	○	○	○	○
I'm good at reassuring people so that they're more likely to go along with what I say	○	○	○	○	○
When someone has made me upset or angry, I often conceal my feelings	○	○	○	○	○
If someone says or does something I don't like, I sometimes sulk	○	○	○	○	○
When someone is unhappy, I reassure them that things will get better	○	○	○	○	○

	1 - Strongly disagree	2 - Disagree	3 - Neither agree nor disagree	4 -Agree	5 -Strongly agree
I am especially nice to people whose friendship is advantageous to me	○	○	○	○	○
If I want someone to do something for me, I try to elicit sympathy from them	○	○	○	○	○
I know how to embarrass someone to stop them from behaving in a particular way	○	○	○	○	○
When someone is unhappy, I try to help them to take a more positive view of their situation	○	○	○	○	○
If someone lacks confidence to do a task, I encourage them to believe they can do it	○	○	○	○	○
I use displays of anger to motivate others	○	○	○	○	○
If someone I know is unhappy, I allow them to express their feelings	○	○	○	○	○
When someone has made me upset or angry, I tend to downplay my feelings	○	○	○	○	○
I sometimes put someone down in public to make them feel bad	○	○	○	○	○
If I don't like someone's behavior I make negative comments in order to make them feel bad	○	○	○	○	○

	1 - Strongly disagree	2 - Disagree	3 - Neither agree nor disagree	4 -Agree	5 -Strongly agree
I use anger to get others to do things I want them to do	○	○	○	○	○
When someone is unhappy I try to cheer them by talking about something positive	○	○	○	○	○
I don't believe in telling others about my problems - I keep them to myself	○	○	○	○	○
If someone has upset me, I express my anger to them	○	○	○	○	○
I sometimes try to undermine another person's confidence	○	○	○	○	○
If someone tries to make me feel better when I am feeling low, I pretend to feel happier to please that person	○	○	○	○	○
I sometimes try to make someone feel bad by blaming them for something which I know isn't their fault	○	○	○	○	○
If someone is anxious, I try to reassure them	○	○	○	○	○
I use criticism to make others feel that they should work harder	○	○	○	○	○
I often conceal feelings of anger and distress from others	○	○	○	○	○

	1 - Strongly disagree	2 - Disagree	3 - Neither agree nor disagree	4 -Agree	5 -Strongly agree
When someone is unhappy, I show that I understand how they are feeling	○	○	○	○	○
I know how to make someone feel ashamed about something that they have done in order to stop them from doing it again	○	○	○	○	○
When someone is in a bad mood I try to divert them by telling jokes or funny stories	○	○	○	○	○
I sometimes use my knowledge of another person's emotional triggers to make them angry	○	○	○	○	○
When someone is under stress I try to boost their confidence in their ability to cope	○	○	○	○	○
I hide my feelings so others won't worry about me	○	○	○	○	○
I sometimes use flattery to gain or keep someone's good opinion	○	○	○	○	○
When someone is anxious about a problem, I try to help them work out a solution	○	○	○	○	○
If someone is feeling angry, I try to help them understand their feelings	○	○	○	○	○
When someone is dealing with a difficult situation, I encourage them by reassuring them that they are coping well	○	○	○	○	○

	1 - Strongly disagree	2 - Disagree	3 - Neither agree nor disagree	4 -Agree	5 -Strongly agree
If someone is annoying me, I sometimes retaliate by saying something unkind that will make them feel bad	○	○	○	○	○
I sometimes deliberately try to make another person feel jealous	○	○	○	○	○
If someone is feeling anxious, I try to calm them down by talking with them	○	○	○	○	○
I sometimes sulk to get someone to change their behavior	○	○	○	○	○
If someone is being awkward, I try to defuse the situation by being cheerful and pleasant	○	○	○	○	○
Input "3 - Neither agree nor disagree" for this row's answer box	○	○	○	○	○
If someone is angry, I try to divert their mood by being cheerful	○	○	○	○	○
I can make someone feel anxious so that they will act in a particular way	○	○	○	○	○
I am not very good at motivating people	○	○	○	○	○
I can pay someone compliments to get in their 'good books'	○	○	○	○	○
If someone is feeling anxious, I try to offer practical help	○	○	○	○	○

	1 - Strongly disagree	2 - Disagree	3 - Neither agree nor disagree	4 -Agree	5 -Strongly agree
I am not very good at changing someone's mood, even if doing so would make them likely to behave in a way that I want them to	○	○	○	○	○
I am not very good at giving positive encouragement to others	○	○	○	○	○
When someone is in a low mood I behave in a happy and cheerful way to make them feel better	○	○	○	○	○
If someone is upset, I try to reassure them by suggesting a possible solution to their problem	○	○	○	○	○
I can use my emotional skills to make others feel guilty	○	○	○	○	○
I sometimes exaggerate a personal or health problem in order to gain sympathy and avoid doing a task	○	○	○	○	○
If someone has a problem I offer to help if they need it	○	○	○	○	○
I feel that I lack emotional skills	○	○	○	○	○

EMOTION REGULATION QUESTIONNAIRE (ERQ)

Reference:

Gross, J.J., & John, O.P. (2003). Individual differences in two emotion regulation processes: Implications for affect, relationships, and well-being. *Journal of Personality and Social Psychology, 85,* 348-362.

Description of Measure:

A 10-item scale designed to measure respondents' tendency to regulate their emotions in two ways: (1) Cognitive Reappraisal and (2) Expressive Suppression. Respondents answer each item on a 7-point Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree).

Note: the authors request that researchers do not change the order of the items.

Abstracts of Selected Related Articles:

Ochsner, K. & Gross, J. J. (2005). The cognitive control of emotion. *Trends in Cognitive Sciences, 9,* 242-249.

> The capacity to control emotion is important for human adaptation. Questions about the neural bases of emotion regulation have recently taken on new importance, as functional imaging studies in humans have permitted direct investigation of control strategies that draw upon higher cognitive processes difficult to study in nonhumans. Such studies have examined (1) controlling attention to, and (2) cognitively changing the meaning of, emotionally evocative stimuli. These two forms of emotion regulation depend upon interactions between prefrontal and cingulate control systems and cortical and subcortical emotion-generative systems. Taken together, the results suggest a functional architecture for the cognitive control of emotion that dovetails with findings from other human and nonhuman research on emotion.

Butler, E. A., Egloff, B., Wilhelm, F. H., Smith, N. C., Erikson, E. A., & Gross, J. J. (2003). The social consequences of expressive suppression. *Emotion, 3,* 48-67.

> At times, people keep their emotions from showing during social interactions. The authors' analysis suggests that such expressive suppression should disrupt communication and increase stress levels. To test this hypothesis, the authors conducted 2 studies in which unacquainted pairs of women discussed an upsetting topic. In Study 1, one member of each pair was randomly assigned to (a) suppress her emotional behavior, (b) respond naturally, or (c) cognitively reappraise in a way that reduced emotional responding. Suppression alone disrupted communication and magnified blood pressure responses in the suppressors' partners. In Study 2, suppression had a negative impact on the regulators'

emotional experience and increased blood pressure in both regulators and their partners. Suppression also reduced rapport and inhibited relationship formation.

Mauss, I. B., Levenson, R. W. McCarter, L., Wilhelm, F. H., Gross, J. J. (2005). The tie that binds? Coherence among emotion experience, behavior, and physiology. *Emotion, 5,* 175-190.

Emotion theories commonly postulate that emotions impose coherence across multiple response systems. However, empirical support for this coherence postulate is surprisingly limited. In the present study, the authors (a) examined the within-individual associations among experiential, facial behavioral, and peripheral physiological responses during emotional responding and (b) assessed whether emotion intensity moderates these associations. Experiential, behavioral, and physiological responses were measured second-by-second during a film that induced amusement and sadness. Results indicate that experience and behavior were highly associated but that physiological responses were only modestly associated with experience and behavior. Intensity of amusement experience was associated with greater coherence between behavior and physiological responding; intensity of sadness experience was not. These findings provide new evidence about response system coherence in emotions.

Scale (take directly from http://psychology.stanford.edu/~psyphy/resources.html**):**

Instructions and Items:

We would like to ask you some questions about your emotional life, in particular, how you control (that is, regulate and manage) your emotions. The questions below involve two distinct aspects of your emotional life. One is your emotional experience, or what you feel like inside. The other is your emotional expression, or how you show your emotions in the way you talk, gesture, or behave. Although some of the following questions may seem similar to one another, they differ in important ways. For each item, please answer using the following scale:

1	2	3	4	5	6	7
strongly disagree			**neutral**			**strongly agree**

1. ____ When I want to feel more *positive* emotion (such as joy or amusement), I *change what I'm thinking about*.

2. ____ I keep my emotions to myself.

3. ____ When I want to feel less *negative* emotion (such as sadness or anger), I *change what I'm thinking about*.

4. ____When I am feeling *positive* emotions, I am careful not to express them.

5. ____When I'm faced with a stressful situation, I make myself *think about it* in a way that helps me stay calm.

6. ____ I control my emotions by *not expressing them*.

7. ____When I want to feel more *positive* emotion, I *change the way I'm thinking* about the situation.

8. ____ I control my emotions by *changing the way I think* about the situation I'm in.

9. ____When I am feeling *negative* emotions, I make sure not to express them.

10. ____When I want to feel less *negative* emotion, I *change the way I'm thinking* about the situation.

Scoring:

Items 1, 3, 5, 7, 8, 10 make up the Cognitive Reappraisal facet.
Items 2, 4, 6, 9 make up the Expressive Suppression facet.

Scoring is kept continuous.
Each facet's scoring is kept separate.

Difficulties in Emotion Regulation Scale (DERS)

Please indicate how often the following statements apply to you by writing the appropriate number from the scale below on the line beside each item.

1----------2----------3----------4----------5

almost never	sometimes	about half the time	most of the time	almost always
(0-10%)	(11-35%)	(36-65%)	(66-90%)	(91-100%)

_____ 1) I am clear about my feelings.
_____ 2) I pay attention to how I feel.
_____ 3) I experience my emotions as overwhelming and out of control.
_____ 4) I have no idea how I am feeling.
_____ 5) I have difficulty making sense out of my feelings.
_____ 6) I am attentive to my feelings.
_____ 7) I know exactly how I am feeling.
_____ 8) I care about what I am feeling.
_____ 9) I am confused about how I feel.
_____ 10) When I'm upset, I acknowledge my emotions.
_____ 11) When I'm upset, I become angry with myself for feeling that way.
_____ 12) When I'm upset, I become embarrassed for feeling that way.
_____ 13) When I'm upset, I have difficulty getting work done.
_____ 14) When I'm upset, I become out of control.
_____ 15) When I'm upset, I believe that I will remain that way for a long time.
_____ 16) When I'm upset, I believe that I will end up feeling very depressed.
_____ 17) When I'm upset, I believe that my feelings are valid and important.
_____ 18) When I'm upset, I have difficulty focusing on other things.
_____ 19) When I'm upset, I feel out of control.
_____ 20) When I'm upset, I can still get things done.
_____ 21) When I'm upset, I feel ashamed at myself for feeling that way.
_____ 22) When I'm upset, I know that I can find a way to eventually feel better.
_____ 23) When I'm upset, I feel like I am weak.
_____ 24) When I'm upset, I feel like I can remain in control of my behaviors.
_____ 25) When I'm upset, I feel guilty for feeling that way.
_____ 26) When I'm upset, I have difficulty concentrating.
_____ 27) When I'm upset, I have difficulty controlling my behaviors.
_____ 28) When I'm upset, I believe there is nothing I can do to make myself feel better.
_____ 29) When I'm upset, I become irritated at myself for feeling that way.
_____ 30) When I'm upset, I start to feel very bad about myself.
_____ 31) When I'm upset, I believe that wallowing in it is all I can do.
_____ 32) When I'm upset, I lose control over my behavior.
_____ 33) When I'm upset, I have difficulty thinking about anything else.
_____ 34) When I'm upset I take time to figure out what I'm really feeling.
_____ 35) When I'm upset, it takes me a long time to feel better.
_____ 36) When I'm upset, my emotions feel overwhelming.

Reverse-scored items (place a subtraction sign in front of them) are numbered 1, 2, 6, 7, 8, 10, 17, 20, 22, 24 and 34.

Calculate total score by adding everything up. Higher scores suggest greater problems with emotion regulation.

SUBSCALE SCORING:** The measure yields a total score (SUM) as well as scores on six sub-scales:

1. Nonacceptance of emotional responses (NONACCEPT): 11, 12, 21, 23, 25, 29
2. Difficulty engaging in Goal-directed behavior (GOALS): 13, 18, 20R, 26, 33
3. Impulse control difficulties (IMPULSE): 3, 14, 19, 24R, 27, 32
4. Lack of emotional awareness (AWARENESS): 2R, 6R, 8R, 10R, 17R, 34R
5. Limited access to emotion regulation strategies (STRATEGIES): 15, 16, 22R, 28, 30, 31, 35, 36
6. Lack of emotional clarity (CLARITY): 1R, 4, 5, 7R, 9

Total score: sum of all subscales

**"R" indicates reverse scored item

REFERENCE:

Gratz, K. L. & Roemer, L. (2004). Multidimensional assessment of emotion regulation and dysregulation: Development, factor structure, and initial validation of the Difficulties in Emotion Regulation Scale. *Journal of Psychopathology and Behavioral Assessment, 26,* 41-54.

LEAS-A

Subject#:_____ Study#:_____

INSTRUCTIONS

Please describe what you would feel in the following situations. The only requirement is that you use the word "feel" in your answers. You may make your answers as brief or as long as necessary to express how you would feel. In each situation there is another person mentioned. Please indicate how you think that other person would feel as well.

1. A neighbor asks you to repair a piece of furniture. As the neighbor looks on, you begin hammering the nail but then miss the nail and hit your finger. How would you feel? How would the neighbor feel?

2. A loved one gives you a back rub after you return from a hard day's work. How would you feel? How would your partner feel?

3. As you drive over a suspension bridge you see a person standing on the other side of the guardrail, looking down at the water. How would you feel? How would the person feel?

4. Your boss tells you that your work has been unacceptable and needs to be improved. How would you feel? How would your boss feel?

5. You are standing in line at the bank. The person in front of you steps up to the window and begins a very complicated transaction. How would you feel? How would the person in front of you feel?

6. You have been working hard on a project for several months. Several days after submitting it, your boss stops by to tell you that your work was excellent. How would you feel? How would your boss feel?

7. Your dentist has told you that you have several cavities and schedules you for a return visit. How would you feel? How would the dentist feel?

8. Your doctor told you to avoid fatty foods. A new colleague at work calls to say that she/he is going out for pizza and invites you to go along. How would you feel? How would your colleague feel?

9. You and a friend agree to invest money together to begin a new business venture. Several days later you call the friend back only to learn that she/he changed her/his mind. How would you feel? How would your friend feel?

10. You fall in love with someone who is both attractive and intelligent. Although this person is not well off financially, this doesn't matter to you -- your income is adequate. When you begin to discuss marriage, you learn that she/he is actually from an extremely wealthy family. She/he did not want that known for fear that people would only be interested in her/him for her/his money. How would you feel? How would she/he feel?

LEAS-B

Subject#:_____ Study#:_____

INSTRUCTIONS

Please describe what you would feel in the following situations. The only requirement is that you use the word "feel" in your answers. You may make your answers as brief or as long as necessary to express how you would feel. In each situation there is another person mentioned. Please indicate how you think that other person would feel as well.

1. You are walking through the desert with a guide. You ran out of water hours ago. The nearest well is two miles away according to the guide's map. How would you feel? How would the guide feel?

2. You are running in a race with a friend with whom you have trained for some time. As you near the finish line, you twist your ankle, fall to the ground, and are unable to continue. How would you feel? How would your friend feel?

3. You are traveling in a foreign country. An acquaintance makes derogatory remarks about your native country. How would you feel? How would your acquaintance feel?

4. Your sweetheart has been gone for several weeks but finally comes home. As your sweetheart opens the door....how would you feel? How would your sweetheart feel?

5. You and your spouse are driving home from an evening out with friends. As you turn onto your block you see fire-trucks parked near your home. How would you feel? How would your spouse feel?

6. You receive an unexpected long-distance phone call from a doctor informing you that your mother has died. How would you feel? How would the doctor feel?

7. You tell a friend who is feeling lonely that she/he can call you whenever she/he needs to talk. One night she/he calls at 4:00 a.m. How would you feel? How would your friend feel?

8. Someone who has been critical of you in the past pays you a compliment. How would you feel? How would the other person feel?

9. You sell a favorite possession of your own in order to buy an expensive gift for your spouse. When you give him/her the gift, he/she asks whether you sold the possession. How would you feel? How would your spouse feel?

10. You and your best friend are in the same line of work. There is a prize given annually to the best performance of the year. The two of you work hard to win the prize. One night the winner is announced: your friend. How would you feel? How would your friend feel?

CISS

The following are ways that people react to various difficult, stressful, or upsetting situations. Please select a number from 1 to 5 for each item. Indicate how much you engage in these types of activities when you encounter a difficult, stressful, or upsetting situation.

	Not at all				Very Much
	1	2	3	4	5
Schedule my time better.	○	○	○	○	○
Focus on the problem and see how I can solve it.	○	○	○	○	○
Think about the good times I've had.	○	○	○	○	○
Try to be with other people.	○	○	○	○	○
Blame myself for procrastinating.	○	○	○	○	○
Do what I think is best.	○	○	○	○	○
Become preoccupied with aches and pains.	○	○	○	○	○
Blame myself for having gotten into this situation.	○	○	○	○	○
Window shop.	○	○	○	○	○
Outline my priorities.	○	○	○	○	○
Try to go to sleep.	○	○	○	○	○
Treat myself to a favorite food or snack.	○	○	○	○	○
Feel anxious about not being able to cope.	○	○	○	○	○

Become very tense.	○	○	○	○	○
Think about how I solved similar problems.	○	○	○	○	○
Tell myself that it is really not happening to me.	○	○	○	○	○
Blame myself for being too emotional about the situation.	○	○	○	○	○
Go out for a snack or meal.	○	○	○	○	○
Become very upset.	○	○	○	○	○
Buy myself something.	○	○	○	○	○
Determine a course of action and follow it.	○	○	○	○	○
Blame myself for not knowing what to do.	○	○	○	○	○
Go to a party.	○	○	○	○	○
Work to understand the situation.	○	○	○	○	○
"Freeze" and not know what to do.	○	○	○	○	○
Take corrective action immediately.	○	○	○	○	○
Think about the event and learn from my mistakes.	○	○	○	○	○

Wish that I could change what had happened or how I felt.	○	○	○	○	○
Visit a friend.	○	○	○	○	○
Worry about what I am going to do.	○	○	○	○	○
Spend time with a special person.	○	○	○	○	○
Go for a walk.	○	○	○	○	○
Tell myself that it will never happen again.	○	○	○	○	○
Focus on my general inadequacies.	○	○	○	○	○
Talk to someone whose advice I value.	○	○	○	○	○
Analyze the problem before reacting.	○	○	○	○	○
Phone a friend.	○	○	○	○	○
Get angry.	○	○	○	○	○
Adjust my priorities.	○	○	○	○	○
See a movie.	○	○	○	○	○
Get control of the situation.	○	○	○	○	○
Make an extra effort to get things done.	○	○	○	○	○

Come up with several different solutions to the problem.	○	○	○	○	○
Take some time off and get away from the situation.	○	○	○	○	○
Take it out on other people.	○	○	○	○	○
Use the situation to prove that I can do it.	○	○	○	○	○
Try to be organized so I can be on top of the situation.	○	○	○	○	○
Watch TV.	○	○	○	○	○

The following assessment is used to measure your personal opinion on how much workload was required of you during this first half of your visit today.

In this assessment, you will first be asked to rate six workload measures.

After you have completed the ratings, you will be asked to compare two workload measures and decide which is more important than the other when considering the tasks you completed in the first half of this visit. You will be asked to answer 15 of these pairings.

There are no right or wrong answers.

Please rate all six workload measures below by clicking a point on the scale that best represents your experience with the tasks you completed in the first half of this visit.

Consider each scale individually and select your responses carefully. Beneath each workload measure is the definition of the workload measure.

Please note that the Performance scale goes from **Poor** on the left to **Good** on the right.

Mental Demand: How mentally demanding was the task?

How much mental and perceptual activity was required (e.g. thinking, deciding, calculating, remembering, looking, searching, etc.)? Was the task easy or demanding, simple or complex, exacting or forgiving?

Very Low Very High

0 10 20 30 40 50 60 70 80 90 100

Physical Demand: How physically demanding was the task?

How much physical activity was required (e.g. pushing, pulling, turning, controlling, activating, etc.)? Was the task easy or demanding, slow or brisk, slack or strenuous, restful or laborious?

Very Low Very High

0 10 20 30 40 50 60 70 80 90 100

Temporal Demand: How hurried or rushed was the pace of the task?

How much time pressure did you feel due to the rate or pace at which the tasks or task elements occurred? Was the pace slow and leisurely or rapid and frantic?

Very Low — Very High

0 10 20 30 40 50 60 70 80 90 100

Performance: How successful were you in accomplishing what you were asked to do?

How successful do you think you were in accomplishing the goals of the tasks set by the experimenter (or yourself)? How satisfied were you with your performance in accomplishing these goals?

Poor — Good

0 10 20 30 40 50 60 70 80 90 100

Effort: How hard did you have to work to accomplish your level of performance?

How hard did you have to work (mentally and physically) to accomplish your level of performance?

Very Low — Very High

0 10 20 30 40 50 60 70 80 90 100

Frustration: How insecure, discouraged irritated, stressed, and annoyed were you?

How insecure, discouraged, irritated, stressed, and annoyed versus secure, gratified, content, relaxed and complacent did you feel during the task?

Very Low — Very High

0 10 20 30 40 50 60 70 80 90 100

→

Of the two workload measures below, which one was more important to your experience of workload in the tasks that you completed in the first half of this visit?

- ○ Effort
- ○ Performance

→

Of the two workload measures below, which one was more important to your experience of workload in the tasks that you completed in the first half of this visit?

- ○ Temporal Demand
- ○ Frustration

→

Of the two workload measures below, which one was more important to your experience of workload in the tasks that you completed in the first half of this visit?

- ○ Temporal Demand
- ○ Effort

→

Of the two workload measures below, which one was more important to your experience of workload in the tasks that you completed in the first half of this visit?

- ○ Physical Demand
- ○ Frustration

→

Of the two workload measures below, which one was more important to your experience of workload in the tasks that you completed in the first half of this visit?

- ○ Performance
- ○ Frustration

→

Of the two workload measures below, which one was more important to your experience of workload in the tasks that you completed in the first half of this visit?

- ○ Physical Demand
- ○ Temporal Demand

→

Of the two workload measures below, which one was more important to your experience of workload in the tasks that you completed in the first half of this visit?

- ○ Physical Demand
- ○ Performance

→

Of the two workload measures below, which one was more important to your experience of workload in the tasks that you completed in the first half of this visit?

- ○ Temporal Demand
- ○ Mental Demand

→

Of the two workload measures below, which one was more important to your experience of workload in the tasks that you completed in the first half of this visit?

- ○ Frustration
- ○ Effort

→

Of the two workload measures below, which one was more important to your experience of workload in the tasks that you completed in the first half of this visit?

- ○ Performance
- ○ Mental Demand

→

Of the two workload measures below, which one was more important to your experience of workload in the tasks that you completed in the first half of this visit?

- ○ Performance
- ○ Temporal Demand

→

Of the two workload measures below, which one was more important to your experience of workload in the tasks that you completed in the first half of this visit?

- ○ Mental Demand
- ○ Effort

→

Of the two workload measures below, which one was more important to your experience of workload in the tasks that you completed in the first half of this visit?

- ○ Mental Demand
- ○ Physical Demand

→

Of the two workload measures below, which one was more important to your experience of workload in the tasks that you completed in the first half of this visit?

- ○ Effort
- ○ Physical Demand

→

Survey Powered By Qualtrics

Of the two workload measures below, which one was more important to your experience of workload in the tasks that you completed in the first half of this visit?

- ○ Frustration
- ○ Mental Demand

→

UCLA Empathic Accuracy Task

The Empathic Accuracy Task is designed to understand how well we empathize others in every life. To do so, this task assess the degree to which individuals can accurately infer the affective state of another person using video stimuli that involve dynamic and rapidly changing multi-modal social cues.

The participants watch a practice video first and undergo the same instructions and questions for the full 9-video task. After the practice video, the participants take the full task.

When starting the computerized program, the following instructions display:

> "In this experiment, you will watch a series of film clips in which people will talk about emotional events in their lives—either a memory or current experience.
>
> There will be 9 video clips that average about 2 minutes in length. Before each clip, you will see a fixation cross. Then you will be asked to press the space bar to start the clip shortly afterwards. You will also see a rating scale below the clip.
>
> While watching the clip, use the right and left arrow keys to track how a person in the clip is feeling at each moment. The right key moves the rating to be more positive; the left key moves the rating to be more negative.
>
> For these ratings, you will continuously use the rating scale on the bottom of the screen to rate how the person is feeling at each moment. It is very important for you to focus on the moment-to-moment changes in the person's emotions, and track those changes with the arrow keys.
>
> After you mark your ratings, we will ask you about your general impression of the person in the video. For these, you will use the number keys at the top of the keyboard.
>
> If you have any questions, please ask the experiment now. If not, press the spacebar to begin the experiment."

After the participants watch each video and rate their moment-to-moment impressions of the target individual's emotional state, participants are asked to give an answer on a scale underneath the question. The questions are:

- How SIMILAR do you feel you are to this person?
    - Scale:
        - 1 (Not at all) to 9 (Extremely)
- Overall, how ACCURATE did you think you were about this person's emotions?
    - Scale:
        - 1 (Not at all) to 9 (Extremely)
- Overall, how did you feel while watching this video?
    - Scale:
        - 1 (Very negative) to 9 (Very Positive)
- Overall, how POSITIVE or NEGATIVE do you think this person felt while talking about this event?
    - Scale
        - 1 (Very negative) to 9 (Very Positive)

Situational Test of Emotion Management - Brief (STEM-B)

Reference:
Allen, V. D., Rahman, N., Weissman, A., MacCann, C., & Roberts, R. D. (2013, in draft). Development and Validation of the Situational Test of Emotional Management – Brief (STEM-B) Using Item Response Theory and Latent Class Analysis. [Short Form]
MacCann, C., & Roberts, R. D. (2008). New Paradigms for Assessing Emotional Intelligence: Theory and Data. *Emotion, 8,* 540-551. [Long form]

Description: This situational judgment test assesses emotion management, a key component of emotional intelligence. In each item, the test-taker is required to select the most effective response to manage an emotional situation. The long form consists of 44 items and the short form consists of 18 items.

Test development. The test was developed based on qualitative analysis of semi-structured interviews, and is scored by expert judgment. For more information on test development, see MacCann and Roberts (2008).

Reliability. The Cronbach's alpha for the short form is 0.84.

Instructions (multiple-choice form)

In this test, you will be presented with a few brief details about an emotional situation, and asked to choose from four responses the most effective course of action to manage both the emotions the person is feeling and the problems they face in that situation.

Although more than one course of action might be acceptable, you are asked to choose what you think the most effective response for that person in that situation would be.

Remember, you are not necessarily choosing what you would do, or the nicest thing to do, but choosing the most effective response for that situation.

Test items

1. Wai-Hin and Connie have shared an office for years but Wai-Hin gets a new job and Connie loses contact with her. *What action would be the most effective for Connie?*
(a) Just accept that she is gone and the friendship is over.
(b) Ring Wai-Hin and ask her out for lunch or coffee to catch up.
(c) Contact Wai-Hin and arrange to catch up but also make friends with her replacement.
(d) Spend time getting to know the other people in the office, and strike up new friendships.

2. Manual is only a few years from retirement when he finds out his position will no longer exist, although he will still have a job with a less prestigious role. *What action would be the most effective for Manual?*
(a) Carefully consider his options and discuss it with his family.
(b) Talk to his boss or the management about it.
(c) Accept the situation, but still feel bitter about it.
(d) Walk out of that job.

3. Surbhi starts a new job where he doesn't know anyone and finds that no one is particularly friendly. *What action would be the most effective for Surbhi?*
(a) Have fun with his friends outside of work hours.
(b) Concentrate on doing his work well at the new job.
(c) Make an effort to talk to people and be friendly himself.
(d) Leave the job and find one with a better environment.

4. Andre moves away from the city his friends and family are in. He finds his friends make less effort to keep in contact than he thought they would. *What action would be the most effective for Andre?*
(a) Try to adjust to life in the new city by joining clubs and activities there.
(b) He should make the effort to contact them, but also try to meet people in his new city.
(c) Let go of his old friends, who have shown themselves to be unreliable.
(d) Tell his friends he is disappointed in them for not contacting him.

5. Clayton has been overseas for a long time and returns to visit his family. So much has changed that Clayton feels left out. *What action would be the most effective for Clayton?*
(a) Nothing – it will sort itself out soon enough.
(b) Tell his family he feels left out.
(c) Spend time listening and getting involved again.
(d) Reflect that relationships can change with time.

6. Daniel has been accepted for a prestigious position in a different country from his family, who he is close to. He and his wife decide it is worth relocating. *What action would be the most effective for Daniel?*
(a) Realize he shouldn't have applied for the job if he didn't want to leave.
(b) Set up a system for staying in touch, like weekly phone calls or emails.
(c) Think about the great opportunities this change offers.
(d) Don't take the position.

7. Mei Ling answers the phone and hears that close relatives are in hospital critically ill. *What action would be the most effective for Mei Ling?*
(a) Let herself cry and express emotion for as long as she feels like.
(b) Speak to other family to calm herself and find out what is happening, then visit the hospital.
(c) There is nothing she can do.
(d) Visit the hospital and ask staff about their condition.

8. Shona has not spoken to her nephew for months, whereas when he was younger they were very close. She rings him but he can only talk for five minutes. *What action would be the most effective for Shona?*
(a) Realize that he is growing up and might not want to spend so much time with his family any more.
(b) Make plans to drop by and visit him in person and have a good chat.
(c) Understand that relationships change, but keep calling him from time to time.
(d) Be upset about it, but realize there is nothing she can do.

9. Mina and her sister-in-law normally get along quite well, and the sister-in-law regularly baby-sits for her for a small fee. Lately she has also been cleaning away cobwebs, commenting on the mess, which Mina finds insulting. *What action would be the most effective for Mina?*
(a) Tell her sister-in-law these comments upset her.
(b) Get a new babysitter.
(c) Be grateful her house is being cleaned for free.
(d) Tell her only to baby-sit, not to clean.

10. Juno is fairly sure his company is going down and his job is under threat. It is a large company and nothing official has been said. *What action would be the most effective for Juno?*
(a) Find out what is happening and discuss his concerns with his family.
(b) Try to keep the company afloat by working harder.
(c) Start applying for other jobs.
(d) Think of these events as an opportunity for a new start.

11. Mallory moves from a small company to a very large one, where there is little personal contact, which she misses. *What action would be the most effective for Mallory?*
(a) Talk to her workmates, try to create social contacts and make friends.
(b) Start looking for a new job so she can leave that environment.
(c) Just give it time, and things will be okay.
(d) Concentrate on her outside-work friends and colleagues from previous jobs.

12. A demanding client takes up a lot of Jill's time and then asks to speak to Jill's boss about her performance. Although Jill's boss assures her that her performance is fine, Jill feels upset. *What action would be the most effective for Jill?*
(a) Talk to her friends or workmates about it.
(b) Ignore the incident and move on to her next task.
(c) Calm down by taking deep breaths or going for a short walk.
(d) Think that she has been successful in the past and this client being difficult is not her fault.

13. Blair and Flynn usually go to a cafe after the working week and chat about what's going on in the company. After Blair's job is moved to a different section in the company, he stops coming to the cafe. Flynn misses these Friday talks. *What action would be the most effective for Flynn?*
(a) Go to the cafe or socialize with other workers.
(b) Don't worry about it, ignore the changes and let Blair be.
(c) Not talk to Blair again.
(d) Invite Blair again, maybe rescheduling for another time.

14. Michelle's friend Dara is moving overseas to live with her partner. They have been good friends for many years and Dara is unlikely to come back. *What action would be the most effective for Michelle?*
(a) Forget about Dara.
(b) Spend time with other friends, keeping herself busy.
(c) Think that Dara and her partner will return soon.
(d) Make sure she keeps in contact through email, phone or letter writing.

15. Hannah's access to essential resources has been delayed and her work is way behind schedule. Her progress report makes no mention of the lack of resources. *What action would be the most effective for Hannah?*
(a) Explain the lack of resources to her boss or to management.
(b) Learn that she should plan ahead for next time.
(c) Document the lack of resources in her progress report.
(d) Don't worry about it.

16. Reece's friend points out that her young children seem to be developing more quickly than Reece's. Reece sees that this is true. *What action would be the most effective for Reece?*
(a) Talk the issue over with another friend.
(b) Angrily confront her friend about making such statements.
(c) Realize that children develop at different rates.
(d) Talk to a doctor about what the normal rates of development are.

17. Jumah has been working at a new job part-time while he studies. His shift times for the week are changed at the last minute, without consulting him. *What action would be the most effective for Jumah?*
(a) Refuse to work the new shifts.
(b) Find out if there is some reasonable explanation for the shift changes.
(c) Tell the manager in charge of shifts that he is not happy about it.
(d) Grumpily accept the changes and do the shifts.

18. Julie hasn't seen Ka for ages and looks forward to their weekend trip away. However, Ka has changed a lot and Julie finds that she is no longer an interesting companion. *What action would be the most effective for Julie?*
(a) Cancel the trip and go home.
(b) Realize that it is time to give up the friendship and move on.
(c) Understand that people change, so move on, but remember the good times.
(d) Concentrate on her other, more rewarding friendships.

Scoring the multiple-choice STEM in SPSS

The following SPSS syntax can be used to score the 44 items of the multiple-choice STEM. This assumes that the variable names for the items are STEM01, STEM02, STEM03, STEM04 etc up to STEM18, and that the responses are coded as A=1, B=2, C=3, and D=4.

```
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IF STEM01 = 2 STEM_R01 = 0 .
IF STEM01 = 3 STEM_R01 = 0.916666667 .
IF STEM01 = 4 STEM_R01 = 0.083333333 .

IF STEM02 = 1 STEM_R02 = 0.75 .
IF STEM02 = 2 STEM_R02 = 0.25 .
IF STEM02 = 3 STEM_R02 = 0 .
IF STEM02 = 4 STEM_R02 = 0 .

IF STEM03 = 1 STEM_R03 = 0 .
IF STEM03 = 2 STEM_R03 = 0.166666667 .
IF STEM03 = 3 STEM_R03 = 0.833333333 .
IF STEM03 = 4 STEM_R03 = 0 .

IF STEM04 = 1 STEM_R04 = 0 .
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IF STEM13 = 4 STEM_R13 = 0.833333333 .

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IF STEM18 = 4 STEM_R18 = 0.083333333 .

GERT-S (Geneva Emotion Recognition Test – Short)

The GERT-S is an emotion recognition task that is done via online survey. Participants will take the survey via web browser. Below are the directions explaining the task, along with one of the instructions providing an image from one of the short, 3-second clips that will be shown.

How well can you recognize emotions?

This test measures your ability to recognize emotions expressed in a speaker's face and voice.

It will take you between 10 and 15 minutes to complete the test.

You will see a series of short videos in which actors express different emotions. Your task is to select the emotion word which best describes the emotion the actor wanted to express.
In some cases this can be quite difficult. Just trust your intuition - people's first guesses are usually the best.

Please put on your headphones to hear the sound.

It is essential that you complete the test in one go, without any interruption.

Attention: Please deactivate any add-ons or software that prevents your browser from accessing external sites, such as ad-block programs, for the duration of the test. The videos in this test might otherwise not be displayed correctly.

After each video, 14 emotion words are presented, arranged in a circle that will help you to rapidly select the appropriate emotion:

After having watched a video, please select the emotion word that best describes the emotion the actor wanted to express by clicking on the respective circle.

As the actors' utterances consist of a sequence of meaningless syllables, **you will not be able to understand any words**. However, you can still recognize the emotional tone of the utterance.

You can watch each video only once.

Please play the **example video** below to make sure you hear the sound and adjust the volume if necessary.

Inter-Personal Affect Regulation Task

For each question, please answer in <u>two ways</u>. First, please select the answer that you think would be the most effective response for <u>achieving the stated goal</u>. Second, please select the response that <u>you are most likely to actually choose</u> if you were in the situation.

1

Situation:

Your friend Alex comes to you distressed because her significant other, Sam, yelled at her and broke some things around her apartment.

Alex's thoughts and feelings:

Alex feels afraid of Sam. At the same time, Alex is confused because she thought things were going great with Sam. Alex wonders what she did to make Sam mad.

Goal:

Say something to Alex to improve how she is feeling about the situation in the long-term.

Responses:

A. I feel like you are making a big deal out of this unnecessarily. Sam didn't actually hit you, and all couples argue from time to time. I think you should try to forgive and forget."

B. "I'm so sorry that this happened to you, but it's definitely not your fault. You are not responsible for Sam's choices, regardless of the circumstance."

C. "That sounds like a mess. Let's go shopping to replace the things Sam broke. It'll be good for both of you to take some time to cool down."

D. "Wow, Sam must have been really upset to actually start breaking things. Do you have any idea why he was so angry with you?"

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

2

Situation:

Mike was recently injured and now needs to use a wheelchair until he heals. He has trouble reaching destinations on time and doing certain things on his own.

Mike's thoughts and feelings:

He feels frustrated that he cannot move any faster with his injury and embarrassed that he needs to request help for things that he could easily do without the injury.

Goal:

Say something to Mike to improve how he feels about the situation with regard to his future.

Responses:

A. "It seems like you're getting the hang of that wheelchair! At least you'll only have to deal with it until you're healed. So don't worry about it."

B. "Hey, maybe you can learn to do some wheelies while you're in the chair and show off. That way, if I end up in a wheelchair someday, you can teach me all your tricks."

C. "I know that you're frustrated, but no one thinks less of you for being injured. I'm sure you would be understanding of a friend in a similar situation."

D. "You could probably make it to places on time if you rolled faster or got up earlier. But I'm sure you'll get the hang of it eventually. It'll just take time."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

3

Situation:

Your co-worker Brian confides in you that a girl you both work with has been hitting on him. He's uninterested and would like her to stop.

Brian's thoughts and feelings:

He feels uncomfortable with her advances, but is afraid of rejecting her and hurting her feelings. He's also afraid of looking like a jerk to his other co-workers and wants to maintain professional relationships.

Goal:

Says something to Brian to improve how he feels about the situation.

Responses:

A. “You’re complaining about someone hitting on you? You should really be taking this as a compliment. It’s just harmless flirting, so I don’t understand what you are getting so worked up about.”

B. “I know you think she might get her feelings hurt, but I think you should talk to her. She might not know she’s making you uncomfortable. I’m sure the others will understand if you talk to her nicely.”

C. “She’ll get the message if you keep ignoring her. Just focus on your work. She’ll have to stop eventually and this way you won’t embarrass her or make her feel uncomfortable.”

D. “That is very strange and I think you have every right to feel uncomfortable. Anyone remotely interested in you *must* have some serious issues. I would steer clear of her.” (*Said Sarcastically*)

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

4

Situation:

Francis has a terrible headache. He is in a loud, crowded office and is trying to get work done.

Francis' thoughts and feelings:

His headache is making him very irritable. He is becoming annoyed by the bright light in the room and all the loud chatter from the people around him. Francis thinks everyone else is being inconsiderate and that they must not respect him.

Goal:

Say something to Francis to improve how he feels about the situation.

Responses:

A. "Next time that these people are trying to get work done, we should plan to do everything we can to distract them. That way they'll know how it feels."

B. "Just deal with it. I know you're annoyed but you aren't the first person in the world to get a headache at work. You don't want these people to think you're an uptight jerk do you?"

C. "Try to power through it until we can break for lunch. Everyone has to deal with annoyances like this at some point or another. It'll be over soon enough."

D. "Sorry your head hurts. They probably don't even know that they're annoying you. Would you like to go somewhere else to get work done instead?"

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

5

Situation:

Wyatt dropped out of high school when he was seventeen. Whenever someone brings up the topic of school or work with him he tends to get very defensive and agitated.

Wyatt's thoughts and feelings:

Wyatt feels ashamed about having to drop out of school and is worried that other people might think less of him if they knew.

Goal:

Say something to Wyatt to improve how he feels about the situation.

Responses:

A. "It's fine to keep people out of your business. They don't have any right to pry into your past anyway. You have no obligation to discuss it with anyone you don't want to."

B. "People are always going to ask, so you should try and make up a whole bunch of interesting stories about where you've been to school."

C. "Maybe you should just go back to school if you're feeling so bad about it. You would feel better about yourself and people would obviously stop asking you about it. So what's stopping you?"

D. "I'm sorry you feel ashamed. Perhaps people are just interested to hear how you're making things work on this less traditional path."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

6

Situation:

Jessica has a friend whose company recently became tremendously successful. When her friend first started her company she asked Jessica to be her partner, but Jessica turned her down.

Jessica's thoughts and feelings:

Jessica feels jealous of her friend who has suddenly become successful, seemingly out of nowhere. She regrets not taking her friend up on her offer to join the business.

Goal:

Say something to Jessica to improve how she feels about the situation.

Responses:

A. "You should be happy for your friend. She worked hard and as a result she's been successful. Besides, if you act jealous and mean to her you might never have the chance to join in on her success. I am sure you had your reasons, but you made a choice and you need to accept that."

B. "It must be so upsetting to watch from the outside. I think anyone in your position would feel this sort of jealousy and regret, but there's no way you could have known how things would turn out. I'm sure you had good reasons for making your decision at the time."

C. "You shouldn't stress yourself out about this. It was probably a one-in-a-million chance that she succeeded; how could you have known? You made a practical decision. Don't beat yourself up about it!"

D. "Maybe you'll think up your own million-dollar idea if you take a breather and treat yourself to something nice! It doesn't sound like you were all that interested in the business to begin with, so you're better off pursuing something else you are passionate about."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

7

Situation:

A group of Felix's friends played a prank on him. The prank unintentionally ruined some of his belongings. His friends paid for the damage but Felix is still upset.

Felix's thoughts and feelings:

Felix is agitated. He thinks his friends should have known that he wouldn't find the prank funny. He feels disrespected and thinks that no one understands that it's more than just the damage he's upset about.

Goal:

Say something to Felix to improve how he feels about the situation.

Responses:

A. "Well, if they've paid you back then there's nothing else you can do about it. Let's go hang out with some other friends instead to take your mind off of it."

B. "I agree. That was really disrespectful. It sounds like they're trying to fix things by paying you. Have you told them why you're still upset?"

C. "Take it easy. They paid for the things they broke so what else could they possibly do? I think you're being too hard on them."

D. "I would just take the money and let this all blow over. They probably didn't mean to hurt you or break your things with the prank."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

8

Situation:

Josh's great aunt passed away. However, Josh is really tight on money and he cannot afford to take time off of work to go to her funeral.

Josh's thoughts and feelings:

Josh is grieving the loss of his aunt but feels upset that he's not able to grieve alongside his family because of his financial situation.

Goal:

Say something to Josh to improve how he feels about the situation.

Responses:

A. "I'm sorry about your aunt. If you can't do anything about it, getting upset over it won't do any good and will just add more stress to what you're already dealing with."

B. "If I were in your position, I would do whatever I could to go to my aunt's funeral. Work can't possibly be more important. Have you asked your boss about maybe getting paid time off or something?"

C. "This whole situation must be so upsetting for you. Let's go and do something after you're done with work to get your mind off of it."

D. "I'm so sorry for your loss, it's terrible that you can't go. Is there any other way you can show your support, or be with your family, when you don't have work?"

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

9

Situation:

Josie has had the same job for a long time. She has begun to hate going to work every day. She doesn't want to look for a new job because her current job pays well and she is worried that other places would be even less enjoyable than where she currently works.

Josie's thoughts and feelings:

Josie feels bored and unfulfilled at her current job, but she is afraid that she would regret leaving this job to work somewhere else if it was just as bad.

Goal:

Say something to Josie to improve how she feels about the situation.

Responses:

A. "Let's go do something that'll take your mind off work. Your job doesn't have to be your whole life. You can do fun things and pursue your other interests when you're off the clock."

B. "Maybe it's your job performance that's making you feel unfulfilled. You should try to work harder and strive for more. Do you know of any promotions you could work toward for the future?"

C. "I understand feeling burned out. Would there be any harm in looking at other jobs? It seems like you'll either find a better job or perhaps you'll come to appreciate your current job more."

D. "Everyone feels like that at some point or another. Most people hate their jobs from time to time, but it usually comes and goes in waves. I think you could ride this feeling out and you'll come to like your job again."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

10

Situation:

Larry's brother was recently arrested and convicted of a violent crime. Larry's family wants to support his brother, but Larry doesn't.

Larry's thoughts and feelings:

Larry feels disgust for his brother's acts. He thinks that just because he's related to his brother doesn't mean that he has to support him. At the same time, he is fearful of conflict with the rest of his family.

Goal:

Say something to Larry to improve how he feels about the situation.

Responses:

A. "Blood is thicker than water. He's still your brother no matter what he did. You should try and forgive him."

B. "You can put on a brave face for your family. They don't have to know that you don't like your brother anymore."

C. You don't need to pay attention to any of them. Just keep living your life. Your brother can't influence your life from jail."

D. "You're entitled to your own feelings. Have you tried explaining to your family why you feel the way you do? Perhaps they are having a similar internal conflict.

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

11

Situation:

Ian is upset with his roommate John. John offered to give him a ride to the airport and then later told him he had been unexpectedly called into work only a few hours before Ian needed a ride. Ian had to pay for a shuttle to the airport.

Ian's thoughts and feelings:

Ian is angry because he thinks that if his roommate had said something earlier he could have asked someone else, and saved a lot of money.

Goal:

Say something to Ian to improve how he feels about the situation.

Responses:

A. "It sucks that you had to pay for a shuttle. That would be frustrating. I wonder if John had any control over the situation? It seems like he was just as surprised as you were."

B. "I don't mean to sound insensitive, but honestly this sounds like it might be your fault. You could have had a backup plan or checked in with John about his work commitments."

C. "Things like this just happen sometimes. I don't think it's anyone's fault that you ended up having to pay your own way. You should try to relax about it. I'm sure at one point or another you have unintentionally made John frustrated too."

D. "It won't do any good to dwell on it. You should do something fun on your vacation that will help you to relax. I'm sure by the end of this week you will have totally forgotten about this whole thing."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

12

Situation:

Austin is meeting up with Nick, an old acquaintance that he hasn't seen in a while. Nick is offering Austin a great place to live for an affordable price on a property that Nick owns. Austin used to be unkind to Nick when they were in school a few years ago.

Austin's thoughts and feelings:

Austin feels apprehensive about meeting up with Nick because he feels guilty about treating him poorly before. He's worried that Nick still holds a grudge and that Nick's offer can't be as good as it seems because of their past.

Goal:

Say something to Austin to improve how he feels about the situation.

Responses:

A. "I wouldn't go if I were you. There are always going to be more offers so why bother drudging up a bad feeling from the past just to look at one house?"

B. "It was pretty terrible of you to treat him badly and never apologize. He probably just wants to hang the offer over your head as payback. He sounds like such a jerk."

C. "I can see why you'd be nervous. But this might be a good opportunity to learn how he really feels about what you did. It also gives you a chance to set things right."

D. "It might be awkward, but maybe he just forgot about it. Meet up with him anyway and try to just focus on business. I think that'd be the most professional way to handle it.

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

13

Situation:

Marvin's parents weren't very good to him while he was growing up. He decided to cease contact with them when he became an adult. Now it is years later and Marvin's parents are contacting him. They want his forgiveness for the way they treated him.

Marvin's thoughts and feelings:

Growing up, Marvin always wanted a good relationship with his parents. He now feels conflicted about whether he should forgive them or stay angry. He also feels it is unfair that they seemingly expect him to forgive them so easily.

Goal:

Say something to Marvin to improve how he feels about the situation.

Responses:

A. "I'd feel pretty confused about what to do to, as well. Maybe start slow and see if you naturally grow to feel less hostile toward them. I think you will be able to tell if they have really changed."

B. "They're your parents; they raised you. Try to remember that everyone gets mad at their parents sometimes, but we forgive them because they're family and they love you."

C. "You don't need them. You have better people in your life now. I think you should focus on them rather than wasting energy on mending negative relationships. It is good to be appreciative toward your parents for raising you, but you don't owe them anything just because you're related."

D. "You don't have to decide anything right now. Maybe just don't think about it for a while. Keep focused on your own life and just see how things progress before you make a decision."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

14

Situation:

Kenneth has needed to take care of his mom ever since she had a stroke. He's having to juggle a lot of responsibilities by having to work, take care of his own kids, and also be her primary caregiver.

Kenneth's thoughts and feelings:

Kenneth feels stressed out and resentful towards his mom since he doesn't have any time to himself anymore. On the other hand, he thinks he would feel guilty and ashamed if he expressed how much he was struggling, or if he tried to reduce his responsibilities, because he takes pride in caring for his family.

Goal:

Say something to Kenneth to improve how he feels about the situation.

Responses:

A. "It sounds like you're being spread so thin. I think it would be difficult for anyone to keep that up alone for long. Is there anyone else who could help you out, even just for a little bit?"

B. "Your family needs you to do this for them. Wouldn't you want someone to take care of you if you were in their position? I know it's hard, but it's the right thing to do and you will regret it later on if you don't."

C. "You've gotten this far already, so it's obvious you're capable of doing it. It's mind over matter. Just keep doing what you're doing and I am sure that you'll get through this just fine."

D. "It sounds to me like you need some time to yourself. Go take a break, go somewhere nice and relax. You deserve it, and if you don't, you'll just end up burning out."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

15

Situation:

Isaiah's new neighbor has been acting very standoffish towards him. Isaiah has seen his new neighbor act friendly toward other people in the neighborhood, just not toward him.

Isaiah's thoughts and feelings:

Isaiah feels snubbed by his neighbor, and feels personally insulted that he would be nice to everyone in the neighborhood except for him, for seemingly no reason.

Goal:

Say something to Isaiah to improve how he feels about the situation.

Responses:

A. "I don't think it's worth focusing on. Have fun with your other neighbors and don't worry so much about him being rude to you. No one really has much of a say in who their neighbors are and he's probably just a rude person in general."

B. "He'll probably warm up to you eventually. It's not like he can avoid you forever. I think you should just keep to yourself and wait for him to talk to you."

C. "I would feel frustrated by that too, especially because it sounds like there is no good reason for it. Have you ever tried to approach him? Maybe he's just shy, and somehow he already got introduced to the other neighbors."

D. "Do you think you could have done something to make him not like you? It's weird that he wouldn't like you without knowing anything about you."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

16

Situation:

Aaron challenged one of his less athletic friends to a slam-dunk competition. Aaron was sure that he would win, but on the day of the competition, he lost very badly to his friend and stormed out of the room.

Aaron's thoughts and feelings:

Aaron feels embarrassed that he was so overconfident, only to lose in front of all of his friends. He feels even more embarrassed that he got so upset.

Goal:

Say something to Aaron to improve how he feels about the situation.

Responses:

A. "I think you're just being a sore loser. Your friend did well. You shouldn't be angry just because he was better than you expected. His abilities don't have any real effect on your own."

B. "It was probably just a fluke. This will just be one of those things everyone forgets. Just move on and don't focus on it too much. It's not like anyone actually thinks you are less athletic or worse at basketball because of this."

C. "It sucks that you didn't have fun, but it's just a game. Instead of playing more basketball, do you want to go do something else instead?"

D. "I can definitely see why you feel disappointed, and I'm sorry about the whole situation. I bet you'd gain a lot of respect from everybody if you go congratulate your friend on his win."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

17

Situation:

Enrico has been going to the gym with his friend, Rebecca. Enrico usually goes casually with the goal to just stay healthy, but Rebecca is constantly trying to push both herself and Enrico to their limits. As they are working out, she is constantly commenting disapprovingly on his workout routine.

Enrico's thoughts and feelings:

Enrico is annoyed at Rebecca and feels pressured by her comments. All he wants is a stress-free workout. He doesn't want to stop going to the gym with Rebecca because they're good friends, but he also doesn't want to confront her about her comments because he doesn't know if she'll be receptive.

Goal:

Say something to Enrico to improve how he feels about the situation.

Responses:

A. "I think you should try and relax so that you have more energy while you're at the gym. Maybe do something calming, like reading in your down time."

B. "That does sound really frustrating. Rebecca might just be trying to help; she may not even realize that it bothers you. You should try to talk to her about it."

C. "Maybe she's just trying to help. You might not be getting all of the benefits from your workout if you aren't pushing yourself."

D. "If you just ignore any comments she makes on your workout, then she ought to get the message. Just change the subject whenever she brings it up."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

18

Situation:

Your friend Kyle just found out that he did poorly on a very important exam that can determine whether or not he will get into graduate school.

Kyle's thoughts and feeling:

He feels discouraged about performing poorly on such a crucial exam that he had put so much effort into. He feels worried that he won't be able to get into graduate school. He thinks that now he cannot pursue the career he's been planning on for years.

Goal:

Improve how Kyle feels about his situation.

Responses:

A. "All I know is that you have been working way too hard for this recently. If anyone needs a drink, it's you. I'm taking you out tonight."

B. "Well this is probably for the best. I'm not sure graduate school would suit you that well anyway, considering it's such a huge commitment. Maybe this is a sign that you should reconsider your plans."

C. "Everybody struggles the first time they take that exam; this was just a trial run. Now that you have a better idea of what to expect, you can take it again and I bet you'll do great."

D. "These tests are stupid. You are incredibly smart and one of the most qualified people I know. I know that it's easier said than done, but try not to let this get you down for too long"

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

19

Situation:

Your friend Cali has just gotten into a horrible fight with her parents. The fight was because Cali's parents disapprove of her relationship with her significant other.

Cali's thoughts and feelings:

Cali feels angry because she thinks that her parents will not give her significant other a chance. She thinks that, as an adult, she should be trusted to make her own decisions about her relationships, but worries that if she continues to date this person, it will negatively affect her relationship with her parents.

Goal:

Improve how Cali feels about her situation.

Responses:

A. "I'm sorry, but you aren't the only one with parents who hate their boyfriend. It's just something you have to accept and hope that eventually your parents will get over it. It's not like they can hold a grudge forever."

B. "I can imagine how torn you feel. Maybe if they spent more time with him they would see what you see, rather than being so critical. It won't be pleasant at first, but you could start going out all together so they can get to know him better."

C. "We need to go out and do something fun to get your mind off this. You've been focusing on this constantly and at this point, it's just not helpful to think about it anymore. So can we please just go get dinner and see a movie tonight?"

D. "I'm so sorry about your parents being so rigid. But at least this experience is teaching you how *not* to parent your future children. You'll know way better than to judge someone so quickly. I just don't understand why they don't trust your judgment."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

20

Situation:

For a recent research project, Michael has been studying re-forestation and its effect on the community. Michael thinks his findings are very interesting and decides to present it to a few colleagues and professors he works with. During his presentation, one of the professors makes a rude comment about why Michael's conclusions are wrong.

Michael's thoughts and feelings:

Michael thinks what the professor said was uncalled for and could have been said in a much nicer way. He feels offended because he put a lot of effort into his presentation.

Goal:

Improve how Michael feels about his situation.

Responses:

A. "You should show that professor how it feels, make the same comment during his next presentation. He needs to get off his high horse and be reminded what it feels like to be a student."

B. "You shouldn't take these things too seriously. You should have just pictured the audience naked during your presentation. That always makes me laugh. Then I don't care so much what their comments are."

C. "Yeah, I can see why you were offended. You should schedule a meeting with the professor and politely let him know that you felt that his comment was a bit offensive. Perhaps he didn't even mean for it to come out that way."

D. "Michael, you are really being too sensitive about this. He's your teacher, he has reason to give you constructive criticism if he feels it will benefit you. You aren't considering his perspective, and I think it's making you overreact."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

21

Situation:

Your best friend Jessica recently got into a tragic car accident and was hospitalized for several weeks. Her arm was severely damaged in the accident and they had to amputate it and give her a prosthetic limb. Jessica has now gone back to normal life, but she is very upset about losing her arm.

Jessica's thoughts and feelings:

Jessica feels frustrated and helpless. She thinks it's not fair that her life will never be same.

Goal:

Improve how Jessica feels about her situation.

Responses:

A. "Let's get together and you can vent about it. You might feel better if you talk to someone about how you are feeling. Actually, this is just a thought, but have you considered seeing a therapist?"

B. "Why don't we get your mind off things and go to that music festival this weekend? I hear your favorite band is playing. Maybe it will remind you that life can still be enjoyable even after your loss."

C. "There are many people that lost even more than an arm, and they got through it. I believe in you and I know you will get through this. You can't let your disability stand in your way."

D. "I understand why you must be so upset; it's not fair that this had to happen to you. I am definitely always here for you. If there is anything I can do to help, let me know."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

22

Situation:

Your best friend, Rico, has been planning to go on a cruise vacation with his family for the past year. It took them many months to plan the whole vacation. Now, the cruise is exactly one week away, and Rico has just been given a really important and unexpected career opportunity. After some thought, Rico reluctantly accepts the opportunity, knowing that he has to miss the cruise in order to work on it.

Rico's thoughts and feelings:

Rico feels very disappointed because he was really excited for his trip. Rico knows his family will understand, but he feels discouraged because lately his life has been all work and no play, and he could really use a break.

Goal:

Improve how Rico feels about his situation.

Responses:

A. "I know you can't go on the vacation, but you should at least enjoy yourself a little bit. Let's go to that new sushi place downtown. Dinner is on me tonight! You'll have some fun and you won't even need to worry about breaking the bank!"

B. "There is no reason to be down. You should feel lucky that you have even been given that opportunity in the first place. Do you know how many people would kill for that chance?"

C. "Life is really all about working. The sooner you get used to that, the easier life will be. Plus, think about how much money you'll be saving by skipping out on such a huge trip! I can only imagine how expensive that would have been."

D. "That must have been such a hard decision to make. I know you've been planning this vacation for a while now. It's going to feel great once you get to that next step in your career though. Then you can take an even better vacation!"

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

23

Situation:

One of Joelle's most prized possessions is a watch that was given to her by her grandmother, with whom she was very close. The watch has a lot of sentimental value to her, especially since her grandmother has now passed away. Joelle took her watch off and absentmindedly put it on the coffee table when she got home from work. A few hours later, she noticed the watch on the floor, destroyed from her dog chewing on it.

Joelle's thoughts and feelings:

Joelle feels devastated because she thinks the profound memory of her grandmother is lost forever. Joelle also feels really angry at herself. She thinks she should have been more careful.

Goal:

Improve how Joelle feels about her situation.

Responses:

A. "Well, you should know better than to put your watch where your dog can get it. Next time, be more careful with things that are important to you."

B. "That's a shame. Why don't we go shopping for a new one? I know that just any new watch would never hold the same value to you, but I bet we can find one that's very similar to your grandmother's watch."

C. "I don't blame you. It's absolutely crushing to lose something with so much personal value. Just last year I lost the necklace that my dad gave me over a decade ago. I always loved it so much and losing it was incredibly upsetting."

D. "I know it must be devastating to lose something so special, but at least the memories of your grandmother will never be lost. You'll never forget her, and that's what is most important.

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

24

Situation:

Mitch recently adopted a new dog from the pound. He and his dog, Pongo, get along great. Pongo is always really sweet and loves to play. However, Pongo can often be unruly. He is constantly disobedient and destroys the house every time Mitch leaves to go to work. Mitch doesn't know what to do because Pongo's behavior is becoming very disruptive to his daily life.

Mitch's thoughts and feelings:

Mitch feels conflicted because he cares for Pongo and he loves the companionship. However, he doesn't know if he can tolerate much more of his uncontrollable behavior.

Goal:

Improve how Mitch feels about his situation.

Responses:

A. "That's rough; taking care of a rowdy dog can be very frustrating, not to mention time consuming. But I know how much Pongo means to you. Have you thought about hiring a dog trainer?"

B. "You should know better than to get a dog if you know you won't have enough patience for it. Dogs are a big responsibility. Didn't you know that?"

C. "You should be happy that you saved a dog from the pound! Thanks to you, he will have a much better life, so it's worth all the frustration."

D. "It sounds like Pongo may be too disruptive for your everyday life. What if you found Pongo a new home? Someone who is retired will probably have more time to train Pongo."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

25

Situation:

Your friend Ben has missed his flight and has no other way of getting to his brother's wedding on time.

Ben's thoughts and feelings:

Ben feels disappointed and guilty that he will miss the wedding, and worries that his brother and his fiancé will feel hurt and angry because of it.

Goal:

Improve how Ben feels about this situation.

Responses:

A. "Honestly, weddings are awful, and they are always the same. The cake, the music, the archaic ceremony—almost everything about them is miserable. A missed flight is a great excuse; if I was you, I'd be thrilled."

B. "I can definitely see why you are worried, but I think they will understand. We have all missed a flight before. Even if they are upset at first, they'll know that you wanted to be there and didn't mean for this to happen."

C. "Well what time did you get to the airport? You know you are supposed to arrive at least an hour and a half before your flight leaves don't you? I know a lot of people don't take that rule seriously and they always seem to end up in these types of situations."

D. "Now you're free this weekend! Let's get your mind off that wedding and go out for dinner tonight; it'll be my treat. I'm way more fun than anyone at that wedding anyways! You'll be happy that you stuck around."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

26

Situation:

Richard graduated with his bachelor's degree over six months ago, and has since been struggling to find a job. Today, he found out that the position that he most recently interviewed for did not offer him the job.

Richard's thoughts and feelings:

He feels frustrated at how difficult it has been to find a job after working so hard in school to get his degree. He is beginning to lose confidence in his abilities because of how many employers have turned him down.

Goal:

Improve how Richard feels about his situation.

Responses:

A. "I know that many of my friends who graduated recently are going through a similar thing. I think it has less to do with your capability and more about who you know these days. You are incredibly qualified; it's just difficult to find a job right now, no matter who you are or how perfect you might be for the position."

B. "That is so frustrating. Have you considered applying for internships? It might be a good option for now, while you continue to apply for full-time positions. It seems impossible for new graduates to be hired without 'prior experience' so adding an internship to your resume could really help."

C. "I just don't understand why this has to be so difficult. I mean, I had a job lined up before I even graduated. I know a lot of people go through this sort of thing though; you're definitely not alone. I guess I'm just really glad that I planned ahead."

D. "I know this must be really frustrating, but think of all the free time you have to do other things! I know you've been saying that you want to get back into your old hobbies and this could be the perfect time. Take advantage of it!"

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

27

Situation:

You're out having drinks with your friend Kyle, who is a manager at an Italian restaurant. He tells you that one of his subordinates, Nate, has been eating some of the spaghetti before it gets to customers' tables. Kyle isn't sure if he wants to bring up the issue with Nate, as he's been known to have a temper, and Kyle doesn't like conflict.

Kyle's thoughts and feelings:

He's anxious to talk to Nate because he doesn't like to be assertive. He's also unsure of what to say to Nate that would cause the least amount of conflict. He thinks that maybe if he simply doesn't address the issue, it will resolve itself. Then he won't have to deal with an unhappy employee.

Goal:

Improve how Kyle feels about the situation.

Responses:

A. "So let me get this straight, Kyle: Nate is stuffing his face with spaghetti in the back, and some customers never get their food? And no one has said anything to him about it or addressed the situation at all? That's hilarious! Don't you think that's funny?"

B. "That's a tough spot to be in. I know you don't like to assert yourself, but it's an important quality of a good manager. You should talk to Nate about this issue and let him know that eating the restaurant's food supply has a negative impact on business."

C. "I don't know of any other manager who would have let this happen; you need to be more on top of your employees. Do you realize the effect this could have on your business? I'm just surprised that you wouldn't care to get this under control sooner."

D. "Wow I'm sorry you're having such a hard time at work. But I'm sure that you will figure it out soon enough! Maybe coming to this party with me tonight will help you clear your head. You can reassess the situation and decide what to do later on!"

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

28

Situation:

You're having dinner with your friend Joey from work. Joey gets the feeling that Jane, another one of your coworkers, really doesn't like him.

Joey's thoughts and feelings:

He thinks that Jane has a misrepresented view of who he is as a person. Because of this, he feels confused and really uncomfortable around Jane.

Goal:

Improve how Joey feels about the situation.

Responses:

A. "I'm sorry, it's hard to feel misunderstood, especially when you have no idea why. Would it help if we talked about it?"

B. "Forget Jane, there is really no reason to care about what she thinks anyway. You should stop dwelling on it and come to the baseball game with me after dinner."

C. "What do you think this is, high school? Either address the situation by asking her directly like an adult or get over it."

D. "Well I think you're a good person, just like every other person in your life who actually knows you. So it doesn't really matter what Jane thinks."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

29

Situation:

Salem let a new friend borrow his expensive set of speakers. Salem asked for his speakers back but his friend has been dodging his calls and avoiding him.

Salem's thoughts and feelings:

Salem is starting to doubt that his friend will return the speakers, and feels deceived because he may never get them back.

Goal:

Say something to Salem to improve how he will feel about the situation in the long-term.

Responses:

A. "That would make me so mad. It's hard to know until you talk with him face to face though—maybe he's been overwhelmed at work but still plans to give them back."

B. "I think you might just have to accept that your speakers are gone. But at least you found out the truth about this friendship early on rather than trusting him for years and then realizing that he's a bad friend."

C. "He might bring them back eventually, or he might not. You should just enjoy spending time with your good friends instead of wasting time on him."

D. "You shouldn't have trusted your expensive stuff with someone you hardly knew. You were almost asking for them to be stolen."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

30

Situation:

Your old friend, Chloe, just moved to a new city and decided to throw a party for some of her new friends. When it came time for the party, hardly anyone decided to show up. The people who did show up ended up leaving shortly after arriving.

Chloe's thoughts and feelings:

Chloe feels lonely in her new city and let down by her new friends. She thinks that maybe they weren't as close of friends as she thought they were.

Goal:

Say something to Chloe to improve how she feels about her situation.

Responses:

A. "Let's just come up with more party ideas for next time to make it more enticing. No one can resist a good party."

B. "I'm sorry that your party didn't go the way you wanted. Did your friends say why they couldn't come?"

C. "I would come to one of your parties. These people who bailed on you must not be very good friends."

D. "They were probably just busy. Try not to obsess over it or they might think that you're too clingy."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

31

Situation:

While Joel's mother-in-law was babysitting his son, she completely ignored Joel's warnings about his son's food allergies. Now Joel has to take his son to the hospital due to an allergic reaction.

Joel's thoughts and feelings:

He feels angry that his mother-in-law put his son's health at risk and he feels upset because she betrayed his trust.

Goal:

Say something to Joel to improve how he feels about the situation.

Responses:

A. "I would be so upset if that happened to me. Why do you think she didn't trust you when you warned her?"

B. "Wow, that was really careless of your mother-in-law. But he's a tough little guy. I'm sure he'll be fine."

C. "I can watch him this weekend if you want to have a night out. You deserve it after this."

D. "I could never imagine that happening to me. I'd be so afraid of letting anyone babysit who didn't know about those kinds of things."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

32

Situation:

Cody's roommate likes to burn incense. The landlord made it clear to them that there's a strict "no smoke" policy, including incense, and that they both could be kicked out if they burn incense in their apartment.

Cody's thoughts and feelings:

Cody doesn't have a personal problem with his roommate burning incense, but he is constantly stressed whenever his roommate lights the incense because he's worried they'll be kicked out. Cody doesn't like having to live in constant fear, but he doesn't want to impose on his roommate, either.

Goal:

Say something to Cody to improve how he feels about the situation.

Responses:

A. "Well he has the same right to the place as you do, so his incense burning shouldn't be any of your business. People should feel free to do what they want to in the privacy of their own home you know? It would be rude to tell him to stop just for your sake."

B. "I think you should try to get out of the house when he's burning it. Then you don't have to constantly be thinking about it."

C. "You've gotten this far and nothing bad has happened. I wouldn't too much about it. The smoke from incense is so minimal; I have a hard time believing that anyone would be paying enough attention to notice it from outside the apartment."

D. "I don't blame you-- I'd be stressed out too. Maybe he doesn't realize he's putting you both at risk? He might be more understanding than you think if you bring it up respectfully."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

33

Situation:

Elyssa is one week into a month-long trip that she planned and paid a lot of money for. A lot of things so far have either been underwhelming or have gone more poorly than expected.

Elyssa's thoughts and feelings:

Elyssa is feeling like she's wasted money on this trip and is frustrated that things aren't turning out as expected. She wants to go home but feels like that would waste even more money since she already paid for the rest of the trip in advance.

Goal:

Say something to Elyssa to improve how she feels about the situation.

Responses:

A. "That really sucks. How much did the trip cost? At least now you know to actually do some research on the places you're going before you get there. Hopefully next time you'll be better at planning your trip."

B. "I'm sorry you're not having a good trip so far; that's so disappointing. I know this is unexpected, but since you are here now and have already paid for it, I wonder if there is something you can do to turn things around and still enjoy where you are."

C. "Aw come on, get over it and stop your complaining. I know what you should do. Get dressed up, go out on the town, stuff your face with some of the local foods, and maybe have a few of those funny little drinks with the umbrellas on them. That always works for me."

D. "You might as well try and get the most out of the rest of the trip. Just try to put on a happy face and have fun or you'll bring everyone down."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

34

Situation:

Your friend and coworker, Alex, calls you sounding very upset that he has just been fired from his job for an offense that he did not commit.

Alex's thoughts and feeling:

He felt he was trustworthy and dedicated to the job, and now he feels shocked for being accused and punished for something that he did not do. At the same time, he is worried about being unemployed.

Goal:

Improve how Alex feels about his situation in the long-term.

Responses:

A. "I'm so sorry, Alex, that is rough. I can talk to the manager tomorrow to back you up if you want."

B. "Don't even worry about it; working there sucks anyways. Now you can find a decent job where management is appreciative of their devoted employees."

C. "I think you need a night out. Let's go get a drink tonight to take your mind off things."

D. "Well I mean, I can understand where they're coming from. I know that you didn't do it, but you have to admit that it wouldn't have been out of character for you."

Which of the responses above do you think would be the most effective response for achieving the stated goal?

A B C D

Which of the responses above are you most likely to actually choose if you were in the situation?

A B C D

CAMS-R

People have a variety of ways of relating to their thoughts and feelings. For each of the items below, rate how much each of these ways applies to *you*.

	Rarely/Not at all 1	Sometimes 2	Often 3	Almost always 4
It is easy for me to concentrate on what I am doing.	○	○	○	○
I am preoccupied by the future.	○	○	○	○
I can tolerate emotional pain.	○	○	○	○
I can accept things I cannot change.	○	○	○	○
I can usually describe how I feel at the moment in considerable detail.	○	○	○	○
I am easily distracted.	○	○	○	○
I am preoccupied by the past.	○	○	○	○
It's easy for me to keep track of my thoughts and feelings.	○	○	○	○
I try to notice my thoughts without judging them.	○	○	○	○
I am able to accept the thoughts and feelings I have.	○	○	○	○
I am able to focus on the present moment.	○	○	○	○
I am able to pay close attention to one thing for a long period of time.	○	○	○	○

Cognitive Reappraisal Assessment

This task assesses a participant's ability to reappraise a situation, that is, to view it from another perspective. Participants are shown 4 videos in this task and then asked after each the degree to which they felt each emotion in a list.

Participants indicate the amount of each emotion experienced during each video using a scale from 1 ("Not at all") to 9 ("Extremely") for the following emotions:

- Amusement
- Anger
- Anxiety
- Contempt
- Frustration
- Fear
- Happiness
- Interest
- Love
- Sadness
- Hopelessness
- Loneliness
- Optimism

The videos are presented in a particular order each administration:

1. Neutral clip (man making a sandcastle)
2. Sad Clip 1 (scene from the movie "Fatal Attraction")
3. Sad Clip 2 (scene from the movie "I Am Sam")
4. Sad Clip 3 (scene from the movie "Kramer vs. Kramer")

Half of the participants are randomly assigned to Group 1 and simply report their emotions normally on clips 1, 2, and 4, and the other half are randomly assigned to Group 2 and report their emotions on clips 1, 2, and 3.

The two groups are also asked to reappraise the sad situation in one of the four videos. That is, to think about the situation from a positive perspective. Groups 1 and 2 do this on clips 3 and 4, respectively.

The instructions for the reappraisal differs from the simple instructions presented before each regular emotion reporting video ("Please watch the following film clip carefully"). Before each reappraisal video, the participants are presented the following instructions:

> "Please watch the following film clip carefully. This time, as you watch, try to think about the situation you see in a more positive light. You can achieve this in several different ways. For example, try to imagine advice that you could give to the characters in the film clip to make them feel better. This could be advice that would help them think about the positive bearing this event could have on their lives. Or, think about the good things they might learn from this experience. Keep in mind that even though a situation may be painful in the moment, in the long run, it could make one's life better, or have unexpected good outcomes. In other words, try to think about the situation in as positive terms as you possibly can. This can be difficult at times, so it is very important that you try your best. Please ask the research assistant if you have any questions about this task. It is very important that you carefully watch the film clip, but think about it from a positive perspective."

CRT-7

A bat and a ball cost $1.10 in total. The bat costs a dollar more than the ball. How much does the ball cost?

Cents:

If it takes 5 machines 5 minutes to make 5 widgets, how long would it take 100 machines to make 100 widgets?

Minutes:

In a lake, there is a patch of lily pads. Every day, the patch doubles in size. If it takes 48 days for the patch to cover the entire lake, how long would it take for the patch to cover half the lake?

Days:

If John can drink one barrel of water in 6 days, and Mary can drink one barrel of water in 12 days, how long would it take them to drink one barrel of water together?

Days:

Jerry received both the 15th highest and the 15th lowest mark in the class. How many students are in the class?

Students:

A man buys a pig for $60, sells it for $70, buys it back for $80, and sells it finally for $90. How much has he made?

Dollars:

Simon decided to invest $8,000 in the stock market one day early in 2008. Six months after he invested, on July 17, the stocks he had purchased were down 50%. Fortunately for Simon, from July 17 to October 17, the stocks he purchased went up 75%. At this point, Simon has:

- ○ Broken even in the stock market
- ○ Is ahead of where he began
- ○ Has lost money

MSCEIT™ DATA ENTRY SHEET

John D. Mayer, Ph.D, Peter Salovey, Ph.D., & David R. Caruso, Ph.D.

Instructions: Please complete the information below. Read each question in the MSCEIT™ Item Booklet carefully, and completely fill in the bubble on this sheet that corresponds to your answer. Follow the sections in order, and fill in a bubble for each question on the front and back of this form.

Subject ID: _____ Date: _____

Optional Demographic Information: Gender: ☐ Male ☐ Female Age: _____

Ethnicity: ☐ White/Caucasian ☐ Black/African American/African Canadian ☐ Hispanic ☐ Asian ☐ Native/Aboriginal ☐ Other: _____

For Administrative Purposes Only: Today's Date: _____ ID# _____

SECTION A

Face 1

1. ① ② ③ ④ ⑤
2. ① ② ③ ④ ⑤
3. ① ② ③ ④ ⑤
4. ① ② ③ ④ ⑤
5. ① ② ③ ④ ⑤

Face 2

1. ① ② ③ ④ ⑤
2. ① ② ③ ④ ⑤
3. ① ② ③ ④ ⑤
4. ① ② ③ ④ ⑤
5. ① ② ③ ④ ⑤

Face 3

1. ① ② ③ ④ ⑤
2. ① ② ③ ④ ⑤
3. ① ② ③ ④ ⑤
4. ① ② ③ ④ ⑤
5. ① ② ③ ④ ⑤

Face 4

1. ① ② ③ ④ ⑤
2. ① ② ③ ④ ⑤
3. ① ② ③ ④ ⑤
4. ① ② ③ ④ ⑤
5. ① ② ③ ④ ⑤

SECTION B

1a. ① ② ③ ④ ⑤
b. ① ② ③ ④ ⑤
c. ① ② ③ ④ ⑤

2a. ① ② ③ ④ ⑤
b. ① ② ③ ④ ⑤
c. ① ② ③ ④ ⑤

3a. ① ② ③ ④ ⑤
b. ① ② ③ ④ ⑤
c. ① ② ③ ④ ⑤

4a. ① ② ③ ④ ⑤
b. ① ② ③ ④ ⑤
c. ① ② ③ ④ ⑤

5a. ① ② ③ ④ ⑤
b. ① ② ③ ④ ⑤
c. ① ② ③ ④ ⑤

SECTION C

1. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
2. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
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19. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
20. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

SECTION D

Scenario 1

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3. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
4. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Scenario 2

1. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
2. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
3. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
4. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Scenario 3

1. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
2. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
3. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
4. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Scenario 4

1. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
2. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
3. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
4. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Scenario 5

1. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
2. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
3. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
4. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Please complete all items on the back of this page.

MSCEIT™

John D. Mayer, Ph.D, Peter Salovey, Ph.D., &
David R. Caruso, Ph.D.

SECTION E

Image 1

1. ① ② ③ ④ ⑤
2. ① ② ③ ④ ⑤
3. ① ② ③ ④ ⑤
4. ① ② ③ ④ ⑤
5. ① ② ③ ④ ⑤

Image 2

1. ① ② ③ ④ ⑤
2. ① ② ③ ④ ⑤
3. ① ② ③ ④ ⑤
4. ① ② ③ ④ ⑤
5. ① ② ③ ④ ⑤

Image 3

1. ① ② ③ ④ ⑤
2. ① ② ③ ④ ⑤
3. ① ② ③ ④ ⑤
4. ① ② ③ ④ ⑤
5. ① ② ③ ④ ⑤

Image 4

1. ① ② ③ ④ ⑤
2. ① ② ③ ④ ⑤
3. ① ② ③ ④ ⑤
4. ① ② ③ ④ ⑤
5. ① ② ③ ④ ⑤

Image 5

1. ① ② ③ ④ ⑤
2. ① ② ③ ④ ⑤
3. ① ② ③ ④ ⑤
4. ① ② ③ ④ ⑤
5. ① ② ③ ④ ⑤

Image 6

1. ① ② ③ ④ ⑤
2. ① ② ③ ④ ⑤
3. ① ② ③ ④ ⑤
4. ① ② ③ ④ ⑤
5. ① ② ③ ④ ⑤

SECTION F

1a. ① ② ③ ④ ⑤
b. ① ② ③ ④ ⑤
c. ① ② ③ ④ ⑤

2a. ① ② ③ ④ ⑤
b. ① ② ③ ④ ⑤
c. ① ② ③ ④ ⑤

3a. ① ② ③ ④ ⑤
b. ① ② ③ ④ ⑤
c. ① ② ③ ④ ⑤

4a. ① ② ③ ④ ⑤
b. ① ② ③ ④ ⑤
c. ① ② ③ ④ ⑤

5a. ① ② ③ ④ ⑤
b. ① ② ③ ④ ⑤
c. ① ② ③ ④ ⑤

SECTION G

1. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
2. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
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10. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
11. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
12. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

SECTION H

1. 1. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
   2. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
   3. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

2. 1. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
   2. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
   3. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

3. 1. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
   2. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ
   3. Ⓐ Ⓑ Ⓒ Ⓓ Ⓔ

Thank you for completing the MSCEIT.

Southampton Mindfulness Questionnaire

Usually, when I have distressing thoughts or images

	Agree Totally	Agree Strongly	Agree Slightly	Unsure	Disagree Slightly	Disagree Strongly	Disagree Totally
1. I am able just to notice them without reacting							
2. They take over my mind for quite a while afterwards							
3. I judge the thought/image as good or bad							
4. I feel calm soon after							
5. I am able to accept the experience							
6. I get angry that this happens to me							
7. I notice how brief thoughts and images really are							
8. I judge myself as good or bad, depending what the thought/image is about							
9. I 'step back' & am aware of the thought or image without getting taken over by it							
10. I just notice them and let them go							
11. I accept myself the same whatever the thought/image is about							
12. In my mind I try and push them away							
13. I keep thinking about the thought or image after it's gone							
14. I find it so unpleasant I have to distract myself & not notice them							
15. I try just to experience the thoughts or images without judging them							
16. I lose myself in the thought/images							

Southampton Mindfulness Questionnaire

Background

The thinking behind the measure is that there are 4 related (i.e. not independent) facets of mindfulness: mindful observation (MO), letting go of reacting (LG), opening awareness to difficult experience (O), acceptance (A). The measure has four items for each. MO has three items worded positively (i.e. agreement indicates more mindfulness) and one negatively (i.e. agreement indicates being less mindful); opening awareness has three negative items to counter balance. Acceptance and Letting go both have two positive and two negative. The four subscales have the following items, with positive or negative wording:

	Positive	Negative
MO	1, 7, 9	16
LG	4, 10	2, 13
O	5	6, 12, 14
A	11, 15	3, 8

Scoring

- Agree Totally (score 6), Agree Strongly (score 5), Agree Slightly (score 4), Unsure (score 3), Disagree Slightly (score 2), Disagree Strongly (score 1), Disagree Totally (score 0).
- The negative items are reversed for scoring.
- The SMQ has a range of scores from 0 to 96 (The four facets may identify particular points for intervention and are useful in teaching, but are not conceptualised as independent nor reported as separate scores).

Paul Chadwick
2008-09-30

TASIT-S (The Awareness of Social Inference Test – Short)

The TASIT-S is a test of social inference detection ability. Through watching videos and answering questions about the videos, participants are tested on three different abilities:

- Emotion recognition skills (one person in video)
    - What emotion is that person feeling?
- Social inference (two people in video, focus on one)
    - What might that person be thinking in this conversation?
    - How does context impact the true meaning of their words (white lie, sarcasm)?

PART 1: EMOTION RECOGNITION

Participants are shown eleven 15-60 second video clips with a target individual made apparent in each. After watching the video clips, participants are asked what emotion the target individual was feeling.

The choices for emotions were happy, surprised, neutral (not showing any emotion strongly), sad, angry, anxious, revolted.

PART 2: SOCIAL INFERENCE, MINIMAL

Participants are shown ten 15-60 second video clips of conversations between two people in which half include the usage of sarcasm. After watching the video clips, participants are asked questions that address four aspects of the interaction, each referring to one of the characters in the scene.

- Do: What one of the people is DOING to the other person, as in, what are they trying to make another person do or feel
- Say: What is one person TRYING TO SAY to the other person, for instance, someone might say “it’s hot in here” to mean “you should open the window”
- Think: What one of the people is THINKING. That is, what is their underlying belief which might be different than what they are saying.
- Feel: What is one of the people FEELING? That is, what is the emotion that they are feeling or how do they feel towards the other person.

PART 3: SOCIAL INFERENCE, ENRICHED

- Part 3 is similar to Part 2 in that it is the same format for videos and questions. The only difference is the videos in Part 3 are half of the videos include usages of sarcasm and white lies (“Of course Calvin ate his dinner” said while the plate is clearly still full).

Online Supplemental Materials

Appendix A: MEPS Task Instructions and Story Stimuli (shown in female form)

"In this part of the experiment you are going to be presented with the beginning and end of 5 stories. Each story has a beginning problem and an ending solution. You will be asked to create the middle of each story, i.e. the steps you would take to solve the problem in each story. You will have 5 minutes to write out as much detail as you can for each story."

Problem 1: Mrs. A was listening to the people speak at a meeting about how to make things better in her neighborhood. She wanted to say something important and have a chance to be a leader too. The story ends with her being elected leader and presenting a speech. You begin the story at the meeting where she wanted to have a chance to be a leader.

Problem 2: H loved her boyfriend very much, but they had many arguments. One day the boyfriend left H. H wanted things to be better. The story ends with everything fine between H and her boyfriend. You begin the story with H's boyfriend leaving her after an argument.

Problem 3: Mrs. P came home after shopping and found that she had lost her watch. She was very upset about it. The story ends with Mrs. P finding her watch and feeling good about it. You begin the story where Mrs. P found that she had lost her watch.

Problem 4: C had just moved in that day and didn't know anyone. C wanted to have friends in the neighborhood. The story ends with C having many good friends and feeling at home in the

neighborhood. You begin the story with C in her room immediately after arriving in the neighborhood.

Problem 5: During the war, a woman's husband and children were tortured and killed by a soldier and the woman swore revenge. The story begins one day after the war, when the woman enters a restaurant and sees the soldier. The story ends with the woman killing the soldier. You begin the story when the woman sees the soldier.

Problem 6: One day A saw a beautiful man she had never seen before while eating in a restaurant. She was immediately attracted to him. The story ends when they get married. You begin the story when A first notices the man in the restaurant.

Problem 7: B needed money badly. The story begins one day when she notices a valuable diamond in a shop window. B decides to steal it. The story ends when B succeeds in stealing the diamond. You begin the story when B sees the diamond.

Problem 8: J noticed that her friends seemed to be avoiding her. J wanted to have friends and be liked. The story ends when J's friends like her again. You begin the story where J first notices her friends avoiding her.

Problem 9: One day G was standing around with some other people when one of them said something very nasty to G. G got very mad. G got so mad she decided to get even with the other

person. The story ends with G happy because she got even. You begin the story when G decided to get even.

Problem 10: J is having trouble getting along with the boss on her job. J is very unhappy about this. The story ends with J's boss liking her. You begin the story where J isn't getting along with her boss.

Appendix B: Self-relevant Task Instructions and Story Stimuli

"In this part of the experiment you are going to be presented with the beginning and end of 5 different stories. Each story has a beginning problem and an ending solution. You will be asked to create the middle of each story, i.e. the steps you would take to solve the problem in each story. People in your age group have reported that the problems you will see are ones that they have personally had. You will have 5 minutes to write out as much detail as you can for each story."

Problem 1: You would like to declutter your living space. The story ends with you decluttering your living space. The story begins with you wanting to declutter your living space.

Problem 2: You would like to eat better. The story ends with you eating better. The story begins with you wanting to eat better.

Problem 3: You would like to exercise more. The story ends with you exercising more. The story begins with you wanting to exercise more.

Problem 4: You would like to learn a new skill. The story ends with you learning a new skill. The story begins with you wanting to learn a new skill.

Problem 5: You would like to make more time for family. The story ends with you making more time for family. The story begins with you wanting to make more time for family.

Problem 6: You would like to manage your finances better. The story ends with you managing your finances better. The story begins with you wanting to manage your finances better.

Problem 7: You would like to plan a day trip. The story ends with you planning a day trip. The story begins with you wanting to plan a day trip.

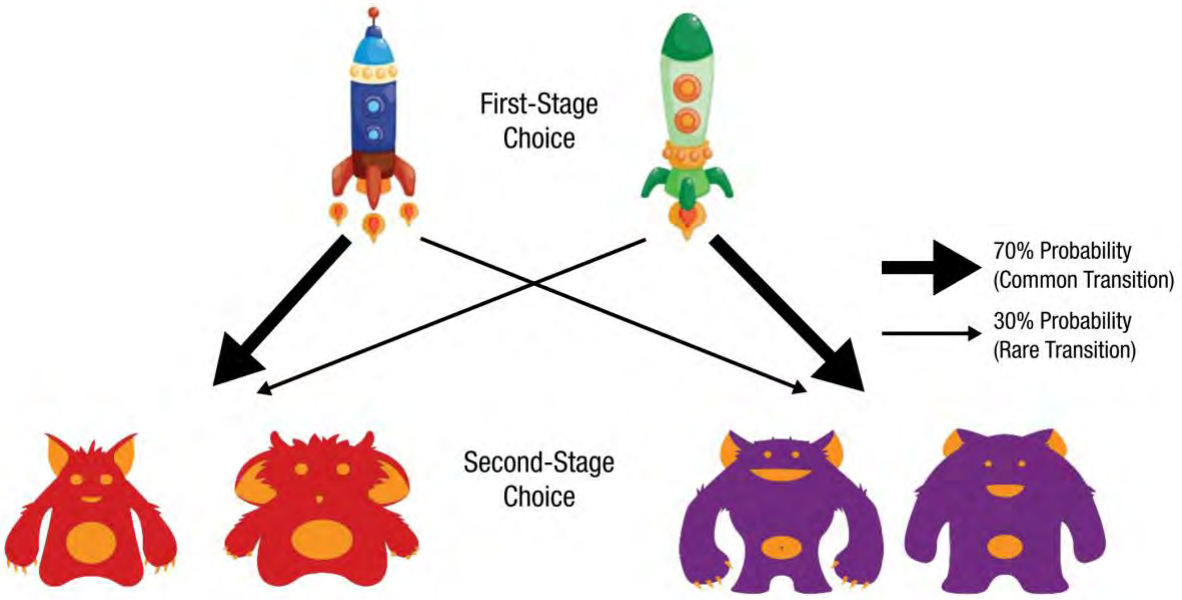
Problem 8: You would like to schedule healthcare visits. The story ends with you scheduling healthcare visits. The story begins with you wanting to schedule healthcare visits.

Problem 9: You would like to stay mentally active. The story ends with you staying mentally active. The story begins with you wanting to stay mentally active.

Problem 10: You would like to volunteer/help others more. The story ends with you volunteering/helping others more. The story begins with you wanting to volunteer/help others more.

Two Step Task

In this task participants will have the option on each trial to pick between two spaceships. Each spaceship if chosen has a certain probability of leading to a specific planet. On each planet is two aliens and each if selected has a probability of either awarding the participant with a treasure or not. The task consists of 200 trials split into four fifty trial blocks following the pattern described above.



pat.wp1 PERCEPTION of AFFECT TASK

Hospital ID# _____/Subject ID# _____

Sub-Task I: Sentences

The purpose of this task is to observe the manner in which individuals match emotional words with sentences that have emotional content.

INSTRUCTIONS: Please read each sentence and circle the word that seems to be the best match for the emotion of the underlined person or persons in that sentence. Then, rate the intensity of the emotional experience of the underlined person or persons by circling the appropriate number.

1. When the calves' brains dinner is mistakenly brought to the table, one customer seated there quickly turns his head away.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

2. Being sure that his player did nothing wrong, a coach demands an explanation from the referee about the penalty call.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

3. A young girl wishes she was like her girlfriends and had a date for the high school dance.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

4. Just as the young boy walks into the room, the lights flick on and family members appear with packages in their hands.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

5. When one of the youngsters picks up a slimy snail, one girl looks at the others and covers her eyes.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

6. Passengers listen carefully as a stewardess tells them that the airplane must make an emergency landing.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

7. A man walks from the kitchen to the family room and turns on the radio.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

8. An individual running for governor demands to know who in her office is responsible for leaking the negative "confidential" information about her to the press.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

9. A woman falls asleep while reading the newspaper.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

10. Villagers listen to the bombs move closer and closer.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

11. As a couple eating lunch in the park cannot avoid the stench of two derelicts close by, they hastily move to another bench.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

12. Expecting that a particular car would be far beyond her price range, a car buyer, upon hearing the dollar figure, asks that the salesman repeat the low figure one more time.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

13. Several long-standing friends joke about the past.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

14. An older man looks at a picture of his recently departed wife.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

15. A parent tugs at her child after he swears at her.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

16. A grandfather returns to his room after he is told that his grandson will not be able to visit him after all.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

17. Both teenagers clap to the beat as their favorite song plays on.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

18. A young girl, who has come to believe that her dog is just plain stupid and will never learn how to retrieve, is totally speechless when he actually does return the ball to her.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

19. A child becomes fidgety when a doctor approaches him with a big needle.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

20. Several relatives gather at a funeral.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

21. Tired and hungry, and noting the fine smell of chicken coming from the kitchen, a husband kisses his wife as soon as he sees her.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

22. Several young girls play with a cute three week old puppy.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

23. A young actor, sensing that his acting for the audition was totally lackluster, can hardly believe it when the director gives him the lead role.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

24. A mother says good-bye to her daughter who is going off to college.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

25. Even the thought of seeing the cats' mutilated bodies brings a queer feeling to the newswoman's stomach.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

26. Having finished his lunch, a carpenter continues loading the lumber into his truck.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

27. After her third request for her class's attention, the teacher states that several students will have to remain after school.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

28. Immediately upon hearing the loud barks, the child grabs her mother and holds her tight.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

29. After a great deal of hard work in practice, a young batter hits his first home run.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

30. When he notices that several youngsters are pocketing expensive merchandise, the store owner quickly makes his way toward them.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

31. Having applied for hundreds of jobs over many months and having received just as many negative responses, the applicant is momentarily stunned when he is in fact offered a job.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

32. While speaking on the phone to a business partner, an individual bends down to tie his shoelaces.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

33. While most of the boy scouts walk right to the edge of the cliff, two scouts refuse to even approach the edge.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

34. As the government inspector has difficulty breathing while he inspects the filthy prison cells, he cuts the inspection short.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

35. The seamstress quickly and accurately measures and cuts the material to be used for the dress she is mending.

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 .....BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

Sub-Task II: "The Face Slides"

The purpose of this task is to observe the manner in which individuals match emotional words with emotional facial expressions.

Please view each slide as it is presented and circle the word that seems to be the best match for the emotional expression depicted in each slide. Also, rate the intensity of the emotional experience of the person shown in each slide by circling the appropriate number where 0 means "no intensity" (or no emotion) and 6 means "extremely intense."

1. (WF3-4)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

2. (C1-4)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

3. (JB1-9)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

4. (PF2-12)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

5. (SW1-30)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

6. (JM1-16)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

7. (EM2-4)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

8. (GS1-8)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

9. (C1-23)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

10. (JM3-11)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

11. (A1-25)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

12. (PF1-2)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

13. (PE2-21)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

14. (JJ4-13)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

15. (EM4-24)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

16. (MO2-18)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

17. (NR1-6)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

18. (SW4-9)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

19. (JB1-3)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

20. (PF1-16)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

21. (A2-6)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

22. (PE3-16)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

23. (MO2-11)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

24. (NR2-7)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

25. (JJ5-13)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

26. (PE2-4)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

27. (PE5-7)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

28. (WF2-11)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

29. (PF2-30)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

30. (JJ4-8)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

31. (C1-10)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

32. (SW3-3)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

33. (GS1-16)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

34. (EM4-17)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

35. (EM5-21)

EMOTION	HAPPINESS	SADNESS	FEAR	ANGER	DISGUST	SURPRISE	NEUTRAL
INTENSITY	0 NO INTENSITY	1 BARELY INTENSE	2 A LITTLE INTENSE	3 SOMEWHAT INTENSE	4 VERY INTENSE	5 HIGHLY INTENSE	6 EXTREMELY INTENSE

PAT.wp3 Sub-Task III: Sentences & Faces

The purpose of this task is to observe the manner in which individuals match emotional facial expressions with sentences that have emotional content.

INSTRUCTIONS: Please read each sentence and circle the letter for the facial expression that seems to be the best match for the underlined person or persons in the sentence. Don't be concerned with male/female differences or age differences between persons in the sentences and the person depicted in the photographs.

1. When the calves' brains dinner is mistakenly brought to the table, one customer seated there quickly turns his head away.

A B C D E F G

2. Being sure that his player did nothing wrong, a coach demands an explanation from the referee about the penalty call.

A B C D E F G

3. A young girl wishes she was like her girlfriends and had a date for the high school dance.

A B C D E F G

4. Just as the young boy walks into the room, the lights flick on and family members appear with packages in their hands.

A B C D E F G

5. When one of the youngsters picks up a slimy snail, one girl looks at the others and covers her eyes.

A B C D E F G

6. Passengers listen carefully as a stewardess tells them that the airplane must make an emergency landing.

A B C D E F G

7. A man walks from the kitchen to the family room and turns on the radio.

A B C D E F G

8. An individual running for governor demands to know who in her office is responsible for leaking the negative "confidential" information about her to the press.

A B C D E F G

9. A woman falls asleep while reading the newspaper.

A B C D E F G

10. Villagers listen to the bombs move closer and closer.

A B C D E F G

11. As a couple eating lunch in the park cannot avoid the stench of two derelicts close by, they hastily move to another bench.

A B C D E F G

12. Expecting that a particular car would be far beyond her price range, a car buyer, upon hearing the dollar figure, asks that the salesman repeat the low figure one more time.

A B C D E F G

13. Several long-standing friends joke about the past.

A B C D E F G

14. An older man looks at a picture of his recently departed wife.

A B C D E F G

15. A parent tugs at her child after he swears at her.

A B C D E F G

16. A grandfather returns to his room after he is told that his grandson will not be able to visit him after all.

A B C D E F G

17. Both teenagers clap to the beat as their favorite song plays on.

A B C D E F G

18. A young girl, who has come to believe that her dog is just plain stupid and will never learn how to retrieve, is totally speechless when he actually does return the ball to her.

A B C D E F G

19. A child becomes fidgety when a doctor approaches him with a big needle.

A B C D E F G

20. Several relatives gather at a funeral.

A B C D E F G

21. Tired and hungry, and noting the fine smell of chicken coming from the kitchen, a husband kisses his wife as soon as he sees her.

A B C D E F G

22. Several young girls play with a cute three week old puppy.

A B C D E F G

23. A young actor, sensing that his acting for the audition was totally lackluster, can hardly believe it when the director gives him the lead role.

A B C D E F G

24. A mother says good-bye to her daughter who is going off to college.

A B C D E F G

25. Even the thought of seeing the cats' mutilated bodies brings a queer feeling to the newswoman's stomach.

A B C D E F G

26. Having finished his lunch, a carpenter continues loading the lumber into his truck.

A B C D E F G

27. After her third request for her class's attention, the teacher states that several students will have to remain after school.

A B C D E F G

28. Immediately upon hearing the loud barks, the child grabs her mother and holds her tight.

A B C D E F G

29. After a great deal of hard work in practice, a young batter hits his first home run.

A B C D E F G

30. When he notices that several youngsters are pocketing expensive merchandise, the store owner quickly makes his way toward them.

A B C D E F G

31. Having applied for hundreds of jobs over many months and having received just as many negative responses, the applicant is momentarily stunned when he is in fact offered a job.

A B C D E F G

32. While speaking on the phone to a business partner, an individual bends down to tie his shoelaces.

A B C D E F G

33. While most of the boy scouts walk right to the edge of the cliff, two scouts refuse to even approach the edge.

A B C D E F G

34. As the government inspector has difficulty breathing while he inspects the filthy prison cells, he cuts the inspection short.

A B C D E F G

35. The seamstress quickly and accurately measures and cuts the material to be used for the dress she is mending.

A B C D E F G

PAT.wp4

Sub-Task IV: Faces & Scenes

Subject ID# _____

The purpose of this task is to observe the manner in which individuals match emotional scenes with emotional facial expressions.

Please view each slide as it is presented and circle the letter of the scene that seems to be the best match for the emotional expression depicted in each slide. The arrows in each scene indicate the specific person to be matched with each slide. Don't be concerned about male/female differences between the slides and the scenes.

1. (WF3-4)

A B C D E F G

2. (C1-4)

A B C D E F G

3. (JB1-9)

A B C D E F G

4. (PF2-12)

A B C D E F G

5. (SW1-30)

A B C D E F G

6. (JM1-16)

A B C D E F G

7. (EM2-4)

A B C D E F G

8. (GS1-8)

A B C D E F G

9. (C1-23)

A B C D E F G

10. (JM3-11)

A B C D E F G

11. (A1-25)

A B C D E F G

12. (PF1-2)

A B C D E F G

13. (PE2-21)

A B C D E F G

14. (JJ4-13)

A B C D E F G

15. (EM4-24)

A B C D E F G

16. (MO2-18)

A B C D E F G

17. (NR1-6)

A B C D E F G

18. (SW4-9)

A B C D E F G

19. (JB1-3)

A B C D E F G

20. (PF1-16)

A B C D E F G

21. (A2-6)

A B C D E F G

22. (PE3-16)

A B C D E F G

23. (MO2-11)

A B C D E F G

24. (NR2-7)

A B C D E F G

25. (JJ5-13)

A B C D E F G

26. (PE2-4)

A B C D E F G

27. (PE5-7)

A B C D E F G

28. (WF2-11)

A B C D E F G

29. (PF2-30)

A B C D E F G

30. (JJ4-8)

A B C D E F G

31. (C1-10)

A B C D E F G

32. (SW3-3)

A	B	C	D	E	F	G

33. (GS1-16)

A	B	C	D	E	F	G

34. (EM4-17)

A	B	C	D	E	F	G

35. (EM5-21)

A	B	C	D	E	F	G

Subject ID: _____ Visit: _____ Date: _____

On the next two pages you will see a series of problems. In each problem, you must decide whether the stated conclusion follows logically from the premises or not. You must suppose that the premises are all true and limit yourself only to information contained in these premises. Do not be concerned if some of the terms in some of the problems seem unfamiliar to you.

You will see several problems on the next page. Treat each problem separately. For each problem, decide if the given conclusion follows logically from the premises. Choose YES if, and only if, you judge that the conclusion can be derived from the given premises. Otherwise, choose NO.

Here are some examples:

Example 1:

Premise 1: All fruit are apples
Premise 2: All oranges are fruit
Conclusion: All oranges are apples

For this first example, you would answer "Yes" because if you assume that Premise 1 and Premise 2 are true, then the conclusion must be true.

Example 2:

Premise 1: All apples are fruit
Premise 2: All oranges are fruit
Conclusion: All apples are oranges

For this second example, you would answer "No" because if you assume that Premise 1 and Premise 2 are true, then the conclusion could still be false.

Remember: for each problem, you must decide whether the stated conclusion follows logically from the premises or not. Choose YES if, and only if, you judge that the conclusion can be derived from the given premises. Otherwise, choose NO.

Premise 1: All people who support the war on terror support the troops.
Premise 2: Many Democrats do not support the war on terror.
Conclusion: Many Democrats do not support the troops.

- ○ Yes
- ○ No

Premise 1: All policies aimed at improving national security should be supported by both Democrats and Republicans.
Premise 2: President Obama's immigration policies were aimed at improving national security.
Conclusion: President Obama's immigration policies should be supported by both Democrats and Republicans.

- ○ Yes
- ○ No

Premise 1: All people who deserve tax breaks contribute to society.
Premise 2: People who receive welfare do not contribute to society.
Conclusion: People who receive welfare do not deserve tax breaks.

- ○ Yes
- ○ No

Premise 1: All sacred social institutions should be protected by the government.
Premise 2: Traditional marriage is not a sacred social institution.
Conclusion: Traditional marriage should not be protected by the government.

- ○ Yes
- ○ No

Premise 1: All programs that emphasize equal opportunities for employees promote fair hiring practices.
Premise 2: Affirmative action programs do not emphasize equal opportunities for employees.
Conclusion: Affirmative action programs do not promote fair hiring practices.

- ○ Yes
- ○ No

Premise 1: All good policies make most people happy.
Premise 2: President Obama's healthcare reform plan did not make most people happy.
Conclusion: President Obama's healthcare reform plan was not a good policy.

- ○ Yes
- ○ No

Premise 1: All murder is illegal.
Premise 2: Abortion is not illegal.
Conclusion: Abortion is not murder.

- ○ Yes
- ○ No

Premise 1: All programs that help the economy encourage the unemployed to find jobs.
Premise 2: Welfare programs encourage the unemployed to find jobs.
Conclusion: Welfare programs help the economy.

- ○ Yes
- ○ No

Premise 1: All prejudiced people blame President Obama for the weak economy.
Premise 2: Conservatives blame President Obama for the weak economy.
Conclusion: Conservatives are prejudiced people.

- ○ Yes
- ○ No

Premise 1: All things that harm the economy burden job creators.
Premise 2: Tax increases burden job creators.
Conclusion: Tax increases harm the economy.

- ○ Yes
- ○ No

Premise 1: All drugs that are dangerous should be illegal.
Premise 2: Marijuana is a drug that is dangerous.
Conclusion: Marijuana should be illegal.

- ○ Yes
- ○ No

Premise 1: All things that can jeopardize the safety of children should be strictly regulated by the government.
Premise 2: Gun ownership can jeopardize the safety of children.
Conclusion: Gun ownership should be strictly regulated by the government.

- ○ Yes
- ○ No

Premise 1: All threats to national security involve the military.
Premise 2: Illegal immigration does not involve the military.
Conclusion: Illegal immigration is not a threat to national security.

- ○ Yes
- ○ No

Premise 1: All Marxists believe the free market is unfair.
Premise 2: Some of President Obama's advisors believed the free market is unfair.
Conclusion: Some of the President Obama's advisors were Marxists.

- ○ Yes
- ○ No

Premise 1: All people of faith believe in creationism.
Premise 2: Good scientists are not people of faith.
Conclusion: Good scientists do not believe in creationism.

- ○ Yes
- ○ No

Premise 1: All things that save lives in the long run are morally acceptable.
Premise 2: The death penalty saves lives in the long run.
Conclusion: The death penalty is morally acceptable.

- ○ Yes
- ○ No

[Questions continue on the next page]

Remember: for each problem, you must decide whether the stated conclusion follows logically from the premises or not. Choose YES if, and only if, you judge that the conclusion can be derived from the given premises. Otherwise, choose NO.

Premise 1: All A's are B's
Premise 2: All X's are A's
Conclusion: All X's are B's

- ○ Yes
- ○ No

Premise 1: All A's are B's
Premise 2: Some X's are B's
Conclusion: Some X's are A's

- ○ Yes
- ○ No

Premise 1: All A's are B's
Premise 2: Some X's are not B's
Conclusion: Some X's are not A's

- ○ Yes
- ○ No

Premise 1: All A's are B's
Premise 2: Some X's are A's
Conclusion: Some X's are B's

- ○ Yes
- ○ No

Premise 1: All A's are B's
Premise 2: All X's are not A's
Conclusion: All X's are not B's

- ○ Yes
- ○ No

Premise 1: All A's are B's
Premise 2: All X's are B's
Conclusion: All X's are A's

- ○ Yes
- ○ No

Premise 1: All A's are B's
Premise 2: All X's are not B's
Conclusion: All X's are not A's

- ○ Yes
- ○ No

Premise 1: All A's are B's
Premise 2: Some X's are not B's
Conclusion: Some X's are not A's

- ○ Yes
- ○ No

M/USE Questionnaire

SUBJECT #:_____ DATE: ____/____/_____

Have you ever used marijuana? **Yes / No** (Circle one)
For our purposes, marijuana usage is considered any instance in which you intentionally consumed (smoked, ingested, etc.) any quantity of marijuana.

IF YES:
At what age did you start? _____

At what specific age (in years) was your marijuana usage the heaviest? _____

During your lifetime, approximately how many occasions have you used marijuana?
_____

Consider the extent of marijuana use throughout your lifetime. Please approximate the number of times per month on average which you used marijuana at the following ages:					
Before 15					

During your lifetime, on average, how many times per month have you used marijuana?
_____
In the past four weeks, did you use marijuana?
NO YES
How often? _____ daily / weekly (circle one)
On average, how much do you consume per occasion? _____
If YES, please review the printed calendar reflecting all the days in the past month. Indicate the number
of times you used marijuana on each of these days. If you abstained from marijuana use during a given
day, please write a "0" on that day. Please fill out every day in the calendar with your best guess of
marijuana use.

STRAIN Questionnaire

Please answer "yes" or "no" to the following questions:

Have you ever dropped out or failed out of school?

Have you ever been laid off or fired from a full-time job?

Have you ever actively looked for a job for at least six months, but were unable to find a stable job?

Have you ever been in a job where the demands were overwhelming or where you did not have enough resources or support?

Have you ever experienced exclusion or unfair treatment at a job -- for example, because of your gender, sexual orientation, race, or ethnicity?

As an adult, have you ever experienced financial strain during which time you had difficulty paying for basic things, such as food or rent?

Have you ever lived in cramped or overcrowded living conditions where you did not have enough space or privacy?

Have you ever felt physically unsafe in a neighborhood where you lived?

Have you ever felt like you didn't have a stable place to live?

Have you ever lost a home or been forced to move from your home?

Have you ever experienced a move that greatly disrupted your daily life? For example, maybe you moved further away from work, or from friends or family?

Did a child who lived in your house ever move out for an upsetting reason?

Have you ever been hospitalized because of a major medical or health problem?

Have you ever experienced an ongoing health problem that impacted your daily life -- for example, you had to take time off of work or school?

As an adult, have you ever required some type of ongoing care or support for a health-related issue? For example, you were dependent on someone else for basic things such as eating or using the restroom?

Have you ever had to provide ongoing care for someone close to you because they couldn't take care of themselves? For example, because they were getting old, or experiencing a significant health problem or medical condition?

Would you, or someone you know well, say that you have ever had difficulty with a drinking or drug habit that negatively impacted your job, school, or personal life?

Have you ever been diagnosed with a psychiatric illness such as depression, anxiety, schizophrenia, or bipolar disorder?

Have you ever had an emergency hospitalization for a psychiatric or drug-related reason?

Have you ever had a divorce or the break-up of a serious relationship?

Was there ever a period of time when you had ongoing arguments with a spouse or partner?

Did the arguments ever lead to physical fights?

Have you ever found out that a partner was unfaithful to you?

Have you ever had ongoing legal problems with a partner or spouse -- for example, because of custody issues, financial problems, or a restraining order?

Was there ever a period of time when someone close to you was being emotionally, physically, or sexually abused? For example, when they were being invalidated, blamed, or called names, or when they were being hit or were in danger of being hurt by another person?

Was there ever a period of time when you experienced emotional abuse? This could include times when you were being invalidated, blamed, threatened, or humiliated by another person.

Was there ever a period of time when you were physically abused? This could include times when you were being hit, bruised, restrained, or otherwise physically harmed or hurt.

Was there ever a period of time when you felt socially isolated or had no one to confide in?

Have you ever experienced infertility?

Have you ever experienced a serious problem with a pregnancy that threatened the wellbeing of the baby? For example, you were at risk of having a miscarriage or delivering the baby prematurely, or you lost the baby during delivery?

Have you ever had an abortion?

Have you ever had ongoing difficulties caring for a child because you had limited resources? For example, you had difficulty finding someone to care for them while you were at work, problems getting them to and from childcare because of work, or problems paying for their basic needs like food or clothes?

Have you ever had the misfortune that one of your children died?

Have you ever been held up or robbed?

Has your house ever been broken into?

Have you ever been arrested or had to appear in court for something you did, besides a minor traffic violation?

Have you ever spent time in jail or prison for longer than a week?

Households can sometimes have a primary breadwinner who supports the household financially. Has it ever been the case that your primary household breadwinner lost his or her job?

Has anyone close to you ever been in a life-threatening accident?

Has someone close to you ever died?

Has someone close to you ever tried to take his or her own life?

Have you ever been physically or sexually attacked? This would include an instance when someone tried to hurt, molest, or rape you.

Was there ever a period of time when you were sexually abused on an ongoing basis by someone in your family or close social network? This would include times when someone raped, molested, or made unwanted sexual contacts with you on an ongoing basis.

Before you were 18 years old, did your parents (or main caregivers) ever have ongoing relationship problems, fights, or arguments?

Was there ever a period of time when you were separated from a parent (or main caregiver) for at least one month before you were 18?

Did your parents (or main caregivers) ever get divorced before you were 18?

Did you ever experience harsh discipline from your parents or main caregivers? This could include being spanked, hit, or otherwise hurt?

Were you ever bullied by other kids at school? For example, did other students ever call you names, humiliate you, or belittle you?

Is your mother still alive?

Is your father still alive?

Has someone close to you ever been diagnosed with a physical illness that impacted you?

Has someone close to you ever suffered from a mental or psychiatric illness that impacted you -- for example, severe anxiety, depression, or an ongoing drinking or drug problem?

Did your mother suffer from a mental or psychiatric disorder that impacted you?

Did your father suffer from a mental or psychiatric disorder that impacted you?

A2IE Task (Smith, Fass, & Lane, 2014)

The purpose of this task is to assess brain activity during memory tasks involving internally focused emotions. While inside the MRI scanner, participants will be shown images taken from the International Affective Picture System (IAPS) and asked to respond using a button box. A total of 80 images will be presented, consisting of 40 negative, 20 positive, and 20 neutral images. In each trial, participants will first view a fixation cross, followed by a cue indicating what their focus of attention should be (body, emotion, image, or rest), then the image, followed by a response screen (see **Example Trials**). There will be 14 trials for each type of focus of attention (i.e. somatic sensation, feeling of emotion, image content, or rest), resulting in 42 total trials. Each trial will last between 16.5 and 23.5 seconds, with the entire task will lasting approximately 1200 seconds.

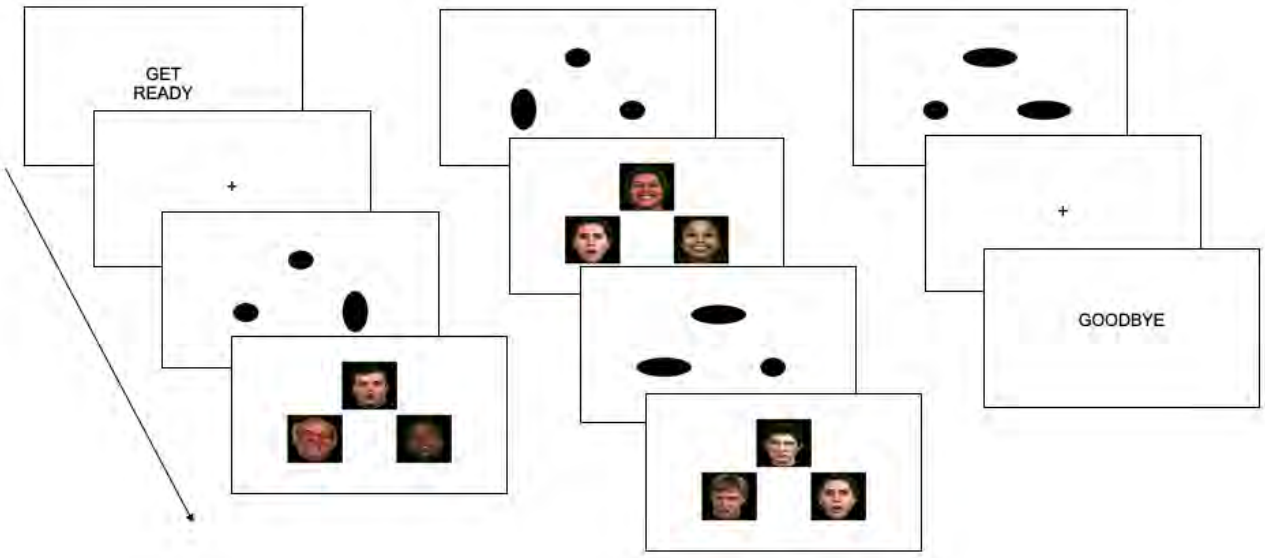
Some of the images shown during the picture task are sexually explicit or violent in nature and subjects are made aware of this possibility during the consenting process. Subjects that decide they feel too uncomfortable may choose to withdraw at any time from the study. However, we do not anticipate any long-term effects from viewing these images and the IAPS photos have been used safely in numerous experimental contexts.

Example Trials

EFAT2 Task (Hariri et al., 2002)

During this task, participants will be either be shown stimuli with containing faces with angry, fearful, or happy emotional expressions; or they will be shown geometric shapes. In each trial, they will be asked to match one of the bottom stimuli to the top stimuli by pressing one of two buttons on the MRI scanner button box that correspond to the side of the screen of the correct match. Participants will be exposed to a total of 24 matching trials, including 12 geometric stimuli, 3 matched angry stimuli, 3 matched fearful stimuli, 3 matched happy stimuli, and 3 fixation points. There are a total of three blocks containing a combination of the potential stimuli conditions, as seen in the example trial below. This task will last approximately 406 seconds.

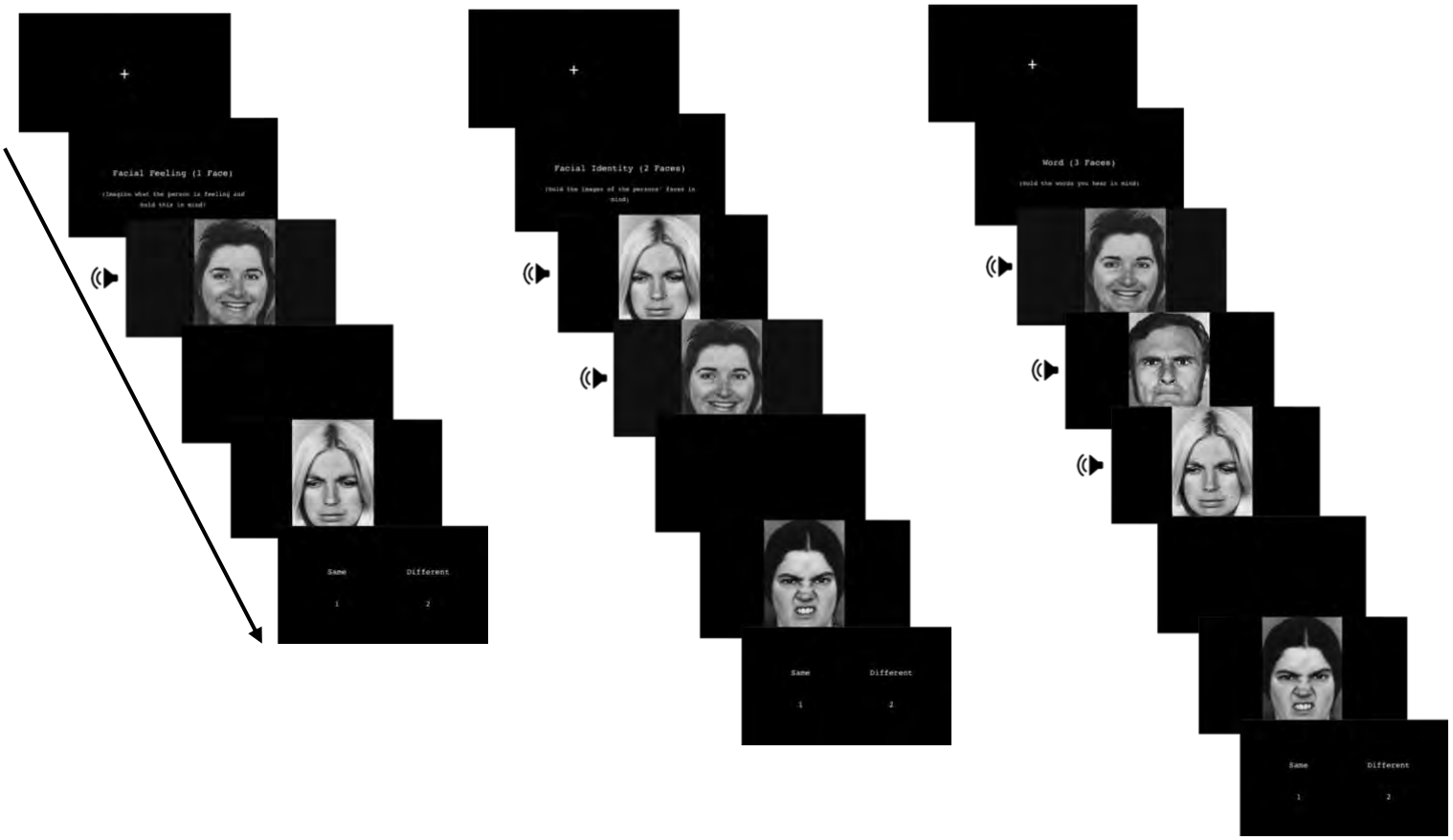
Example trial



Emotional Working Memory Task (Smith et al., 2017)

The purpose of this task is to assess brain activity during memory tasks involving externally focused emotion, specifically faces with varying affective qualities as stimuli. While in the MRI scanner, participants will view emotional faces while hearing emotion words (i.e. happy, surprised, sad, disgusted, angry, afraid). In each trial, participants will first view a fixation cross, then a cue indicating what aspect of the stimulus they should focus on(facial identity, facial feeling, word heard, or pleasantness), followed by either 1, 2, or 3 emotional faces also paired with an emotion word. This is followed by a pause (black screen), then the display of a novel face, and finishing with a response screen (see **Example Trials**). Participants must decide whether the novel face is the same or different from the face they either viewed (facial identity, facial feeling) or heard (word) prior to the pause. Participants will indicate their response using a button box and there will be a total of 42 trials, lasting approximately 856 seconds.

Example Trials



FLOURISHING SCALE

Below are 8 statements with which you may agree or disagree. Using the 1–7 scale below, indicate your agreement with each item by indicating that response for each statement.

- 7 - Strongly agree
- 6 - Agree
- 5 - Slightly agree
- 4 - Neither agree nor disagree
- 3 - Slightly disagree
- 2 - Disagree
- 1 - Strongly disagree

____ I lead a purposeful and meaningful life

____ My social relationships are supportive and rewarding

____ I am engaged and interested in my daily activities

____ I actively contribute to the happiness and well-being of others

____ I am competent and capable in the activities that are important to me

____ I am a good person and live a good life

____ I am optimistic about my future

____ People respect me

Scoring:

Add the responses, varying from 1 to 7, for all eight items. The possible range of scores is from 8 (lowest possible) to 56 (highest PWB possible). A high score represents a person with many psychological resources and strengths

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

Appendix

The Short Dark Triad (SD3)

Instructions: *Please indicate how much you agree with each of the following statements*

Disagree strongly	*Disagree*	*Neither agree nor disagree*	*Agree*	*Agree strongly*
1	*2*	*3*	*4*	*5*

Machiavellianism

1. It's not wise to tell your secrets.
2. I like to use clever manipulation to get my way.
3. Whatever it takes, you must get the important people on your side.
4. Avoid direct conflict with others because they may be useful in the future.
5. It's wise to keep track of information that you can use against people later.
6. You should wait for the right time to get back at people.
7. There are things you should hide from other people to preserve your reputation.
8. Make sure your plans benefit yourself, not others.
9. Most people can be manipulated.

Narcissism

1. People see me as a natural leader.
2. I hate being the center of attention. (R)
3. Many group activities tend to be dull without me.
4. I know that I am special because everyone keeps telling me so.
5. I like to get acquainted with important people.
6. I feel embarrassed if someone compliments me. (R)
7. I have been compared to famous people.
8. I am an average person. (R)
9. I insist on getting the respect I deserve.

Psychopathy

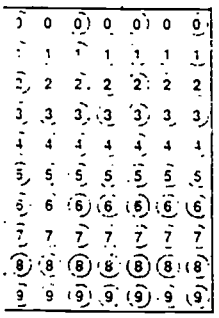
1. I like to get revenge on authorities.
2. I avoid dangerous situations. (R)
3. Payback needs to be quick and nasty.
4. People often say I'm out of control.
5. It's true that I can be mean to others.
6. People who mess with me always regret it.
7. I have never gotten into trouble with the law. (R)
8. I enjoy having sex with people I hardly know
9. I'll say anything to get what I want.

Note. The subscale headings should be removed before the SD3 is administered. Items should be kept in the same order. Reversals are indicated with (R).

Appendix The Short Dark Triad (SD3) Instructions: Please indicate how much you agree with each of the following statements

LEADER ATTRIBUTES INVENTORY
Rating-by-Observer Form

ID NUMBER



Jerome Moss, Jr.
with the assistance of
Qetler Jensrud, Barry Johansen, Hallie Preskill

Marking Directions

- **Use pencil or black or blue pen.**
- **Darken the circle completely.**
- **Erase cleanly any marks you wish to change or X out mark if in pen.**
- **Do not make any stray marks on this form.**

Correct Mark
○●○○
Incorrect Marks
⊘⊗⊙◔

SECTION A

Please provide the following information about yourself.

1. Today's date: _____
   (MONTH) (DAY) (YEAR)
2. Your gender:
   - Female
   - Male
3. Your ethnic group:
   - African American
   - Asian
   - Hispanic
   - Native American
   - White
   - Other _____
4. In relation to the person you are rating, you are his/her:
   - Subordinate
   - Peer
   - Superior
5. How well do you know the person rated?
   - Very well
   - Fairly well
   - Casually
   - Not at all

SECTION B

You have been asked to rate the leadership characteristics (attributes) of another person (usually the person who gave you this form). The purpose is to assist in improving the leadership capabilities of the individual by identifying the relative strengths and development needs of her/his leader attributes, so please be as discriminating in your rating as possible.

You will return this form directly to the National Center for Research in Vocational Education so the person you are rating will not be able to identify your responses. All feedback to the person being rated will be in the form of averages from a group of raters. We urge you to reflect carefully about each statement. Then rate the person on each statement using the following scale.

1. Very Undescriptive
2. Undescriptive
3. Somewhat Undescriptive
4. Somewhat Descriptive
5. Descriptive
6. Very Descriptive

For each of the statements, fill in the circle that best describes the person you are rating.

Attributes

	Very Undescriptive	Undescriptive	Somewhat Undescriptive	Somewhat Descriptive	Descriptive	Very Descriptive
1. *Energetic with stamina* – Approaches tasks with great energy and works long hours when necessary	1	2	3	4	5	6
2. *Insightful* – Reflects on the relationship among events and grasps the meaning of complex issues quickly	1	2	3	4	5	6
3. *Adaptable, open to change* – Encourages and accepts suggestions and constructive criticism from co-workers, and is willing to consider modifying plans	1	2	3	4	5	6
4. *Visionary* – Looks to the future and creates new ways in which the organization can prosper	1	2	3	4	5	6
5. *Tolerant of ambiguity and complexity* – Comfortably handles vague and difficult situations where there is no simple answer or no prescribed method of proceeding	1	2	3	4	5	6
6. *Achievement-oriented* – Shows commitment to achieving goals and strives to keep improving performance	1	2	3	4	5	6
7. *Accountable* – Holds self answerable for work and willingly admits mistakes	1	2	3	4	5	6
8. *Initiating* – Frequently introduces new ideas	1	2	3	4	5	6
9. *Confident, accepting of self* – Appears secure about abilities and recognizes personal shortcomings	1	2	3	4	5	6
10. *Willing to accept responsibility* – Willingly assumes higher level duties and functions within the organization	1	2	3	4	5	6
11. *Persistent* – Continues to act on beliefs despite unexpected difficulties	1	2	3	4	5	6
12. *Enthusiastic, optimistic* – Thinks positively, approaches new tasks with excitement, and deals with challenges as opportunities	1	2	3	4	5	6
13. *Tolerant of frustration* – Acts calmly and patiently even when things don't go as planned	1	2	3	4	5	6
14. *Dependable, reliable* – Can be counted on to follow through to get the job done	1	2	3	4	5	6
15. *Courageous, risk-taker* – Willingly tries out new ideas in spite of possible loss or failure	1	2	3	4	5	6
16. *Even disposition* – Displays a sense of humor and a stable temperament even in stressful situations	1	2	3	4	5	6
17. *Committed to the common good* – Works to benefit the entire organization, not just self	1	2	3	4	5	6
18. *Personal integrity* – Speaks frankly and honestly and practices espoused values	1	2	3	4	5	6

Attributes

	Very Undescriptive	Undescriptive	Somewhat Undescriptive	Somewhat Descriptive	Descriptive	Very Descriptive
19. *Intelligent with practical judgment* – Learns quickly, and knows how and when to apply knowledge	1	2	3	4	5	6
20. *Ethical* – Acts consistently with principles of fairness and right or good conduct that can stand the test of close public scrutiny	1	2	3	4	5	6
21. *Communication (listening, oral, written)* – Listens closely to people at work, and organizes and clearly presents information both orally and in writing	1	2	3	4	5	6
22. *Sensitivity, respect* – Shows genuine concern for the feelings of others and regard for them as individuals	1	2	3	4	5	6
23. *Motivating others* – Creates an environment in which people want to do their best	1	2	3	4	5	6
24. *Networking* – Develops cooperative relationships within and outside of the organization	1	2	3	4	5	6
25. *Planning* – In collaboration with others, develops tactics and strategies for achieving organizational objectives	1	2	3	4	5	6
26. *Delegating* – Appropriately and effectively assigns responsibility and authority	1	2	3	4	5	6
27. *Organizing* – Establishes effective and efficient procedures for getting work done in an orderly manner	1	2	3	4	5	6
28. *Team building* – Facilitates the development of cohesiveness and cooperation among the people at work	1	2	3	4	5	6
29. *Coaching* – Helps people develop knowledge and skills for their work assignments	1	2	3	4	5	6
30. *Conflict management* – Brings conflict into the open and uses it to arrive at constructive solutions	1	2	3	4	5	6
31. *Time management* – Schedules own work activities so that deadlines are met and work goals are accomplished in a timely manner	1	2	3	4	5	6
32. *Stress management* – Effectively deals with the tension of high pressure work situations	1	2	3	4	5	6
33. *Appropriate use of leadership styles* – Uses a variety of approaches to influence and lead others	1	2	3	4	5	6
34. *Ideological beliefs are appropriate to the group* – Models and demonstrates belief in the basic values of the organization	1	2	3	4	5	6
35. *Decision-making* – Makes timely decisions that are in the best interest of the organization by analyzing all available information, distilling key points, and drawing relevant conclusions	1	2	3	4	5	6

Continue to the next page

Attributes

	Very Undescriptive	Undescriptive	Somewhat Undescriptive	Somewhat Descriptive	Descriptive	Very Descriptive
36. *Problem-solving* – Effectively identifies, analyzes, and resolves difficulties and uncertainties at work	1	2	3	4	5	6
37. *Information management* – Identifies, collects, organizes, and analyzes the essential information needed by the organization	1	2	3	4	5	6

Thank you for completing this survey!

Please return the completed survey directly to:

National Center for Research in Vocational Education
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St. Paul, MN 55108

frontiers in Human Neuroscience

ORIGINAL RESEARCH
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Ability-Based Emotional Intelligence Is Associated With Greater Cardiac Vagal Control and Reactivity

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Several distinct models of emotional intelligence (EI) have been developed over the past two decades. The ability model conceptualizes EI as a narrow set of interconnected, objectively measured, cognitive-emotional abilities, including the ability to perceive, manage, facilitate, and understand the emotions of the self and others. By contrast, trait or mixed models focus on subjective ratings of emotional/social competencies. Theoretically, EI is associated with neurobiological processes involved in emotional regulation and reactivity. The neurovisceral integration (NVI) model proposes a positive relationship between cardiac vagal control (CVC) and cognitive-emotional abilities similar to those encompassed by EI. The current study examined the association between CVC and EI. Because ability EI is directly tied to actual performance on emotional tasks, we hypothesized that individuals with higher ability-based EI scores would show greater levels of CVC at rest, and in response to a stressful task. Because mixed-models of EI are not linked directly to observable emotional behavior, we predicted no association with CVC. Consistent with expectations, individuals with higher levels of ability EI, but not mixed EI, had higher levels of CVC. We also found that individuals with greater levels of CVC who demonstrated reactivity to a stress induction had significantly higher EI compared to individuals that did not respond to the stress induction. Our findings support the theoretically expected overlap between constructs within the NVI model and ability EI model, however, the observed effect size was small, and the associations between EI and CVC should not be taken to indicate a causal connection. Results suggest that variance in the ability to understand emotional processes in oneself and to reason about one's visceral experience may facilitate better CVC. Future work manipulating either CVC or EI may prove informative in teasing apart the causal role driving their observed relationship.

Keywords: cardiac vagal control, emotional intelligence, mixed emotional intelligence, ability emotional intelligence, heart rate variability, stress, autonomic control, emotion regulation

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INTRODUCTION

Emotion and cognition represent a dynamic system involved in a reciprocal relationship. Their interplay is proposed to facilitate social adaptation, thus facilitating the optimization of health, and behavior (Lazarus, 1991). The facilitation and balance between emotion and cognition are thought to be a unique set of abilities, separate from general intelligence (IQ), and conceptualized

as emotional intelligence (EI) (Salovey and Mayer, 1990). EI has been defined in a number of ways but is generically described as the awareness and understanding of emotional information relating to oneself and others, and the ability to use that information to facilitate goal-oriented behavior (Payne, 1985; Mayer and Geher, 1996; Goleman, 2006; Smith et al., 2018). The concept of EI has been defined by multiple authors, to index the degree to which emotion relates to adaptive human behavior and social engagement (Bar-On, 2004; Extremera and Fernández-Berrocal, 2005; Pérez et al., 2005; Seal et al., 2009).

Two main models for quantifying EI for research purposes have emerged from previous work and are proposed as either purely "performance ability" or "trait" based (Bar-On, 1997; Mayer et al., 2008). The ability model postulates EI as a narrow construct and uses objective performance-based testing as a means of quantification, whereas trait models theorize that it is a broader skill set and have become known as mixed-models of EI (Mayer et al., 2002; Bar-On, 2004; Gutiérrez-Cobo et al., 2016). The Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT) is the most widely used performance-based ability model test and encompasses a variety of skills and abilities related to emotional processing, such as the ability to use emotions purposefully, distinguish emotional cues, and deliberately use emotions when having to make decisions (Mayer et al., 2001; Brackett et al., 2006). The model proposes a hierarchy of performance based on the quality of responses to a variety of emotion-focused problems. As an ability measure, the MSCEIT comprises a series of tasks that assess discrete emotional skills such as the ability to recognize emotions in visual stimuli such as faces and photographs, the ability to regulate and manage emotions in various contexts, and the ability to solve emotional problems. On the other hand, the Bar-On emotional quotient inventory (EQ-i) is one of the most widely used self-report instruments assessing mixed model EI (Bar-On, 2004). The Bar-On model, and other mixed approaches, generally conceive of EI as a set of stable social and emotional competencies of which the individual is self-aware and that are assessed via self-report statements (Petrides and Furnham, 2001). An alternative conceptualization of EI that has gained attention for its potential to foster a more holistic theory of EI calls for a multi-level model and the integration of a behavioral level of EI relating it to social and professional outcomes (Boyatzis, 2018). A multi-level approach will undoubtedly propel our understanding of EI as a unique and specific construct relating to cognition and behavior. However, the time and resource demands of the qualitative methodology inherent to this type of assessment of EI capacities has been a barrier to its larger scale dissemination and application in research. As such, practitioners wishing to assess EI find themselves having to consider not only theoretical orientations but the resources necessary to adequately assess the capacity (Boyatzis, 2018). Despite more than two decades of intensive research, there continues to be a wide-ranging debate about the construct validity of the various models of EI and how such models relate to cognition (Mayer et al., 2001; Locke, 2005; Alkozei et al., 2018).

It is well accepted that effective emotion regulation strategies contribute to wellbeing and positive mental health outcomes. Higher levels of EI are particularly strong predictors of mental health outcomes and also associated with better physical health (Martins et al., 2010; Fernández-Abascal and Martín-Díaz, 2015). Interestingly, mixed and ability measures of EI are often poorly correlated with one another and predict different aspects of health (Webb et al., 2013). For example, higher mixed EI has been associated with increased well-being, yet attempts to replicate this association with ability tests have been unsuccessful (Furnham and Petrides, 2003; Zeidner and Olnick-Shemesh, 2010). Higher levels of mixed EI may also protect against emotion dysregulation and facilitate greater quality in social interactions (Lopes et al., 2005). Individuals with higher levels of mixed EI demonstrate increased resilience against decrements in personally relevant moral-judgment decisions while sleep deprived, without significant changes for other moral domains (Killgore et al., 2007). Both mixed and ability model scores demonstrate a positive association with accuracy in recognizing emotional facial expressions (Petrides and Furnham, 2003; Wojciechowski et al., 2014). There is a high correlation between mixed EI and job performance, however, well-established measures of knowledge, skills, abilities, and other characteristics offer significant incremental prediction beyond measures of mixed EI (Joseph et al., 2015). The mixed findings for the two models underscore the notion that associations between EI as a quantified measure are dependent on several factors, including cognition, the testing modality, and the degree of emotional content inherent to the endeavor. A growing body of work demonstrates a distinction between cognitive tasks that are emotionally neutral, as opposed to those containing affective stimuli, conceptualized as utilizing "hot" or "cool" cognitive processes (Metcalfe and Mischel, 1999). A recent systematic review of studies showed that ability, but not mixed, EI correlated positively with task performance that required "hot" cognitive processes, while studies investigating the relationship between EI metrics, and "cool" cognitive processes failed to produce any positive associations (Gutiérrez-Cobo et al., 2016). Based on their findings, the authors concluded that current ability and mixed model conceptualizations of EI are only relevant for tasks that require affective processing and that the MSCEIT is the only current ability or mixed model based EI measure that reliably predicts increased performance on affective cognitive tasks.

Emotional functioning depends on a dynamic interplay of the central nervous system and the autonomic nervous system. A fundamental component of the parasympathetic branch of the autonomic nervous system critical to mind-body interactions is cardiac vagal control (CVC), which provides a reliable marker for emotional health (Porges, 1995). Measures of CVC, such as heart rate variability (HRV), are considered representative of interindividual differences in parasympathetic efferent control of cardiac rate, which when high promotes adaptive emotional responding and regulation that underlie physical, and mental health (van Ravenswaaij-Arts et al., 1993; Acharya et al., 2007; Beauchaine and Thayer, 2015). Optimal cardiac reactivity demonstrates tightly coupled reciprocal responsiveness between the sympathetic and parasympathetic systems in reaction to environmental demands (Mccabe et al., 2000). The Polyvagal theory posits that CVC

is responsible for higher-order functions in mammals, from a phylogenetic perspective, by facilitating emotion regulation, and promoting social engagement (Porges, 1995). Individual differences in CVC reactivity predict vulnerability to stress, along with positive outcomes in communication, attention, and the regulation of emotion (Suess et al., 1994; Porges, 1995; Thayer and Lane, 2000; Appelhans and Luecken, 2006). A substantial body of work demonstrates associations between low levels of resting and reactive CVC with multiple forms of internalizing and externalizing psychopathology (Kemp and Quintana, 2013; Shahrestani et al., 2014; Beauchaine, 2015). Greater CVC reactivity buffers against the development of psychopathology and health problems (El-Sheikh et al., 2001). Increases in CVC are related to optimal outcomes in the treatment of major depression and have been suggested as a target for anxiety interventions (Chambers and Allen, 2002; Chalmers et al., 2014).

Cardiac vagal control is important in a wide range of situations that demand effective cognitive-emotional regulation through coordination of biological systems. The degree of influence CVC has over the central autonomic network is thought to rely on prefrontal inhibition, and the neurovisceral integration (NVI) model proposes that the dynamic system contributing to autonomic control involves a negative feedback system guided by attention regulation and affective processing (Thayer and Lane, 2000). The central autonomic network demonstrates a positive relationship between CVC modulation and increased cognitive-emotional abilities that are similar to EI and is predictive of positive behavioral health outcomes in mood disorders, such as depression (Friedman, 2007). Since its initial conception, the NVI model has gained considerable empirical support relevant to positive behavioral health outcomes, and recent work has extended NVI model to a hierarchical model involved in predictive cognitive coding computations (Smith et al., 2017). Cognitive coding computations are critical during early development and are vital to learning and the comprehension of knowledge (Clark and Paivio, 1991). Children with higher levels of resting HRV have higher capacities for sustained attention and higher attention span/persistence in early childhood; which contribute to cognitive development and higher educational attainment (Suess et al., 1994; McClelland et al., 2013). Increased performance in high-stress environments such as sports competition is also linked to greater ability to regulate emotions, as well as resting CVC and its modulation (Crombie et al., 2009; Plews et al., 2012). The use of biofeedback to enhance CVC control is related to improvements in emotional health in the workplace as well as better performance in competitive environments where high levels of stress are inherent (McCraty et al., 2003; Holden, 2006). Favorable results related to increases in resting CVC recovery following a stressor after targeted biofeedback training have been shown to occur and contribute to positive outcomes related to anxiety and emotion regulation (McCraty et al., 1999; Thurber et al., 2010).

Chronic stress and the inability to regulate emotions are associated with maladaptive physiology, mental health, and have a critical impact on multiple aspects of well-being (Chrousos, 2000). Higher levels of ability-based EI predict greater CVC reactivity during more intense emotional experiences (Rash and Prkachin, 2013). Self-report mixed EI metrics also predict positive outcomes and better cardiac responsiveness during stress (Bar-On et al., 2006). Athletes with higher levels of mixed EI have lower levels of CVC reactivity during high-stress competitive environments (Laborde et al., 2011). However, this must be considered in light of the fact that athletes demonstrate atypical autonomic reactivity compared to less physically fit individuals and have significantly higher levels of self-esteem and social connectedness (Koivula et al., 2002; Plews et al., 2012). In conclusion, studies investigating the relationship between the different conceptualizations of EI, CVC, and its reactivity to stress demonstrate consistent positive associations between EI and CVC; but no study to date has investigated this relationship incorporating two of the most widely used and validated measures of mixed and ability EI simultaneously.

To address the current gap in literature associating CVC and EI, we examined the influence of both ability EI and mixed EI on CVC during rest and in response to a potentially stressful task. Since CVC reactivity is linked to flexibility in emotion regulation and ability-based metrics are most representative of cognitive control, likely extending to EI, then individual differences in EI are expected to be related to CVC modulation during stress. In light of prior evidence, three general hypotheses were tested. First, we hypothesized that individuals with higher levels of ability EI would have greater levels of CVC at rest, and if so by the perceiving and understanding domains that are less likely to incorporate acute CVC reactivity. Second, we hypothesized that individuals with higher levels of ability EI would have greater decreases in CVC in response to stress and greater subsequent increases during recovery, and if so, these would be driven by the managing and using domains, which may be more likely to be utilized in contexts requiring CVC reactivity. Finally, we hypothesized that cardiac metrics that are less specifically sensitive to vagally mediated influences (i.e., sensitive to some extent also to sympathetic influences) would not demonstrate the same associations with EI as CVC metrics that reflect primarily parasympathetic influence.

MATERIALS AND METHODS

Participants

One hundred thirty-five healthy adults (87 females) were recruited from the local community via internet, newspaper, radio, and flyer advertisements for the present study. A power analysis modeled on previous work investigating CVC and emotional dispositions suggested that effect sizes were small to medium (Pearson's r ranged from 0.21 to 0.38) (Oveis et al., 2009). Therefore, for the proposed study, we applied the mean effect size (r = 0.29) to estimate power to detect individual differences. That power analysis showed that with $\alpha = 0.05$ (2-tailed), a sample of n = 88 should provide adequate power ($1\text{-}\beta = 0.8$) to detect individual differences to be established by CVC characteristics, which was less than the minimum number of individuals to be recruited for a subsequent study sharing a recruitment effort with the present study. Participants were between the ages of 18–40. Because of the high reading and

cognitive demands of the tasks, participants were required to have an English reading proficiency of 8th grade or higher as defined by the WRAT4 Reading subtest and were also screened to exclude individuals with impaired reading comprehension, and altered mental status or capacity, due to medications, substances, cognitive status, injury, or medical conditions that could influence the outcome of psychological assessment.

Participants were excluded from analyses if they took medication with a mechanism of action that influences cardiac reactivity (21 participants, see **Supplementary Appendix A** for a list of medications) or had unusable EKG data (8 participants). Four participants failed to have their EQi recorded and were also removed from analyses. The final sample for analyses included 102 individuals (64 females, mean age = 22.8 years, *SD* = 4.4). All participants had a high school diploma or equivalent, 91.2% of participants completed some college, 28.4% of participants had a Bachelor's degree or higher. 54.9% of participants were Caucasian, 21.6% were Hispanic/Latino, 12.7% were Asian/Pacific Islander, 4.9% were African American, and 5.9% reported ethnicity as "other."

All participants provided written informed consent before enrollment. The study protocol was approved by the Institutional Review Boards of the University of Arizona and the U.S. Army Human Research Protections Office.

Apparatus and Materials

Psychological Assessment

The Mayer-Salovey-Caruso Emotional Intelligence Test II (MSCEIT) was used to assess ability-based EI and evaluates a number of specific skills and abilities related to reasoning about and regulating emotional processes (Mayer et al., 2003). The MSCEIT is a 141-item performance test requiring subjects to identify emotions in faces and designs, to specify emotions or feelings that interfere with or facilitate specific thought processes, demonstrate an understanding of how various emotions combine to create higher-order emotions and how these blends may change over time, as well as demonstrate knowledge of how specific emotional management strategies will lead to various consequences in oneself and others. The test yields a total EI score, two area scores (experiencing and strategic), and four branch scores (perceiving, using, understanding, and managing); derived from eight task-level scores. The area scores are specific to the ability to recognize emotions and determine how they interact with a thought or understand emotional meanings relative to others and manage them. The branch scores are specific to the ability to identify emotions, facilitate thought using emotions, understand emotions, and manage emotions. The MSCEIT has been found to have adequate reliability (split-half reliability overall = 0.91) and good discriminant and convergent validity (Mayer et al., 2002).

Mixed EI was assessed using the *Bar-On EQ-I 2* (EQi), a self-report inventory designed to evaluate the construct of EI and the underlying factors that contribute to emotionally intelligent behavior (Bar-On et al., 2006). The EQi is a 133-item self-report measure using short sentences (e.g., "I am good at reading other people's emotions") and a 5-point Likert response scale ranging from (1) "very seldom or not true of me" to (5) "very often true of me or true of me." The measure provides several scores, including a general metric of total EI and five composite scales (self-perception, self-expression, interpersonal, decision making, stress management), assessing various features of mixed EI. The EQi has been found to have good discriminant and convergent validity, as well as very high reliability (internal consistency = 0.97) (Bar-On, 2004).

Physiological Assessment

Physiological data were recorded using a Zephyr Biopatch[1] with conductive adhesive hydrogel foam electrodes. The device was placed at the sternum, and the ECG signal was sampled at 1000 Hz, which is above the minimum suggested sampling frequency (Camm et al., 1996). Off-line analysis was performed by extracting the inter-beat interval (IBI) series from the raw digitized ECG signal using QRSTool Software (Allen et al., 2007).

Procedure

After providing informed consent, participants underwent an ECG reactivity assessment that entailed two five-minute resting periods separated by a 90-s cognitive challenge as a stress induction (serial subtraction) (Tomaka et al., 1994; Seraganian et al., 1997). During resting periods, participants were instructed to sit quietly without talking or moving while focusing on a fixation cross positioned in front of them. During the stress induction, participants were asked to count backward by 17, starting from 1,025, as quickly as possible. Participants were provided pre-recorded auditory feedback contingent on their performance via an E-Prime program[2], controlled by a research technician. To maximize the stress induction, participants were instructed to begin again if they made an error in their subtraction, or that they needed to go faster and to start again if they reached predetermined points without error. Participants completed all psychological measures, including the MSCEIT and EQi, subsequent to the ECG reactivity assessment.

Physiological Data Reduction and Variable Selection

The extracted IBI series were hand corrected by a trained and experienced technician to eliminate artifacts such as ectopic, erroneous, and missed beats (Berntson et al., 1990). Data were processed using Matlab (version 2015B[3]) with parameters modeled on those of CMetX Cardiac Metric Software (Allen et al., 2007), with the additional incorporation of a moving window. The moving window used 30-s segments that shifted by 3-s at a time. Estimates of multiple metrics of cardiac chronotropy were derived using the extracted time series. The moving window approach ensures that variance estimates from a non-stationary time series (as is almost always the case with interbeat-interval data) are not inflated by recording length. The mean value across all 30-s epochs was taken for each metric as the final value to be used in analyses.

[1]https://www.zephyranywhere.com/media/download/zephyr-performance-biopatch-hp-brochure.pdf

[2]https://pstnet.com/products/e-prime/

[3]https://www.mathworks.com

CVC Variable Selection and Estimates

Increased influence of the vagus nerve on heart rate leads to larger variance in the time interval between heartbeats; a phenomenon classified HRV. HRV is widely accepted as representative of CVC and is sensitive to both the parasympathetic and sympathetic influences of the autonomic nervous system, but it reflects predominantly parasympathetic influences when individuals are at rest (Allen et al., 2007; Kromenacker et al., 2018). The root mean square of successive differences (RMSSD) is another time-domain measure proposed to quantify the parasympathetic nervous system's impact on HRV (Von Neumann, 1941; Malik et al., 1996). The Polyvagal theory proposes respiratory sinus arrhythmia (RSA) as a measure of CVC, indexing the magnitude of respiratory-linked changes in HRV (Porges, 1995). Individual differences in RMSSD are associated with similar outcomes as RSA, such as susceptibility to cardiovascular disease, but more sensitive to low-frequency HRV contributions that can represent a combination of parasympathetic and sympathetic influences on HRV (Berntson et al., 2005; Thayer et al., 2010; Kromenacker et al., 2018). While RSA is the gold standard in the non-invasive quantification of parasympathetic control, it is still an imperfect index of CVC, as it is susceptible to the influence of respiration (Grossman et al., 1991; Allen et al., 2007). RMSSD is less sensitive to the impact of slow respiration and individuals breathing outside the targeted range, but debate remains regarding the underlying influence on this time domain metric (Hill et al., 2009). Previous work shows high correlations between RSA and RMSSD (r's = 0.85–0.91) but RSA has higher correlations with HRV (r = 0.90) than RMSSD (r = 0.84) (Berntson et al., 2005; Kleiger et al., 2005; Allen et al., 2007).

Respiratory sinus arrhythmia was estimated by calculating HRV in the high-frequency band that captures respiratory-related changes in the timing of heart beats (0.12–0.4 Hz). The IBI series was converted to a time series sampled at 10 Hz with linear interpolation and a 241-point optimal finite impulse response digital filter designed using FWTGEN V3.8 (Cook and Miller, 1992) with half amplitude frequencies of 0.12–0.4 Hz. RSA is the natural log of the variance of this filtered time series. HRV is the natural log of the variance of the unfiltered time series. RMSSD was also quantified as a measure of CVC, to be utilized in the event the RSA metric was compromised by individuals with a peak frequency of respiration below 0.12 Hz. An estimate of RMSSD was derived using the root mean square of successive differences in the IBI time series across each moving window. An index of respiration rate was obtained using a fast Fourier transform on the IBI series, and the dominant frequency in the power spectrum of the respiration waveform was inspected to ensure the rate did not fall below 0.12 Hz, which invalidates the estimate of RSA for such segments (Grossman and Taylor, 2007). During the resting baseline period, 77.2% of individuals had max power frequencies that fell below 0.12 Hz. Due to this problem, which invalidated the RSA measure in the majority of subjects, all analyses targeting CVC were conducted using RMSSD rather than RSA. CVC estimates represent mean levels during each unique condition (i.e., during the baseline resting period, during the stressor, and during the post-stress recovery resting period).

MSCEIT Scoring

Raw data from the MSCEIT were scored by the Multi-Health-Systems using consensus scoring adjusted for age and gender. Consensus scoring is based on the concept that general consensus should identify the optimal answer to the majority of emotion-based questions, as emotions are evolved signals that require the majority of the group to understand and accept as valid/accurate (Mayer et al., 2003).

Statistical Analysis

All statistical tests used an *a priori* significance level of $p \leq 0.05$. Inspection of skewness, kurtosis, and the Shapiro-Wilk test indicated non-normal distributions among multiple variables. Due to deviations from normality and the presence of heteroscedasticity, log transformations of variables of interest were employed. However, as some variables of interest still failed to achieve normality assumptions, optimal model parameters were identified using akaike's information criterion (AIC) penalized-likelihood criteria, and the optimal model parameters reported utilized employed fixed variances and separate covariances with restricted maximum likelihood estimation.

Software and packages utilized

All statistical analyses were performed using R (version 3.5.1[4]). Correlation analyses were performed using the *hmisc* package (Harrell, 2018). Linear regression model assumptions were interrogated and ensured to have been met using the *gvlma* package (Pena and Slate, 2014). Linear models were analyzed utilizing the *nlme* and *predictmeans* packages (Luo et al., 2014; Pinheiro et al., 2014). Penalized likelihood criteria were analyzed using the *glmnet* package (Friedman et al., 2010). Hierarchical agglomerative clustering was conducted using the *FactoMineR* package (Lê et al., 2008; Wickham, 2016). Stepwise variable selection was implemented using the stepAIC function in the MASS package (Ripley, 2002). Figures and tables were generated using the *corrplot* and *ggplot2* packages (Wei and Simko, 2013; Lüdecke, 2018).

Zero-order correlation analysis

Bivariate Spearman correlations were performed across all subjects for age, total EI scores, and cardiovascular variables for resting baseline, stress reactivity and recovery indices (change in RMSSD from the prior level). EI subscale correlations are presented in the **Supplementary Material S3**.

EI predicting baseline CVC

A simple linear regression model was used to predict baseline cardiac metrics, based on the total score of each EI measure. Outcomes and predictors were log transformed [y' = log(y)] after the initial model failed to meet the model assumptions of skewness, kurtosis, and heteroscedasticity. Model assumptions were satisfied utilizing the log-transformed variables. To identify which EI subscale drove potential significant effects, a multiple linear regression model was fit using all sub scale scores from the unique EI metric and an automated forward and backward stepwise variable selection method simplified the model to limit multi-collinearity between predictors.

[4]https://www.r-project.org

Physiological response to serial subtraction

A linear mixed model for repeated measures over time using generalized least squares was used to investigate changes in RMSSD in response to the serial subtraction task and subsequent recovery following the stress induction.

EI predicting change in CVC across conditions

The identified optimal parameters for the linear mixed models assessing RMSSD across time were used to investigate the main effect and interactions for EI measures and RMSSD levels across the stress induction and recovery conditions using RMSSD as the dependent variable and condition, total ability EI, and total mixed EI scores as predictors. AIC penalized-likelihood criteria was used to determine if the addition of the EI total scores in a main effect or interaction model had a significant influence beyond the simpler model with only condition (e.g., resting baseline, stress induction, and resting recovery levels), as a predictor.

Investigating potential influential covariates

Akaike's information criterion penalized-likelihood criteria was used to determine if covariates of interest had a significant influence on the models with a least absolute shrinkage and selection operator (LASSO) regression analysis using baseline RMSSD as an outcome variable and gender, age, caffeine consumption that day, and time of day as predictors. Regression models were rerun, accounting for the identified covariates of influence, to investigate potential increases in the total variance accounted for within the models and compared to the simpler model using AIC penalized-likelihood criteria.

Exploring individual differences in CVC in response to stress and recovery

To investigate potential group level effects associated with individual differences in CVC, a principal components analysis (PCA) in conjunction with hierarchical agglomerative clustering was employed across RMSSD at rest, stress induction, and recovery. Initial analyses investigating between-group effects were conducted using *t*-tests. However, residuals were not normally distributed, so non-parametric two-tailed Mann-Whitney *U* tests were utilized for group-level analyses examining associations CVC responsiveness to stress induction and EI variables.

Secondary analyses

Additional secondary analyses on HRV and HR are presented in the **Supplementary Materials**, including statistical methods and results. See **Supplementary Material S1** and **Supplementary Tables S2, S3, S6, S7**.

RESULTS

Descriptive Statistics and Correlations

Table 1 presents descriptive statistics, means, and associated standard deviations for the demographic, EI, and physiological variables.

TABLE 1 | Descriptive statistics of the sample.

Measure	Mean	St. Dev.
Age	22.78	4.39
Baseline RMSSD	32.74	19.64
Stress induction RMSSD	26.81	13.40
Stress recovery RMSSD	33.61	17.94
Baseline HRV	7.26	0.98
Stress induction HRV	7.49	0.84
Stress recovery HRV	7.30	0.90
Baseline HR	84.63	11.15
Stress induction HR	95.20	13.91
Stress recovery HR	83.27	11.48
EQi total	102.79	12.62
EQi interpersonal branch	105.78	13.62
EQi decision making branch	101.85	12.80
EQi stress management branch	104.84	12.30
EQi self perception branch	101.46	13.46
EQi self expression branch	97.64	14.10
MSCEIT total	107.97	12.52
MSCEIT perceiving branch	110.16	12.81
MSCEIT using branch	106.93	13.48
MSCEIT understanding branch	111.84	18.92
MSCEIT managing branch	100.97	11.79

RMSSD, root mean square of successive differences; HRV, heart rate variability; HR, heart rate; EQi, Bar-On EQ-I 2; MSCEIT, Mayer-Salovey-Caruso Emotional Intelligence Test II; St. Dev., standard deviation.

Full Sample Zero-Order Correlations

Figure 1 presents bivariate correlations assessing relationships among RMSSD, HRV, and HR at baseline resting levels, and stress reactivity and recovery indices (change in RMSSD from the prior level), with age, depression, and total EI scores across the total sample. Baseline RMSSD showed positive associations with the MSCEIT total score. Total mixed EI had a positive association with change in RMSSD from stress induction to recovery. No associations were observed for HRV or HR at baseline, change after stress, or after recovery. Age had a negative association with the MSCEIT total score, as well as baseline and recovery levels of HR; however, age had a high degree of positive skew. None of the observed associations remained significant after Bonferroni correction for multiple comparisons.

EI Predicting Baseline CVC

EI and RMSSD

Total ability EI was a significant predictor for baseline RMSSD, $F(1,99) = 4.60$, $p = 0.03$, (**Figure 2A**). The observed effect was driven by the understanding branch of ability EI, $F(1,100) = 3.89$, $p = 0.05$, which was not significantly associated with baseline RMSSD as an independent predictor. In contrast to ability EI, total mixed EI was not a significant predictor of baseline RMSSD, $F(1,99) = 0.26$, $p = 0.61$ (**Figure 2B**). HRV and HR during the baseline resting condition were not significant predictors of EI (**Figure 2C–E**). See **Supplementary Table S1** for RMSSD model coefficients, sums of squares, and partial eta-squared.

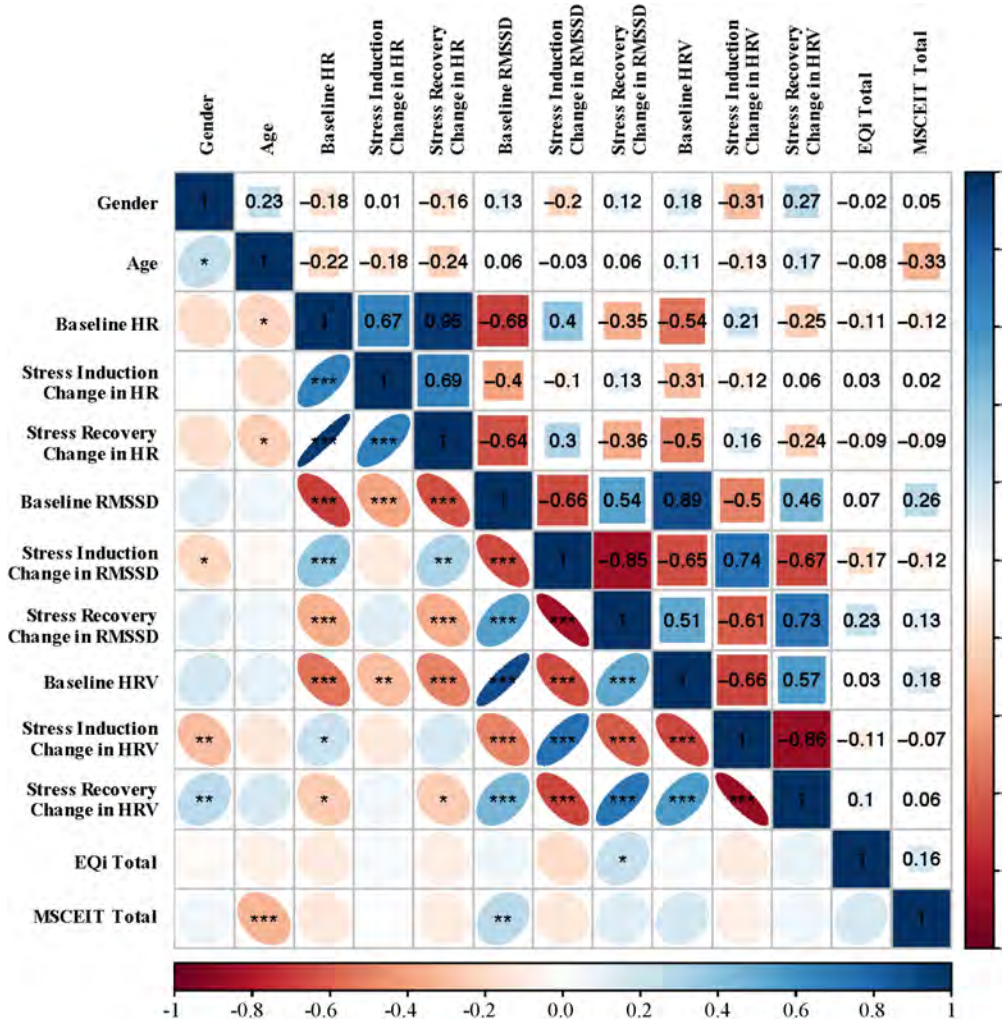

FIGURE 1 | Bivariate Spearman correlations performed across all subjects with correlation coefficients in the upper portion of the matrix and significant correlations identified in the lower portion of the matrix. *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$. RMSSD, root mean square of successive differences; HRV, heart rate variability; EQi, Bar-On EQ-I 2; MSCEIT, Mayer-Salovey-Caruso Emotional Intelligence Test II.

Physiological Response to Serial Subtraction

A linear mixed model was utilized to assess the response to the serial subtraction task and subsequent recovery following the stress induction. As expected, the model demonstrated that participants showed significant reductions in RMSSD during the stress induction and significant increases during recovery relative to baseline levels, $F(2,303) = 9.55$, $p < 0.0001$. See **Supplementary Table S4** for model coefficients, sums of squares, and partial eta-squared.

EI Predicting Change in CVC Across Conditions

Total ability EI and total mixed EI scores were both incorporated into the physiological response to serial subtraction linear mixed model to assess whether EI could account for changes in RMSSD during stress induction or recovery conditions; beyond the associations observed for RMSSD during the baseline resting condition. There was no significant main effect of total ability EI and RMSSD with condition, $F(1,301) = 2.03$, $p = 0.08$ or total mixed EI and RMSSD with condition, $F(1,301) = 0.80$, $p = 0.54$. No significant interactions between EI and stress induction or recovery conditions were observed for ability EI, $F(2,294) = 0.86$, $p = 0.42$, or mixed EI, $F(2,294) = 1.95$, $p = 0.14$. The addition of total EI scores was not favored over the simpler model only including RMSSD and condition, for the main effect *L.Ratio* = 3.24, $p = 0.20$, or interaction *L.Ratio* = 11.85, $p = 0.22$. See **Supplementary Table S5** for model coefficients, standard errors, and beta values.

Investigating the Potential Influence of Covariates

Gender and caffeine use were tested as potentially influential covariates affecting CVC during rest, based on prior literature (Allen et al., 2007). The combination of both covariates

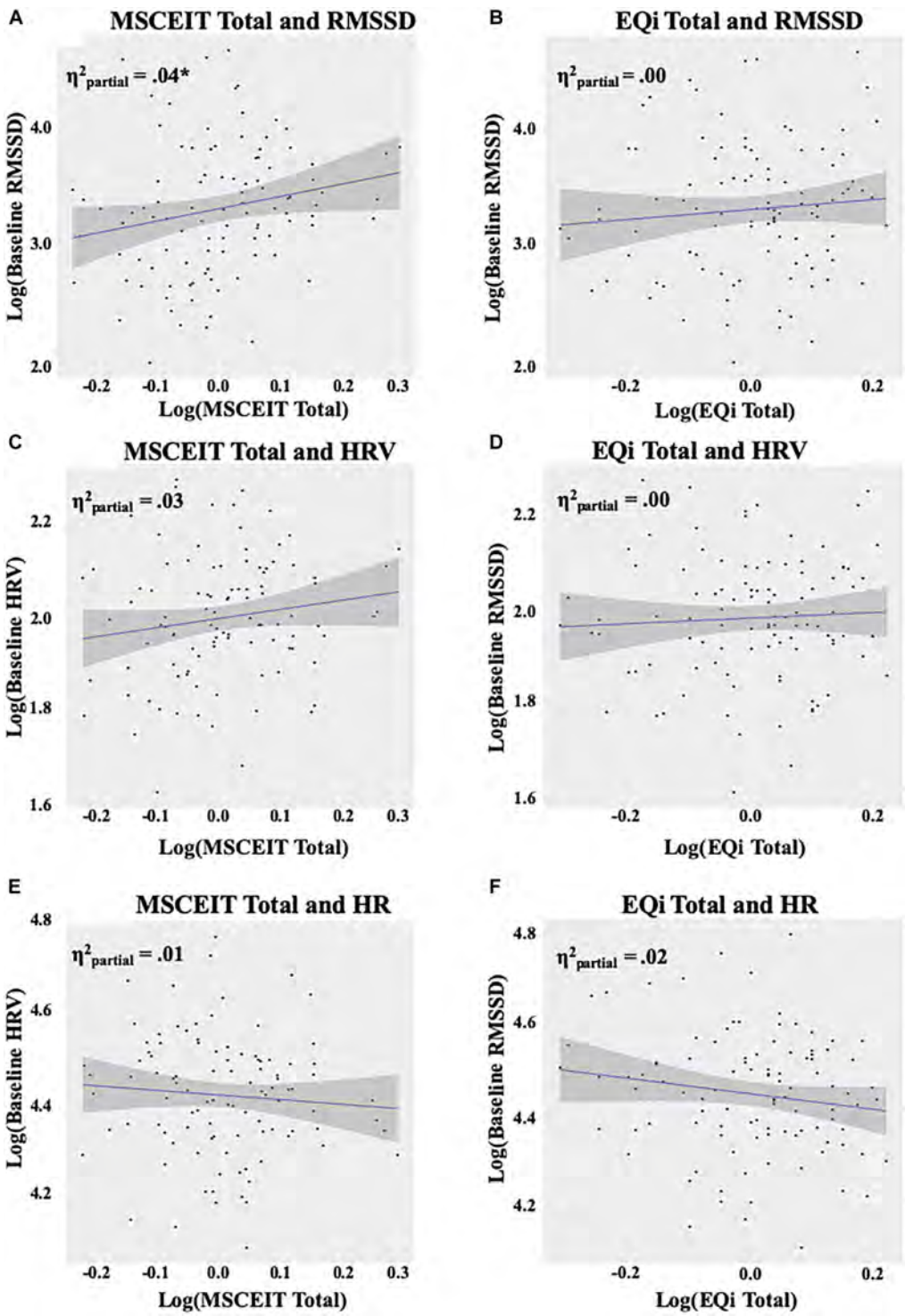

FIGURE 2 | Panels **(A,B)** depict the relationship between EI measures and RMSSD at baseline, panels **(C,D)** depict the relationship between EI measures and HRV at baseline, and panels **(E,F)** depict the relationship between EI measures and HR at baseline. The intercept reflects levels at baseline, and the shaded area represents the 95% confidence interval. Plots and values are displayed on a log scale reflecting the data transformations utilized to meet model assumptions. RMSSD, root mean square of successive differences; HRV, heart rate variability; HR, heart rate; EQi, Bar-On EQ-I 2; MSCEIT, Mayer-Salovey-Caruso Emotional Intelligence Test II; $\eta^2_{partial}$, partial eta-squared. *$p < 0.05$.

was not favored over the simpler model main effect model only including RMSSD and EI, *nor was their* addition independently. See **Supplementary Material S2** for model comparison statistics.

Exploring Individual Differences in CVC in Response to Stress and Recovery

CVC Reactivity Cluster Identification

The principal components analysis identified two components that accounted for 97.93% of the cumulative percentage of variance in RMSSD across conditions. Hierarchical agglomerative clustering classified three unique groups based on CVC (**Figure 3A**). Due to the large variance in the sample sizes between the clusters identified (n = 53, n = 39, and n = 10), the two unique groups that had similar decreases in RMSSD during stress and subsequent increases during the recovery were collapsed to form two groups with comparable sample sizes to assess differences in CVC responsiveness [i.e., CVC-non-responders (n = 53) and CVC-responders (n = 49)] (**Figure 3B**). **Table 2** presents initial group descriptive statistics, means, and associated standard deviations for the demographic, EI, and physiological variables. **Table 3** presents the collapsed groups descriptive statistics, means, and associated standard deviations for the demographic, EI, and physiological variables.

CVC Responsiveness to Stress Predicting EI

Compared to CVC-non-responders, individuals that experienced decreases in RMSSD during the stress induction condition and subsequent increases during recovery had significantly higher levels of total ability EI (W = 891, p = 0.01). The association was not driven by a specific subscale. There were no significant differences between groups for total mixed EI (W = 1105.5, p = 0.26). See **Supplementary Table S8** for model coefficients, group means, and standard deviations.

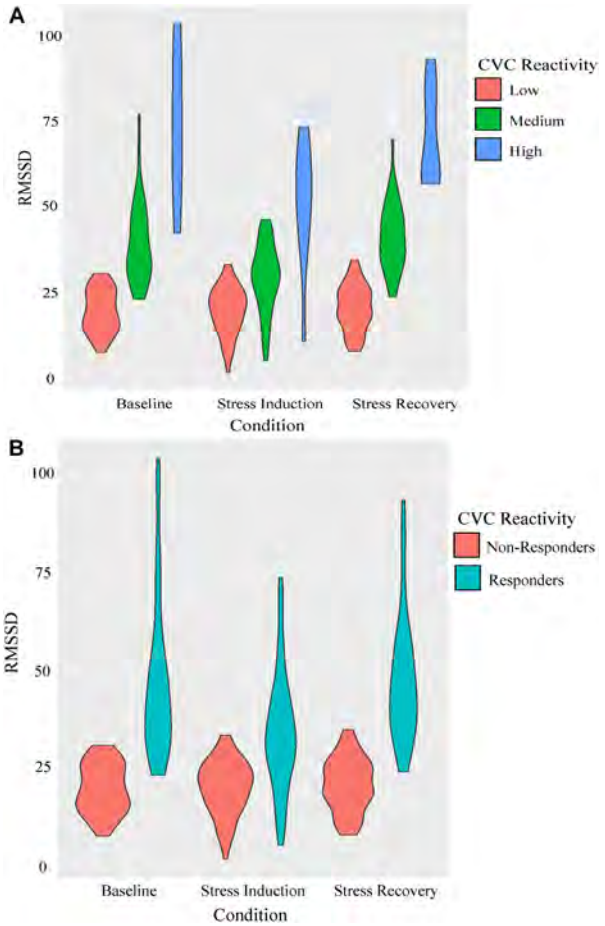

FIGURE 3 | Parameters of RMSSD estimates across conditions for the CVC reactivity groups presented as violin plots. Outlines illustrate kernel probability density, i.e., the width of the shaded area represents the proportion of the data located there. Panel **(A)** represents the initial groupings identified using hierarchical cluster analysis. Panel **(B)** represents the collapsed grouping discriminating CVC reactivity to the stress induction for Mann-Whitney U analyses.

DISCUSSION

In this study, we investigated the relationship between EI, as measured by two alternate theoretical models, and CVC under resting and reactive conditions. Based on prior findings, we hypothesized that higher ability EI would be associated with higher levels of CVC. Overall, we found support for this hypothesis, although with some qualifications. We discuss these findings and their implications in detail below.

Primary Hypotheses

First, we hypothesized that individuals with higher levels of ability EI would have greater levels of CVC at rest. This hypothesis was supported, as individuals with higher levels of CVC at rest indeed had significantly higher levels of total ability EI, whereas no association was found with total mixed EI. Contradictory to expectations, higher levels of understanding emotions and the ability to perceive emotions were not significantly associated with resting CVC, even though understanding emotions was found to drive the association with total ability EI. This may be because the ability to perceive emotions is more specific to affective processing and the ability to self-regulate in environments eliciting more personally relevant emotion-specific contexts (Rash and Prkachin, 2013). The only other study investigating ability EI and CVC did not find any association with total EI at rest (Rash and Prkachin, 2013). However, participants in that study may have been aware that the experiment involved a personally relevant experiential sadness induction, as they had to provide a personalized sadness narrative before their laboratory visit. This may have led to affect specific introspective thoughts during the resting period. Our study had greater statistical power than the Rash & Prkachin study and, therefore, may be more representative of the typical resting condition utilized in CVC reactivity assessments (Rash and Prkachin, 2013). Thus, we conclude that individuals with greater demonstrated ability EI, perhaps by those who show a more sophisticated understanding of emotions, the factors that influence them, and how they may

TABLE 2 | Descriptive statistics of groups identified using hierarchical agglomerative clustering.

	CVC low responders		CVC middle responders		CVC high responders	
Measure	**Mean**	**St. Dev.**	**Mean**	**St. Dev.**	**Mean**	**St. Dev.**
Age	22.72	4.59	23.16	4.62	21.80	2.10
Baseline RMSSD	19.76	6.21	39.69	11.83	73.44	21.49
Stress induction RMSSD	20.03	6.92	29.49	10.07	51.51	18.15
Stress recovery RMSSD	20.79	6.77	41.42	9.81	70.36	14.19
EQi total	101.21	13.30	105.97	10.83	100.70	13.94
MSCEIT total	104.81	11.59	112.24	13.43	107.44	9.75

RMSSD, root mean square of successive differences; HRV, heart rate variability; HR, heart rate; EQi, Bar-On EQ-I 2; MSCEIT, Mayer-Salovey-Caruso Emotional Intelligence Test II.

TABLE 3 | Descriptive statistics of the collapsed grouping utilized for group level analyses.

	CVC responders		CVC non-responders	
Measure	**Mean**	**St. Dev.**	**Mean**	**St. Dev.**
Age	22.88	4.24	22.72	4.59
Baseline RMSSD	46.72	19.76	19.76	6.21
Stress induction RMSSD	34.08	14.99	20.03	6.92
Stress recovery RMSSD	47.45	15.98	20.79	6.77
EQi total	104.88	11.58	101.21	13.30
MSCEIT total	111.24	12.81	104.81	11.59

RMSSD, root mean square of successive differences; HRV, heart rate variability; HR, heart rate; EQi, Bar-On EQ-I 2; MSCEIT, Mayer-Salovey-Caruso Emotional Intelligence Test II.

evolve over time and during the course of social interactions, also show a greater capacity to regulate cardiac vagal responsiveness.

Second, we hypothesized that individuals who have higher levels of ability EI would have greater decreases in CVC in response to stress and show subsequent increases during recovery. This hypothesis was not supported by initial statistical models. Participants with greater modulation in CVC across the stress induction period (RMSSD decrease) and subsequent recovery (RMSSD increase) did not have higher levels of total ability EI or mixed EI. Baseline differences in CVC appear to drive the observed association with EI since no interactions with stress induction or recovery conditions were found. Although sympathetic and parasympathetic outflows tend to have a close-fitting reciprocal relationship, modes of autonomic control are not always linear (Berntson et al., 1991). Higher resting CVC is associated with situationally appropriate emotional responding and can mitigate the experience of negative emotional arousal in response to stress (Fabes and Eisenberg, 1997). This may represent an adaptive response where activation of parasympathetic systems attenuates sympathetic dominance when individuals experience stressors. From these findings, we conclude that individuals with higher ability EI demonstrate a greater level of resting CVC.

Exploratory Analyses

As part of the present study, we also sought to clarify how the predictive validity of EI on CVC compares to other cardiac metrics. The observed associations between ability EI and RMSSD, but not HRV or HR, suggest that parasympathetic influences on autonomic control are responsible for the majority of observed associations with ability-based EI. RMSSD is a metric that results in a differential gain function such that it weights more heavily the high-frequency vagal influence whereas HRV is a metric that results in a flat gain function that will capture frequencies that represent a combination of sympathetic and parasympathetic influences (Allen et al., 2007).

We also sought to determine how categorization based on individual differences in CVC reactivity would predict ability EI and mixed EI. Individual categorization based on responsiveness to the stress induction confirmed the relationship observed in the linear regression models. Individuals identified as responders to the stress induction had significantly higher ability EI scores compared to CVC non-responders; while no difference between groups was observed for mixed EI scores. Intriguingly, no specific domain of ability EI displayed significant positive associations with CVC responders. These findings suggest that during stressful experiences, individuals with higher baseline levels of CVC and greater cardiovascular responses, which reflect higher baseline parasympathetic control, greater withdrawal during stressors and greater increases during the subsequent recovery, may have a greater capacity to modulate CVC and in a manner that facilitates the ability to cope with emotional demands.

Considerations

Our findings are consistent with the only other study that investigated direct associations between HRV as a metric representative of autonomic control and quantified EI (Rash and Prkachin, 2013). Two other studies examining CVC and EI used less known mixed-model-based metrics to quantify EI, which may have contributed to their varied findings, and failure to distinguish associations between EI and baseline CVC (Laborde et al., 2011; Plews et al., 2012). EI as a measurable construct remains highly debated, and the call for an increased focus on refinement in its assessment may lead to greater clarity about the association between EI and CVC (Fiori and Antonakis, 2011). The substantial body of work associating CVC and emotional regulation emphasizes the notion that if EI is validly conceived and measured, at least some aspects should have significant associations with autonomic processes. While the amount of variance accounted for in our significant baseline model using RMSSD (*partial* $\eta^2 = 0.04$) was relatively small, the findings are consistent with the amount of unique variance accounted for by the association between RSA and ability EI in the only other study examining CVC and the MSCEIT (Rash and Prkachin, 2013). The theoretical construct of EI also remains heavily debated, and a multi-level theoretical approach incorporating actual behavioral outcomes will be critical to the construct in achieving its potential for psychometric validity (Boyatzis, 2018). In light of this, we believe that our study offers a unique and valuable insight into the relationship between CVC and EI that will help propel future

investigations relating these two constructs (Ioannidis, 2005). Based on the Polyvagal theory, the relationship between higher CVC and reactivity is associated with adaptive and beneficial behavioral responding, which based on the evidence presented, is associated with higher levels of EI. Whether higher CVC leads to higher EI or higher EI results in higher and more responsive CVC is, at present, an empirical question, and one that might be fruitfully examined in a longitudinal developmental study, or in a study training CVC and EI to observe the time-dependent changes in each.

The interplay between emotion and feeling are critical components in the maintenance of health and the facilitation of perception, decision making, and learning; and an inability to integrate the two processes often leads to maladaptive behavior (Damasio, 2001). Decreased CVC is associated with both mild and more severe forms of psychopathology and is becoming a more widely accepted biomarker for susceptibility to emotion dysregulation (Thayer et al., 2012). The cognitive system contributing to autonomic control, as defined by the NVI model, is especially sensitive to negative feedback (Thayer and Lane, 2000). Lower resting CVC is associated with perceived difficulties in emotion regulation, specific to decrements in emotional clarity and impulse control (Williams et al., 2015). Attention regulation and affective processing are necessary to counter sympathetic activation during non-optimal contexts and facilitate social interaction as described by the Polyvagal theory (Porges, 1995). There is also an association between stress-related illness, blunted autonomic regulation, and negative family-of-origin relationship experiences (Luecken et al., 2005). This further highlights the impact of biopsychosocial development on physiologic and emotion regulation capacities that should theoretically relate to the construct of EI. Higher levels of cognitive-emotional abilities contribute to emotion regulation abilities that drive positive behavioral outcomes. A recent systematic review of 135 papers concluded resting CVC is associated with flexible emotional responding and emotion regulation strategies, as well as supports CVC as an objective marker of emotion regulation (Balzarotti et al., 2017). The interplay between decrements in physiological resources (e.g., during sleep deprivation, environmental extremes, emotional stress, and physical hardship), and degradation of cognitive function contribute to potentially detrimental decision making and allude to the need for novel interventions to mitigate the impact of stress on cognitive systems.

The use of biofeedback to augment CVC and its reactivity under stressful conditions is widely used and increasingly has focused on domains ranging from workplace office environments to fitness centers (McCraty et al., 2003; Düking et al., 2017). Interventions targeting emotional processes, such as mindfulness-attention training, can lead to positive outcomes in well-being, and have a substantial impact on emotion-specific neurocognitive processing (Shapiro et al., 2008; Desbordes et al., 2012). Recent work has also demonstrated that EI is malleable and susceptible to increases with targeted training (Alkozei et al., 2018; Mattingly and Kraiger, 2018). The current findings suggest there is a need for further study into the use of training interventions targeting CVC and EI in conjunction as a useful non-pharmacological method for improving well-being; perhaps mitigating symptomology associated with decreases in emotional processing on both an impermanent and pathological level in a manner that promotes well-being.

LIMITATIONS

Several limitations should be considered when interpreting the results of this study. We have interpreted the decrease in RMSSD during stress and subsequent increase during recovery as evidence of an optimal adaptive emotion regulation process, relative to the experience of stress. While the stress induction indeed produced a significant decrease in CVC across the sample of participants, a subset of individuals experienced increases in autonomic control during the stress induction or no change at all. It is possible that some individuals did not take the task seriously and did not actively engage in the serial subtraction task. Using a multi-faceted stress induction, such as the serial subtraction task in conjunction with a cold pressor or the Trier Social Stress Test, as well as variations in stressors more specific to different emotions may be more appropriate in future work to assess the relationship between EI and the experience of stress. The use of an affect induction, such as sadness, would also provide valuable information on individual differences in the associations between CVC, stress, affect, and EI.

Recent work has demonstrated the usual reciprocal relationship between the sympathetic and parasympathetic systems, representing the widely accepted fluctuations in autonomic control in response to stress, is dependent on individuals' cumulative exposure to risk, and resting sympathetic activation (Giuliano et al., 2017). It is possible that the exposure to stress and adversity may have moderated the response to the serial subtraction task and contributed to the observed individual differences in CVC. Further exploration of the influence of cumulative life experiences on CVC and EI is necessary. Of note, we did not collect data on body mass index or specific to anxiety/depression in the present study, which have both been shown to impact HRV. It is conceivable that these unmeasured factors may have also influenced the statistical models and would be appropriate to examine in future work. Participants also completed EI assessment measures after the stress reactivity assessment, leaving the potential for the residual effects of the stress induction to affect individual's performance on the subsequent measurement of EI, and measurements assessing the behavioral level of EI were also not collected. Lastly, multiple biological systems and factors influence autonomic control, and the associations observed between EI and CVC should not be taken to indicate a causal connection (Bauman et al., 2002).

CONCLUSION

The present study examined the association between the mixed and ability models of EI and their relation to CVC at rest

and in response to a stressor. These findings help clarify the relationship between individual differences in the two most widely used metrics of EI for the mixed and ability models and their associations with CVC. Higher levels of total ability EI and the ability to understand the complexities of emotions were associated with an index of cardiac parasympathetic control at rest. Larger reductions in parasympathetic control during stress and the ability to recover were also found to be associated with higher total ability EI and driven by the ability to understand emotions. These results suggest that differences in the ability to understand emotional processes in oneself and reason about one's visceral experience may facilitate better cognitive and emotional processing. Additional research is needed to clarify the degree to which affect influences the relationship between stress and EI, as well as whether improvements in EI can also lead to subsequent increases in CVC or vice versa.

ETHICS STATEMENT

This study was carried out in accordance with the recommendations of the Institutional Review Board (IRB) of the University of Arizona and the United States Army Human Research Protection Office (HRPO). All subjects gave written informed consent in accordance with the Declaration of Helsinki. The protocol was approved by the Institutional Review Board (IRB) of the University of Arizona and the United States Army Human Research Protection Office (HRPO).

AUTHOR CONTRIBUTIONS

JV analyzed the data and wrote the initial draft of the manuscript. AA contributed to writing the initial draft of the manuscript. AR contributed to the statistical analysis and writing of the manuscript. JA aided in study design, as well as, contributed to data processing, statistical analysis, and writing of the manuscript. WK designed and supervised all aspects of the study and contributed to the writing of the manuscript.

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SUPPLEMENTARY MATERIAL

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Conflict of Interest Statement: The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Ability-Based Emotional Intelligence is Associated with Greater Cardiac Vagal Tone

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University of Arizona, Tucson, AZ

Background: The Ability Model of Emotional Intelligence (EI) conceptualizes EI as a set of interconnected cognitive-emotional abilities, including the ability to perceive, manage, and understand the emotions of the self and others. The neurovisceral integration (NVI) model proposes a positive relationship between cardiac vagal tone (CVT) and similar cognitive-emotional abilities. However, the relationship between EI scores and CVT has yet to be examined directly. CVT can be estimated using the root mean square of successive differences (RMSSD) in heart beat intervals. The current study examined the association between CVT and EI. We hypothesized that individuals with greater levels of RMSSD at rest, and in response to a stressful task, would have higher EI scores.

Methods: One hundred thirty-five healthy adults (48 men), ranging in age from 18-38 years, underwent a reactivity assessment comprised of two five-minute resting periods separated by a 90-second serial subtraction challenge. Participants also completed the *Mayer-Salovey-Caruso Emotional Intelligence Test* (MSCEIT), which assesses the EI abilities described above.

Results: We found significant positive associations between RMSSD at rest and MSCEIT scores, including those associated with overall EI (p=.045), as well as the with the abilities to understand (p=.045) and reason about (p=.024) emotions. We also found significant interactions between RMSSD during the reactivity assessment and overall EI (p=.036), as well as with the specific abilities to manage (p=.045), and reason about (p=.019) emotions.

Conclusions: Consistent with expectations, higher levels of RMSSD were associated with higher levels of EI. Our findings support the theoretically expected overlap between constructs within the NVI and ability EI models. Preliminary findings from our lab suggest that EI is malleable and can be improved through psychoeducation. Further work will be necessary to examine whether improvements in EI can also lead to subsequent increases in CVT or vice versa.

Support: USAMRMC (W81XWH-16-1-0062).

The Influence of Habitual Sleep Duration on Rational Thinking Ability

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Introduction:

Higher cognitive abilities, such as executive functions, can be impaired by acute sleep loss, but findings have been inconsistent across different cognitive abilities. It is possible that long-term habitual sleep patterns may affect executive functions differently than acute sleep loss. Habitual sleep duration has been found to be associated with several aspects of physical health, including obesity and cardiac health. However, few studies have explored the role of habitual sleep duration on rational thinking, a computational method of solving problems. We focused on whether long-term sleeping patterns versus short-term sleep habits (hours of sleep the night before, self-reported sleepiness during testing, caffeine ingestion before testing) may affect scores on a measure of rational thinking, an understudied aspect of executive function.

Participants & Methods: 30 participants completed several questionnaires while in a private laboratory testing room. Participants were administered a Stanford Sleepiness Scale, a questionnaire regarding recent sleep habits, the Pittsburgh Sleep Quality Index (PSQI), and the Cognitive Reflection Test (CRT-7). The CRT-7 measures "rational thinking", which is a task designed to assess the ability to "override" reflexive thought processes and employ deliberate cognition.

Results:

Higher CRT-7 scores were associated with the average hours of sleep per night over the past month (r=.496, p<.01). This association remained significant after controlling for Stanford Sleepiness Scores at the beginning of the visit (r=.521, p<.01) and hours of sleep the previous night (r=.505, p<.005). Additionally, there was no significant difference between average scores on the CRT-7 between subjects who drank a caffeinated beverage before their study visit (M=2.77, SD=2.09) and those who did not (M=2.35, SD=1.66); t(28)=.610, p=.547.

Conclusions

Greater average habitual sleep during the month prior to testing was associated with greater cognitive reflection (i.e., rational thinking), regardless of recent sleep debt or caffeine use. Thus, for higher cognitive abilities, such as cognitive reflection, long term habitual sleep patterns may play a more important role than immediate sleep loss or alertness. This may explain some of the inconsistencies in the literature regarding the effects of sleep loss on higher executive function capacities.

Political Perspective is Associated with Differences in Trait Anxiety and Depression

Poster No:

1850

Submission Type:

New Research Poster Submission

Authors:

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Abstract:

Objective: Prior research suggested that politically conservative viewpoints are likely driven by greater fear, anxiety, and greater sensitivity to threat than liberal perspectives. A handful of research studies suggest that the thinking of political conservatives can be explained by a negativity bias, a greater startle reflex, and a tendency to fear new experiences. However, most of those studies were published between 2008 and 2016, a time when the dominant political party in power (i.e., the presidency) also held a liberal perspective. Thus, while it is possible that conservatives are just anxious people who are driven by fear, an alternative hypothesis is that trait-anxiety may relate instead to holding a political perspective that differs from the perspective of those who are currently in power (i.e., being in the "out-group"). With the recent shift in the American presidency from a Democrat (Barak Obama) to a Republican (Donald Trump), we hypothesized that the association between trait-anxiety and political perspective would be in the opposite direction (i.e., showing more anxiety among liberals).

Methods: A total of 148 (41 male; 107 female) adults (M age=22.6, SD=4.8) completed a battery of questionnaires, including the Spielberger State-Trait Anxiety Inventory (STAI), the Beck Depression Inventory (BDI), and questions about political ideology (i.e., 7-point scale of "strongly liberal" to "strongly conservative") and political identity (i.e., 5-point scale from "strong Democrat" to "strong Republican"). Data were collected between September 24, 2018 and June 9, 2019, during the Republican presidency of Donald Trump.

Results: Partial correlations, controlling for sex, showed that greater conservative political ideology was associated with lower trait anxiety (r=-.20, p=.013), but not with state anxiety (r=-.12, ns), or depression (r=-.14, p=.084). Similarly, stronger Republican identity was associated with reduced trait anxiety (r=-.24, p=.003), and depression (r=-.20, p=.015), but not state anxiety (r=-.13, ns).

Conclusions: Consistent with our hypotheses, individuals endorsing stronger politically conservative/Republican perspectives tended to have lower trait anxiety and depression than those with more liberal/Democratic leanings. Because these findings are contrary to studies collected during the previous presidential administration, we suggest that mental health may have less to do with one's absolute political leaning and more to do with whether one's political perspective is aligned with the prevailing political climate. Thus, those in the current political "outgroup" are more likely to experience anxiety or depression than those whose perspective aligns with the party in power. To understand the anxiety experienced by their clients, practitioners need to see beyond their clients' political perspective and consider the degree to which the perspective is concordant or discrepant from the prevailing climate.

Demographic:

Adults

Disorder:

Anxiety

Treatment Approach:

Not Applicable

Preliminary Validation of a Web-Based Emotional Intelligence Training Program for Enhancing Emotional Resilience

Poster No:

1848

Submission Type:

New Research Poster Submission

Authors:

W. Killgore[1], J. Skalamara[1], J. Vanuk[1], R. Woods-Lubert[1], S. Cloonan[1], A. Alkozei[1], N. Dailey[1], R. Lane[1], K. Weihs[1], J. Allen[1], R. Smith[2]

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Laureate Institute

Abstract:

Objective: The ability to remain resilient to emotionally challenging situations is critical for healthy psychological, interpersonal, and social functioning. We propose that emotional intelligence (EI), which comprises the ability to accurately perceive, understand, and manage emotions and use emotional information to facilitate thought and performance, is an important aspect of such resilience. We, therefore, developed an online training program to potentially enhance these abilities. The program includes 13 training modules designed to develop a range of emotional skills and enhance understanding of emotional concepts. Here, we assessed the preliminary validity of the training program.

Methods: As part of an ongoing study, healthy adults were randomly assigned to undergo a 10-hour Emotional Intelligence Training (EIT) program (n=58) or a non-emotional Placebo program (n=58) of similar duration and difficulty level. Participants were assigned to complete the program within one to three weeks and were assessed for their EI and emotional skills at baseline and following completion of training using the Mayer-Salovey-Caruso Emotional Intelligence Test (MSCEIT)-a measure of the "ability model" of EI, Self-Rated Emotional Intelligence Scale (SREIS)-a measure of the "trait/mixed-model" of EI, the Levels of Emotional Awareness Scale (LEAS), the Structured Test of Emotion Management (STEM-B), and the Interpersonal Affect Regulation Test (IPART).

Results: Relative to Placebo, the EIT program led to a significant improvement in Total EI scores on the MSCEIT (p=.017), Total EI scores on the SREIS (p=.018), overall emotional awareness as measured by the LEAS (p=.02), emotional regulation scores on the STEM-B (p=.023), and the ability to select responses that would improve the mood of another person on the IPART (p=.0002). We further divided the sample into those of low-average, high-average, or superior EI at baseline and found that the EIT program was differentially effective for different groups (p=.027). The EIT program led to the greatest improvement among the low-average (10.03 point increase, p = .023), and high-average (6.31 point increase, p=.012) groups, but not for those who began training in the superior group (-3.81 points, p=.263).

Conclusions: The EIT program was efficacious in enhancing several aspects of EI, as measured by diverse measures of the construct, including the ability and trait models of EI, a measure of emotional awareness, and measures of the ability to regulate emotions in oneself and in others. Moreover, the program showed the greatest benefit for those with the greatest need. Although these data are preliminary and further research on the EIT program is ongoing, these initial data suggest that EI is a modifiable skillset that can be significantly enhanced via a simple online program. This program could be easily and widely disseminated to build EI skills and emotional resilience.

Demographic:

Adults

Disorder:

Resilience

Treatment Approach:

Experimental/Emerging Therapeutics

Curriculum Vitae

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PLACE AND DATE OF BIRTH	Anchorage Alaska, September 2, 1965
CITIZENSHIP	USA

CHRONOLOGY OF EDUCATION

8/83 - 5/85	A.A. (Liberal Arts), San Antonio College
8/83 - 5/85	A.A.S (Radio-TV-Film), San Antonio College
8/85 - 5/90	B.A. (Psychology), *Summa cum laude* with Distinction, University of New Mexico
8/90 - 5/92	M.A. (Clinical Psychology), Texas Tech University
8/92 - 8/96	Ph.D. (Clinical Psychology), Texas Tech University Dissertation Title: *Development and validation of a new instrument for the measurement of transient mood states: The facial analogue mood scale (FAMS).* Lubbock, TX: Texas Tech University;1995. Advisor: Bill Locke, Ph.D.

POST-DOCTORAL TRAINING

8/95 - 7/96	Predoctoral Fellow, Clinical Psychology, Yale School of Medicine
8/96 - 7/97	Postdoctoral Fellow, Clinical Neuropsychology, University of OK Health Sciences Center
8/97 - 7/99	Postdoctoral Fellow, Clinical Neuropsychology, University of Pennsylvania Medical School
7/99 - 9/00	Research Fellow, Neuroimaging, McLean Hospital/ Harvard Medical School
9/13 - 5/14	Certificate in Applied Biostatistics, Harvard Medical School

LICENSURE/CERTIFICATION

2001 -	Licensed Psychologist, #966, State of New Hampshire

CHRONOLOGY OF EMPLOYMENT

Academic Appointments

10/00 - 8/02	Instructor in Psychology in the Department of Psychiatry Harvard Medical School, Boston, MA
9/02 - 7/07	Clinical Instructor in Psychology in the Department of Psychiatry Harvard Medical School, Boston, MA
8/07 - 10/10	Instructor in Psychology in the Department of Psychiatry Harvard Medical School, Boston, MA
4/08-	Faculty Affiliate, Division of Sleep Medicine Harvard Medical School, Boston, MA
10/10 - 10/12	Assistant Professor of Psychology in the Department of Psychiatry Harvard Medical School, Boston, MA
10/12 - 6/14	Associate Professor of Psychology in the Department of Psychiatry Harvard Medical School, Boston, MA
7/14-	Associate Professor of Psychology in the Department of Psychiatry (part-time) Harvard Medical School, Boston, MA
7/14-	Professor of Psychiatry—Tenured University of Arizona College of Medicine, Tucson, AZ
7/14-	Professor of Medical Imaging University of Arizona College of Medicine, Tucson, AZ
9/14-	Professor of Psychology University of Arizona College of Science, Tucson, AZ

Hospital/Clinical/Institutional Appointments

10/00 - 8/02	Assistant Research Psychologist, McLean Hospital, Belmont, MA
8/02 - 7/04	Research Psychologist, Department of Behavioral Biology, Walter Reed Army Institute of Research, Silver Spring, MD
7/04 - 10/07	Chief, Neurocognitive Performance Branch, Walter Reed Army Institute of Research, Silver Spring, MD
10/07 - 3/10	DoD Contractor, Chief Psychologist, GovSource, Inc., U.S. Department of Defense (DoD)
8/08	Consulting Psychologist, The Brain Institute, University of Utah
9/02 - 4/05	Special Volunteer, National Institute on Deafness and Other Communication Disorders (NIDCD), National Institutes of Health (NIH), Bethesda, MD
9/02 - 7/07	Research Consultant, McLean Hospital, Belmont, MA
8/05 - 5/06	Neuropsychology Postdocotoral Research Program Training Supervisor, Walter Reed Hospital, Washington, DC
8/07 -	Research Psychologist, McLean Hospital, Belmont, MA
7/10 - 6-11	DoD Contractor, Consulting Psychologist, Clinical Research Management (CRM)
7/11 - 6/14	Director, Social Cognitive, and Affective Neuroscience (SCAN) Laboratory, McLean Hospital, Belmont, MA
7/14-	Director, Social, Cognitive, and Affective Neuroscience (SCAN) Laboratory, University of Arizona, Tucson, AZ
3/16 -12/18	ORISE Knowledge Preservation Fellow; Walter Reed Army Institute of Research, Silver Spring, MD

Military Positions

11/01 - 8/02	First Lieutenant, Medical Service Corps, United States Army Reserve (USAR)
8/02 - 7/05	Captain, Medical Service Corps, United States Army-Active Regular Army (RA)
8/05 - 10/07	Major, Medical Service Corps, United States Army-Active Regular Army (RA)
10/07 - 7/12	Major, Medical Service Corps, United States Army Reserve (USAR)
7/12 – 9/19	Lieutenant Colonel, Medical Service Corps, United States Army Reserve (USAR)
3/16 -	Deputy Consultant to the Surgeon General of the Army (SGA) for 71F Research Psychology, US Army Reserves
9/19-	Colonel, Medical Service Corps, United States Army Reserve (USAR)

HONORS AND AWARDS

1990	Outstanding Senior Honors Thesis in Psychology, University of New Mexico
1990-1995	Maxey Scholarship in Psychology, Texas Tech University
2001	Rennick Research Award, Co-Author, International Neuropsychological Society
2002	Honor Graduate, AMEDD Officer Basic Course, U.S. Army Medical Department Center and School
2002	Lynch Leadership Award Nominee, AMEDD Officer Basic Course, U.S. Army Medical Department Center and School
2003	Outstanding Research Presentation Award, 2003 Force Health Protection Conference, U.S. Army Center for Health Promotion and Preventive Medicine
2003	Who's Who in America
2004	Who's Who in Medicine and Healthcare
2005	Edward L. Buescher Award for Excellence in Research by a Young Scientist, Walter Reed Army Institute of Research (WRAIR) Association
2009	Merit Poster Award, International Neuropsychological Society
2009	Outstanding Research Presentation Award, 2009 Force Health Protection Conference, U.S. Army Center for Health Promotion and Preventive Medicine
2010	Best Paper Award, Neuroscience, 27th U.S. Army Science Conference
2011	Published paper included in *Best of Sleep Medicine 2011*
2011	Blue Ribbon Finalist, 2011 Top Poster Award in Clinical and Translational Research, Society of Biological Psychiatry
2012	Defense Advanced Research Projects Agency (DARPA) Young Faculty Award in Neuroscience
2014	Blue Ribbon Finalist, 2014 Top Poster Award in Basic Neuroscience, Society of Biological Psychiatry
2014	Harvard Medical School Excellence in Mentoring Award Nominee
2014	AASM Young Investigator Award (co-author), Honorable Mention, American Academy of Sleep Medicine
2017	Trainee Abstract Merit Award (mentor/co-author), Sleep Research Society
2018	Trainee Abstract Merit Award (mentor/co-author), Sleep Research Society.
2020	Nelson Butters Award for Best Paper by a Postdoctoral Fellow (mentor/co-author), International Neuropsychological Society

SERVICE/OUTREACH

Local/State Service/Outreach

2003	Scientific Review Committee, Walter Reed Army Institute of Research (WRAIR), Silver Spring, MD
2005	Scientific Review Committee, Walter Reed Army Institute of Research (WRAIR), Silver Spring, MD
2012-14	McLean Hospital Research Committee, McLean Hospital, Belmont, MA
2016	House Ad Hoc Committee on Treatment of Traumatic Brain Injuries and Benefits of Hyperbaric Oxygen Therapy, Arizona House of Representatives

National/International Service/Outreach

2004	University of Alabama, Clinical Nutrition Research Center (UAB CNRC) Pilot/Feasibility Study Program Review Committee
2006	U.S. Small Business Administration, Small Business Technology Transfer (STTR) Program Review Committee
2006	Cognitive Performance Assessment Program Area Steering Committee, U.S. Army Military Operational Medicine Research Program Funding Panel
2006	External Member, Doctoral Thesis Committee, Belinda J. Liddle, Ph.D., University of Sydney, Australia
2007	Cognitive Performance Assessment Program Area Steering Committee, U.S. Army Military Operational Medicine Research Program Funding Panel
2008	United States Army Medical Research and Materiel Command (USAMRMC) Congressionally Directed Medical Research Programs (CDMRP) Extramural Grant Review Panel
2008-2011	Long-Distance High School Research Mentor, Christina Song, NY
2009	NIH-CSR Brain Disorders and Clinical Neuroscience N02 Member Study Conflict Section Review Panel
2009	Sleep Physiology and Fatigue Interventions Program Area Steering Committee, U.S. Army Military Operational Medicine Research Program
2009	Scotland, UK, Biomedical and Therapeutic Research Committee, Grant Reviewer
2010	Canada, Social Sciences and Humanities Research Council of Canada, Grant Reviewer
2011	National Science Foundation (NSF) Grant Reviewer
2011-	National Network of Depression Centers (NNDC), Military Task Group
2011	Israel, Israel Science Foundation (ISF), Grant Reviewer
2011	Scientific Review Committee, US Army Institute of Environmental Medicine (USARIEM)
2012	National Science Foundation (NSF) Grant Reviewer
2012-	American Academy of Sleep Medicine, Member
2013	Israel, Israel Science Foundation (ISF), Grant Reviewer
2014-	Organization for Human Brain Mapping, Member
2015-	Human Affectome Project Advisory Board Member
2016-	Sleep Research Society Member
2017-2018	External Reviewer, Doctoral Thesis Reviewer, Kalina R. Rossa, Queensland University of Technology, Australia.
2018	Marsden Fund Council Grant Proposal Referee, Royal Society Te Aparangi, New Zealand.
2018	External Faculty Promotion Dossier Reviewer, Oregon Health & Science University
2018-2019	Long-Distance High School Research Mentor, Taleen Postian, Byram Hills HS, NY
2019	External Reviewer, Doctoral Thesis Reviewer, William Ryan McMahon, Monash University, Australia.

Departmental Committees

2006	Chair, Undergraduate Honors Thesis Committee, Jessica Richards, Department of Psychology, University of Maryland, Baltimore County, MD
2012-2014	Member, Research Committee, McLean Hospital, Belmont, MA
	Psychiatry Senior Research Manager Candidate Search Committee, Department of Psychiatry, University of Arizona, Tucson, AZ
2014-2015	Member, Faculty Search Committee, Department of Psychology, University of Arizona, Tucson, AZ.
2014-2016	Member, Comprehensive Examination Committee, Natalie Bryant, Department of Psychology, University of Arizona, Tucson, AZ
2014-2015	Chair/Research Faculty Mentor, Undergraduate Honors Thesis Committee, Haley Kent, Department of Biochemistry, University of Arizona, Tucson, AZ
2014-	Member, Psychiatry Research Investigator Committee, Department of Psychiatry, University of Arizona, Tucson, AZ.
2015	Member, Dissertation Committee, Ryan S. Smith, Ph.D., Department of Psychology, University of Arizona, Tucson AZ.
2015	Imaging Excellence Cluster Hire Search Committee, Department of Medical Imaging, University of Arizona, Tucson, AZ
2015-	Member, Mentoring Committee, Department of Psychiatry, University of Arizona, Tucson, AZ
2016	Member, Chief of Neuroradiology Faculty Search Committee, Department of Medical Imaging, University of Arizona, Tucson, AZ
2016-2017	Member, Dissertation Committee, Brian Arizmendi, Department of Psychology, University of Arizona, Tucson, AZ
2016-2017	Member, Masters Thesis Committee, Saren Seeley, Department of Psychology, University of Arizona, Tucson, AZ
2016-2017	Member, Masters Thesis Committee, Mairead McConnell, Department of Psychology, University of Arizona, Tucson, AZ
2016-2018	Member, Masters Thesis Committee, John Vanuk, Department of Psychology, University of Arizona, Tucson, AZ
2016-2017	Faculty Advisor, Undergraduate Honor Thesis Committee, Matthew Nettles, Neuroscience/Cognitive Science, University of Arizona, Tucson, AZ
2016-	Scientific Review Committee, Department of Psychiatry, University of Arizona, Tucson, AZ
2017-2018	Faculty Advisor, Undergraduate Honors Thesis Committee, Debby Waugaman, Psychology, University of Arizona, Tucson, AZ
2017-2018	Faculty Advisor, Undergraduate Honors Thesis Committee, Jun Lee, Department of Psychology, University of Arizona, Tucson, AZ
2017-	Chair, Psychiatry Research Committee, Department of Psychiatry, University of Arizona, Tucson, AZ
2017-	Member, Promotion and Tenure Committee, Department of Psychiatry, University of Arizona, Tucson, AZ
2019	Member, Comprehensive Examination Committee, Ji-Soo Kim, Department of Psychology, University of Arizona, Tucson, AZ
2019	Member, Comprehensive Examination Committee, John Vanuk, Department of Psychology, University of Arizona, Tucson, AZ

2019- Member, Masters Thesis Committee, Veronica Kraft, Department of Psychology, University of Arizona, Tucson, AZ
2019 Faculty Advisor, Undergraduate Honors Thesis Committee, Giovanna Gutierrez, Department of Neuroscience and Cognitive Science, University of Arizona, Tucson, AZ
2019-2020 Faculty Advisor, Undergraduate Honors Thesis Committee, Corinne Meinhausen, Department of Neuroscience and Cognitive Science, University of Arizona, Tucson, AZ
2019- Faculty Advisor, Undergraduate Honors Thesis Committee, Jared Kleiner, Department of Neuroscience and Cognitive Science, University of Arizona, Tucson, AZ

University Committees/Service

2014 Ad Hoc Member, Interview Committee for Defense and Security Research Institute Director Position, University of Arizona, Tucson, AZ.
2014-2018 Member, Mechanisms of Emotion, Social Relationships, and Health Interdisciplinary Developing Research Program, Clinical and Translational Science Institute, BIO5, University of Arizona, Tucson, AZ
2015 Vice President's Executive Committee for Defense and Security Strategic Planning, University of Arizona, Tucson, AZ
2015- MRI Operations Committee, University of Arizona, Tucson, AZ
2016 Faculty Mentor, Undergraduate Biology Research Program (UBRP), University of Arizona, Tucson, AZ
2016 Faculty Mentor, Border Latino & American Indian Summer Exposure to Research (BLAISER) Program, University of Arizona, Tucson, AZ
2016 Faculty Mentor, Medical Student Research Committee (MSRC) Program, University of Arizona College of Medicine, Tucson, AZ
2018 Administrative Review Committee: Psychiatry Department Chair
2019 Reviewer, Psychology Department Faculty Pilot Grant Program
2019 Reviewer, Arizona Alzheimer's Consortium
2019- 3T Faculty Advisory Committee, University of Arizona, Tucson, AZ
2019 Faculty Mentor, Steps 2 STEM High School Research Internship Program, Tucson, AZ
2020 Sleep & Circadian Science Center Construction Manager at Risk Search Committee, Tucson, AZ

Editorial Board Membership

2009-2018 Editorial Board Member, International Journal of Eating Disorders
2012- Editorial Board Member, Dataset Papers in Neuroscience
2012- Editorial Board Member, Dataset Papers in Psychiatry
2012- Editor, Journal of Sleep Disorders: Treatment and Care

Ad Hoc Journal Reviewer (103 Journals)

2001-2012 Reviewer, Psychological Reports
2001-2012 Reviewer, Perceptual and Motor Skills
2002 Reviewer, American Journal of Psychiatry
2002-2013 Reviewer, Biological Psychiatry

2003	Reviewer, Clinical Neurology and Neurosurgery
2004-2016	Reviewer, NeuroImage
2004-2006	Reviewer, Neuropsychologia
2004-2016	Reviewer, Journal of Neuroscience
2004	Reviewer, Consciousness and Cognition
2005	Reviewer, Experimental Brain Research
2005	Reviewer, Schizophrenia Research
2005-2012	Reviewer, Archives of General Psychiatry
2005	Reviewer, Behavioral Brain Research
2005-2009	Reviewer, Human Brain Mapping
2005-2013	Reviewer, Psychiatry Research: Neuroimaging
2006	Reviewer, Journal of Abnormal Psychology
2006	Reviewer, Psychopharmacology
2006	Reviewer, Developmental Science
2006	Reviewer, Acta Psychologica
2006, 2015	Reviewer, Neuroscience Letters
2006-2020	Reviewer, Journal of Sleep Research
2006-2016	Reviewer, Physiology and Behavior
2006-2019	Reviewer, SLEEP
2007	Reviewer, Journal of Clinical and Experimental Neuropsychology
2008	Reviewer, European Journal of Child and Adolescent Psychiatry
2008	Reviewer, Judgment and Decision Making
2008-2010	Reviewer, Aviation, Space, & Environmental Medicine
2008	Reviewer, Journal of Psychophysiology
2008	Reviewer, Brazilian Journal of Medical and Biological Research
2008	Reviewer, The Harvard Undergraduate Research Journal
2008	Reviewer, Bipolar Disorders
2008-2013	Reviewer, Chronobiology International
2008	Reviewer, International Journal of Obesity
2009	Reviewer, European Journal of Neuroscience
2009-2018	Reviewer, International Journal of Eating Disorders
2009	Reviewer, Psychophysiology
2009	Reviewer, Traumatology
2009	Reviewer, Clinical Medicine: Therapeutics
2009	Reviewer, Acta Pharmacologica Sinica
2009	Reviewer, Collegium Antropologicum
2009	Reviewer, Journal of Psychopharmacology
2009-2014	Reviewer, Obesity
2009	Reviewer, Scientific Research and Essays
2009	Reviewer, Child Development Perspectives
2009-2010	Reviewer, Personality and Individual Differences
2009-2010	Reviewer, Noise and Health
2009-2010	Reviewer, Sleep Medicine
2010	Reviewer, Nature and Science of Sleep
2010	Reviewer, Psychiatry and Clinical Neurosciences
2010	Reviewer, Learning and Individual Differences
2010	Reviewer, Cognitive, Affective, and Behavioral Neuroscience
2010	Reviewer, BMC Medical Research Methodology

2010-2011	Reviewer, Journal of Adolescence
2010-2012	Reviewer, Brain Research
2011	Reviewer, Brain
2011-2019	Reviewer, Social Cognitive and Affective Neuroscience
2011	Reviewer, Journal of Traumatic Stress
2011	Reviewer, Social Neuroscience
2011-2014	Reviewer, Brain and Cognition
2011	Reviewer, Frontiers in Neuroscience
2011-2012	Reviewer, Sleep Medicine Reviews
2012	Reviewer, Journal of Experimental Psychology: General
2012	Reviewer, Ergonomics
2012-2017	Reviewer, Behavioral Sleep Medicine
2012	Reviewer, Neuropsychology
2012	Reviewer, Emotion
2012	Reviewer, JAMA
2012	Reviewer, BMC Neuroscience
2012-2015	Reviewer, Cognition and Emotion
2012	Reviewer, Journal of Behavioral Decision Making
2012	Reviewer, Psychosomatic Medicine
2012-2014	Reviewer, PLoS One
2012	Reviewer, American Journal of Critical Care
2012-2014	Reviewer, Journal of Sleep Disorders: Treatment and Care
2013	Reviewer, Experimental Psychology
2013	Reviewer, Clinical Interventions in Aging
2013	Reviewer, Frontiers in Psychology
2013	Reviewer, Brain Structure and Function
2013	Reviewer, Appetite
2013-2018	Reviewer, JAMA Psychiatry
2014	Reviewer, Acta Psychologica
2014	Reviewer, Neurology
2014	Reviewer, Applied Neuropsychology: Child
2014-2016	Reviewer, Journal of Applied Psychology
2015	Reviewer, Early Childhood Research Quarterly
2015	Reviewer, Behavioral Neuroscience
2015-2019	Reviewer, Scientific Reports
2016-2018	Reviewer, Neuroscience & Biobehavioral Reviews
2016	Reviewer, Psychological Science
2016	Reviewer, Medicine & Science in Sports and Exercise
2016	Reviewer, Archives of Clinical Neuropsychology
2016	Reviewer, Advances in Cognitive Psychology
2017	Reviewer, Data in Brief
2017	Reviewer, Neuroscience
2017-2018	Reviewer, Sleep Health
2017	Reviewer, Journal of Experimental Social Psychology
2017-2018	Reviewer, Neural Plasticity
2018	Reviewer, NeuroImage: Clinical
2018	Reviewer, Journal of Psychiatric Research
2018	Reviewer, Journal of Clinical Sleep Medicine

2019	Reviewer, Harvard Review of Psychiatry
2019	Reviewer, Progress in Brain Research
2020	Reviewer, Journal of Experimental Psychology: Learning, Memory, and Cognition

PUBLICATIONS/CREATIVE ACTIVITY

Refereed Journal Articles

1. **Killgore WD**. The Affect Grid: a moderately valid, nonspecific measure of pleasure and arousal. Psychol Rep. 83(2):639-42, 1998.

2. **Killgore WD**. Empirically derived factor indices for the Beck Depression Inventory. Psychol Rep. 84(3 Pt 1):1005-13, 1999.

3. **Killgore WD**. Affective valence and arousal in self-rated depression and anxiety. Percept Mot Skills. 89(1):301-4, 1999.

4. **Killgore WD**, Adams RL. Prediction of Boston Naming Test performance from vocabulary scores: preliminary guidelines for interpretation. Percept Mot Skills. 89(1):327-37, 1999.

5. **Killgore WD**, Gangestad SW. Sex differences in asymmetrically perceiving the intensity of facial expressions. Percept Mot Skills. 89(1):311-4, 1999.

6. **Killgore WD**. The visual analogue mood scale: can a single-item scale accurately classify depressive mood state? Psychol Rep. 85(3 Pt 2):1238-43, 1999.

7. **Killgore WD**, DellaPietra L, Casasanto DJ. Hemispheric laterality and self-rated personality traits. Percept Mot Skills. 89(3 Pt 1):994-6, 1999.

8. **Killgore WD**, Glosser G, Casasanto DJ, French JA, Alsop DC, Detre JA. Functional MRI and the Wada test provide complementary information for predicting post-operative seizure control. Seizure. 8(8):450-5, 1999.

9. **Killgore WD**. Evidence for a third factor on the Positive and Negative Affect Schedule in a college student sample. Percept Mot Skills. 90(1):147-52, 2000.

10. **Killgore WD**, Dellapietra L. Item response biases on the logical memory delayed recognition subtest of the Wechsler Memory Scale-III. Psychol Rep. 86(3 Pt 1):851-7, 2000.

11. **Killgore WD**, Casasanto DJ, Yurgelun-Todd DA, Maldjian JA, Detre JA. Functional activation of the left amygdala and hippocampus during associative encoding. Neuroreport. 11(10):2259-63, 2000.

12. Yurgelun-Todd DA, Gruber SA, Kanayama G, **Killgore WD**, Baird AA, Young AD. fMRI during affect discrimination in bipolar affective disorder. Bipolar Disord. 2(3 Pt 2):237-48, 2000.

13. **Killgore WD**. Sex differences in identifying the facial affect of normal and mirror-reversed faces. Percept Mot Skills. 91(2):525-30, 2000.

14. **Killgore WD**, DellaPietra L. Using the WMS-III to detect malingering: empirical validation of the rarely missed index (RMI). J Clin Exp Neuropsychol. 22(6):761-71, 2000.

15. **Killgore WD**. Academic and research interest in several approaches to psychotherapy: a computerized search of literature in the past 16 years. Psychol Rep. 87(3 Pt 1):717-20, 2000.

16. Maldjian JA, Detre JA, **Killgore WD**, Judy K, Alsop D, Grossman M, Glosser G. Neuropsychologic performance after resection of an activation cluster involved in cognitive memory function. AJR Am J Roentgenol. 176(2):541-4, 2001.

17. **Killgore WD**, Oki M, Yurgelun-Todd DA. Sex-specific developmental changes in amygdala responses to affective faces. Neuroreport. 12(2):427-33, 2001.

18. **Killgore WD**, Yurgelun-Todd DA. Sex differences in amygdala activation during the perception of facial affect. Neuroreport. 12(11):2543-7, 2001.

19. Casasanto DJ, **Killgore WD**, Maldjian JA, Glosser G, Alsop DC, Cooke AM, Grossman M, Detre JA. Neural correlates of successful and unsuccessful verbal memory encoding. Brain Lang. 80(3):287-95, 2002.

20. **Killgore WD**. Laterality of lesions and trait-anxiety on working memory performance. Percept Mot Skills. 94(2):551-8, 2002.

21. **Killgore WD**, Cupp DW. Mood and sex of participant in perception of happy faces. Percept Mot Skills. 95(1):279-88, 2002.

22. Yurgelun-Todd DA, **Killgore WD**, Young AD. Sex differences in cerebral tissue volume and cognitive performance during adolescence. Psychol Rep. 91(3 Pt 1):743-57, 2002.

23. Yurgelun-Todd DA, **Killgore WD**, Cintron CB. Cognitive correlates of medial temporal lobe development across adolescence: a magnetic resonance imaging study. Percept Mot Skills. 96(1):3-17, 2003.

24. **Killgore WD**, Young AD, Femia LA, Bogorodzki P, Rogowska J, Yurgelun-Todd DA. Cortical and limbic activation during viewing of high- versus low-calorie foods. Neuroimage. 19(4):1381-94, 2003.

25. **Killgore WD**, Yurgelun-Todd DA. Activation of the amygdala and anterior cingulate during nonconscious processing of sad versus happy faces. Neuroimage. 21(4):1215-23, 2004.

26. **Killgore WD**, Yurgelun-Todd DA. Sex-related developmental differences in the lateralized activation of the prefrontal cortex and amygdala during perception of facial affect. Percept Mot Skills. 99(2):371-91, 2004.

27. **Killgore WD**, Glahn DC, Casasanto DJ. Development and Validation of the Design Organization Test (DOT): a rapid screening instrument for assessing visuospatial ability. J Clin Exp Neuropsychol. 27(4):449-59, 2005.

28. **Killgore WD**, Yurgelun-Todd DA. Body mass predicts orbitofrontal activity during visual presentations of high-calorie foods. Neuroreport. 16(8):859-63, 2005.

29. Wesensten NJ, **Killgore WD**, Balkin TJ. Performance and alertness effects of caffeine, dextroamphetamine, and modafinil during sleep deprivation. J Sleep Res. 14(3):255-66, 2005.

30. **Killgore WD**, Yurgelun-Todd DA. Social anxiety predicts amygdala activation in adolescents viewing fearful faces. Neuroreport. 16(15):1671-5, 2005.

31. **Killgore WD**, Yurgelun-Todd DA. Developmental changes in the functional brain responses of adolescents to images of high and low-calorie foods. Dev Psychobiol. 47(4):377-97, 2005.

32. Kahn-Greene ET, Lipizzi EL, Conrad AK, Kamimori GH, **Killgore WD**. Sleep deprivation adversely affects interpersonal responses to frustration. Pers Individ Dif. 41(8):1433-1443, 2006.

33. McBride SA, Balkin TJ, Kamimori GH, **Killgore WD**. Olfactory decrements as a function of two nights of sleep deprivation. J Sens Stud. 24(4):456-63, 2006.

34. **Killgore WD**, Yurgelun-Todd DA. Ventromedial prefrontal activity correlates with depressed mood in adolescent children. Neuroreport. 17(2):167-71, 2006.

35. **Killgore WD**, Vo AH, Castro CA, Hoge CW. Assessing risk propensity in American soldiers: preliminary reliability and validity of the Evaluation of Risks (EVAR) scale--English version. Mil Med. 171(3):233-9, 2006.

36. **Killgore WD**, Balkin TJ, Wesensten NJ. Impaired decision making following 49 h of sleep deprivation. J Sleep Res. 15(1):7-13, 2006.

37. **Killgore WD**, Stetz MC, Castro CA, Hoge CW. The effects of prior combat experience on the expression of somatic and affective symptoms in deploying soldiers. J Psychosom Res. 60(4):379-85, 2006.

38. **Killgore WD**, McBride SA, Killgore DB, Balkin TJ. The effects of caffeine, dextroamphetamine, and modafinil on humor appreciation during sleep deprivation. Sleep. 29(6):841-7, 2006.

39. **Killgore WD**, McBride SA. Odor identification accuracy declines following 24 h of sleep deprivation. J Sleep Res. 15(2):111-6, 2006.

40. **Killgore WD**, Yurgelun-Todd DA. Affect modulates appetite-related brain activity to images of food. Int J Eat Disord. 39(5):357-63, 2006.

41. Kendall AP, Kautz MA, Russo MB, **Killgore WD**. Effects of sleep deprivation on lateral visual attention. Int J Neurosci. 116(10):1125-38, 2006.

42. Yurgelun-Todd DA, **Killgore WD**. Fear-related activity in the prefrontal cortex increases with age during adolescence: a preliminary fMRI study. Neurosci Lett. 406(3):194-9, 2006.

43. **Killgore WD**, Killgore DB, Ganesan G, Krugler AL, Kamimori GH. Trait-anger enhances effects of caffeine on psychomotor vigilance performance. Percept Mot Skills. 103(3):883-6, 2006.

44. **Killgore WD**, Yurgelun-Todd DA. Unconscious processing of facial affect in children and adolescents. Soc Neurosci. 2(1):28-47, 2007.

45. **Killgore WD**, Yurgelun-Todd DA. The right-hemisphere and valence hypotheses: could they both be right (and sometimes left)?. Soc Cogn Affect Neurosci. 2(3):240-50, 2007.

46. **Killgore WD**, Killgore DB. Morningness-eveningness correlates with verbal ability in women but not men. Percept Mot Skills. 104(1):335-8, 2007.

47. **Killgore WD**, Killgore DB, Day LM, Li C, Kamimori GH, Balkin TJ. The effects of 53 hours of sleep deprivation on moral judgment. Sleep. 30(3):345-52, 2007.

48. Rosso IM, **Killgore WD**, Cintron CM, Gruber SA, Tohen M, Yurgelun-Todd DA. Reduced amygdala volumes in first-episode bipolar disorder and correlation with cerebral white matter. Biol Psychiatry. 61(6):743-9, 2007.

49. Kahn-Greene ET, Killgore DB, Kamimori GH, Balkin TJ, **Killgore WD**. The effects of sleep deprivation on symptoms of psychopathology in healthy adults. Sleep Med. 8(3):215-21, 2007.

50. **Killgore WD**. Effects of sleep deprivation and morningness-eveningness traits on risk-taking. Psychol Rep. 100(2):613-26, 2007.

51. **Killgore WD**, Gruber SA, Yurgelun-Todd DA. Depressed mood and lateralized prefrontal activity during a Stroop task in adolescent children. Neurosci Lett. 416(1):43-8, 2007.

52. **Killgore WD**, Yurgelun-Todd DA. Positive affect modulates activity in the visual cortex to images of high calorie foods. Int J Neurosci. 117(5):643-53, 2007.

53. Vo AH, Satori R, Jabbari B, Green J, **Killgore WD**, Labutta R, Campbell WW. Botulinum toxin type-a in the prevention of migraine: a double-blind controlled trial. Aviat Space Environ Med. 78(5 Suppl):B113-8, 2007.

54. **Killgore WD**, Yurgelun-Todd DA. Neural correlates of emotional intelligence in adolescent children. Cogn Affect Behav Neurosci. 7(2):140-51, 2007.

55. **Killgore WD**, Kendall AP, Richards JM, McBride SA. Lack of degradation in visuospatial perception of line orientation after one night of sleep loss. Percept Mot Skills. 105(1):276-86, 2007.

56. **Killgore WD**, Lipizzi EL, Kamimori GH, Balkin TJ. Caffeine effects on risky decision making after 75 hours of sleep deprivation. Aviat Space Environ Med. 78(10):957-62, 2007.

57. **Killgore WD**, Richards JM, Killgore DB, Kamimori GH, Balkin TJ. The trait of Introversion-Extraversion predicts vulnerability to sleep deprivation. J Sleep Res. 16(4):354-63, 2007.

58. **Killgore WD**, Kahn-Green ET, Killgore DB, Kamimori GH, Balkin TJ. Effects of acute caffeine withdrawal on Short Category Test performance in sleep-deprived individuals. Percept Mot Skills. 105(3 pt.2):1265-74, 2007.

59. **Killgore WD**, Killgore DB, McBride SA, Kamimori GH, Balkin TJ. Odor identification ability predicts changes in symptoms of psychopathology following 56 hours of sleep deprivation. J Sensory Stud. 23(1):35-51, 2008.

60. **Killgore WD**, Rupp TL, Grugle NL, Reichardt RM, Lipizzi EL, Balkin TJ. Effects of dextroamphetamine, caffeine and modafinil on psychomotor vigilance test performance after 44 h of continuous wakefulness. J Sleep Res. 17(3):309-21, 2008.

61. Huck NO, McBride SA, Kendall AP, Grugle NL, **Killgore WD**. The effects of modafinil, caffeine, and dextroamphetamine on judgments of simple versus complex emotional expressions following sleep deprivation. Int. J Neuroscience. 118(4):487-502, 2008.

62. **Killgore WD**, Kahn-Greene ET, Lipizzi EL, Newman RA, Kamimori GH, Balkin TJ. Sleep deprivation reduces perceived emotional intelligence and constructive thinking skills. Sleep Med. 9(5):517-26, 2008.

63. **Killgore WD**, Grugle NL, Killgore DB, Leavitt BP, Watlington GI, McNair S, Balkin TJ. Restoration of risk-propensity during sleep deprivation: caffeine, dextroamphetamine, and modafinil. Aviat Space Environ Med. 79(9):867-74, 2008.

64. **Killgore WD**, Muckle AE, Grugle NL, Killgore DB, Balkin TJ. Sex differences in cognitive estimation during sleep deprivation: effects of stimulant countermeasures. Int J Neurosci. 118(11):1547-57, 2008.

65. **Killgore WD**, Cotting DI, Thomas JL, Cox AL, McGurk D, Vo AH, Castro CA, Hoge CW. Post-combat invincibility: violent combat experiences are associated with increased risk-taking propensity following deployment. J Psychiatr Res. 42(13):1112-21, 2008.

66. **Killgore WD**, Gruber SA, Yurgelun-Todd DA. Abnormal corticostriatal activity during fear perception in bipolar disorder. Neuroreport. 19(15):1523-7, 2008.

67. **Killgore WD**, McBride SA, Killgore DB, Balkin TJ, Kamimori GH. Baseline odor identification ability predicts degradation of psychomotor vigilance during 77 hours of sleep deprivation. Int. J Neurosci. 118(9):1207-1225, 2008.

68. **Killgore WD**, Rosso HM, Gruber SA, Yurgelun-Todd DA. Amygdala volume and verbal memory performance in schizophrenia and bipolar disorder. Cogn Behav Neur. 22(1):28-37, 2009.

69. **Killgore WD**, Kahn-Greene ET, Grugle NL, Killgore DB, Balkin TJ. Sustaining executive functions during sleep deprivation: A comparison of caffeine, dextroamphetamine, and modafinil. Sleep. 32(2):205-16, 2009.

70. **Killgore WD**, Grugle NL, Reichardt RM, Killgore DB, Balkin TJ. Executive functions and the ability to sustain vigilance during sleep loss. Aviat Space Environ Med. 80(2):81-7, 2009.

71. Picchioni, D, **Killgore, WD,** Braun, AR, & Balkin, TJ. Positron emission tomography correlates of EEG microarchitecture waveforms during non-REM sleep. Int J Neurosci. 119: 2074-2099, 2009.

72. **Killgore, WD**, Lipizzi, EL, Grugle, NL, Killgore, DB, & Balkin, TJ. Handedness correlates with actigraphically measured sleep in a controlled environment. Percept Mot Skills. 109: 395-400, 2009.

73. **Killgore, WD**, Killgore, DB, Grugle, NL, & Balkin, TJ. Odor identification predicts executive function deficits during sleep deprivation. Int J Neurosci, 120: 328-334, 2010.

74. **Killgore, WD**, Ross, AJ, Kamiya, T, Kawada, Y, Renshaw, PF, & Yurgelun-Todd, DA. Citicoline affects appetite and cortico-limbic responses to images of high calorie foods. Int J Eat Disord. 43: 6-13, 2010.

75. **Killgore, WD,** & Yurgelun-Todd, DA. Cerebral correlates of amygdala responses during non-conscious perception of facial affect in adolescent and pre-adolescent children. Cogn Neurosci, 1: 33-43, 2010.

76. **Killgore, WD**, & Yurgelun-Todd, DA. Sex differences in cerebral responses to images of high vs low calorie food. Neuroreport, 21: 354-358, 2010.

77. **Killgore, WD**, Grugle, NL, Killgore, DB, & Balkin, TJ. Sex differences in self-reported risk-taking propensity on the Evaluation of Risks scale. Percept Mot Skills, 106: 693-700, 2010.

78. **Killgore, WD**, Kelley, AM, & Balkin, TJ. So you think you're bulletproof: Development and validation of the Invincibility Belief Index. Mil Med, 175: 499-508, 2010.

79. **Killgore, WD**, Castro, CA, & Hoge, CW. Preliminary Normative Data for the Evaluation of Risks Scale—Bubble Sheet Version (EVAR-B) for Large Scale Surveys of Returning Combat Veterans. Mil Med, 175: 725-731, 2010.

80. Britton, JC, Rauch, SL, Rosso, IM, **Killgore, WD**, Price, LM, Ragan, J, Chosak, A, Hezel, D, Pine, DS, Leibenluft, E, Pauls, DL, Jenike, MA, Stewart, SE. Cognitive inflexibility and frontal cortical activation in pediatric obsessive-compulsive disorder. J Am Acad Child Adolesc Psychiatry, 49: 944-953, 2010.

81. Britton, JC, Stewart, SE, **Killgore, WD**, Rosso, IM, Price, LM, Gold, AL, Pine, DS, Wilhelm, S, Jenike, MA, & Rauch, SL. Amygdala activation in response to facial expressions in pediatric obsessive-compulsive disorder. Depress Anxiety, 27: 643-651, 2010.

82. Rupp, TL, **Killgore, WD**, & Balkin, TJ. Socializing by day may affect performance by night: Vulnerability to sleep deprivation is differentially mediated by social exposure in extraverts vs. introverts. Sleep, 33: 1475-1485, 2010.

83. Rosso, IM, Makris, N, Britton, JC, Price, LM, Gold, AL, Zai, D, Bruyere, J, Deckersbach, T, **Killgore, WD**, & Rauch, SL. Anxiety sensitivity correlates with two indices of right anterior insula structure in specific animal phobia. Depress Anxiety, 27: 1104-1110, 2010.

84. **Killgore, WD**, Britton, JC, Price, LM, Gold, AL, Deckersbach, T, & Rauch, SL. Neural correlates of anxiety sensitivity during masked presentation of affective faces. Depress Anxiety, 28: 243-249, 2011.

85. **Killgore, WD**, Kamimori, GH, & Balkin, TJ. Caffeine protects against increased risk-taking propensity during severe sleep deprivation. J Sleep Res 20: 395-403, 2011.

86. Capaldi, VF, Guerrero, ML, & **Killgore, WD**. Sleep disruption among returning combat veterans from Iraq and Afghanistan. Mil Med, 176: 879-888, 2011.

87. **Killgore, WD**, Grugle, NL, & Balkin, TJ. Gambling when sleep deprived: Don't bet on stimulants. Chronobiol Int, 29: 43-54, 2012.

88. Gruber, SA, Dahlgren, MK, Sagar, KA, Gonenc, A, & **Killgore, WD.** Age of onset of marijuana use impacts inhibitory processing. Neurosci Lett 511(2):89-94, 2012.

89. **Killgore, WD**, Capaldi, VF, & Guerrero, ML. Nocturnal polysomnographic correlates of daytime sleepiness. Psychol Rep, 110(10), 63-72, 2012.

90. **Killgore, WD**, Weber, M, Schwab, ZJ, DelDonno, SR, Kipman, M, Weiner, MR, & Rauch, SL. Grey matter correlates of trait and ability models of emotional intelligence. Neuroreport 23, 551-555, 2012.

91. **Killgore, WD**, Schwab, ZJ, Kipman, M, DelDonno, SR, Weber, M. Voxel-based morphometric grey matter correlates of daytime sleepiness. Neurosci Lett, 518(1), 10-13, 2012.

92. **Killgore, WD**, Schwab, ZJ, & Weiner, MR. Self-reported nocturnal sleep duration is associated with next-day resting state functional connectivity. Neuroreport, 23, 741-745, 2012.

93. **Killgore, WD**, & Schwab, ZJ. Sex differences in the association between physical exercise and cognitive ability. Perceptual and Motor Skills, 115, 605-617, 2012.

94. Kipman, M, Weber, M, Schwab, ZJ, DelDonno, SR, & **Killgore, WD**. A funny thing happened on the way to the scanner: Humor detection correlates with gray matter volume. Neuroreport, 23, 1059-1064, 2012.

95. **Killgore, WD**, Schwab, ZJ, Weber, M, Kipman, M, DelDonno, SR, Weiner, MR, & Rauch, SL. Daytime sleepiness affects prefrontal regulation of food intake. NeuroImage, 71, 216-223, 2013.

96. **Killgore, WD**, Schwab, ZJ, Kipman, M, DelDonno, SR, & Weber, M. Insomnia-related complaints correlate with functional connectivity between sensory-motor regions. Neuroreport, 24, 233-240, 2013.

97. Weber, M, Webb, CA, DelDonno, SR, Kipman, M, Schwab, ZJ, Weiner, MR, & **Killgore, WD**. Habitual 'Sleep Credit' is associated with greater gray matter volume of the medial prefrontal cortex, higher emotional intelligence, and better mental health. Journal of Sleep Research, 22, 527-534, 2013.

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Book Chapters/Editorials/Other Published Articles

1. **Killgore, WD.** Cortical and limbic activation during visual perception of food. In Dube, L, Bechara, A, Dagher, A, Drewnowski, A, Lebel, J, James, P, & Yada, R. (Eds), Obesity Prevention: The Role of Brain and Society on Individual Behavior. Elsevier, Boston, 2010, pp. 57-71.

2. **Killgore, WD.** Asleep at the trigger: Warfighter judgment and decision-making during prolonged wakefulness. In Bartone, P. (Ed), Applying Research Psychology to Improve Performance and Policy. 2010, pp. 59-77.

3. **Killgore, WD.** Effects of Sleep Deprivation on Cognition. In Kerkhof, G. & Van Dongen, H. Progress in Brain Research: Sleep and Cognition. Elsevier, B.V. New York, 2010, pp. 105-129.

4. **Killgore, WD.** Caffeine and other alerting agents. In Thorpy, M. & Billiard, M. (Eds), Sleepiness: Causes, Consequences, Disorders and Treatment. Cambridge University Press, UK, 2011, pp. 430-443.

5. **Killgore WD.** Priorities and challenges for caffeine research: Energy drinks, PTSD, and withdrawal reversal. The Experts Speak Column, J Caffeine Res, 1, 11-12, 2011.

6. **Killgore, WD.** Odor identification ability predicts executive function deficits following sleep deprivation. In Lee-Chiong, T (Ed), Best of Sleep Medicine 2011. National Jewish Health, Denver CO, 2011, pp. 31-33.

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13. Weber, M., & **Killgore, WD**. What are the emerging therapeutic uses of bright light therapy for neurological disorders? (Editorial). Future Neurology, 8, 495-497, 2013.

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15. **Killgore, WD**. Sleep deprivation and behavioral risk taking. In Watson, RR, Sleep Modulation by Obesity, Diabetes, Age and Diet, 2015, pp. 279-287. Elsevier, San Diego, CA.

16. **Killgore, WD**. Lighting the way to better sleep and health (Editorial). Journal of Sleep Disorders: Treatment and Care, 5:1, 2016.

17. Singh, P, & **Killgore WD**. Time dependent differences in gray matter volume post mild traumatic brain injury. Neural Regeneration Research, 11, 920-921, 2016.

18. Klimova, A, Singh, P, & **Killgore WD**. White matter abnormalities in MS: Advances in diffusion tensor imaging/tractography. In Watson, RR & Killgore, WD (Eds), Nutrition and Lifestyle in Neurological Autoimmune Diseases: Multiple Sclerosis. Elsevier, San Diego, CA, pp. 21-28, 2017.

19. Alkozei, A, Smith, R, & **Killgore, WD**. Grateful people are happy and healthy—But why? Frontiers for Young Minds (in press).

20. Smith, R, Alkozei, A, & **Killgore WD**. How do emotions work? Frontiers for Young Minds (in press).

21. Satterfield, BC, & **Killgore, WD**. Sleep loss, executive function, and decision-making. In Grandner, MG (Ed), Sleep and Health. Elsevier, San Diego (in press).

22. Satterfield, BC, Raikes, AC, & **Killgore, WD**. Sleep in social cognition and judgment. In Krizan, Z. (Ed), Sleep, Personality, and Social Behavior. Springer Nature (in press).

23. Raikes, AC, Athey, A, Alfonso-Miller, P, **Killgore, WD**, & Grandner, MA. Author response: Concussion assessment tools—A possible measure of sleepiness? Sleep Medicine, 66, 260-261, 2020.

Books

1. Watson, RR, **& Killgore, WD** (Eds.). Nutrition and lifestyle in neurological autoimmune diseases: Multiple Sclerosis. Elsevier, San Diego, CA, 2017.

Published U.S. Government Technical Reports

1. **Killgore, WD**, Estrada, A, Rouse, T, Wildzunas, RM, Balkin, TJ. Sleep and performance measures in soldiers undergoing military relevant training. USAARL Report No. 2009-13. June, 2009.

2. Kelley, AM, **Killgore, WD**, Athy, JR, Dretsch, M. Risk propensity, risk perception, and sensation seeking in U.S. Army Soldiers: A preliminary study of a risk assessment battery. USAARL Report No. 2010-02. DTIC #: ADA511524. October, 2009.

CONFERENCES/SCHOLARLY PRESENTATIONS

Colloquia

2000 *The Neurobiology of Emotion in Children*, McLean Hospital, Belmont, MA *[Invited Lecture]*

2001 *The Neurobiology of Emotion in Children and Adolescents*, McLean Hospital, Belmont, MA *[Invited Lecture]*

2002 Cortico-Limbic Activation in Adolescence and Adulthood, Youth Advocacy Project, Cape Cod, MA [Invited Lecture]

2008 Lecture on *Sleep Deprivation, Executive Function, and Resilience to Sleep Loss*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2008 Lecture on *The Role of Research Psychology in the Army*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2008 Lecture on *Combat Stress Control: Basic Battlemind Training*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2009 Lecture entitled *Evaluate a Casualty, Prevent Shock, and Prevent Cold Weather injuries*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA*[Invited Lecture]*

2009 Lecture on *Combat Exposure and Sleep Deprivation Effects on Risky Decision-Making*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2009 Lecture on the *Sleep History and Readiness Predictor (SHARP)*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2009 Lecture on *The Use of Actigraphy for Measuring Sleep in Combat and Military Training*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2010 Lecture entitled *Casualty Evaluation*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2010 Lecture entitled *Combat Stress and Risk-Taking Behavior Following Deployment*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2010 Lecture entitled *Historical Perspectives on Combat Medicine at the Battle of Gettysburg*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2010 Lecture entitled *Sleep Loss, Stimulants, and Decision-Making*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2010 Lecture entitled *PTSD: New Insights from Brain Imaging*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2011 Lecture entitled *Effects of bright light therapy on sleep, cognition and brain function after mild traumatic brain injury*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2011 Lecture entitled *Laboratory Sciences and Research Psychology in the Army*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2011 Lecture entitled *Tools for Assessing Sleep in Military Settings*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2011 Lecture entitled *The Brain Basis of Emotional Trauma and Practical Issues in Supporting Victims of Trauma*, U.S. Department of Justice, United States Attorneys Office, Serving Victims of Crime Training Program, Holyoke, MA *[Invited Lecture]*

2011 Lecture entitled *The Brain Altering Effects of Traumatic Experiences*; 105th Reinforcement Training Unit (RTU), U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2012 Lecture entitled *Sleep Loss, Caffeine, and Military Performance*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2012 Lecture entitled *Using Light Therapy to Treat Sleep Disturbance Following Concussion*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2013 Lecture entitled *Brain Responses to Food: What you See Could Make you Fat*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2013 Lecture entitled *Predicting Resilience Against Sleep Loss*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2014 Lecture entitled *Get Some Shut-Eye or Get Fat: Sleep Loss Affects Brain Responses to Food*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2014 Lecture entitled *Emotional Intelligence: Developing a Training Program*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2014 Lecture entitled *Supporting Cognitive and Emotional Health in Warfighters*. Presented to the Senior Vice President for the Senior Vice President for Health Sciences and Dean of the Medical School, University of Arizona, Tucson, AZ *[Invited Lecture]*

2015 Lecture entitled *Understanding the Effects of Mild TBI (Concussion) on the Brain*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2015 Presentation entitled Superhuman Brains: The Neurocircuitry that Underlies the Ability to Resist Sleep Deprivation. Presented at the Neuroscience Datablitz, University of Arizona, Tucson, AZ *[Invited Lecture]*

2015 Presentation entitled: SCAN Lab Traumatic Stress Study. Presented at the Tucson Veteran Center, Tucson AZ *[Invited Lecture]*

2016 Presentation entitled: SCAN Lab Overview. Presented at the University of Arizona 2016 Sleep workshop, Tucson, AZ *[Invited Lecture]*

2016 Lecture entitled *Trauma Exposure and the Brain*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2016 Presentation entitled *Supporting Cognitive and Emotional Health in Warfighters*. UAHS Development Team, University of Arizona Health Sciences Center, Tucson, AZ *[Invited Lecture]*

2016 Lecture entitled Novel Approaches for Reducing Depression in the Military; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2016 Presentation entitled: SCAN Lab Traumatic Stress and TBI Studies. Presented at the Tucson Veteran Center, Tucson AZ *[Invited Lecture]*

2016 Lecture entitled The Battle for Mosul: An S2 Brief; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2017 Lecture entitled *A New Experimental Treatment for Sleep Problems Following Mild TBI*; 105th IMA Detachment, U.S. Army Reserve Center, Boston, MA *[Invited Lecture]*

2017 Lecture entitled *Basics of Neuroimaging Research*; UA Psychiatry Resident Neuroscience Course, University of Arizona Department of Psychiatry, Tucson, AZ *[Invited Lecture]*

2019 Presentation entitled Physiology Student Opportunities in the Social Cognitive and Affective Neuroscience Lab. Presented at the University of Arizona Physiology Honors Academy, Tucson, AZ *[Invited Discussant]*

2019 Presentation entitled Morning Blue Light Exposure Improves Sleep and Fear Extinction Recall in PTSD. Presented at the University of Arizona Sleep Lecture Series, Tucson, AZ *[Invited Lecture]*

2019 Presentation entitled Morning Blue Light Exposure Improves Sleep and Fear Extinction Recall in PTSD. Presented at the Annual Club Hypnos Meeting Datablitz, San Antonio, TX *[Invited Lecture]*

Seminars

2001 *Using Functional MRI to Study the Developing Brain*, Judge Baker Children's Center, Harvard Medical School, Boston, MA *[Invited Lecture]*

2002 Lecture on the *Changes in the Lateralized Structure and Function of the Brain during Adolescent Development*, Walter Reed Army Institute of Research, Washington, DC *[Invited Lecture]*

2005 Lecture on *Functional Neuroimaging, Cognitive Assessment, and the Enhancement of Soldier Performance*, Walter Reed Army Institute of Research, Washington, DC *[Invited Lecture]*

2005 Lecture on *The Sleep History and Readiness Predictor*: Presented to the Medical Research and Materiel Command, Ft. Detrick, MD *[Invited Lecture]*

2006 Lecture on *Optimization of Judgment and Decision Making Capacities in Soldiers Following Sleep Deprivation*, Brain Imaging Center, McLean Hospital, Belmont MA *[Invited Lecture]*

2006 Briefing to the Chairman of the Cognitive Performance Assessment Program Area Steering Committee, U.S. Army Military Operational Medicine Research Program, entitled *Optimization of Judgment and Decision Making Capacities in Soldiers Following Sleep Deprivation*, Walter Reed Army Institute of Research *[Invited Lecture]*

2005 Briefing to the Chairman of the National Research Council (NRC) Committee on Strategies to Protect the Health of Deployed U.S. Forces, John H. Moxley III, on the *Optimization of Judgment and Decision Making Capacities in Soldiers Following Sleep Deprivation*, Walter Reed Army Institute of Research, Washington, DC *[Invited Lecture]*

2006 Lecture on *Norming a Battery of Tasks to Measure the Cognitive Effects of Operationally Relevant Stressors*, Cognitive Performance Assessment Program Area Steering Committee, U.S. Army Military Operational Medicine Research Program, Washington, DC *[Invited Lecture]*

2007 Lecture on *Cerebral Responses During Visual Processing of Food*, U.S. Army Institute of Environmental Medicine, Natick, MA *[Invited Lecture]*

2007 Briefing on the *Measurement of Sleep-Wake Cycles and Cognitive Performance in Combat Aviators*, U.S. Department of Defense, Defense Advanced Research Projects Agency (DARPA), Washington, DC *[Invited Lecture]*

2007 Lecture on *The Effects of Fatigue and Pharmacological Countermeasures on Judgment and Decision-Making*, U.S. Army Aeromedical Research Laboratory, Fort Rucker, AL *[Invited Lecture]*

2008 Lecture on the *Validation of Actigraphy and the SHARP as Methods of Measuring Sleep and Performance in Soldiers*, U.S. Army Aeromedical Research Laboratory, Fort Rucker, AL *[Seminar]*

2009 Lecture on Sleep Deprivation, *Executive Function, and Resilience to Sleep Loss*: Walter Reed Army Institute of Research AIBS Review, Washington DC *[Invited Lecture]*

2009 Lecture Entitled *Influences of Combat Exposure and Sleep Deprivation on Risky Decision-Making*, Evans U.S. Army Hospital, Fort Carson, CO *[Invited Lecture]*

2009 Lecture on *Making Bad Choices: The Effects of Combat Exposure and Sleep Deprivation on Risky Decision-Making*, 4th Army, Division West, Quarterly Safety Briefing to the Commanding General and Staff, Fort Carson, CO*[Invited Lecture]*

2010 Lecture on *Patterns of Cortico-Limbic Activation Across Anxiety Disorders*, Center for Anxiety, Depression, and Stress, McLean Hospital, Belmont, MA *[Invited Lecture]*

2010 Lecture on *Cortico-Limbic Activation Among Anxiety Disorders*, Neuroimaging Center, McLean Hospital, Belmont, MA *[Invited Lecture]*

2011 Lecture on *Shared and Differential Patterns of Cortico-Limbic Activation Across Anxiety Disorders*, McLean Research Day Brief Communications, McLean Hospital, Belmont, MA *[Invited Lecture]*

2011 Lecture Entitled *The effects of emotional intelligence on judgment and decision making, Military Operational Medicine Research Program Task Area C*, R & A Briefing, Walter Reed Army Institute of Research, Silver Spring, MD *[Invited Lecture]*

2011 Lecture Entitled *Effects of bright light therapy on sleep, cognition, brain function, and neurochemistry following mild traumatic brain injury*, Military Operational Medicine Research Program Task Area C, R & A Briefing, Walter Reed Army Institute of Research, Silver Spring, MD *[Invited Lecture]*

2012 Briefing to GEN (Ret) George Casey Jr., former Chief of Staff of the U.S. Army, entitled *Research for the Soldier*. McLean Hospital, Belmont, MA. *[Invited Lecture]*

2012 Lecture Entitled *Effects of bright light therapy on sleep, cognition, brain function, and neurochemistry following mild traumatic brain injury*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD *[Invited Lecture]*

2013 Lecture Entitled *Update on the Effects of Bright light therapy on sleep, cognition, brain function, and neurochemistry following mild traumatic brain injury*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD *[Invited Lecture]*

2013 Lecture Entitled *Internet Based Cognitive Behavioral Therapy: Effects on Depressive Cognitions and Brain Function*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD [*Invited Lecture*]

2013 Seminar Entitled *Predicting Resilience Against Sleep Loss*, United States Military Academy at West Point, West Point, NY [*Invited Symposium*].

2014 Lecture entitled *Sleep Loss, Brain Function, and Cognitive Performance*, presented to the Psychiatric Genetics and Translational Research Seminar, Massachusetts General Hospital/Harvard Medical School, Boston, MA *[Invited Lecture]*

2014 Grand Rounds Lecture entitled *Sleep Loss, Brain Function, and Performance of the Emotional-Executive System*. University of Arizona Psychiatry Grand Rounds, Tucson, AZ *[Invited Lecture]*

2014 Psychology Department Colloquium entitled *Sleep Loss, Brain Function, and Performance of the Emotional-Executive System*. University of Arizona Department of Psychology, Tucson, AZ *[Invited Lecture]*

2014 Lecture Entitled *Internet Based Cognitive Behavioral Therapy: Effects on Depressive Cognitions and Brain Function*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD *[Invited Lecture]*

2014 Lecture Entitled *The Neurobiological Basis and Potential Modification of Emotional Intelligence Through Affective/Behavioral Training*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD *[Invited Lecture]*

2014 Lecture entitled *Supporting Cognitive and Emotional Health in Warfighters*. Presented to the Senior Vice President for t for Health Sciences and Dean of the Medical School, University of Arizona, Tucson, AZ *[Invited Lecture]*

2015 Lecture entitled *Sleep Loss and Brain Responses to Food*. Presented for the Sleep Medicine Lecture Series, University of Arizona Medical Center, Tucson, AZ *[Invited Lecture]*

2015 Presentation entitled *Superhuman Brains: The Neurocircuitry that Underlies the Ability to Resist Sleep Deprivation*. Presented at the Neuroscience Datablitz, University of Arizona, Tucson, AZ *[Invited Lecture]*

2015 Lecture entitled *Sleep Deprivation Selectively Impairs Emotional Aspects of Cognition*. Presented at the Pamela Turbeville Speaker Series, McClelland Institute for Children, Youth, and Families, Tucson, AZ, *[Invited Lecture]*

2015 Lecture Entitled Multimodal Neuroimaging to Predict Resistance to Sleep Deprivation, presented at the Pulmonary Research Conference, Department of Medicine, Sleep Medicine Sleep Lecture Series, University of Arizona College of Medicine, Tucson, AZ *[Invited Lecture]*.

2015 Lecture entitled Sleep Deprivation Selectively Impairs Emotional Aspects of Cognition. Presented at the Pamela Turbeville Speaker Series, McClelland Institute for Children, Youth, and Families, Tucson, AZ, *[Invited Lecture]*

2015 Lecture Entitled *Effects of bright light therapy on sleep, cognition, brain function, and neurochemistry following mild traumatic brain injury*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD *[Invited Lecture]*

2015 Lecture Entitled *A Non-Pharmacologic Method for Enhancing Sleep in PTSD*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD *[Invited Lecture]*

2015 Lecture Entitled *Internet Based Cognitive Behavioral Therapy: Effects on Depressive Cognitions and Brain Function*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD *[Invited Lecture]*

2015 Lecture Entitled *Operating Under the Influence: The Effects of Sleep Loss and Stimulants on Decision-Making and Performance.* Presented at the annual SAFER training for interns and residents, University of Arizona Department of Psychiatry, Tucson AZ *[Invited Lecture]*

2016 Lecture entitled *Translational Neuroimaging: Using MRI Techniques to Promote Recovery and Resilience*. Functional Neuroimaging Course, Spring 2016, Psychology Department, University of Arizona, Tucson, AZ *[Invited Lecture]*

2016 Lecture entitled *Supporting Cognitive and Emotional Health in Warfighters*. Presented at the Department of Behavioral Biology, Walter Reed Army Institute of Research, Silver Spring, MD *[Invited Lecture]*

2016 Lecture Entitled *Internet Based Cognitive Behavioral Therapy: Effects on Depressive Cognitions and Brain Function*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD *[Invited Lecture]*

2016 Lecture Entitled *A Model for Predicting Cognitive and Emotional Health from Structural and Functional Neurocircuitry following TBI*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD *[Invited Lecture]*

2016 Lecture Entitled *Refinement and Validation of a Military Emotional Intelligence Training Program*, Military Operational Medicine Research Program 2016 Resilience In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD *[Invited Lecture]*

2017 Lecture Entitled *Bright Light Therapy for Treatment of Sleep Problems following Mild TBI*, Military Operational Medicine Research Program Combat Casualty Care In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD *[Invited Lecture]*

2017 Lecture Entitled *Refinement and Validation of a Military Emotional Intelligence Training Program*, Military Operational Medicine Research Program 2017 Resilience In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD *[Invited Lecture]*

2018 Lecture Entitled *Introduction to Chronobiology (Part 1)*, Sleep Research Seminar Series, Walter Reed Army Institute of Research, Silver Spring, MD *[Invited Lecture]*

2018 Lecture Entitled *Introduction to Chronobiology (Part 2)*, Sleep Research Seminar Series, Walter Reed Army Institute of Research, Silver Spring, MD *[Invited Lecture]*

2018 Lecture Entitled *A Non-Pharmacologic Method for Enhancing Sleep in PTSD*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD *[Invited Lecture]*

2018 Lecture Entitled *Refinement and Validation of a Military Emotional Intelligence Training Program*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD *[Invited Lecture]*

2019 Lecture Entitled *Update: A Non-Pharmacologic Method for Enhancing Sleep in PTSD*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD *[Invited Lecture]*

2019 Lecture Entitled *Update: Refinement and Validation of a Military Emotional Intelligence Training Program*, Military Operational Medicine Research Program In Progress Review (IPR) Briefing, U.S. Army Medical Research and Materiel Command, Fort Detrick, MD *[Invited Lecture]*

2019 Grand Rounds Lecture entitled *Light Therapy: Implications for Recovery Following PTSD and mTBI*. University of Arizona Psychiatry Grand Rounds, Tucson, AZ *[Invited Lecture]*

Symposia/Conferences

1999 Oral Platform Presentation entitled *Functional MRI lateralization during memory encoding predicts seizure outcome following anterior temporal lobectomy*, 27th Annual Meeting of the International Neuropsychological Society, Boston, MA. *[Submitted Presentation]*

2000 Lecture on the *Neurobiology of Emotional Development in Children*, 9th Annual Parents as Teachers Born to Learn Conference, St. Louis, MO *[Invited Lecture]*

2001 Oral Platform Presentation entitled *Sex differences in functional activation of the amygdala during the perception of happy faces*, 29th Annual Meeting of the International Neuropsychological Society, Chicago, IL. *[Submitted Presentation]*

2002 Oral Platform Presentation entitled *Developmental changes in the lateralized activation of the prefrontal cortex and amygdala during the processing of facial affect*, 30th Annual Meeting of the International Neuropsychological Society, Toronto, Ontario, Canada. *[Submitted Presentation]*

2002 Oral Platform Presentation *Gray and white matter volume during adolescence correlates with cognitive performance: A morphometric MRI study*, 30th Annual Meeting of the International Neuropsychological Society, Toronto, Ontario, Canada. *[Submitted Presentation]*

2004 Lecture on *Sleep Deprivation, Cognition, and Stimulant Countermeasures*: Seminar Presented at the Bi-Annual 71F Research Psychology Short Course, Ft. Detrick, MD, U.S. Army Medical Research and Materiel Command *[Invited Lecture]*

2004 Lecture on the *Regional Cerebral Blood Flow Correlates of Electroencephalographic Activity During Stage 2 and Slow Wave Sleep: An H215O PET Study*: Presented at the Bi-Annual 71F Research Psychology Short Course, Ft. Detrick, MD, U.S. Army Medical Research and Materiel Command *[Invited Lecture]*

2004 Oral Platform Presentation entitled *Regional cerebral metabolic correlates of electroencephalographic activity during stage-2 and slow-wave sleep: An H215O PET*

Study, 18th Associated Professional Sleep Societies Annual Meeting, Philadelphia, PA. *[Submitted Presentation]*

2006 Lecture on *The Sleep History and Readiness Predictor*: Presented at the Bi-Annual 71F Research Psychology Short Course, Ft. Rucker, AL, U.S. Army Medical Research and Materiel Command *[Invited Lecture]*

2007 Symposium on *Cortical and Limbic Activation in Response to Visual Images of Low and High-Caloric Foods*, 6th Annual Meeting of the International Society for Behavioral Nutrition and Physical Activity (ISBNPA), Oslo, Norway *[Invited Lecture]*

2008 Lecture on *Sleep Deprivation, Executive Function, & Resilience to Sleep Loss*, First Franco-American Workshop on War Traumatism, IMNSSA, Toulon, France *[Invited Lecture]*

2009 Symposium Entitled *Sleep Deprivation, Judgment, and Decision-Making*, 23rd Annual Meeting of the Associated Professional Sleep Societies, Seattle, WA *[Invited Symposium]*

2009 Symposium Session Moderator for *Workshop on Components of Cognition and Fatigue: From Laboratory Experiments to Mathematical Modeling and Operational Applications*, Washington State University, Spokane, WA *[Invited Speaker]*

2009 Lecture on *Comparative Studies of Stimulant Action as Countermeasures for Higher Order Cognition and Executive Function Impairment that Results from Disrupted Sleep Patterns*, Presented at the NIDA-ODS Symposium entitled: Caffeine: Is the Next Problem Already Brewing, Rockville, MD *[Invited Lecture]*

2010 Oral Platform Presentation entitled *Sleep deprivation selectively impairs emotional aspects of cognitive functioning*, 27th Army Science Conference, Orlando, FL. *[Submitted Presentation]*

2010 Oral Platform Presentation entitled *Exaggerated amygdala responses to masked fearful faces are specific to PTSD versus simple phobia*, 27th Army Science Conference, Orlando, FL. *[Submitted Presentation]*

2012 Oral Symposium Presentation entitled *Shared and distinctive patterns of cortico-limbic activation across anxiety disorders*, 32nd Annual Conference of the Anxiety Disorders Association of America, Arlington, VA. *[Invited Symposium]*

2012 Oral Platform Presentation entitled *Shared and unique patterns of cortico-limbic activation across anxiety disorders*. 40th Meeting of the International Neuropsychological Society, Montreal, Canada. *[Submitted Presentation]*

2013 Lecture entitled *Brain responses to visual images of food: Could your eyes be the gateway to excess?* Presented to the NIH Nutrition Coordinating Committee and the Assistant Surgeon General of the United States, Bethesda, MD *[Invited Lecture]*

2014 Symposium Entitled *Operating Under the Influence: The Effects of Sleep Loss and Stimulants on Decision-Making and Performance*, Invited Faculty Presenter at the 34th

Annual Cardiothoracic Surgery Symposium (CREF), San Diego, CA [*Invited Symposium*].

2014 Symposium Entitled *The Effects of Sleep Loss on Food Preference*, SLEEP 2014, Minneapolis, MN *[Invited Symposium]*

2015 Symposium Entitled *The Neurobiological Basis and Potential Modification of Emotional Intelligence in Military Personnel*. Invited presentation at the Yale Center for Emotional Intelligence, New Haven, CT *[Invited Lecture]*

2015 Lecture Entitled *Predicting Resilience to Sleep Loss with Multi-Modal Neuroimaging*. Invited presentation at the DARPA Sleep Workshop 2015, Arlington, VA *[Invited Lecture]*

2015 Symposium Entitled: *The Brain and Food: How your (sleepy) Eyes Might be the Gateway to Excess*, Invited Faculty Presenter at the 2015 University of Arizona Update on Psychiatry, Tucson, AZ [*Invited Symposium*].

2015 Oral Platform presentation entitled *Multimodal Neuroimaging to Predict Resistance to Sleep Deprivation*, Associated Professional Sleep Societies (APSS) SLEEP meeting, Seattle, WA *[Invited Lecture]*

2015 Symposium Entitled presentation entitled *Sleep Deprivation and Emotional Decision Making*, Virginia Tech Sleep Workshop, Arlington, VA *[Invited Symposium]*

2016 Oral Platform presentation entitled *Default Mode Activation Predicts Vulnerability to Sleep Deprivation in the Domains of Mood, Sleepiness, and Vigilance*. Presentation given at the Associated Professional Sleep Societies (APSS) SLEEP meeting, Denver, CO *[Invited Lecture]*

2016 Symposium presentation entitled *Short Wavelength Light Therapy Facilitates Recovery from Mild Traumatic Brain Injury*, 2016 Military Health Systems Research Symposium (MHSRS), Orlando, FL *[Invited Lecture]*

2017 Lecture Entitled: *Military Update on Blue Light Therapy for mTBI*. Lecture presented at the DoD Sleep Research Meeting breakout session at the Associated Professional Sleep Societies (APSS) SLEEP meeting, Boston, MA *[Invited Lecture]*

2017 Symposium entitled: *Judgment and Decision Making During Sleep Loss*. Invited symposium presentation at the SLEEP 2017 Trainee Symposium Series, Associated Professional Sleep Societies (APSS) SLEEP meeting, Boston, MA *[Invited Lecture]*

2017 Oral Platform presentation entitled *Short Wavelength Light Therapy Facilitates Recovery from Mild Traumatic Brain Injury*. Presentation given at the

Associated Professional Sleep Societies (APSS) SLEEP meeting, Boston, MA *[Invited Lecture]*

2017 Symposium entitled: What makes a super-soldier: Identifying the neural correlates of individual differences in resilience against sleep deprivation. Invited symposium presentation at the 2017 Military Health Systems Research Symposium (MHSRS), Orlando, FL *[Invited Lecture]*

2018 Oral Platform presentation entitled: Short Wavelength Light Therapy Enhances Brain and Cognitive Recovery Following Mild Traumatic Brain Injury. Presentation given at the Arizona Research Institute for Biomedical Imaging (ARIBI) Workshop, Tucson, AZ *[Invited Lecture]*

2018 Session Chair: Healthy Shiftwork? Measures, Mitigation and Functional Outcomes. Session presented at the Associated Professional Sleep Societies (APSS) SLEEP Conference (Session O02), Baltimore, MD *[Session Chair]*

2018 Lecture Entitled: *Lapses During Sleep Loss are Predicted by Gray Matter Volume of the Ascending Reticular Activating Systems*. Lecture presented at the 2nd Annual DoD Sleep Research Meeting breakout session at the Associated Professional Sleep Societies (APSS) SLEEP meeting, Baltimore, MD *[Invited Lecture]*

2018 Oral Platform presentation entitled *Resistance to Sleep Deprivation is Predicted by Gray Matter Volume in the Posterior Brain Stem*. Presentation given at the Associated Professional Sleep Societies (APSS) SLEEP meeting, Baltimore, MD *[Invited Lecture]*

2018 Oral Platform presentation entitled *Why Can't You Just Stay Awake? Resistance to Sleep Deprivation is Associated with Measurable Differences in Brainstem Gray Matter*. Presentation given at the Military Health Systems Research Symposium (MHSRS) 2018 Meeting, Orlando, FL *[Invited Lecture]*

2019 Oral Platform presentation entitled Morning Blue Light Exposure Improves Sleep and Fear Extinction Recall in PTSD. Presentation given at the Associated Professional Sleep Societies (APSS) SLEEP 2019 meeting, San Antonio, TX *[Invited Lecture]*

2019 Oral Platform presentation entitled Blue Light Exposure Enhances Sleep and Fear Extinction Recall in PTSD. Presentation given at the Military Health Systems Research Symposium (MHSRS) 2019 Meeting, Orlando, FL *[Invited Lecture]*

2019 Oral Platform presentation entitled Baseline GABA Levels are Associated with Time-on-Task Performance During Sleep Deprivation. Presentation given at the Military Health Systems Research Symposium (MHSRS) 2019 Meeting, Orlando, FL *[Invited Lecture]*

PEER REVIEWED PUBLISHED ABSTRACTS

1. **Killgore, WD.** Development and validation of a new instrument for the measurement of transient mood states: The facial analogue mood scale (FAMS) [Abstract]. Dissertation Abstracts International: Section B: The Sciences & Engineering 1995; 56 (6-B): 3500.

2. **Killgore, WD,** & Locke, B. A nonverbal instrument for the measurement of transient mood states: The Facial Analogue Mood Scale (FAMS) [Abstract]. Proceedings of the Annual Conference of the Oklahoma Center for Neurosciences 1996, Oklahoma City, OK.

3. **Killgore, WD,** Scott, JG, Oommen, KJ, & Jones, H. Lateralization of seizure focus and performance on the MMPI-2 [Abstract]. Proceedings of the Annual Conference of the Oklahoma Center for Neurosciences 1996, Oklahoma City, OK.

4. **Killgore, WD,** & Adams, RL. Vocabulary ability and Boston Naming Test performance: Preliminary guidelines for interpretation [Abstract]. Archives of Clinical Neuropsychology 1997; 13(1).

5. **Killgore, WD**, Glosser, G, Cooke, AN, Grossman, M, Maldjian, J, Judy, K, Baltuch, G, King, D, Alsop, D, & Detre, JA. Functional activation during verbal memory encoding in patients with lateralized focal lesions [Abstract]. Epilepsia 1998; 39(Suppl. 6): 99.

6. **Killgore, WD.** A new method for assessing subtle cognitive deficits: The Clock Trail Making Test [Abstract]. Archives of Clinical Neuropsychology 1998; 14(1): 92.

7. **Killgore, WD,** & DellaPietra, L. Item response biases on the WMS-III Auditory Delayed Recognition Subtests [Abstract]. Archives of Clinical Neuropsychology 1998; 14(1): 92.

8. **Killgore, WD,** Glosser, G, Alsop, DC, Cooke, AN, McSorley, C, Grossman, M, & Detre, JA. Functional activation during material specific memory encoding [Abstract]. NeuroImage 1998; 7: 811.

9. **Killgore, WD,** & DellaPietra, L. Using the WMS-III to detect malingering: Empirical development of the Rarely Missed Index. [Abstract]. Journal of the International Neuropsychological Society 1999; 5(2).

10. **Killgore, WD,** Glosser, G, & Detre, JA. Prediction of seizure outcome following anterior temporal lobectomy: fMRI vs. IAT [Abstract]. Archives of Clinical Neuropsychology 1999; 14(1): 143.

11. **Killgore, WD,** Glosser, G, King, D, French, JA, Baltuch, G, & Detre, JA. Functional MRI lateralization during memory encoding predicts seizure outcome following anterior temporal lobectomy [Abstract]. Journal of the International Neuropsychological Society 1999; 5(2): 122.

12. **Killgore, WD,** Casasanto, DJ, Maldjian, JA, Alsop, DC, Glosser, G, French, J, & Detre, J. A. Functional activation of mesial temporal lobe during nonverbal encoding [abstract]. Epilepsia,

1999; 40 (Supplement 7): 188.

13. **Killgore, WD,** Casasanto, DJ, Maldjian, JA, Gonzales-Atavales, J, & Detre, JA. Associative memory for faces preferentially activates the left amygdala and hippocampus [abstract]. Journal of the International Neuropsychological Society, 2000; 6: 157.

14. Casasanto, DJ, **Killgore, WD,** Maldjian, JA, Gonzales-Atavales, J, Glosser, G, & Detre, JA. Task-dependent and task-invariant activation in mesial temporal lobe structures during fMRI explicit encoding tasks [abstract]. Journal of the International Neuropsychological Society, 2000; 6: 134. ***[*Winner of Rennick Research Award for Best Research by a Graduate Student]***.

15. **Killgore, WD,** Glahn, D, & Casasanto, DJ. Development and validation of the Design Organization Test (DOT): A rapid screening instrument for assessing for visuospatial ability [abstract]. Journal of the International Neuropsychological Society, 2000; 6: 147.

16. Casasanto DJ, **Killgore, WD,** Glosser, G, Maldjian, JA, & Detre, JA. Hemispheric specialization during episodic memory encoding in the human hippocampus and MTL. Proceedings of the Society for Cognitive Science 2000: Philadelphia, PA.

17. Casasanto, DJ, Glosser, G, **Killgore, WD,** Siddiqi, F, Falk, M, Maldjian, J, Lev-Reis, I, & Detre, JA. FMRI evidence for the functional reserve model of post-ATL neuropsychological outcome prediction. Poster Presented at the David Mahoney Institute of Neurological Sciences 17th Annual Neuroscience Retreat, University of Pennsylvania, April 17, 2000.

18. Casasanto, DJ, **Killgore, WD,** Maldjian, JA, Glosser, G, Grossman, M, Alsop, D. C, & Detre, JA. Neural Correlates of Successful and Unsuccessful Verbal Encoding [abstract]. Neuroimage, 2000 11: S381.

19. Siddiqui, F, Casasanto, DJ, **Killgore, WD,** Detre, JA, Glosser, G, Alsop, DC, & Maldjian, JA. Hemispheric effects of frontal lobe tumors on mesial temporal lobe activation during scene encoding [abstract]. Neuroimage, 2000 11: S448.

20. Oki, M, Gruber, SA, **Killgore, WD,** Yurgelun-Todd, DA. Bilateral thalamic activation occurs during lexical but not semantic processing [abstract]. Neuroimage, 2000 11: S353.

21. Yurgelun-Todd, DA, Gruber, SA, **Killgore, WD,** & Tohen, M. Neuropsychological performance in first-episode bipolar disorder [Abstract]. Collegium Internationale Neuro-Psychopharmacologicum. Brussels, Belgium. July, 2000.

22. **Killgore, WD,** & DellaPietra, L. Detecting malingering with the WMS-III: A revision of the Rarely Missed Index (RMI) [abstract]. Journal of the International Neuropsychological Society, 2001; 7 (2): 143-144.

23. Casasanto, DJ, Glosser, G, **Killgore, WD,** Siddiqi, F, Falk, M, Roc, A, Maldjian, JA, Levy-Reis, I, Baltuch, G, & Detre, JA. Presurgical fMRI predicts memory outcome following anterior temporal lobectomy [abstract]. Journal of the International Neuropsychological Society, 2001; 7 (2): 183.

24. **Killgore, WD,** & Yurgelun-Todd, DA. Amygdala but not hippocampal size predicts verbal memory performance in bipolar disorder [abstract]. Journal of the International Neuropsychological Society, 2001; 7 (2): 250-251.

25. **Killgore, WD,** Kanayama, G, & Yurgelun-Todd, DA. Sex differences in functional activation of the amygdala during the perception of happy faces [abstract]. Journal of the International Neuropsychological Society, 2001; 7 (2): 198.

26. **Killgore, WD,** Gruber, SA, Oki, M, & Yurgelun-Todd, DA. Amygdalar volume and verbal memory in schizophrenia and bipolar disorder: A correlative MRI study [abstract]. Meeting of the International Congress on Schizophrenia Research. Whistler, British Columbia. April 2001.

27. Kanayama, G, **Killgore, WD,** Gruber, SA, & Yurgelun-Todd, DA. FMRI BOLD activation of the supramarginal gyrus in schizophrenia [abstract]. Meeting of the International Congress on Schizophrenia Research. Whistler, British Columbia. April 2001.

28. Gruber, SA, **Killgore, WD,** Renshaw, PF, Pope, HG. Jr, Yurgelun-Todd, DA. Gender differences in cerebral blood volume after a 28-day washout period in chronic marijuana smokers [abstract]. Meeting of the International Congress on Schizophrenia Research. Whistler, British Columbia. April 2001.

29. Rohan, ML, **Killgore, WD,** Eskesen, JG, Renshaw, PF, & Yurgelun-Todd, DA. Match-warped EPI anatomic images and the amygdala: Imaging in hard places. Proceedings of the International Society for Magnetic Resonance in Medicine, 2001; 9: 1237.

30. **Killgore, WD** & Yurgelun-Todd, DA. Developmental changes in the lateralized activation of the prefrontal cortex and amygdala during the processing of facial affect [Abstract]. Oral platform paper presented at the 30th Annual Meeting of the International Neuropsychological Society, Toronto, Ontario, Canada, February 13-16, 2002.

31. Yurgelun-Todd, DA. & **Killgore, WD.** Gray and white matter volume during adolescence correlates with cognitive performance: A morphometric MRI study [Abstract]. Oral platform paper presented at the 30th Annual Meeting of the International Neuropsychological Society, Toronto, Ontario, Canada, February 13-16, 2002.

32. **Killgore, WD,** Reichardt, R. Kautz, M, Belenky, G, Balkin, T, & Wesensten, N. Daytime melatonin-zolpidem cocktail: III. Effects on salivary melatonin and performance [abstract]. Poster presented at the 17th Annual Meeting of the Associated Professional Sleep Societies, Chicago, Illinois, June 3-8, 2003.

33. **Killgore, WD,** Young, AD, Femia, LA, Bogorodzki, P, Rogowska, J, & Yurgelun-Todd, DA. Cortical and limbic activation during viewing of high- versus low-calorie foods [abstract]. Poster Presented at the Organization for Human Brain Mapping Annual Meeting, New York, NY, June 18-22, 2003.

34. **Killgore, WD,** & Yurgelun-Todd, DA. Amygdala activation during masked presentations of sad and happy faces [abstract]. Poster presented at the Organization for Human Brain Mapping Annual Meeting, New York, NY, June 18-22, 2003.

35. **Killgore, WD,** Stetz, MC, Castro, CA, & Hoge, CW. Somatic and emotional stress symptom expression prior to deployment by soldiers with and without previous combat experience [abstract]. Poster presented at the 6th Annual Force Health Protection Conference, Albuquerque, NM, August, 11-17, 2003. ***[*Winner: Best Paper Award]***

36. Wesensten, NJ, Balkin, TJ, Thorne, D, **Killgore, WD,** Reichardt, R, & Belenky, G. Caffeine, dextroamphetamine, and modafinil during 85 hours of sleep deprivation: I. Performance and alertness effects [abstract]. Poster presented at the 75th Annual Meeting of the Aerospace Medical Association, Anchorage, AK, May 2-6 2004.

37. **Killgore, WD,** Braun, AR, Belenky, G, Wesensten, NJ, & Balkin, TJ. Regional cerebral metabolic correlates of electroencephalographic activity during stage-2 and slow-wave sleep: An H215O PET Study [abstract]. Oral platform presentation at the 18th Associated Professional Sleep Societies Annual Meeting, Philadelphia, PA, June 5-10, 2004.

38. **Killgore, WD,** Arora, NS, Braun, AR, Belenky, G, Wesensten, NJ, & Balkin, TJ. Sleep strengthens the effective connectivity among cortical and subcortical regions: Evidence for the restorative effects of sleep using H215O PET [abstract]. Poster presented at the 17th Congress of the European Sleep Research Society, Prague, Czech Republic, October 5-9, 2004.

39. **Killgore, WD,** Arora, NS, Braun, AR, Belenky, G, Wesensten, NJ, & Balkin, TJ An H215O PET study of regional cerebral activation during stage 2 sleep [abstract]. Poster presented at the 17th Congress of the European Sleep Research Society, Prague, Czech Republic, October 5-9, 2004.

40. Wesensten, N, **Killgore, WD,** Belenky, G, Reichardt, R, Thorne, D, & Balkin, T. Caffeine, dextroamphetamine, and modafinil during 85 H of sleep deprivation. II. Effects of tasks of executive function [abstract]. Poster presented at the 17th Congress of the European Sleep Research Society, Prague, Czech Republic, October 5-9, 2004.

41. Balkin, T, Reichardt, R, Thorne, D, **Killgore, WD,** Belenky, G, & Wesensten, N. Caffeine, dextroamphetamine, and modafinil during 85 hours of sleep deprivation. I. Psychomotor vigilance and objective alertness effects [abstract]. Oral paper presentation at the 17th Congress of the European Sleep Research Society, Prague, Czech Republic, October 5-9, 2004.

42. Belenky, G, Reichardt, R, Thorne, D, **Killgore, WD,** Balkin, T, & Wesensten, N. Caffeine, dextroamphetamine, and modafinil during 85 hours of sleep deprivation. III. Effect on recovery sleep and post-recovery sleep performance [abstract]. Oral paper presentation at the 17th Congress of the European Sleep Research Society, Prague, Czech Republic, October 5-9, 2004.

43. Vo, A, Green, J, Campbell, W, **Killgore, WD,** Labutta, R, & Redmond, D. The quantification of disrupted sleep in migraine via actigraphy: A pilot study [abstract]. Abstract presented at the Associated Professional Sleep Societies 19th Annual Meeting, Denver, CO, June 18-23, 2005. SLEEP, 28 (Supplement), A281.

44. Kendall, AP, **Killgore, WD,** Kautz, M, & Russo, MB. Left-visual field deficits in attentional processing after 40 hours of sleep deprivation [abstract]. Abstract presented at the Associated

Professional Sleep Societies 19th Annual Meeting, Denver, CO, June 18-23, 2005. SLEEP, 28 (Supplement), A143.

45. Reichardt, RM, Grugle, NL, Balkin, TJ, & **Killgore, WD.** Stimulant countermeasures, risk propensity, and IQ across 2 nights of sleep deprivation [abstract]. Abstract presented at the Associated Professional Sleep Societies 19th Annual Meeting, Denver, CO, June 18-23, 2005. SLEEP, 28 (Supplement), A145.

46. Killgore, DB, McBride, SA, Balkin, TJ, & **Killgore, WD.** Post-stimulant hangover: The effects of caffeine, modafinil, and dextroamphetamine on sustained verbal fluency following sleep deprivation and recovery sleep [abstract]. Abstract presented at the Associated Professional Sleep Societies 19th Annual Meeting, Denver, CO, June 18-23, 2005. SLEEP, 28 (Supplement), A137.

47. **Killgore, WD,** Balkin, TJ, & Wesensten, NJ. Impaired decision-making following 49 hours of sleep deprivation [abstract]. Abstract presented at the Associated Professional Sleep Societies 19th Annual Meeting, Denver, CO, June 18-23, 2005. SLEEP, 28 (Supplement), A138.

48. **Killgore, WD,** McBride, SA, Killgore, DB, & Balkin, TJ. Stimulant countermeasures and risk propensity across 2 nights of sleep deprivation [abstract]. Abstract presented at the Associated Professional Sleep Societies 19th Annual Meeting, Denver, CO, June 18-23, 2005. SLEEP, 28 (Supplement), A136.

49. McBride, SA, Balkin, TJ, & **Killgore, WD.** The effects of 24 hours of sleep deprivation on odor identification accuracy [abstract]. Abstract presented at the Associated Professional Sleep Societies 19th Annual Meeting, Denver, CO, June 18-23, 2005. SLEEP, 28 (Supplement), A137.

50. Picchioni, D, **Killgore, WD,** Braun, AR, & Balkin, TJ. PET correlates of EEG activity during non-REM sleep. Poster presentation at the annual UCLA/Websciences Sleep Training Workshop, Lake Arrowhead, CA, September, 2005.

51. **Killgore, WD,** Killgore, DB, McBride, SA, & Balkin, TJ. Sustained verbal fluency following sleep deprivation and recovery sleep: The effects of caffeine, modafinil, and dextroamphetamine. Poster presented at the 34th Meeting of the International Neuropsychological Society, Boston, MA, February 1-4, 2006.

52. **Killgore, WD,** Balkin, TJ, & Wesensten, NJ. Decision-making is impaired following 2-days of sleep deprivation. Poster presented at the 34th Meeting of the International Neuropsychological Society, Boston, MA, February 1-4, 2006.

53. **Killgore, WD,** & Yurgelun-Todd, DA. Neural correlates of emotional intelligence in adolescent children. Poster presented at the 34th Meeting of the International Neuropsychological Society, Boston, MA, February 1-4, 2006.

54. **Killgore, WD,** & Yurgelun-Todd, DA. Social anxiety predicts amygdala activation in adolescents viewing fearful faces. Poster presented at the 34th Meeting of the International Neuropsychological Society, Boston, MA, February 1-4, 2006.

55. McBride, SA & **Killgore, WD.** Sleepy people smell worse: Olfactory deficits following extended wakefulness. Paper presented at the Workshop on Trace Gas Detection Using Artificial, Biological, and Computational Olfaction. Monell Chemical Senses Center, Philadelphia, PA, March 29-31, 2006.

56. **Killgore, WD,** Day LM, Li, C, Kamimori, GH, Balkin, TJ, & Killgore DB. Moral reasoning is affected by sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A137.

57. **Killgore, WD,** Killgore DB, Kahn-Green, E, Conrad, A, Balkin, TJ, & Kamimori, G. H. Introversion-Extroversion predicts resilience to sleep loss [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A137.

58. Newman, R, Kamimori, GH, **Killgore, WD.** Sleep deprivation diminishes constructive thinking [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A136-137.

59. Huck, NO, Kendall, AP, McBride, SA, **Killgore, WD.** The perception of facial emotion is enhanced by psychostimulants following two nights of sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A136.

60. O'Sullivan, M, Reichardt, RM, Krugler, AL, Killgore, DB, & **Killgore, WD.** Premorbid intelligence correlates with duration and quality of recovery sleep following sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A372.

61. McBride, SA, **Killgore, WD,** Kahn-Green, E, Conrad, A, & Kamimori, GH. Caffeine administered to maintain overnight alertness does not disrupt performance during the daytime withdrawal period [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A136.

62. McBride, SA, Killgore DB, Balkin, TJ, Kamimori, GH, & **Killgore, WD.** Sleepy people smell worse: Olfactory decrements as a function of sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A135.

63. Day, LM, Li, C, Killgore, DB, Kamimori, GH, & **Killgore, WD.** Emotional intelligence moderates the effect of sleep deprivation on moral reasoning [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A135.

64. Murray, CJ, Killgore, DB, Kamimori, GH, & **Killgore, WD.** Individual differences in stress management capacity predict responsiveness to caffeine during sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake

City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A43.

65. Murray, CJ, Newman, R, O'Sullivan, M, Killgore, DB, Balkin, TJ, & **Killgore, WD.** Caffeine, dextroamphetamine, and modafinil fail to restore Stroop performance during sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A370-371.

66. Richards, J, Killgore, DB, & **Killgore, WD.** The effect of 44 hours of sleep deprivation on mood using the Visual Analog Mood Scales [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A132.

67. Richards, J, & **Killgore, WD.** The effect of caffeine, dextroamphetamine, and modafinil on alertness and mood during sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A43.

68. Lipizzi, EL, Leavitt, BP, Killgore, DB, Kamimori, GH, & **Killgore, WD.** Decision making capabilities decline with increasing duration of wakefulness [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A131.

69. Lipizzi, EL, Killgore, DB, Kahn-Green, E, Kamimori, GH, & **Killgore, WD.** Emotional intelligence scores decline during sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A131.

70. Kahn-Green, E, Day, L, Conrad, A, Leavitt, BP, Killgore, DB, & **Killgore, WD.** Short-term vs. long-term planning abilities: Differential effects of stimulants on executive function in sleep deprived individuals [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A370.

71. Kahn-Green, E, Conrad, A, Killgore, DB, Kamimori, GH, & **Killgore, WD.** Tired and frustrated: Using a projective technique for assessing responses to stress during sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A130.

72. Killgore, DB, Kahn-Green, E, Balkin, TJ, Kamimori, GH, & **Killgore, WD.** 56 hours of wakefulness is associated with a sub-clinical increase in symptoms of psychopathology [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A130.

73. Killgore, DB, McBride, SA, Balkin, TJ, Leavitt, BP, & **Killgore, WD.** Modafinil improves humor appreciation during sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A42.

74. Reichardt, RM, Killgore, DB, Lipizzi, EL, Li, CJ, Krugler, AL, & **Killgore, WD.** The effects of stimulants on recovery sleep and post-recovery verbal performance following 61-hours of sleep deprivation [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A42.

75. Bailey, JD, Richards, J, & **Killgore, WD.** Prediction of mood fluctuations during sleep deprivation with the SAFTE Model [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A60.

76. Kendall, AP, McBride, S. A, & **Killgore, WD.** Visuospatial perception of line orientation is resistant to one night of sleep loss [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A369.

77. Kendall, AP, McBride, SA, Kamimori, GH, & **Killgore, WD.** The interaction of coping skills and stimulants on sustaining vigilance: Poor coping may keep yoiu up at night [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A129.

78. Muckle, A, Killgore, DB, & **Killgore, WD.** Gender differences in the effects of stimulant medications on the ability to estimate unknown quantities when sleep deprived [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A369.

79. Krugler, AL, **Killgore, WD,** & Kamimori, G. H. Trait anger predicts resistance to sleep loss [abstract]. Abstract presented at the 20th Meeting of the Associated Professional Sleep Societies, Salt Lake City, UT, June 17-22, 2006. SLEEP, 29 (Supplement), A129.

80. **Killgore, WD,** Cotting, DI, Vo, A. H, Castro, CA, & Hoge, CW. The invincibility syndrome: Combat experiences predict risk-taking propensity following redeployment [abstract]. Abstract presented at the 9th Annual Force Health Protection Conference, Albuquerque, NM, August 6-11, 2006.

81. **Killgore, WD,** Wesensten, NJ, & Balkin, TJ. Stimulants improve tactical but not strategic planning during prolonged wakefulness [abstract]. Abstract presented at the 9th Annual Force Health Protection Conference, Albuquerque, NM, August 6-11, 2006.

82. **Killgore, WD,** Balkin, TJ, Wesensten, NJ, & Kamimori, G. H. The effects of sleep loss and caffeine on decision-making [abstract]. Abstract presented at the 9th Annual Force Health Protection Conference, Albuquerque, NM, August 6-11, 2006.

83. **Killgore, WD,** Balkin, TJ, & Kamimori, GH. Sleep loss can impair moral judgment [abstract]. Abstract presented at the 9th Annual Force Health Protection Conference, Albuquerque, NM, August 6-11, 2006.

84. **Killgore, WD,** Lipizzi, EL, Reichardt, RM, Kamimori, GH, & Balkin, TJ. Can stimulants reverse the effects of sleep deprivation on risky decision-making [abstract]? Abstract presented

at the 25th Army Science Conference, Orlando, FL, November 27-30, 2006.

85. **Killgore, WD,** Killgore, DB, Kamimori, GH, & Balkin, TJ. Sleep deprivation impairs the emotional intelligence and moral judgment capacities of Soldiers [abstract]. Abstract presented at the 25th Army Science Conference, Orlando, FL, November 27-30, 2006.

86. **Killgore, WD,** Cotting, DI, Vo, AH, Castro, C.A, & Hoge, CW. The post-combat invincibility syndrome: Combat experiences increase risk-taking propensity following deployment [abstract]. Abstract presented at the 25th Army Science Conference, Orlando, FL, November 27-30, 2006.

87. Adam, GE, Szelenyi, ER, **Killgore, WD,** & Lieberman, HR. A double-blind study of two days of caloric deprivation: Effects on judgment and decision-making. Oral paper presentation at the Annual Scientific Meeting of the Aerospace Medical Association, New Orleans, LA, May, 2007.

88. Killgore, DB, Kahn-Greene, ET, Kamimori, GH, & **Killgore, WD.** The effects of acute caffeine withdrawal on short category test performance in sleep deprived individuals [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A43.

89. Richards, JM, Lipizzi, EL, Kamimori, GH, & **Killgore, WD.** Extroversion predicts change in attentional lapses during sleep deprivation [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A137.

90. Lipizzi, EL, Richards, JM, Balkin, TJ, Grugle, NL, & **Killgore, WD.** Morningness-Eveningness and Intelligence [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A345.

91. Lipizzi, EL, Richards, JM, Balkin, TJ, Grugle, NL, & **Killgore WD.** Morningness-Eveningness affects risk-taking propensity during sleep deprivation [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A136.

92. McBride, SA, Ganesan, G, Kamimori, GH, & **Killgore, WD.** Odor identification ability predicts vulnerability to attentional lapses during 77 hours of sleep deprivation [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A135.

93. Smith, KL, McBride, S. A, Kamimori, GH, & **Killgore, WD.** Individual differences in odor discrimination predict mood dysregulation following 56 hours of sleep deprivation [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A136.

94. McBride, SA, Leavitt, BP, Kamimori, GH, & **Killgore, WD.** Odor identification accuracy predicts resistance to sleep loss. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A137.

95. Killgore, DB, McBride, SA, Balkin, TJ, Grugle, NL. & **Killgore, WD.** Changes in odor discrimination predict executive function deficits following 45 hours of wakefulness [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A136.

96. Rupp, TL, Killgore, DB, Balkin, TJ, Grugle, NL, & **Killgore, WD.** The effects of modafinil, dextroamphetamine, and caffeine on verbal and nonverbal fluency in sleep deprived individuals [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A43.

97. Newman, RA, Krugler, AL, Kamimori, GH, & **Killgore, WD.** Changes in state and trait anger following 56 hours of sleep deprivation [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A138.

98. Rupp, TL, Grugle, NL, Krugler, AL, Balkin, TJ, & **Killgore, WD.** Caffeine, dextroamphetamine, and modafinil improve PVT performance after sleep deprivation and recovery sleep [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A44.

99. **Killgore, WD,** Lipizzi, EL, Balkin, TJ, Grugle, NL, & Killgore, DB. The effects of sleep deprivation and stimulants on self-reported sensation seeking propensity [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A42.

100. **Killgore, WD,** Richards, JM, Balkin, TJ, Grugle, NL, & Killgore DB. The effects of sleep deprivation and stimulants on risky behavior [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A41.

101. Newman, RA, Smith, KL, Balkin, TJ, Grugle, NL, & **Killgore, WD.** The effects of caffeine, dextroamphetamine, and modafinil on executive functioning following 45 hours of sleep deprivation [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A45.

102. Richards, JM, Lipizzi, EL, Balkin, TJ, Grugle, NL, & **Killgore, WD.** Objective alertness predicts mood changes during 44 hours of sleep deprivation [abstract]. Abstract presented at the 21st Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 9-14, 2007. SLEEP, 30 (Supplement), A56.

103. **Killgore, WD,** & Yurgelun-Todd, DA. Cortical and Limbic Activation in Response to Visual Images of Low and High-Caloric Food [abstract]. Oral symposium presented at the 6th Annual Conference of the Society of Behavioral Nutrition and Physical Activity (ISBNPA), Oslo, Norway, June 20-23, 2007. Proceedings of the ISBNPA, 2007, 75.

104. Estrada, A, **Killgore, WD,** Rouse, T, Balkin, TJ, & Wildzunas, RM. Total sleep time measured by actigraphy predicts academic performance during military training [abstract]. Abstract presented at the 22nd Meeting of the Associated Professional Sleep Societies, Baltimore, MD,

June 7-12, 2008. SLEEP, 31 (Supplement), A134.

105. **Killgore, WD,** Lipizzi, EL, Smith, KL, Killgore, DB, Rupp, TL, Kamimori, GH, & Balkin, T. J. Nonverbal intelligence is inversely related to the ability to resist sleep loss [abstract]. Abstract presented at the 22nd Meeting of the Associated Professional Sleep Societies, Baltimore, MD, June 7-12, 2008. SLEEP, 31 (Supplement), A134.

106. **Killgore, WD,** Lipizzi, EL, Killgore, DB, Rupp, TL, Kamimori, GH, & Balkin, TJ. Emotional intelligence predicts declines in emotion-based decision-making following sleep deprivation [abstract]. Abstract presented at the 22nd Meeting of the Associated Professional Sleep Societies, Baltimore, MD, June 7-12, 2008. SLEEP, 31 (Supplement), A134.

107. Reid, CT, Smith, K, **Killgore, WD,** Rupp, TL, & Balkin, TJ. Higher intelligence is associated with less subjective sleepiness during sleep restriction [abstract]. Abstract presented at the 22nd Meeting of the Associated Professional Sleep Societies, Baltimore, MD, June 7-12, 2008. SLEEP, 31 (Supplement), A375.

108. Newman, R, **Killgore, WD,** Rupp, T. L, & Balkin, TJ. Better baseline olfactory discrimination is associated with worse PVT and MWT performance with sleep restriction and recovery [abstract]. Abstract presented at the 22nd Meeting of the Associated Professional Sleep Societies, Baltimore, MD, June 7-12, 2008. SLEEP, 31 (Supplement), A375.

109. Smith, KL, Reid, CT, **Killgore, WD,** Rupp, TL, & Balkin, TJ. Personality factors associated with performance and sleepiness during sleep restriction and recovery [abstract]. Abstract presented at the 22nd Meeting of the Associated Professional Sleep Societies, Baltimore, MD, June 7-12, 2008. SLEEP, 31 (Supplement), A376.

110. Lipizzi, EL, **Killgore, WD,** Rupp, TL, & Balkin, TJ. Risk-taking behavior is elevated during recovery from sleep restriction [abstract]. Abstract presented at the 22nd Meeting of the Associated Professional Sleep Societies, Baltimore, MD, June 7-12, 2008. SLEEP, 31 (Supplement), A376.

111. Lipizzi, EL, Rupp, TL, **Killgore, WD,** & Balkin, TJ. Sleep restriction increases risk-taking behavior [abstract]. Poster presented at the 11th Annual Force Health Protection Conference, Albuquerque, NM, August, 9-15, 2008.

112. **Killgore, WD,** Estrada, A, Balkin, TJ, & Wildzunas, RM. Sleep duration during army training predicts course performance [abstract]. Poster presented at the 11th Annual Force Health Protection Conference, Albuquerque, NM, August, 11-17, 2008.

113. **Killgore, WD,** Lipizzi, EL, Smith, KL, Killgore, DB, Rupp, TL, Kamimori, GH, & Balkin, TJ. Higher cognitive ability is associated with reduced relative resistance to sleep loss [abstract]. Poster presented at the 11th Annual Force Health Protection Conference, Albuquerque, NM, August, 11-17, 2008.

114. **Killgore, WD,** Rupp, TL, Grugle, NL, Lipizzi, EL, & Balkin, TJ. Maintaining alertness during sustained operations: Which stimulant is most effective after 44 hours without sleep [abstract]? Poster presented at the 11th Annual Force Health Protection Conference, Albuquerque, NM,

August, 11-17, 2008.

115. **Killgore, WD,** Newman, RA, Lipizzi, EL, Kamimori, GH, & Balkin, TJ. Sleep deprivation increases feelings of anger but reduces verbal and physical aggression in Soldiers [abstract]. Poster presented at the 11th Annual Force Health Protection Conference, Albuquerque, NM, August, 11-17, 2008.

116. Kelley, AM, Dretsch, M, **Killgore, WD,** & Athy, JR. Risky behaviors and attitudes about risk in Soldiers. Abstract presented at the 29th Annual Meeting of the Society for Judgment and Decision Making, Chicago, IL, November, 2008.

117. **Killgore, WD,** Ross, AJ, Silveri, MM, Gruber, SA, Kamiya, T, Kawada, Y, Renshaw, PF, & Yurgelun-Todd, DA. Citicoline affects appetite and cortico-limbic responses to images of high calorie foods. Abstract presented at the Society for Neuroscience, Washington DC, November 19, 2008.

118. Britton, JC, Stewart, SE, Price, LM, **Killgore, WD,** Gold, AL, Jenike, MA, & Rauch, SL. Reduced amygdalar activation in response to emotional faces in pediatric Obsessive-Compulsive Disorder. Abstract presented at the Annual meeting of the American College of Neuropsychopharmacology, Scottsdale, AZ, December 7-11, 2008.

119. **Killgore, WD,** Balkin, TJ, Estrada, A, & Wildzunas, RM. Sleep and performance measures in soldiers undergoing military relevant training. Abstract presented at the 26th Army Science Conference, Orlando, FL, December 1-4, 2008.

120. **Killgore, WD** & Yurgelun-Todd, DA. Cerebral correlates of amygdala responses during non-conscious perception of affective faces in adolescent children. Abstract presented at the 37th Annual Meeting of the International Neuropsychological Society, Atlanta, GA, February 11-14, 2009.

121. **Killgore, WD,** Killgore, DB, Grugle, NL, & Balkin, TJ. Odor identification ability predicts executive function deficits following sleep deprivation. Abstract presented the 37th Annual Meeting of the International Neuropsychological Society, Atlanta, GA, February 11-14, 2009.

122. **Killgore, WD,** Rupp, TL, Killgore, DB, Grugle, NL, and Balkin, TJ. Differential effects of stimulant medications on verbal and nonverbal fluency during sleep deprivation. Abstract presented the 37th Annual Meeting of the International Neuropsychological Society, Atlanta, GA, February 11-14, 2009.

123. **Killgore, WD,** Killgore, DB, Kamimori, GH, & Balkin, TJ. When being smart is a liability: More intelligent individuals may be less resistant to sleep deprivation. Abstract presented the 37th Annual Meeting of the International Neuropsychological Society, Atlanta, GA, February 11-14, 2009.

124. **Killgore, WD,** Britton, JC, Price, LM, Gold, AL, Deckersbach, T, & Rauch, SL. Introversion is associated with greater amygdala and insula activation during viewing of masked affective stimuli. Abstract presented the 37th Annual Meeting of the International Neuropsychological Society, Atlanta, GA, February 11-14, 2009.

125. **Killgore, WD,** Britton, JC, Price, LM, Gold, AL, Deckersbach, T, & Rauch, SL. Amygdala responses of specific animal phobics do not differ from healthy controls during masked fearful face perception. Abstract presented the 37th Annual Meeting of the International Neuropsychological Society, Atlanta, GA, February 11-14, 2009.

126. **Killgore, WD,** Britton, JC, Price, LM, Gold, AL, Deckersbach, T, & Rauch, SL. Small animal phobics show sustained amygdala activation in response to masked happy facial expressions. Abstract presented the 37th Annual Meeting of the International Neuropsychological Society, Atlanta, GA, February 11-14, 2009. ***[*Merit Poster Award]***

127. Price, LM, **Killgore, WD,** Britton, JC, Kaufman, ML, Gold, AL, Deckersbach, T, & Rauch, SL. Anxiety sensitivity correlates with insula activation in response to masked fearful faces in specific animal phobics and healthy subjects. Abstract presented at the Annual Conference of the Anxiety Disorders Association of America, Santa Ana Pueblo, New Mexico, March 12-15, 2009.

128. **Killgore, WD,** Britton, JC, Price, LM, Gold, AL, Deckersbach, T, & Rauch, SL. Neuroticism is inversely correlated with amygdala and insula activation during masked presentations of affective stimuli. Abstract presented at the Annual Conference of the Anxiety Disorders Association of America, Santa Ana Pueblo, New Mexico, March 12-15, 2009.

129. **Killgore, WD,** Kelley, AM, & Balkin, TJ. Development and validation of a scale to measure the perception of invincibility. Abstract presented at the Annual Conference of the Anxiety Disorders Association of America, Santa Ana Pueblo, New Mexico, March 12-15, 2009.

130. Kelly, AM, **Killgore WD,** Athy, J, & Dretsch, M. Risk propensity, risk perception, risk aversion, and sensation seeking in U.S. Army soldiers. Abstract presented at the 80th Annual Scientific Meeting of the Aerospace Medical Association, Los Angeles, CA, May 3-7, 2009.

131. Britton, JC, Stewart, SE, Price, LM, **Killgore, WD,** Jenike, MA, & Rauch, SL. The neural correlates of negative priming in pediatric obsessive-compulsive disorder (OCD). Abstract presented at the 64th Annual Scientific Meeting of the Society of Biological Psychiatry, Vancouver, Canada, May 14-16, 2009.

132. **Killgore, WD,** Killgore, DB, Kamimori, GH, & Balkin, TJ. Caffeine protects against increased risk-taking behavior during severe sleep deprivation. Abstract presented at the 23rd Annual Meeting of the Associated Professional Sleep Societies, Seattle, Washington, June 7-12, 2009.

133. Killgore, DB, **Killgore, WD,** Grugle, NL, & Balkin, TJ. Executive functions predict the ability to sustain psychomotor vigilance during sleep loss. Abstract presented at the 23rd Annual Meeting of the Associated Professional Sleep Societies, Seattle, Washington, June 7-12, 2009.

134. **Killgore, WD,** & Yurgelun-Todd, DA. Trouble falling asleep is associated with reduced activation of dorsolateral prefrontal cortex during a simple attention task. Abstract presented at the 23rd Annual Meeting of the Associated Professional Sleep Societies, Seattle, Washington, June 7-12, 2009.

135. **Killgore, WD,** Kelley, AM, & Balkin, TJ. A new scale for measuring the perception of

invincibility. Abstract presented at the 12th Annual Force Health Protection Conference, Albuquerque, New Mexico, August 14-21, 2009.

136. **Killgore, WD,** Killgore, DB, Grugle, NL, & Balkin, TJ. Executive functions contribute to the ability to resist sleep loss. Abstract presented at the 12th Annual Force Health Protection Conference, Albuquerque, New Mexico, August 14-21, 2009.

137. **Killgore, WD,** Killgore, DB, Kamimori, GH, & Balkin, TJ. Caffeine reduces risk-taking behavior during severe sleep deprivation. Abstract presented at the 12th Annual Force Health Protection Conference, Albuquerque, New Mexico, August 14-21, 2009. ***[*Winner Best Paper Award: Research]***

138. **Killgore, WD,** Castro, CA, & Hoge, CW. Normative data for the Evaluation of Risks Scale—Bubble Sheet Version (EVAR-B) for large scale surveys of returning combat veterans. Abstract presented at the 12th Annual Force Health Protection Conference, Albuquerque, New Mexico, August 14-21, 2009.

139. **Killgore, WD,** Castro, CA, & Hoge, CW. Combat exposure and post-deployment risky behavior. Abstract presented at the 12th Annual Force Health Protection Conference, Albuquerque, New Mexico, August 14-21, 2009.

140. **Killgore, WD**, Price, LM, Britton, JC, Simon, N, Pollack, MH, Weiner, MR, Schwab, ZJ, Rosso, IM, & Rauch, SL. Paralimbic responses to masked emotional faces in PTSD: Disorder and valence specificity. Abstract presented at the Annual McLean Hospital Research Day, January 29, 2010.

141. **Killgore, WD**, Killgore, DB, Kamimori, GH, & Balkin, TJ. Caffeine minimizes behavioral risk-taking during 75 hours of sleep deprivation. Abstract presented at the 38th Annual Meeting of the International Neuropsychological Society, Acapulco, Mexico, February 3-6, 2010.

142. **Killgore, WD** & Balkin, TJ. Vulnerability to sleep loss is affected by baseline executive function capacity. Abstract presented at the 38th Annual Meeting of the International Neuropsychological Society, Acapulco, Mexico, February 3-6, 2010.

143. **Killgore, WD**, Smith, KL, Reichardt, RM., Killgore, DB, & Balkin, TJ. Intellectual capacity is related to REM sleep following sleep deprivation. Abstract presented at the 38th Annual Meeting of the International Neuropsychological Society, Acapulco, Mexico, February 3-6, 2010.

144. **Killgore, WD** & Yurgelun-Todd, DA. Cerebral correlates of amygdala responses to masked fear, anger, and happiness in adolescent and pre-adolescent children. Abstract presented at the 38th Annual Meeting of the International Neuropsychological Society, Acapulco, Mexico, February 3-6, 2010.

145. **Killgore, WD**, Post, A, & Yurgelun-Todd, DA. Sex differences in cortico-limbic responses to images of high calorie food. Abstract presented at the 38th Annual Meeting of the International Neuropsychological Society, Acapulco, Mexico, February 3-6, 2010.

146. **Killgore, WD** & Yurgelun-Todd, DA. Self-reported insomnia is associated with increased

activation within the default-mode network during a simple attention task. Abstract presented at the 38th Annual Meeting of the International Neuropsychological Society, Acapulco, Mexico, February 3-6, 2010.

147. **Killgore, WD**, Price, LM, Britton, JC, Gold, AL, Deckersbach, T, & Rauch, SL. Neural correlates of anxiety sensitivity factors during presentation of masked fearful faces. Abstract presented at the 38th Annual Meeting of the International Neuropsychological Society, Acapulco, Mexico, February 3-6, 2010.

148. **Killgore, WD**, Grugle, NL, Conrad, TA, & Balkin, TJ. Baseline executive function abilities predict risky behavior following sleep deprivation. Abstract presented at the 24th Annual Meeting of the Associated Professional Sleep Societies, San Antonio, Texas, June 5-9, 2010.

149. **Killgore, WD**, Grugle, NL, & Balkin, TJ. Judgment of objective vigilance performance is affected by sleep deprivation and stimulants. Abstract presented at the 24th Annual Meeting of the Associated Professional Sleep Societies, San Antonio, Texas, June 5-9, 2010.

150. Killgore, DB, **Killgore, WD**, Grugle, NL, & Balkin, TJ. Resistance to sleep loss and its relationship to decision making during sleep deprivation. Abstract presented at the 24th Annual Meeting of the Associated Professional Sleep Societies, San Antonio, Texas, June 5-9, 2010.

151. Killgore DB, **Killgore, WD**, Grugle, NL, & Balkin, TJ. Subjective sleepiness and objective performance: Differential effects of stimulants during sleep deprivation. Abstract presented at the 24th Annual Meeting of the Associated Professional Sleep Societies, San Antonio, Texas, June 5-9, 2010.

152. Rupp, TL, **Killgore, WD**, & Balkin, TJ. Vulnerability to sleep deprivation is differentially mediated by social exposure in extraverts vs. introverts. Oral presentation at the "Data Blitz" section at the 24th Annual Meeting of the Associated Professional Sleep Societies, San Antonio, Texas, June 5-9, 2010.

153. Rupp, TL, **Killgore, WD**, & Balkin, TJ. Extraverts may be more vulnerable than introverts to sleep deprivation on some measures of risk-taking and executive functioning. Abstract presented at the 24th Annual Meeting of the Associated Professional Sleep Societies, San Antonio, Texas, June 5-9, 2010.

154. Rupp, TL, **Killgore, WD**, & Balkin, TJ. Vulnerability to sleep deprivation is differentially mediated by social exposure in extraverts vs. introverts. Abstract presented at the 24th Annual Meeting of the Associated Professional Sleep Societies, San Antonio, Texas, June 5-9, 2010.

155. Capaldi, VF, Guerrero, ML, & **Killgore, WD**. Sleep disorders among OIF and OEF Soldiers. Abstract presented at the 24th Annual Meeting of the Associated Professional Sleep Societies, San Antonio, Texas, June 5-9, 2010.

156. **Killgore, WD**, Killgore, DB, Kamimori, GH, & Balkin, TJ. Caffeine reduces behavioral risk-taking during sleep deprivation. Abstract presented at the 65th Annual Meeting of the Society for Biological Psychiatry, New Orleans, Louisiana, May 20-22, 2010.

157. **Killgore, WD**, Price, LM, Britton, JC, Simon, N, Pollack, MH, Weiner, MR, Schwab, ZJ, Rosso, IM, & Rauch, SL. Paralimbic responses to masked emotional faces in PTSD: Disorder and valence specificity. Abstract presented at the 65th Annual Meeting of the Society for Biological Psychiatry, New Orleans, Louisiana, May 20-22, 2010.

158. Rosso, IM, Makris, N, Britton, JC, Price, LM, Gold, AL, Deckersbach, T, **Killgore, WD**, & Rauch SL. Anxiety sensitivity correlates with insular cortex volume and thickness in specific animal phobia. Abstract presented at the 65th Annual Meeting of the Society for Biological Psychiatry, New Orleans, Louisiana, May 20-22, 2010.

159. Rupp, TL, **Killgore, WD**, & Balkin, TJ. Vulnerability to sleep deprivation is mediated by social exposure in extraverts versus introverts. Oral platform presentation at the 20th Congress of the European Sleep Research Society, Lisbon, Portugal, September 14-18, 2010.

160. **Killgore, WD**, Estrada, A, & Balkin, TJ. A tool for monitoring soldier fatigue and predicting cognitive readiness: The Sleep History and Readiness Predictor (SHARP). Abstract presented at the 27th Army Science Conference, Orlando, FL, November 29-December 2, 2010.

161. **Killgore, WD**, Kamimori, GH, & Balkin, TJ. Caffeinated gum minimizes risk-taking in soldiers during prolonged sleep deprivation. Abstract presented at the 27th Army Science Conference, Orlando, FL, November 29-December 2, 2010.

162. **Killgore, WD**, Britton, JC, Schwab, ZJ, Weiner, MR, Rosso, IM, & Rauch, SL. Exaggerated amygdala responses to masked fearful faces are specific to PTSD versus simple phobia. Oral platform presentation at the 27th Army Science Conference, Orlando, FL, November 29-December 2, 2010. ***[*Winner Best Paper in Neuroscience]***

163. **Killgore, WD**, Kamimori, GH, & Balkin, TJ. Sleep deprivation selectively impairs emotional aspects of cognitive functioning. Oral platform presentation at the 27th Army Science Conference, Orlando, FL, November 29-December 2, 2010.

164. Rupp, TL, **Killgore, WD**, & Balkin, TJ. Evaluation of personality and social exposure as individual difference factors influencing response to sleep deprivation. Oral platform presentation at the 27th Army Science Conference, Orlando, FL, November 29-December 2, 2010.

165. **Killgore, WD**, Britton, JC, Rosso, IM, Schwab, ZJ, Weiner, MR, & Rauch, SL. Shared and differential patterns of amygdalo-cortical activation across anxiety disorders. Abstract presented at the 49th Annual Meeting of the American College of Neuropsychopharmacology, Miami Beach, FL, December 5-9, 2010.

166. Rosso, IM, **Killgore, WD**, Britton, JC, Weiner, MR, Schwab, ZJ, & Rauch, SL. Neural correlates of PTSD symptom dimensions during emotional processing: A functional magnetic resonance imaging study. Abstract presented at the 49th Annual Meeting of the American College of Neuropsychopharmacology, Miami Beach, FL, December 5-9, 2010.

167. **Killgore, WD,** Rosso, IM, Britton, JC, Schwab, ZJ, Weiner, MR, & Rauch, SL. Cortico-limbic activation differentiates among anxiety disorders with and without a generalized threat response.

Abstract presented at the McLean Hospital Research Day, January 13, 2011.

168. Weiner, MR, Schwab, ZJ, Rauch, SL, & **Killgore WD**. Personality factors predict brain responses to images of high-calorie foods. Abstract presented at the McLean Hospital Research Day, January 13, 2011.

169. Schwab, ZJ, Weiner, MR, Rauch, SL, & **Killgore, WD.** Emotional and cognitive intelligence: Support for the neural efficiency hypothesis. Abstract presented at the McLean Hospital Research Day, January 13, 2011.

170. Crowley, DJ, Covell, MJ, **Killgore, WD**, Schwab, ZJ, Weiner, MR, Acharya, D, Rosso, IM, & Silveri, MM. Differential influence of facial expression on inhibitory capacity in adolescents versus adults. Abstract presented at the McLean Hospital Research Day, January 13, 2011.

171. **Killgore, WD**, Britton, JC, Rosso, IM, Schwab, ZJ, Weiner, MR, & Rauch, SL. Similarities and differences in cortico-limbic responses to masked affect probes across anxiety disorders. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.

172. Rosso, IM, **Killgore, WD**, Britton, JC, Weiner, MR, Schwab, ZJ, & Rauch, SL. Hyperarousal and reexperiencing symptoms of post-traumatic stress disorder are differentially associated with limbic-prefrontal brain responses to threatening stimuli. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.

173. Schwab, ZJ, Weiner, MR, Rauch, SL, & **Killgore, WD**. Neural correlates of cognitive and emotional intelligence in adults. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.

174. Schwab, ZJ, Weiner, MR, Rauch, SL, & **Killgore, WD**. Cognitive and emotional intelligences: Are they distinct or related constructs? Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.

175. Schwab, ZJ, Weiner, MR, Rauch, SL, & **Killgore, WD**. Discrepancy scores between cognitive and emotional intelligence predict neural responses to affective stimuli. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.

176. **Killgore, WD**, Schwab, ZJ, Weiner, MR, & Rauch, SL. Smart people go with their gut: Emotional intelligence correlates with non-conscious insular responses to facial trustworthiness. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.

177. **Killgore, WD**, Weiner, MR, Schwab, ZJ, & Rauch, SL. Whom can you trust? Neural correlates of subliminal perception of facial trustworthiness. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.

178. Weiner, MR, Schwab, ZJ, & Rauch, SL, **Killgore, WD**. Impulsiveness predicts responses of brain reward circuitry to high-calorie foods. Abstract presented at the 39th Annual Meeting of

the International Neuropsychological Society, Boston, MA, February 2-5, 2011.

179. Weiner, MR, Schwab, ZJ, & Rauch, SL, **Killgore, WD**. Conscientiousness predicts brain responses to images of high-calorie foods. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.

180. Crowley, DJ, Covell, MJ, **Killgore, WD**, Schwab, ZJ, Weiner, MR, Acharya, D, Rosso, IM, & Silveri, MM. Differential influence of facial expression on inhibitory capacity in adolescents versus adults. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.

181. Gruber, SA, Dahlgren, MK, **Killgore, WD**, Sagar, KA, & Racine, MT. Marijuana: Age of onset of use impacts executive function and brain activation. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.

182. **Killgore, WD,** Conrad, TA, Grugle, NL, & Balkin, TJ. Baseline executive function abilities correlate with risky behavior following sleep deprivation. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.

183. **Killgore, WD,** Grugle, NL, Killgore, DB, & Balkin, TJ. Resistance to sleep loss and decision making during sleep deprivation. Abstract presented at the 39th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 2-5, 2011.

184. **Killgore, WD,** Rosso, IM, Britton, JC, Schwab, ZJ, Weiner, MR, & Rauch, SL. Cortico-limbic activation differentiates among anxiety disorders with and without a generalized threat response. Abstract presented at the 66th Annual Meeting of the Society for Biological Psychiatry, San Francisco, CA, May 12-14, 2011. ***[*Blue Ribbon Finalist: Clinical/Translational]***

185. Schwab, ZJ, Weiner, MR, Rauch, SL, & **Killgore, WD.** Emotional and cognitive intelligence: Support for the neural efficiency hypothesis. Abstract presented at the 66th Annual Meeting of the Society for Biological Psychiatry, San Francisco, CA, May 12-14, 2011.

186. Weiner, MR, Schwab, ZJ, Rauch, SL, & **Killgore WD**. Personality factors predict brain responses to images of high-calorie foods. Abstract presented at the 66th Annual Meeting of the Society for Biological Psychiatry, San Francisco, CA, May 12-14, 2011.

187. **Killgore, WD,** Grugle, NL, & Balkin, TJ. Sleep deprivation impairs recognition of specific emotions. Abstract presented at the 25th Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 11-15, 2011.

188. **Killgore, WD,** & Balkin, TJ. Does vulnerability to sleep deprivation influence the effectiveness of stimulants on psychomotor vigilance? Abstract presented at the 25th Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 11-15, 2011.

189. Killgore, DB, **Killgore, WD,** Grugle, NJ, & Balkin, TJ. Sleep deprivation impairs recognition of specific emotions. Abstract presented at the 25th Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 11-15, 2011.

190. Weiner, MR, Schwab, ZJ, & **Killgore, WD.** Daytime sleepiness is associated with altered brain activation during visual perception of high-calorie foods: An fMRI study. Abstract presented at the 25th Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 11-15, 2011.

191. Schwab, ZJ, Weiner, MR, & **Killgore, WD.** Functional MRI correlates of morningness-eveningness during visual presentation of high calorie foods. Abstract presented at the 25th Annual Meeting of the Associated Professional Sleep Societies, Minneapolis, MN, June 11-15, 2011.

192. **Killgore, WD,** Weiner, MR, & Schwab, ZJ. Daytime sleepiness affects prefrontal regulation of food intake. Abstract presented at the McLean Hospital Research Day, January 11, 2012.

193. Kipman, M, Schwab ZJ, Weiner, MR, DelDonno, S, Rauch SL, & **Killgore WD**. The insightful yet bitter comedian: The role of emotional versus cognitive intelligence in humor appreciation. Abstract presented at the McLean Hospital Research Day, January 11, 2012.

194. Weber, M, & **Killgore, WD**. Gray matter correlates of emotional intelligence. Abstract presented at the McLean Hospital Research Day, January 11, 2012.

195. Schwab, ZJ, & **Killgore, WD**. Sex differences in functional brain responses to food. Abstract presented at the McLean Hospital Research Day, January 11, 2012.

196. DelDonno, S, Schwab, ZJ, Kipman M, Rauch, SL, & **Killgore, WD**. The influence of cognitive and emotional intelligence on performance on the Iowa Gambling Task. Abstract presented at the McLean Hospital Research Day, January 11, 2012.

197. Song, CH, Kizielewicz, J, Schwab, ZJ, Weiner, MR, Rauch, SL, & **Killgore, WD**. Time is of the essence: The Design Organization Test as a valid, reliable, and brief measure of visuospatial ability. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.

198. Kipman, M, Schwab, ZJ, DelDonno, S, & **Killgore, WD**. Gender differences in the contribution of cognitive and emotional intelligence to the left visual field bias for facial perception. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.

199. Kipman, M., Schwab, ZJ, Weiner, MR, DelDonno, S, Rauch, SL, & **Killgore, WD**. Contributions of emotional versus cognitive intelligence in humor appreciation. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.

200. Schwab, ZJ, & **Killgore, WD**. Disentangling emotional and cognitive intelligence. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.

201. Schwab, ZJ, & **Killgore, WD**. Sex differences in functional brain responses to food. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal,

CA, February 15-18, 2012.

202. DelDonno, S, Schwab, ZJ, Kipman, M, Rauch, SL, & **Killgore, WD**. The influence of cognitive and emotional intelligence on performance on the Iowa Gambling Task. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.

203. **Killgore, WD**, Britton, JC, Rosso, IM, Schwab, ZJ, Weiner, MR, & Rauch, SL. Shared and unique patterns of cortico-limbic activation across anxiety disorders. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.

204. **Killgore, WD**, & Balkin, TJ. Sleep deprivation degrades recognition of specific emotions. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.

205. **Killgore, WD**, & Schwab, ZJ. Emotional intelligence correlates with somatic marker circuitry responses to subliminal cues of facial trustworthiness. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.

206. **Killgore, WD**, & Schwab, ZJ. Trust me! Neural correlates of the ability to identify facial trustworthiness. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.

207. **Killgore, WD**, Schwab, ZJ, Weiner, MR, Kipman, M, DelDonno, S, & Rauch SL. Overeating is associated with altered cortico-limbic responses to images of high calorie foods. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.

208. **Killgore, WD**, Weiner, MR, & Schwab, ZJ. Daytime sleepiness affects prefrontal regulation of food intake. Abstract presented at the 40th Annual Meeting of the International Neuropsychological Society, Montreal, CA, February 15-18, 2012.

209. Weber, M, DelDonno, S, Kipman M, Schwab, ZJ, & **Killgore WD**. Grey matter correlates of self-reported sleep duration. Abstract presented at the Harvard Medical School Research Day, Boston, MA, March 28, 2012.

210. **Killgore, WD**. Overlapping and distinct patterns of neurocircuitry across PTSD, Panic Disorder, and Simple Phobia. Abstract presented at the 32nd Annual Conference of the Anxiety Disorders Association of America, Arlington, VA, April 12-15, 2012.

211. **Killgore, WD**, Britton, JC, Rosso, IM, Schwab, ZJ, & Rauch, SL. Shared and unique patterns of cortico-limbic activation across anxiety disorders. Abstract presented at the 67th Annual Meeting of the Society of Biological Psychiatry, Philadelphia, PA, May 3-5, 2012.

212. **Killgore, WD**, Schwab, ZJ, & Rauch, SL. Daytime sleepiness affects prefrontal inhibition of food consumption. Abstract presented at the 67th Annual Meeting of the Society of Biological Psychiatry, Philadelphia, PA, May 3-5, 2012.

213. Rosso, IM, Britton, JC, Makris, N, **Killgore, WD**, Rauch SL, & Stewart ES. Impact of major depression comorbidity on prefrontal and anterior cingulate volumes in pediatric OCD. Abstract presented at the 67th Annual Meeting of the Society of Biological Psychiatry, Philadelphia, PA, May 3-5, 2012.

214. Kipman, M, Weber, M, DelDonno, S., Schwab, ZJ, & **Killgore, WD**. Morningness-Eveningness correlates with orbitofrontal gray matter volume. Abstract presented at the 26th Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.

215. Kipman, M, Schwab, ZJ, Weber, M, DelDonno, S, & **Killgore, WD**. Yawning frequency is correlated with reduced medial thalamic volume. Abstract presented at the 26th Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.

216. Weber, M, DelDonno, S, Kipman M, Schwab, ZJ, & **Killgore WD**. Grey matter correlates of daytime sleepiness. Abstract presented at the 26th Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.

217. Weber, M, DelDonno, S, Kipman M, Schwab, ZJ, & **Killgore WD**. Grey matter correlates of self-reported sleep duration. Abstract presented at the 26th Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.

218. DelDonno, S, Weber, M, Kipman M, Schwab, ZJ, & **Killgore, WD**. Resistance to insufficient sleep correlates with olfactory cortex gray matter. Abstract presented at the 26th Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.

219. DelDonno, S, Schwab, ZJ, Kipman, M, Weber, M, & **Killgore, WD**. Weekend sleep is related to greater coping and resilience capacities. Abstract presented at the 26th Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.

220. Schwab, ZJ, DelDonno, S, Weber, M, Kipman M, & **Killgore, WD**. Habitual caffeine consumption and cerebral gray matter volume. Abstract presented at the 26th Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.

221. Schwab, ZJ, & **Killgore, WD**. Daytime sleepiness affects prefrontal regulation of food intake. Abstract presented at the 26th Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.

222. **Killgore, WD**, Schwab, ZJ, DelDonno S, Kipman, M, Weber M, & Rauch, SL. Greater nocturnal sleep time is associated with increased default mode functional connectivity. Abstract presented at the 26th Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.

223. **Killgore, WD**, Kamimori, GH, & Balkin, TJ. Caffeine improves efficiency of planning and sequencing abilities during sleep deprivation. Abstract presented at the 26th Annual Meeting of the Associated Professional Sleep Societies, Boston, MA, June 9-13, 2012.

224. Sneider, JT, **Killgore, WD**, Crowley, DJ, Cohen-Gilbert, JE, Schwab, ZJ, & Silveri, MM.

Inhibitory capacity in emerging adult binge drinkers: Influence of Facial Cues. Abstract presented at the 35th Annual Scientific Meeting of the Research Society on Alcoholism, San Francisco, CA, June 23-27, 2012.

225. **Killgore WD**. Multimodal neuroimaging to predict cognitive resilience against sleep loss. Abstract presented at the DARPA Young Faculty Award 2012 Meeting, Arlington, VA, July 30-31, 2012. ***[*Winner Young Faculty Award in Neuroscience]***

226. Cohen-Gilbert, JE, **Killgore WD**, Crowley, DJ, Covell, MJ, Schwab, ZJ, Weiner, MR, Acharya, D, Sneider, JT, & Silveri, MM. Differential influence of safe versus threatening facial expressions on inhibitory control across adolescence and adulthood. Abstract presented at the Society for Neuroscience 2012 Meeting, New Orleans, LA, October 13-17, 2012.

227. Weber, M, DelDonno, S, Kipman M, Schwab, ZJ, & **Killgore WD**. Grey matter correlates of self-reported sleep duration. Abstract presented at the Harvard Division of Sleep Medicine Annual Poster Session, Boston, MA, September 27, 2012.

228. Weber, M, DelDonno, SR, Kipman, M, Preer, LA, Schwab ZJ, Weiner, MR, & **Killgore, WD.** The effect of morning bight light therapy on sleep, cognition and emotion following mild traumatic brain injury. Abstract presented at the 2012 Sleep Research Network Meeting, 22-23 October 2012, Bethesda, MD.

229. Sneider, JT, **Killgore, WD**, Crowley, DJ, Cohen-Gilbert, JE, Schwab, ZJ, & Silveri, MM. Inhibitory capacity in emerging adult binge drinkers: Influence of Facial Cues. Abstract presented at the Annual McLean Hospital Research Day, January 16, 2013.

230. Cohen-Gilbert, JE, **Killgore WD**, Crowley, DJ, Covell, MJ, Schwab, ZJ, Weiner, MR, Acharya, D, Sneider, JT, & Silveri, MM. Differential influence of safe versus threatening facial expressions on inhibitory control across adolescence and adulthood. Abstract presented at the Annual McLean Hospital Research Day, January 16, 2013.

231. Tkachenko, O, Schwab, ZJ, Kipman, M, DelDonno, S, Gogel, H., Preer, L, & **Killgore, WD**. Smarter women need less sleep. Abstract presented at the Annual McLean Hospital Research Day, January 16, 2013.

232. DelDonno, S, Kipman, M, Schwab, ZJ, & **Killgore, WD**. The contributions of emotional intelligence and facial perception to social intuition. Abstract presented at the Annual McLean Hospital Research Day, January 16, 2013.

233. Kipman, M, Schwab, ZJ, DelDonno, S, Weber, M, Rauch, SL, & **Killgore, WD**. The neurocircuitry of impulsive behavior. Abstract presented at the Annual McLean Hospital Research Day, January 16, 2013.

234. Preer, LA, Tkachenko, O, Gogel, H, Schwab, ZJ, Kipman, M, DelDonno, SR, Weber, M, Webb, CA, & **Killgore, WD**. Emotional intelligence as a mediator of the association between anxiety sensitivity and anxiety symptoms. Abstract presented at the Annual McLean Hospital Research Day, January 16, 2013.

235. Gogel, H, DelDonno, S, Kipman M, Preer, LA, Schwab, ZJ, Tkachenko, O, & **Killgore, WD**. Validation of the Design Organization Test (DOT) in a healthy population. Abstract presented at the Annual McLean Hospital Research Day, January 16, 2013.

236. Brennan, BP, Schwab, ZS, Athey, AJ, Ryan, EM, Pope, HG, **Killgore, WD**, Jenike, MA, & Rauch, SL. A functional magnetic resonance imaging study of rostral anterior cingulate cortex activation in obsessive-compulsive disorder using an emotional counting stroop paradigm. Abstract presented at the Annual McLean Hospital Research Day, January 16, 2013.

237. Cohen-Gilbert, JE, Schwab, ZJ, **Killgore, WD**, Crowley, DJ, & Silveri MM. Influence of Binge Drinking on the Neural Correlates of Inhibitory Control during Emotional Distraction in Young Adults. Abstract presented at the 3rd International Conference on Applications of Neuroimaging to Alcoholism (ICANA-3), New Haven, CT, February 15-18, 2013.

238. Weber, M, & **Killgore, WD**. The interrelationship between 'sleep credit', emotional intelligence and mental health – a voxel-based morphometric study. Abstract presented at Harvard Medical School Psychiatry Research Day, April 10, 2013.

239. Cohen-Gilbert, JE, Schwab, ZJ, **Killgore, WD**, Crowley, DJ, & Silveri MM. Influence of Binge Drinking on the Neural Correlates of Inhibitory Control during Emotional Distraction in Young Adults. Abstract presented at Harvard Medical School Psychiatry Research Day, April 10, 2013.

240. Mundy, EA, Weber, M, Rauch, SL, **Killgore, WD**, & Rosso, IM. The relationship between subjective stress levels in childhood and anxiety as well as perceived stress as an adult. Abstract presented at Harvard Medical School Psychiatry Research Day, April 10, 2013.

241. Webb, CA, **Killgore, WD**, Britton, JC, Schwab, ZJ, Price, LM, Weiner, MR, Gold, AL, Rosso, IM, Simon, NM, Pollack, MH, & Rauch, SL. Comparing categorical versus dimensional predictors of functional response across three anxiety disorders. Abstract presented at the 68th Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.

242. Preer, LA, Tkachenko, O, Gogel, H, Schwab, ZJ, Kipman, M, DelDonno, SR, Weber, M, Webb, CA, Rauch, SL, & **Killgore, WD**. Linking Sleep Trouble to Neuroticism, Emotional Control, and Impulsiveness. Abstract presented at the 68th Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.

243. Preer, LA, Tkachenko, O, Gogel, H, Schwab, ZJ, Kipman, M, DelDonno, SR, Weber, M, Webb, CA, Rauch, SL, & **Killgore, WD**. Emotional Intelligence as a Mediator of the Association between Anxiety Sensitivity and Anxiety Symptoms. Abstract presented at the 68th Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.

244. Kipman, M, Schwab, ZJ, DelDonno, S, Weber, M, Rauch, SL, & **Killgore, WD**. The neurocircuitry of impulsive behavior. Abstract presented at the 68th Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.

245. Weber, M, **Killgore, WD**, Rosso, IM, Britton, JC, Simon, NM, Pollack, MH, & Rauch, SL. Gray matter correlates of posttraumatic stress disorder—A voxel based morphometry study. Abstract presented at the 68th Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA,

May 16-18, 2013.

246. Weber, M, Penetar, DM, Trksak, GH, DelDonno, SR, Kipman, M, Schwab, ZJ, & **Killgore, WD**. Morning blue wavelength light therapy improves sleep, cognition, emotion and brain function following mild traumatic brain injury. Abstract presented at the 68th Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.

247. Tkachenko, O, Schwab, ZJ, Kipman, M, Preer, LA, Gogel, H, DelDonno, SR, Weber, M, Webb, CA, Rauch, SL, & **Killgore, WD**. Difficulty in falling asleep and staying asleep linked to a sub-clinical increase in symptoms of psychopathology. Abstract presented at the 68th Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.

248. **Killgore, WD**, Schwab, ZJ, Kipman, M, DelDonno, SR, Rauch, SL, & Weber, M. Problems with sleep initiation and sleep maintenance correlate with functional connectivity among primary sensory cortices. Abstract presented at the 68th Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.

249. **Killgore, WD**, Schwab, ZJ, Kipman, M, DelDonno, SR, Rauch, SL, & Weber, M. A Couple of Hours Can Make a Difference: Self-Reported Sleep Correlates with Prefrontal-Amygdala Connectivity and Emotional Functioning. Abstract presented at the 68th Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.

250. Brennan, BP, Schwab, ZS, Athey, AJ, Ryan, EM, Pope, HG, **Killgore, WD**, Jenike, MA, & Rauch, SL. A functional magnetic resonance imaging study of rostral anterior cingulate cortex activation in obsessive-compulsive disorder using an emotional counting stroop paradigm. Abstract presented at the 68th Annual Meeting of the Society of Biological Psychiatry, San Francisco, CA, May 16-18, 2013.

251. Weber, M, & **Killgore, WD**. The interrelationship between 'sleep credit', emotional intelligence and mental health – a voxel-based morphometric study. Abstract presented at the SLEEP 2013 Annual Meeting, Baltimore, MD, June 1-5, 2013.

252. Weber, M, Penetar, DM, Trksak, GH, DelDonno, SR, Kipman, M, Schwab, ZJ, & **Killgore, WD**. Morning blue wavelength light therapy improves sleep, cognition, emotion and brain function following mild traumatic brain injury. Abstract presented at the SLEEP 2013 Annual Meeting, Baltimore, MD, June 1-5, 2013.

253. **Killgore, WD**, Schwab, ZJ, Kipman, M, DelDonno, SR, & Weber, M. Problems with Sleep Initiation and Sleep Maintenance Correlate with Functional Connectivity Among Primary Sensory Cortices. Abstract presented at the SLEEP 2013 Annual Meeting, Baltimore, MD, June 1-5, 2013.

254. **Killgore, WD**, Schwab, ZJ, Kipman, M, DelDonno, SR, & Weber, M. A Couple of Hours Can Make a Difference: Self-Reported Sleep Correlates with Prefrontal-Amygdala Connectivity and Emotional Functioning. Abstract presented at the SLEEP 2013 Annual Meeting, Baltimore, MD, June 1-5, 2013.

255. Tkachenko, O, Schwab, ZJ, Kipman, M, DelDonno, SR, Preer, LA, Gogel, H, Weber, M, Webb,

CA, & **Killgore, WD**. Difficulty in falling asleep and staying asleep linked to a sub-clinical increase in symptoms of psychopathology. Abstract presented at the SLEEP 2013 Annual Meeting, Baltimore, MD, June 1-5, 2013.

256. Preer, LA, Tkachenko, O, Gogel, H, Schwab, ZJ, Kipman, M, DelDonno, SR, Weber, M, Webb, CA, & **Killgore, WD**. Linking Sleep Initiation Trouble to Neuroticism, Emotional Control, and Impulsiveness. Abstract presented at the SLEEP 2013 Annual Meeting, Baltimore, MD, June 1-5, 2013.

257. **Killgore, WD**. Sleep duration contributes to cortico-limbic functional connectivity, emotional functioning, & psychological health. Abstract presented at the 52nd Annual Meeting of the American College of Neuropsychopharmacology, Hollywood, FL, December 8-12, 2013.

258. Preer, L, Tkachenko, O, Gogel, H, Bark, JS, Kipman, M, Olson, EA, & **Killgore, WD**. The role of personality in sleep initiation problems. Abstract presented at the Annual McLean Hospital Research Day, January 22, 2014.

259. Demers, LA, Olson, EA, Weber, M, Divatia, S, Preer, L, & **Killgore, WD**. Paranoid traits are related to deficits in complex social decision-making and reduced superior temporal sulcus volume. Abstract presented at the Annual McLean Hospital Research Day, January 22, 2014.

260. Tkachenko, O, Weber, M, Gogel, H, & **Killgore, WD**. Predisposition towards unhealthy foods linked with increased gray matter in the cerebellum. Abstract presented at the Annual McLean Hospital Research Day, January 22, 2014.

261. Olson, EA, Weber, M, Tkachenko, O, & **Killgore, WD**. Daytime sleepiness is associated with decreased integration of remote outcomes on the IGT. Abstract presented at the Annual McLean Hospital Research Day, January 22, 2014.

262. Cui, J, Tkachenko, O, & **Killgore, WD**. Can the activation of anterior cingulate predict the emotional suppression? An fMRI study with masked faces. Abstract presented at the Annual McLean Hospital Research Day, January 22, 2014.

263. Gogel, H, & **Killgore WDS**. A psychometric validation of the Design Organization Test (DOT) in a healthy sample. Abstract presented at the 42nd Annual Meeting of the International Neuropsychological Society, Seattle WA, February 12-15, 2014.

264. **Killgore, WD**, Kipman, M, Tkachenko, O, Gogel, H., Preer, L, Demers, LA, Divatia, SC, Olson, EA, & Weber, M. Predicting resilience against sleep loss with multi-modal neuroimaging. Abstract presented at the 42nd Annual Meeting of the International Neuropsychological Society, Seattle WA, February 12-15, 2014.

265. **Killgore, WD**, Weber, M, Bark, JS, Kipman, M, Gogel, H, Preer, L, Tkachenko, O, Demers, LA, Divatia, SC, & Olson, EA. Physical exercise correlates with hippocampal volume in healthy adults. Abstract presented at the 42nd Annual Meeting of the International Neuropsychological Society, Seattle WA, February 12-15, 2014.

266. **Killgore, WD**, Tkachenko, O, Weber, M, Kipman, M, Preer, L, Gogel, H, & Olson, EA. The

association between sleep, functional connectivity, and emotional functioning. Abstract presented at the 42nd Annual Meeting of the International Neuropsychological Society, Seattle WA, February 12-15, 2014.

267. Preer, L, Tkachenko, O, Gogel, H, Bark, JS, Kipman, M, Olson, EA, & **Killgore, WD**. The role of personality in sleep initiation problems. Abstract presented at the 42nd Annual Meeting of the International Neuropsychological Society, Seattle WA, February 12-15, 2014.

268. Tkachenko, O, Weber, M, Olson, EA, Gogel, H, Preer, LA, Divatia, SC, Demers, LA, & **Killgore, WD**. Gray matter volume within the medial prefrontal cortex correlates with behavioral risk taking. Abstract presented at the 42nd Annual Meeting of the International Neuropsychological Society, Seattle WA, February 12-15, 2014.

269. Olson, EA, Weber, M, Bark JS, Demers L, Divatia, SC, Gogel, H, Kipman M, Preer, L, Tkachenko, O, & **Killgore, WD**. Sex differences in threat evaluation of emotionally neutral faces. Abstract presented at the 42nd Annual Meeting of the International Neuropsychological Society, Seattle WA, February 12-15, 2014.

270. Cui, J, Tkachenko, O, & **Killgore, WD**. Can the activation of anterior cingulate predict the emotional suppression? An fMRI study with masked faces. Abstract presented at the 36nd Annual Conference of the Anxiety Disorders Association of America, Chicago, IL, March 27-30, 2014.

271. Webb, CA, Weber, M, Mundy, EA, & **Killgore, WD**. Reduced gray matter volume in the anterior cingulate, orbitofrontal cortex and thalamus as a function of depressive symptoms: A voxel-based morphometric analysis. Abstract presented at the 36nd Annual Conference of the Anxiety Disorders Association of America, Chicago, IL, March 27-30, 2014.

272. Weber, M, Penetar, DM, Trksak, GH, Kipman, M, Tkachenko, O, Bark, JS, Jorgensen, AL, Rauch, SL, & **Killgore, WD**. Light therapy may improve sleep and facilitate recovery from mild traumatic brain injury. Abstract presented at the 10th World Congress on Brain Injury, San Francisco, CA, March 19-22, 2014.

273. Cui, J, Tkachenko, O, & **Killgore, WD**. Can the activation of anterior cingulate predict the emotional suppression? An fMRI study with masked faces. Abstract presented at the 21st Annual Meeting of the Cognitive Neuroscience Society, Boston, MA, April 5-8, 2014.

274. Divatia, S, Demers, LA, Preer, L, Olson, EA, Weber, M, & **Killgore, WD**. Advantageous decision making linked with increased gray matter volume in the ventromedial prefrontal cortex. Abstract presented at the 21st Annual Meeting of the Cognitive Neuroscience Society, Boston, MA, April 5-8, 2014.

275. Demers, LA, Olson, EA, Weber, M, Divatia, S, Preer, L, & **Killgore, WD**. Paranoid traits are related to deficits in complex social decision making and reduced superior temporal sulcus volume. Abstract presented at the 21st Annual Meeting of the Cognitive Neuroscience Society, Boston, MA, April 5-8, 2014.

276. Preer, LA, Weber, M, Tkachenko, O, Divatia, S, Demers, LA, Olson, EA, & **Killgore, WD**.

Gray matter volume in the amygdala is associated with facial assessments of trustworthiness. Abstract presented at the 21st Annual Meeting of the Cognitive Neuroscience Society, Boston, MA, April 5-8, 2014.

277. Tkachenko, O, Weber, M, Gogel, H, & **Killgore, WD**. Predisposition towards unhealthy foods linked with increased gray matter volume in the cerebellum. Abstract presented at the 21st Annual Meeting of the Cognitive Neuroscience Society, Boston, MA, April 5-8, 2014.

278. Olson, EA, Weber, M, Gogel, H, & **Killgore, WD**. Daytime sleepiness is associated with decreased integration of remote outcomes on the IGT. Abstract presented at the 21st Annual Meeting of the Cognitive Neuroscience Society, Boston, MA, April 5-8, 2014.

279. Demers, LA, Preer, LA, Gogel, H, Olson, EA, Weber, M, & **Killgore, WD**. Left-hemifield bias on sad chimeric face task correlates with interpersonal emotional intelligence. Abstract presented at the 69th Annual Meeting of the Society of Biological Psychiatry, New York, NY, May 8-10, 2014.

280. Weber, M, **Killgore, WD**, Olson, EA, Rosso, IM, & Rauch, SL. Morphological brain network organization in relation to trauma and posttraumatic stress disorder. Abstract presented at the 69th Annual Meeting of the Society of Biological Psychiatry, New York, NY, May 8-10, 2014.

281. Divatia, S, Demers, LA, Preer, L, Gogel, H, Kipman, M, & **Killgore, WD**. Schizotypal and manic traits are associated with poorer perception of emotions in healthy individuals. Abstract presented at the 69th Annual Meeting of the Society of Biological Psychiatry, New York, NY, May 8-10, 2014.

282. **Killgore, WD**, Weber, M, Olson, EA, & Rauch, SL. Sleep reduction and functioning of the emotion regulation circuitry. Abstract presented at the 69th Annual Meeting of the Society of Biological Psychiatry, New York, NY, May 8-10, 2014. ***[*Blue Ribbon Finalist for Top Poster Award: Basic Neuroscience]***

283. Webb, CA, Weber, M, Mundy, EA, & **Killgore, WD**. Reduced gray matter volume in the anterior cingulate, orbitofrontal cortex and thalamus as a function of depressive symptoms: A voxel-based morphometric analysis. Abstract presented at the 69th Annual Meeting of the Society of Biological Psychiatry, New York, NY, May 8-10, 2014.

284. Marin MF, Song H, Landau AJ, Lasko NB, Foy Preer LA, Campbell A, Pace-Schott EF, **Killgore WD**, Orr SP, Pitman RK, Simon NM, Milad MR (2014). Psychophysiological and Neuroimaging Correlates of Fear Extinction Deficits Across Anxiety Disorders. Abstract presented at the 69th Annual Meeting of the Society of Biological Psychiatry, New York, NY, May 8-10, 2014.

285. **Killgore, WD**. The effects of sleep loss on food preference. Abstract presented at SLEEP 2014, Minneapolis, MN, May 31-June 4, 2014.

286. Weber, M, & **Killgore, WD**. Sleep habits reflect in functional brain network organization. Abstract presented at SLEEP 2014, Minneapolis, MN, May 31-June 4, 2014. ***[*2014 AASM Young Investigator Award, Honorable Mention]***

287. Freed, MC, Novak, LA, **Killgore, WD**, Koehlmoos, TP, Ginsberg, JP, Krupnick, J, Rauch S, Rizzo, A, Engle, CC. DoD IRB delays: Do they really matter? And if so, why and for whom? Abstract presented at the Military Health System Research Symposium, Fort Lauderdale, FL, August 18-21, 2014.

288. Freed, MC, Novak, LA, **Killgore, WD**, Koehlmoos, TP, Ginsberg, JP, Krupnick, J, Rauch S, Rizzo, A, Engle, CC. DoD IRB delays: Do they really matter? And if so, why and for whom? Abstract presented at the AMSUS Annual Meeting, Washington DC, December 2-5, 2014.

289. **Killgore, WD**, Demers, LA, Olson, EA, Rosso, IM, Webb, CA, & Rauch, SL. Anterior cingulate gyrus and sulcus thickness: A potential predictor of remission following internet-based cognitive behavioral therapy for major depressive disorder. Abstract presented at the 53rd Annual Meeting of the American College of Neuropsychopharmacology, Phoenix, AZ, December 7-11, 2014.

290. Olson, EA, Buchholz, J, Rosso, IM, **Killgore, WD**, Webb, CA, Gogel, H, & Rauch, SL. Internet-based cognitive behavioral therapy effects on symptom severity in major depressive disorder: preliminary results from a randomized controlled trial. Abstract presented at the 53rd Annual Meeting of the American College of Neuropsychopharmacology, Phoenix, AZ, December 7-11, 2014.

291. Brennan, B, Tkachenko, O, Schwab, Z, Ryan, E, Athey, A, Pope, H, Dougherty, D, Jenike, M, **Killgore, WD**, Hudson, J, Jensen, E, & Rauch SL. Abstract presented at the 53rd Annual Meeting of the American College of Neuropsychopharmacology, Phoenix, AZ, December 7-11, 2014.

292. Alkozei, A, Pisner, D, & **Killgore, WD**. Emotional intelligence is differentially correlated with prefrontal cortical responses to backward masked fearful and angry faces. Abstract presented at the 43rd Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.

293. Alkozei, A, Schwab, Z, & **Killgore, WD**. Looking for evil intent: Emotional intelligence and the use of socially relevant facial cues during an emotional decision making task. Abstract presented at the 43rd Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.

294. Shane, BR, Alkozei, A, & **Killgore, WD**. The contribution of general intelligence and emotional intelligence to the ability to appreciate humor. Abstract presented at the 43rd Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.

295. Markowski, SM, Alkozei, A, & **Killgore, WD**. Sleep onset latency and duration are associated with self-perceived invincibility. Abstract presented at the 43rd Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.

296. Pisner, D, Alkozei, A, & **Killgore, WD**. Visuospatial reasoning mediates the relationship between emotion recognition and emotional intelligence. Abstract presented at the 43rd Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.

297. Vanuk, JR, Fridman, A, Demers, LA, Divatia, S, & **Killgore, WD**. Engaging in meditation and

internet based training as a means of enhancing emotional intelligence. Abstract presented at the 43rd Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.

298. Vanuk, JR, Divatia, S, Demers, LA, Markowski, SM, & **Killgore, WD**. Napping in conjunction with brief internet-based training as a means of enhancing emotional intelligence. Abstract presented at the 43rd Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.

299. Cui, J, Tkachenko, O, Gogel, H, Kipman, M, Preer, LA, Weber, M, Divatia, SC, Demers, LA, Olson, EA, Buchholz, JL, Bark, JS, Rosso, IM, Rauch, SL, & **Killgore, WD**. Fractional Anisotropy of frontoparietal connections presicts individual resistance to sleep deprivation. Abstract presented at the 43rd Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.

300. **Killgore, WD**, Olson, EA, Weber, M, Rauch, SL, & Nickerson, LD. Emotional intelligence is associated with coordinated resting state activity between emotion regulation and interoceptive experience networks. Abstract presented at the 43rd Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.

301. **Killgore, WD**, Demers, LA, Divatia, S, Kipman, M, Tkachenko, O, Weber, M, Preer, LA, Gogel, H, Olson, EA, Vanuk, JR, & Rauch, SL. Enhancing emotional intelligence via brief internet-based training. Abstract presented at the 43rd Annual Meeting of the International Neuropsychological Society, Denver, CO, February 4-7, 2015.

302. Buchholz, JL, Rosso, IM, Olson, EA, **Killgore, WD**, Fukunaga, R, Webb, CA, & Rauch, SL. Internet-based cognitive behavioral therapy is associated with symptom reduction and cognitive restructuring in adults with major depressive disorder. Abstract presented at the Anxiety and Depression Conference, Miami, FL, April 9-12, 2015.

303. Alkozei, A, Pisner, D, Rauch, SL, & **Killgore, WD**. Emotional intelligence and subliminal presentations of social threat. Abstract presented at the 70th Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.

304. Shane, BR, Alkozei, A, Vanuk, JR, Weber, M, & **Killgore, WD**. The effect of bright light therapy for improving sleep among individuals with mild traumatic brain injury. Abstract presented at the 70th Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.

305. Vanuk, JR, Shane, BR, Alkozei, A, & **Killgore, WD**. Trait emotional intelligence is associated with greater resting state functional connectivity within the default mode and task positive networks. Abstract presented at the 70th Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.

306. Vanuk, JR, Fridman, A, Demers, LA, & **Killgore, WD**. Engaging in meditation and internet-based training as a means of enhancing emotional intelligence. Abstract presented at the 70th Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.

307. Pisner, D, Alkozei, A, & **Killgore, WD**. Trait emotional suppression is associated with decreased activation of the insula and thalamus in response to masked angry faces. Abstract presented at the 70th Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.

308. Markowski, SM, Alkozei, A, & **Killgore, WD**. The trait of neuroticism predicts neurocognitive performance in healthy individuals. Abstract presented at the 70th Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.

309. Buchholz, JL, Rosso, IM, **Killgore, WD**, Fukunaga, R, Olson, EA, Demers, LA, & Rauch, SL. Amygdala volume is associated with helplessness in adults with major depressive disorder (MDD). Abstract presented at the 70th Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.

310. Sneider, JT, **Killgore, WD**, Rauch, SL, Jensen, JE, & Silveri, MM. Sex differences in the associations between prefrontal GABA and resistance to sleep deprivation. Abstract presented at the 70th Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.

311. **Killgore, WD**, Rosso, IM, Rauch, SL, & Nickerson, LD. Emotional intelligence correlates with coordinated resting state activity between brain networks involved in emotion regulation and interoceptive experience. Abstract presented at the 70th Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.

312. **Killgore, WD**, Demers, LA, Divatia, S, Rosso, IM, & Rauch, SL. Boosting Emotional intelligence with a brief internet-based program. Abstract presented at the 70th Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.

313. **Killgore, WD**, Vanuk, JR, Alkozei, A, Markowski, SM, Pisner, D, Shane, BR, Fridman, A, & Knight, SA. Greater daytime sleepiness correlates with altered thalamocortical connectivity. Abstract presented at the 70th Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.

314. **Killgore, WD**, Tkachenko, O, Gogel, H, Kipman, M, Sonis, LA, Divatia, SC, Demers, LA, Olson, EA, Buchholz, JL, Rosso, IM, & Rauch, SL. Activation of the ventral striatum predicts overeating during subsequent sleep loss. Abstract presented at the 70th Annual Meeting of the Society of Biological Psychiatry, Toronto, Ontario, CA, May 14-16, 2015.

315. Alkozei, A, Markowski, SM, Shane, BR, Rauch, SL, & **Killgore, WD**. Emotional resilience is not associated with increased emotional resistance to sleep deprivation. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.

316. Alkozei, A, Pisner, D, Markowski, SM, Rauch, SL, & **Killgore, WD**. The effect of emotional resilience on changes in appetitie for high-sugary food during sleep loss. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.

317. Markowski, SM, Alkozei, A, Rauch, SL, & **Killgore, WD**. Self-perceived invincibility is associated with sleep onset latency and duration. Abstract presented at the SLEEP 2015 Meeting,

Seattle, WA, June 6-10, 2015.

318. Markowski, SM, Alkozei, A, Rauch, SL, & **Killgore, WD**. Sex differences in the association between personality and resistance to sleep deprivation. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.

319. Shane, BR, Alkozei, A, & **Killgore, WD**. Physical exercise may contribute to vulnerability to sleep deprivation. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.

320. Cui, J, Tkachenko, O, Gogel, H, Kipman, M, Sonis, LA, Weber, M, Divatia, SC, Demers, LA, Olson, EA, Buchholz, JL, Rosso, IM, Rauch, SL, & **Killgore, WD**. Resistance to sleep deprivation involves greater functional activation and white matter connectivity within a fronto-parietal network. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.

321. Vanuk, JR, Rosso, IM, Rauch, SL, Alkozei, A, Markowski, SM, Pisner, D, Shane, BR, Fridman A, Knight, SA, & **Killgore, WD**. Daytime sleepiness is associated with altered thalamocortical connectivity. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.

322. Sneider, JT, Jensen JE, Silveri, MM, & **Killgore, WD**. Prefrontal GABA predicts resistance to sleep deprivation. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.

323. **Killgore, WD**, Tkachenko, O, Gogel, H, Kipman, M, Sonis, LA, Weber, M, Divatia, SC, Demers, LA, Olson, EA, Buchholz, JL, Rosso, IM, & Rauch, SL. Individual differences in rested activation of the ventral striatum predict overeating during sleep deprivation. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.

324. **Killgore, WD**, Tkachenko, O, Rosso, IM, Rauch, SL, & Nickerson, LA. Multimodal neuroimaging to predict resistance to sleep deprivation. Abstract presented at the SLEEP 2015 Meeting, Seattle, WA, June 6-10, 2015.

325. Nickerson, LD & **Killgore, WD**. Resting state brain circuits underpinning a neurobiological model of Theory of Mind and Mentalizing. Abstract presented at the Organization for Human Brain Mapping Annual Meeting, 2015, Honolulu, HI, June 14-18, 2015.

326. Rosso, IM, Olson, EA, **Killgore WD**, Fukunaga, R, Webb, CA, & Rauch SL. A randomized trial of internet-based cognitive behavioral therapy for major depressive disorder. Abstract presented at the 54th Annual Meeting of the American College of Neuropsychopharmacology, Hollywood, FL, December 6-10, 2015.

327. Alkozei, A & **Killgore, WD**. Exposure to blue wavelength light is associated with increased dorsolateral prefrontal cortex responses during a working memory task. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

328. Klimova, A, Pisner, D & **Killgore, WD**. Neural correlates of cognitive and emotional impairments in acute versus chronic mild traumatic brain injury: a diffusion tensor imaging study. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

329. Markowski, S, Alkozei, A, & **Killgore, WD.** Greater neuroticism predicts higher performance in immediate memory, language, and attention in healthy individuals. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

330. Alkozei, A & **Killgore, WD.** Exposure to blue wavelength light suppresses anterior cingulate cortex activation in response to uncertainty during anticipation of negative or positive stimuli. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

331. Smith, R, Alkozei, A, Bao, J, & **Killgore, WD.** Successful goal-directed memory suppression is associated with increased inter-hemispheric coordination between right and left fronto-parietal control networks. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

332. Singh, P, Fridman, A, Pisner, D, Singh, A, & **Killgore, WD.** A voxel based morphometric analysis of ventromedial prefrontal cortex volume related with executive function task performance post mild traumatic injury. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

333. **Killgore, WD.** Baseline responsiveness of the ventral striatum predicts overeating during subsequent sleep deprivation. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

334. **Killgore, WD** & Nickerson, LD. Predicting resistance to sleep deprivation using multimodal neuroimaging. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

335. Sneider, J, Jensen, JE, Silveri, MM, & **Killgore, WD.** Prefrontal GABA correlates with the ability to sustain vigilance during sleep deprivation. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

336. Buchholz, JL, Olson, EA, Fukunaga, R, Webb, CA, **Killgore, WD**, Rauch, SL, & Rosso, IM. Expressive suppression is associated with greater lateral orbitofrontal cortex volume in adults with major depressive disorder. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

337. Fridman, A, Pisner, D, Singh, P, & **Killgore, WD**. Gray matter volume in left medial prefrontal cortex is related to life satisfaction in individuals with mild traumatic brain injury. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

338. Singh, P, Pisner, D, Fridman, A, Roberts, S, & **Killgore, WD.** Volumetric differences in gray matter in healthy versus overweight/obese individuals post mild traumatic brain injury: A voxel based morphometric study. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

339. **Killgore, WD** & Weber, M. Blue wavelength light therapy reduces daytime sleepiness following mild traumatic brain injury. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

340. **Killgore, WD**, Weber, M, & Penetar, D. Blue wavelength light therapy improves balance following mild traumatic brain injury. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

341. Pisner, D, Smith, R, Alkozei, A, Klimova, A, & **Killgore, WD.** Highways of the emotional intellect: White matter microstructural correlates of an ability-based measure of emotional intelligence. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

342. Vanuk, JR, Smith, R, Knight, S, & **Killgore, WD.** Resting RSA correlates with coordinated resting state activity between brain networks involved in emotion perception. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

343. Vanuk, JR, Alkozei, A, Markowski, S, & **Killgore WD.** Greater resting state functional connectivity within the default mode and task positive networks is associated with trait emotional intelligence. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

344. Fukunaga, R, Webb, CA, Olson, EA, **Killgore, WD**, Rauch, SL, & Rosso, IM. Reduced rostral anterior cingulate volume is associated with greater frequency of negative automatic thoughts in adults with major depressive disorder. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

345. Olson, EA, Fukunaga, R., Webb, CA, Rosso, IM, **Killgore, WD**, & Rauch, SL. Delay discounting and anhedonia are independently associated with suicidal ideation in depression. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

346. Pisner, D, Singh, P, Fridman, A, & **Killgore, WD**. Resilience following mild traumatic brain injury is associated with gray matter volume in the left precentral gyrus. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

347. Sing, P, Fridman, A, Pisner, D, & **Killgore, WD.** Time dependent differences in gray matter volume in individuals post mild traumatic brain injury: A voxel based morphometric study. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

348. Smith, C, Smith, R, Sanova, A, & **Killgore, WD.** The neural basis of emotional working memory and its relation to adaptive emotional functioning. Abstract presented at the 44th Annual Meeting of the International Neuropsychological Society, Boston, MA, February 3-6, 2016.

349. Quan, M, Gruber, SA, Lukas, SE, Hill, KP, **Killgore, WD**, & Nickerson, LD. Altered functional

connectivity within large-scale brain networks during a cognitive task in chronic marijuana smokers. Abstract presented at the Harvard Psychiatry Research Day, Boston, MA, March 23, 2016. ***[*Semi Finalist Poster: Harvard Medical School Mysell Award]***

350. Fukunaga, R, Webb, CA, Olson, EA, **Killgore, WD**, Rauch, SL, & Rosso, IM. Improvement in negative automatic thoughts as a mediator of symptom improvement in internet-based cognitive behavioral therapy for major depressive disorder. Abstract presented at the 2016 Meeting of the Anxiety and Depression Association of America, Philadelphia, PA, March 31-April 3, 2016.

351. Bernstein, AS, Pisner, D, Klimova, A, Umapathy, L, Do, L, Squire, S, **Killgore, WD**, & Trouard, T. Effects of multiband acceleration on high angular resolution diffusion imaging data collection, processing, and analysis. Abstract presented at the 24th Annual Meeting of the International Society for Magnetic Resonance in Medicine (IMSRM), Singapore, May 7-8, 2016.

352. Alkozei, A, Markowski, SM, Pisner, D, Fridman, A, Shane, BR, Vanuk, JR, Knight, SA, & **Killgore, WD.** Exposure to blue wavelength light reduces activation within the anterior cingulate cortex during anticipation of certain reward stimuli. Abstract presented at the 71st Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.

353. Alkozei, A., Pisner, D, Markowski, SM, Vanuk, JR, Fridman, A, Shane, BR, Knight SA, & **Killgore, WD.** Increases in prefrontal activation after exposure to blue versus amber wavelength light during cognitive load. Abstract presented at the 71st Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.

354. Pisner, DA, Smith, R, Alkozei, A, Klimova, A, Millan, M, & **Killgore, WD.** Highways of the emotional intellect: White matter mictrostructural correlates of an ability-based measure of emotional intelligence. Abstract presented at the 71st Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.

355. Singh, P, Pisner, D, Fridman, A, Singh A, Millan, M, & **Killgore, WD.** A voxel based morphometric analysis of ventromedial prefrontal cortex volume related with executive function task performance post mild traumatic brain injury. Abstract presented at the 71st Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.

356. Smith, R, Smith, C, Khodr, O, Nettles, M, Sanova, A, & **Killgore, WD.** Emotional working memory: A relatively unexplored aspect of emotional and cognitive ability. Abstract presented at the 71st Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.

357. Smith, R, Nettles, M, Khodr, O, Sanova, A, Smith, C, Alkozei, A, & **Killgore, WD.** Conflict-related dorsomedial frontal activation during healthy food decisions is associated with increased cravings for high-fat foods. Abstract presented at the 71st Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.

358. Smith, R, Sanova, A, Nettles, M, Khodr, O, Smith, C, Alkozei, A, Lane, RD, & **Killgore, WD**. Unwanted reminders: The effects of emotional memory suppression on later neuro-cognitive processing. Abstract presented at the 71st Annual Scientific Convention of the Society for

Biological Psychiatry, Atlanta, GA, May 12-14, 2016.

359. **Killgore, WD**, Weber, M, Palmer, W, & Penetar, D. Blue wavelength light therapy improves balance following mild traumatic brain injury. Abstract presented at the 71st Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.

360. **Killgore, WD**, Tkachenko, O, Palmer, W, & Rauch, SL. Default mode activation predicts vulnerability to sleep deprivation in domains of mood, sleepiness, and vigilance. Abstract presented at the 71st Annual Scientific Convention of the Society for Biological Psychiatry, Atlanta, GA, May 12-14, 2016.

361. Alkozei, A, Markowski, SM, Pisner, D, Fridman, A, Shane, BR, Vanuk, JR, Knight, SA, Grandner, MA, & **Killgore, WD.** Exposure to blue wavelength light reduces activation within the anterior cingulate cortex during anticipation of certain reward stimuli. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

362. Alkozei, A, Pisner, D, Markowski, SM, Vanuk, JR, Fridman, A, Shane, BR, Knight, SA, Grandner, MA, & **Killgore, WD.** Exposure to blue wavelength light is associated with increased dorsolateral prefrontal cortex responses and increases in response times during a working memory task. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

363. Davis, B, Yang, R, **Killgore, WD**, Gallagher, RA, Carrazco, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Nightmares in a community sample: Prevalence and associations with daytime function independent of poor sleep quality and depression. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

364. Fisseha, E, Havens, C, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Sleep duration's important role in the relationship among difficulty concentrating, fatigue, stress, and depressed mood: Data from the SHADES study. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

365. Graham, PM, Goldstein, M, David, BM, Perlis, ML, Perfect, MM, Frye, S, **Killgore, WD**, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Longitudinal analysis of sleep duration using actigraphy and sleep diary: Stability and agreement over 8-11 months. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

366. Granados, K, Rojo-Wissar, DM, Chakravorty, S, Prather, A, Perfect, MM, Frye, S, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Adverse childhood exposures associated with adult insomnia symptoms. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

367. Grandner, MA, **Killgore, WD**, Khader, W, & Perlis, ML. Positive and negative mood ratings

across 24-hours. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

368. Hall, C, Forbush, S, Youngstedt, S, **Killgore, WD**, Barilla, H, Gehrels, J, Alfonso-Miller, P, Palmer, W, Carrazco, N, & Grandner, MA. Habitual sleep duration and health: A possible role for exercise. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

369. Jackson, N, Patterson, F, Seixas, A, Jean-Louis, G, **Killgore, WD**, & Grandner, MA. Using big data to determine the social, behavioral, and environmental, determinants of sleep duration in the U.S. population: Application of a machine learning approach to data from approximately 700,000 Americans. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

370. **Killgore, WD**, Tkachenko, O, Grandner, MA, & Rauch, SL. Default mode activation predicts vulnerability to sleep deprivation in the domains of mood, sleepiness, and vigilance. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

371. **Killgore, WD**, Weber, M, Grandner, MA, & Penetar, DM. Blue wavelength light therapy improves balance following mild traumatic brain injury. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

372. Knight, SA & Killgore, WD. Typical sleep duration is associated with constructive thinking patterns. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

373. Kotzin, MD, Alkozei, A, Knight, SA, Grandner, MA, & **Killgore, WD**. The effects of trait gratitude on quality of sleep, intrusiveness, of pre-sleep cognitions, and daytime energy in healthy individuals. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

374. Markowski, SM, Alkozei, A, McIntosh, MB, Grandner, MA, & **Killgore, WD**. Chronotype and risk-taking propensity. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

375. McIntosh, MB, Markowski, SM, Grandner, MA, & **Killgore, WD**. Prior-night sleep duration is negatively associated with impulsivity in women. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

376. Ocano, D, Jean-Louis, G, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Sleep duration and decreased social support from family, friends, and significant other: Influence of insomnia and perceived stress level. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

377. Okuagu, A, Perlis, ML, Ellis, JA, Prather, AA, **Killgore, WD**, Gallagher, RA, Carrazco, N,

Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Does thinking keep people awake? Or does it matter what they are thinking about? Self-directed cognitions associated with insomnia and insufficient sleep. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

378. Olivier, K, Gallagher, RA, **Killgore, WD**, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Development and initial validation of the Assessment of Sleep Environment: A novel inventory for describing and quantifying the impact of environmental factors on sleep. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

379. Paine, KN, Forbush, S, Ellis, J, Nowakowski, S, Newman-Smith, K, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Sleep duration and satisfaction with life, health, finances and relationship. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

380. Rhee, JU, Haynes, P, Chakravorty, S, Patterson, F, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Susceptibility to smoking during the day and its relationship with insomnia and sleep duration. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

381. Roberts, SE, Singh, P, Grandner, MA, & **Killgore, WD.** Later wake up time and impulsivity. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

382. Saccone, J, Davis, B, Chakravorty, S, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Habitual caffeine use and motivation to consume caffeine: Associations with sleep duration, sleepiness, fatigue, and insomnia severity. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

383. Singh, A, Fridman, A, Silveri, MM, Grandner, MA, & **Killgore, WD.** Medial prefrontal GABA predicts hunger ratings during sleep deprivation for men but not women. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

384. Vanuk, JR, Alkozei, A, Smith, R, Pisner, D, Markowski, SM, Shane, BR, Fridman, A, Knight, SA, Grandner, MA, & **Killgore, WD.** Changes in heart rate variability due to light exposure predict frontoparietal connectivity. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

385. Vanuk, JR, Alkozei, A, Knight, SA, Fridman, A, Markowski, SM, Pisner, D, Shane, BR, Grandner, MA, & **Killgore, WD.** The effects of light exposure on heart rate variability predict sleepiness and vigilance. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

386. Warlick, C, Chakravorty, S, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller, P,

Gehrels, J, & Grandner, MA. Timing of alcohol intake associated with insomnia symptoms. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

387. Waugaman, DL, Markowski, SM, Alkozei, A, Grandner, MA, & **Killgore, WD.** Chronotype and Emotional Intelligence. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

388. Weber, M, Grandner, MA, & **Killgore, WD.** Smaller gray matter volume of the visual cortex predicts vulnerability to sleep deprivation. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

389. Weber, M, Grandner, MA, & **Killgore, WD.** Blue wavelength light therapy reduces daytime sleepiness following mild traumatic brain injury. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

390. Yang, R, Ocano, D, Chakravorty, S, **Killgore, WD**, Gallagher, RA, Carrazco, N, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Relationship between insomnia and depression moderated by caffeine. Abstract presented at the 30th Annual Meeting of the Associated Professional Sleep Societies (SLEEP 2016), Denver, CO, June 11-15, 2016.

391. **Killgore, WD**, Vanuk, JR, Pisner, D, Penetar, DM, & Weber, M. Short wavelength light therapy facilitates recovery from mild traumatic brain injury. Abstract presented at the 2016 Military Health System Research Symposium (MHSRS), Orlando, FL, August 15-18, 2016.

392. **Killgore, WD**, Alkozei, A, Smith, R, Divatia, S, & Demers, L. Enhancing emotional intelligence skills with a brief internet-based program: A pilot study. Abstract presented at the 2016 Military Health System Research Symposium (MHSRS), Orlando, FL, August 15-18, 2016.

393. **Killgore, WD**, Rosso, IM, Olson, EA, Webb, CA, Fukunaga, R, Gogel, H, Buchholz, JL, & Rauch, SL. Efficacy of an internet-based cognitive behavior therapy program for major depression. Abstract presented at the 2016 Military Health System Research Symposium (MHSRS), Orlando, FL, August 15-18, 2016.

394. **Killgore, WD**, & Nickerson, LA. Linked analysis of multimodal neuroimaging identifies neural systems associated with the ability to resist sleep deprivation. Abstract presented at the 2016 Military Health System Research Symposium (MHSRS), Orlando, FL, August 15-18, 2016.

395. Vanuk, JR, Allen, JJB, & **Killgore, WD**. Heart rate variability during light exposure and subsequent network connectivity patterns. Abstract presented at the Annual Meeting of the Society for Psychophysiological Research, Minneapolis, MN, September 21-25, 2016.

396. Haberman, JT, Olson, EA, Webb, CA, **Killgore, WD**, Rauch, SL, & Rosso, IM. The relation between treatment expectancies and outcome in internet-based cognitive behavioral therapy for major depressive disorder. Abstract presented at the Association for Behavioral and Cognitive Therapies, New York, NY, October 27-30, 2016.

397. Rosso, IM, Olson, EA, Thomas, MO, Webb, CA, **Killgore, WD**, & Rauch, SL. Anterior

cingulate cortex morphology predicts remission from major depression following internet-based cognitive behavior therapy. Abstract presented at the 55th Annual Meeting of the American College of Neuropsychopharmacology, Hollywood, FL, December 4-8, 2016.

398. Shane, BR, Vanuk, JR, Bajaj, S, Millan, M, **Killgore, WD**. Multimodal brain imaging in patients receiving bright light therapy following a mild traumatic brain injury. Abstract presented at the Western Medical Research Conference, Carmel CA, January 26-28, 2017.

399. Franco, J, Millan, M, Shane, BR, Castellanos, A, **Killgore, WD**. Blue wavelength light therapy increases thalamic grey matter volume following mild traumatic brain injury. Abstract presented at the 45th Annual Meeting of the International Neuropsychological Society, New Orleans, LA, February 1-4, 2017.

400. Alkozei, A, Smith, R, Demers, LA, Divatia, S, Weber, M, Berryhill, SM, & **Killgore, WD**. Emotional intelligence can be trained via an online training program and is associated with better performance on the IGT. Abstract accepted for oral platform presentation at the 45th Annual Meeting of the International Neuropsychological Society, New Orleans, LA, February 1-4, 2017.

401. Li, H, Gruber, S, Lukas, S, Silveri, M, Hill, K, **Killgore, WD**, & Nickerson, LD. Data fusion to investigate the effect of chronic heavy marijuana use on brain structure. Abstract presented at the 2017 Harvard Psychiatry Research Day Poster Session, Boston, MA, April 12, 2017.

402. Challener, S, Alkozei, A, Fridman, A, Dormer A, & **Killgore, WD.** Higher depressive symptoms are associated with lower activation in the orbitofrontal cortex when anticipating negative stimuli in individuals with PTSD. Abstract presented at the 72nd Annual Convention of the Society for Biological Psychiatry, San Diego, CA, May 18-20, 2017.

403. Alkozei, A, Smith R, Fridman A, Dormer, A, Challener, S, & **Killgore, WD.** Neural responses to emotional stimuli in individuals with PTSD after daily morning blue light exposure. Abstract presented at the 72nd Annual Convention of the Society for Biological Psychiatry, San Diego, CA, May 18-20, 2017.

404. Alkozei, A, Smith R, Fridman, A, Dormer, A, Challener, S, & **Killgore, WD.** The role of trait gratitude on functional brain activation changes when anticipating negative events in individuals with PTSD. Abstract presented at the 72nd Annual Convention of the Society for Biological Psychiatry, San Diego, CA, May 18-20, 2017.

405. Fridman, AJ, Alkozei, A, Smith, R, Challener, S, Knight, SA, & **Killgore, WD**. Resiliency is associated with reduced activation within the retrosplenial cortex and secondary motor area for individuals with PTSD during anticipation of a negative event. Abstract presented at the 72nd Annual Convention of the Society for Biological Psychiatry, San Diego, CA, May 18-20, 2017.

406. Vanuk, JR, Millan, M, Shane, BR, Bajaj, S, & **Killgore, WD**. Blue light therapy following a mild traumatic brain injury improves MPFC-amygdala functional connectivity and mood. Abstract presented at the 72nd Annual Convention of the Society for Biological Psychiatry, San Diego, CA, May 18-20, 2017.

407. **Killgore, WD**, Shane, BR, Vanuk, JR, Franco, J, Castellanos, A, Millan, M, Grandner, MA, &

Bajaj, S. Light therapy facilitates thalamo-cortical brain recovery from mild traumatic brain injury. Abstract presented at the 72nd Annual Convention of the Society for Biological Psychiatry, San Diego, CA, May 18-20, 2017.

408. Smith, R, Lane, RD, Alkozei, A, Bao J, Smith, C, Sanova, A, Nettles, M, & **Killgore, WD**. Common and unique neural systems underlying the maintenance of emotional vs. bodily reactions to affective stimuli: the moderating role of emotional awareness. Abstract presented at the 72nd Annual Convention of the Society for Biological Psychiatry, San Diego, CA, May 18-20, 2017.

409. Bajaj, S, Alkozei, A & **Killgore, WD**. Effect of bright light therapy on white matter abnormalities following a mild traumatic brain injury. Abstract presented at the 72nd Annual Convention of the Society for Biological Psychiatry, San Diego, CA, May 18-20, 2017.

410. Alkozei, A, Smith, R, Fridman, A, Dormer A, Challener, S, Grandner, MA, & **Killgore, WD**. Daily morning blue light exposure leads to changes in functional brain responses during emotional anticipation in individuals with PTSD. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

411. Gottschlich, MK, Hyman, S, Millan M, Pisner, D, Singh, A, Knight, SA, Grandner, MA, & **Killgore, WD**. Post-concussion severity is associated with sleep problems and neuropsychological status. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

412. Vanuk, JR, Shane, BR, Millan, M., Bajaj, S, Grandner, MA, & **Killgore, WD**. Short-wavelength light therapy as a way of improving sleep, cognition, and functional connectivity following mild traumatic brain injury. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

413. **Killgore, WD**, Shane, BR, Vanuk, JR, Franco, J, Castellanos, A, Millan, M, Grandner, MA, & Bajaj, S. Short wavelength light therapy facilitates recovery from mild traumatic brain injury. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

414. **Killgore, WD**, Capaldi, VF, Balkin, TJ, & Kamimori, GH. The trait of introversion-extraversion contributes to sustained performance on planning and sequencing abilities during sleep deprivation. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

415. Bajaj, S, Alkozei, A, Grandner, MA, & **Killgore, WD**. Effect of bright light therapy on brain and behavioral abnormalities following a mild traumatic brain injury. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

416. Oliver, K, Gallagher, R, Hale, L, Barrett, M, Branas, C, **Killgore, WD**, Parthasarathy, S, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Development and initial validation of a brief measure of control over sleep. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

417. Grandner, MA, Athey, A, **Killgore WD**, Alfonso-Miller, P. Preliminary results of a sleep health intervention in student athletes: Changes in sleep, energy level, and mental well-being, and body weight. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

418. Yang, R, Gallagher, R, Hale, L, Perlis, M, Barrett, M, Branas, C, **Killgore, WD**, Parthasarathy, S, Alfonso-Miller, P, Gehrels, J, Grandner, MA. Would you call yourself a short or long sleeper? Perceptions of sleep category associated with reported sleep duration, insomnia, and health. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

419. Fisseha, E, Gallagher, R, Hale, L, Branas, C, Barrett, M, **Killgore, WD**, Alfonso-Miller, P, Jean-Louis, G, Seixas, A, Williams, N, Gehrels, J, & Grandner, MA. Habitual weekday sleep duration associated with multiple dimensions of socioeconomic status. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

420. Poling, K, Gallagher, R, Hale, L, Branas, C, Seixas, A, Jean-Louis, G, **Killgore, WD**, Alfonso-Miller, P, Parthasarathy, S, Gehrels, J, & Grandner, MA. Sleep partially mediates the association between food insecurity and obesity: Roles of short sleep duration, insomnia, and socioeconomic factors. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

421. Forbush, S, Fisseha, E, Gallagher, R, Hale, L, Malone, S, Patterson, F, Branas, C, Barrett, M, **Killgore, WD**, Gehrels, J, Alfonso-Miller, P, & Grandner, MA. Sociodemographics, poor overall health, cardiovascular disease, depression, fatigue, and daytime sleepiness associated with social jetlag independent of sleep duration and insomnia. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

422. Till, K, Athey, A, Chakravorty, S, **Killgore, WD**, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Insomnia and daytime tiredness in student athletes associated with risky behaviors and poor decision making when under the influence of alcohol. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

423. Warlick, C, Hall, C, Athey, A, Chakravorty, S, **Killgore, WD**, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Difficulty sleeping associated with substance use among student athletes. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

424. Jaszewski, A, Athey, A, **Killgore, WD**, Alfonso-Miller, P, Gehrels, J, & Grandner, MA. Sleep duration and quality associated with mental well-being in student athletes. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

425. Athey, A, Alfonso-Miller, P, **Killgore, WD**, & Grandner, MA. Preliminary results of a sleep health intervention in student athletes: Perceived changes to sleep, performance, and mental and physical wellbeing. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

426. Goel, N, Taylor, DM, Abel, T, **Killgore, WD**, Pearson-Leary, J, & Bhatnagar, S. MicroRNAs are cross-species markers of sleep loss in humans and rats. Abstract presented at the Organization for Human Brain Mapping Conference, Boston, MA, June 3-7, 2017.

427. Meridew, C, Jaszewski, A, Athey, A, Alfonso-Miller, P, **Killgore, WD**, Gehrels, J, & Grandner, MA. Impact of time and activity demands on sleep of student athletes: It's not about reduced sleep opportunity. Abstract presented at the SLEEP Meeting, Boston, MA, June 3-7, 2017.

428. Bajaj, S, Rosso, IM, Rauch, SL, & **Killgore WD**. Impact of bright light therapy on volume and

cortical thickness of the brain following mild traumatic brain injury. Abstract presented at the Organization for Human Brain Mapping Conference, Vancouver, Canada, June 25-29, 2017.***[selected for travel award]**

429. Bajaj, S, Rosso, IM, Rauch, SL, & **Killgore, WD**. Effect of bright light therapy on white matter abnormalities following mild traumatic brain injury. Abstract presented at the Organization for Human Brain Mapping Conference, Vancouver, Canada, June 25-29, June 3-7, 2017.

430. Alkozei, A, Haack, M, Smith, R, Dailey, N, Bajaj, S, & **Killgore, WD**. Chronic sleep restriction increases negative implicit attitudes toward Arab Muslims. Abstract presented at the Military Health Systems Research Symposium, Kissimmee, FL, August 27-30, 2017.

431. **Killgore WD**, Vanuk, JR, Bajaj, S. Blue wavelength light therapy increases axonal myelination in mild traumatic brain injury. Abstract presented at the Military Health Systems Research Symposium, Kissimmee, FL, August 27-30, 2017.

432. **Killgore WD**. What makes a Super-Soldier: Identifying the neural correlates of individual differences in resilience against sleep deprivation. Abstract presented at the Military Health Systems Research Symposium, Kissimmee, FL, August 27-30, 2017.

433. Dailey, NS, Bajaj, S, Alkozei, A, & **Killgore WD**. Neural correlates of aggression during chronic and subacute stages of recovery from mild traumatic brain injury. Abstract presented at the Military Health Systems Research Symposium, Kissimmee, FL, August 27-30, 2017.

434. Bajaj, S, Alkozei, A, & **Killgore WD**. Short wavelength light therapy following mild traumatic brain injury: Can we normalize the abnormal diffusion and quantity of water within the brain? Abstract presented at the Military Health Systems Research Symposium, Kissimmee, FL, August 27-30, 2017.

435. Goel, N, Taylor, DM, Abel, T, **Killgore, WD**, Pearson-Leary, J, & Bhatnagar, S. MicroRNAs are cross-species markers of sleep loss in humans and rats. Abstract presented at the Society for Neuroscience, Washington, DC, November 11-15, 2017.

436. Dailey, NS, Bajaj, S, Alkozei, A, Smith, R, Knight, SA, & **Killgore, WD**. Neural correlates of aggression in the chronic and post-acute stages of recovery from mild traumatic brain injury: A diffusion tensor imaging study. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.

437. Challener, S, Alkozei, A, Fridman, A, Dormer, A, & **Killgore, WD**. Higher depressive symptoms are associated with lower activation in the orbital frontal cortex when anticipating negative stimuli in individuals with PTSD. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.

438. Alkozei, A, Smith, R, Demers, L, Divatia, S, Weber, M, Berryhill, S, & **Killgore, WD**. Emotional intelligence can be trained via an online training program and is associated with better performance on the IGT. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.

439. Satterfield, B, Raikes, AC, & **Killgore, WD**. A voxel-based morphometric analysis of resilience to vigilant attention impairment during sleep deprivation. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.

440. Singh, A, Thurston, MD, Gottschlich, MK, Miller, MA, & **Killgore, WD**. Trait anxiety predicts hostile tendencies post-traumatic brain injury. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.

441. Raikes, AC, Satterfield, BC, Knight, SA, & **Killgore, WD**. Grey matter volumetric differences with increasing numbers of previous mild traumatic brain injuries: A voxel-based morphometric study. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.

442. Bajaj, S, Dailey, N, Alkozei, A, Vanuk, JR, & **Killgore, WD**. Preservation of limbic network structure in healthy young adults. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.

443. Alkozei, A, **Killgore, WD**, Smith, R, Dailey, NS, Bajaj, S, & Haack, M. Chronic sleep restriction increases negative implicit attitudes toward Arab Muslims. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.

444. Skalamera, J, Alkozei, A, Haack, M, & **Killgore, WD**. Chronic sleep restriction increases racial bias and affects actual decision-making about people. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.

445. Alkozei, A, Smith, R, & **Killgore, WD**. Increases in prefrontal activation after exposure to blue versus amber wavelength light during cognitive load. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.

446. Knight, SA, & **Killgore, WD**. Typical sleep duration is associated with constructive thinking patterns. Abstract presented at the University of Arizona Junior Investigator Poster Forum, Tucson, AZ, November 17, 2017.

447. Nickerson, L, Li, H, Smith, S, Lukas, S, Silveri, M, Hill, K, **Killgore, WD**, & Gruber, S. Combining multi-site/study MRI data: A novel linked-ICA denoising method for removing scanner and site variability from muli-modal MRI data. Abstract presented at the American College of Neuropsychopharmacology (ACNP) 56th Annual Meeting, Palm Springs, CA, December 3-7, 2017.

448. Bajaj, S, Raikes, AC, Dailey, NS, Vanuk, JR, Weber, M, Rosso, IM, Rauch, SL, & **Killgore, WD**. Changes in cortical structure, sleep, and anxiety symptoms following blue-wavelength light therapy in individuals with mild traumatic brain injury. Abstract presented at the Big Sky Athletic Training Sports Medicine Conference, Big Sky, MT, February 4-8, 2018.

449. Dailey, NS, Raikes, AC, Smith, R, Alkozei, A, & **Killgore, WD**. The executive control network after mild traumatic brain injury: Associations between functional connectivity and aggression. Abstract presented at the Big Sky Athletic Training Sports Medicine Conference, Big Sky, MT, February 4-8, 2018.

450. Raikes, AC, Satterfield, BC, Dailey, NS, Bajaj, S, & **Killgore, WD**. Self-reported sleep quality is related to cerebellar grey matter volume after mild traumatic brain injury. Abstract presented at the Big Sky Athletic Training Sports Medicine Conference, Big Sky, MT, February 4-8, 2018.

451. Raikes, AC, Bajaj, S, Dailey, NS, Satterfield, BC, Alkozei, A, Smith, R, & **Killgore, WD**. White matter correlates of self-reported sleep quality after a mild traumatic brain injury: A DTI study. Abstract presented at the Big Sky Athletic Training Sports Medicine Conference, Big Sky, MT, February 4-8, 2018.

452. Satterfield, BC, Raikes, AC, & **Killgore, WD**. A voxel-based morphometric analysis of resilience to vigilant attention impairment during sleep deprivation. Abstract presented at the 46th Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.

453. Alkozei, A, Smith, R, Dailey, NS, Bajaj, S, Knight SA, & **Killgore, WD**. Exposure to blue wavelength light during memory consolidation improves long-delay verbal memory performance. Abstract presented at the 46th Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.

454. Alkozei, A, Smith, R, Dailey, NS, Bajaj, S, Haack, M, & **Killgore, WD**. Men, but not Women, show a decrease in implicit preferences for low-calorie food after 3 weeks of chronic sleep restriction. Abstract presented at the 46th Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.

455. Alkozei, A, Smith, R, & **Killgore, WD**. A positive cognitive style mediates the relationship between trait gratitude and depressive symptoms. Abstract presented at the 46th Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.

456. Bajaj, S, Dailey, NS, Alkozei, A, Vanuk, JR, & **Killgore, WD**. Preservation of limbic network structure in healthy young adults. Abstract presented at the 46th Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.

457. Alkozei, A, Smith, R, Demers, LA, Divatia, S, Weber, M, Berryhill, SM, & **Killgore, WD**. Emotional intelligence can be trained via an online training program and is associated with better performance on the IGT. Abstract presented at the 46th Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.

458. Dailey, NS, Bajaj, S, Alkozei, A, Smith, R, Knight, SA, & **Killgore, WD**. Neural correlates of aggression in the chronic and post-acute stages of recovery from mild traumatic brain injury: A diffusion tensor imaging study. Abstract presented at the 46th Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.

459. **Killgore, WD**, Shane, BR, Vanuk, JR, Millan, M, Knight, SA, & Bajaj, S. Blue light therapy accelerates brain and cognitive recovery from mild traumatic brain injury. Abstract presented at the 46th Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.

460. **Killgore, WD**. Default mode activation and the ability to resist sleep deprivation. Abstract presented at the 46th Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.

461. **Killgore, WD**, Capaldi, VF, Balkin, TJ, & Kamimori, GH. Personality traits predict the ability to sustain executive function abilities during sleep deprivation. Abstract presented at the 46th Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.

462. Raikes, AC, & **Killgore, WD**. Increased cerebellar grey matter in the presence of decreased subjective sleep quality following mild traumatic brain injury. Abstract presented at the 46th Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.

463. Raikes, AC, Satterfield, BC, Knight, SA, & **Killgore, WD**. Gray matter volumetric differences with increasing numbers of previous mild traumatic brain injuries: A voxel-based morphometric study. Abstract presented at the 46th Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.

464. Skalamera, J, Alkozei, A, Haack, M, & **Killgore, WD**. Chronic sleep restriction increases implicit racial biases and affects actual decision-making about people. Abstract presented at the 46th Annual Meeting of the International Neuropsychological Society, Washington, DC, February 14-17, 2018.

465. Huanjie, L, Silveri, M, Lukas, SE, Hill, K, **Killgore, WD**, Gruber, S, & Nickerson, LD. Data fusion to investigate multimodal MRI patterns associated with chronic heavy marijuana use. Abstract presented at the Harvard Psychiatry Day Poster Session, Boston, MA, April 4, 2018.

466. Bajaj, S, Dailey, NS, Vanuk, JR, Raikes, A, Weber, M, Rosso, IM, Rauch, SL, & **Killgore, WD**. Impact of blue light therapy on cortical volume, sleep and anxiety symptoms following mild traumatic brain injury. Abstract presented at the Anxiety and Depression Association of America (ADAA) Conference, Washington, DC, April 5-8, 2018.

467. Knight, SA, & **Killgore, WD**. Constructive thinking patterns correlate with typical sleep habits. Abstract presented at the Anxiety and Depression Association of America (ADAA) Conference, Washington, DC, April 5-8, 2018.

468. Raikes, AC, Dailey, NS, Bajaj, S, & **Killgore, WD**. White matter structure changes associated with depressive symptoms following recent mild traumatic brain injury. Abstract presented at the Anxiety and Depression Association of America (ADAA) Conference, Washington, DC, April 5-8, 2018.

469. Singh, A, Thurston, MD, Gottschlich, MK, Miller, MA, & **Killgore, WD**. Trait anxiety predicts hostile tendencies post-traumatic brain injury. Abstract presented at the Anxiety and Depression Association of America (ADAA) Conference, Washington, DC, April 5-8, 2018.

470. Bajaj, S, Raikes, AC, Alkozei, A, Dailey, NS, Satterfield, BC, Vanuk, JR, & **Killgore, WD**. Association between suicidal ideation and cortical volume in a sub-clinical sample of young

individuals. Abstract presented at the Society of Biological Psychiatry 73rd Annual Meeting, New York, NY, May 10-12, 2018.

471. Challener, S, Alkozei, A, Young, A, Ozcan, M, Raikes, AC, & **Killgore, WD**. Sleep problems are associated with greater default mode network activation when anticipating negative stimuli in individuals with PTSD. Abstract presented at the Society of Biological Psychiatry 73rd Annual Meeting, New York, NY, May 10-12, 2018.

472. Dailey, NS, Smith, R, Raikes, AC, Alkozei, A, & **Killgore, WD**. Reduced functional connectivity in the executive control network following mild traumatic brain injury: Implications for emotional regulation. Abstract presented at the Society of Biological Psychiatry 73rd Annual Meeting, New York, NY, May 10-12, 2018.

473. **Killgore, WD**, Kent, HC, Knight, SA, & Alkozei, A. Changes in morning salivary melatonin correlate with prefrontal responses during working memory performance. Abstract presented at the Society of Biological Psychiatry 73rd Annual Meeting, New York, NY, May 10-12, 2018.

474. **Killgore, WD**, Alkozei, A, & Weber, M. Blue light therapy improves executive function following mild traumatic brain injury. Abstract presented at the Society of Biological Psychiatry 73rd Annual Meeting, New York, NY, May 10-12, 2018.

475. Ozcan, M, Challener, S, Yung, A, Alkozei, A, Raikes, AC, & **Killgore, WD**. Daytime sleepiness in individuals with PTSD is associated with greater activation in the right angular gyrus when viewing negative images. Abstract presented at the Society of Biological Psychiatry 73rd Annual Meeting, New York, NY, May 10-12, 2018.

476. Smith, R, Sanova, A, Lane, RD, & **Killgore, WD**. Graph-theoretic correlates of trait differences in emotional awareness. Abstract presented at the Society of Biological Psychiatry 73rd Annual Meeting, New York, NY, May 10-12, 2018.

477. Yung, A, Challener, S, Ozcan, M, Alkozei, A, Raikes, AC, & **Killgore, WD**. Improvements in PTSD symptom severity are associated with greater activation in the hippocampus during anticipation of negative stimuli. Abstract presented at the Society of Biological Psychiatry 73rd Annual Meeting, New York, NY, May 10-12, 2018.

478. Satterfield, BC, Silveri, M, Alkozei, A, Raikes, AC, & **Killgore, WD**. GABA: A neural marker of resilience to psychomotor vigilance impairment during sleep deprivation. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018. [*Trainee Merit Award]

479. Satterfield, BC, Alkozei, A, Raikes, AC, & **Killgore, WD**. Habitual sleep duration predicts caloric and mactronutrient intake during sleep deprivation. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.

480. Bajaj, S, Raikes, A, Dailey, NS, Vanuk, JR, Satterfield, BC, Alkozei, A, Weber, M, Rosso, IM, Rauch, SL, Grandner, MA, & **Killgore, WD**. Impact of blue light therapy on cortical structure, sleep, and anxiety symptoms following mild traumatic brain injury. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.

481. Challener, S, Alkozei, A, Yung, A, Ozcan, M, Raikes, AC, & **Killgore, WD**. Functional impairment due to excessive daytime sleepiness is associated with greater activation in the default mode network when anticipating negative stimuli in individuals with PDSD. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.

482. **Killgore, WD**, Alkozei, A, Knight, SA, Miller, MA, Grandner, MA, & Weber, M. Daily morning blue light exposure enhances executive functioning in individuals with mild traumatic brain injury. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.

483. **Killgore, WD**, & Nickerson, LA. Resistance to sleep deprivation is predicted by gray matter volume in the posterior brain stem. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.

484. Alkozei, A, Kent, HC, Knight, SA, & **Killgore, WD**. Changes in morning salivary melatonin correlate with prefrontal responses during working memory performance. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.

485. Ozcan, M, Alkozei, A, Raikes, A, & **Killgore, WD**. Pre-sleep cognitions partially mediate the relationship between depression and daytime energy. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.

486. Raikes, AC, Dailey, NS, Satterfield, BC, Bajaj, S, & **Killgore, WD**. Self-reported sleep quality is associated with reductions in white-matter integrity following recent mild traumatic brain injury. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.

487. Raikes, AC, Satterfield, BC, Dailey, NS, Bajaj, S, & **Killgore, WD**. Subjectively poor sleep quality is associated with increased cerebellar grey matter volume following mild traumatic brain injury. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.

488. Skalamera, J, Alkozei, A, Haack, M, & **Killgore, WD**. The effect of chronic sleep restriction on implicit racial biases and explicit judgmental decision-making. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.

489. Sanchez, C, Hale, L, Branas, C, Gallagher, R, **Killgore, WD**, Gehrels, J, Alfonso,-Miller, P, & Grandner, MA. Relationships between dietary supplement intake and sleep duration, insomnia, and fatigue. Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.

490. Tubbs, A, Perlis, M, Chakravorty, S, Basner, M, **Killgore, WD**, Gehreles, J, Alfonso-Miller, P, & Grandner, MA. Does increased risk of suicide at night favor one method of suicide over another? Abstract presented at the SLEEP 2018 Annual Meeting, Baltimore, MD, June 2-6, 2018.

491. Huanjie, L, Gruber, S, Smith, SM, Lukas, SE, Silveri, M, Hill, KP, **Killgore, WD**, & Nickerson, LD. Combining multi-site/study MRI data: A novel linked-ICA denoising method for removing scanner and site variability from multi-modal MRI data. Abstract presented at the Joint Annual Meeting of ISMRM-ESMRMB, Paris, France, June 16-21, 2018. [*Trainee Stipend Award]

492. Bajaj, S, Raikes, AC, Alkozei, A, Dailey, NS, Vanuk, J, Satterfield, BC, & **Killgore, WD**. Suicidal ideation is associated with diminished cortical volume in a sub-clinical population. Abstract presented at the Organization for Human Brain Mapping (OHBM) Annual Meeting, Singapore, June 17-21, 2018.

493. Bajaj, S, Raikes, AC, Dailey, NS, Vanuk, J, Alkozei, A, Satterfield, BC, Weber, M, Rosso, IM, Rauch, SL, & **Killgore, WD**. Effect of blue light therapy on cortical volume, sleep, and anxiety symptoms following mild traumatic brain injury. Abstract presented at the Organization for Human Brain Mapping (OHBM) Annual Meeting, Singapore, June 17-21, 2018.

494. Dailey, NS, Bajaj, S, Smith, R, Raikes, AC, Alkozei, A, & **Killgore, WD**. Disrupted functional connectivity and elevated aggression in young adults with mild traumatic brain injury. Abstract presented at the Organization for Human Brain Mapping (OHBM) Annual Meeting, Singapore, June 17-21, 2018.

495. Raikes, AC, Bajaj, S, Dailey, NS, Alkozei, A, Smith, R, & **Killgore, WD**. Post-mTBI white matter correlates of self-reported sleep quality: A DTI study. Abstract presented at the Organization for Human Brain Mapping (OHBM) Annual Meeting, Singapore, June 17-21, 2018.

496. Nickerson, LD, Li, H, , Silveri, MM, Lukas, SE, Hill, KP, **Killgore, WD**, & Gruber, SA. Multimodal MRI data fusion reveals structure-function patterns associated with chronic heavy marijuana use. Abstract presented at the Organization for Human Brain Mapping (OHBM) Annual Meeting, Singapore, June 17-21, 2018.

497. Raikes, AC, Satterfield, BC, Alkozei, A, & **Killgore, WD**. Blue light therapy improves self-reported sleep quality in individuals with a recent mild traumatic brain injury. Abstract presented at the Military Health Systems Research Symposium, Orlando, FL, August 20-23, 2018.

498. **Killgore, WD**. Executive functioning in individuals with mild traumatic brain injury is enhanced by daily morning blue light therapy. Abstract presented at the Military Health Systems Research Symposium, Orlando, FL, August, 20-23, 2018.

499. **Killgore, WD, &** Nickerson, LA. Why can't you just stay awake? Resistance to sleep deprivation is associated with measureable differences in brainstem gray matter. Abstract presented at the Military Health Systems Research Symposium, Orlando, FL, August 20-23, 2018.

500. Dailey, NS, Smith, R, Satterfield, BC, Raikes, AC, & **Killgore, WD**. Verbal fluency following mild traumatic brain injury: The strength of switching. Abstract presented at the American Speech-Language-Hearing Association Annual Convention, Boston, MA, November 15-17, 2018.

501. Forbeck, B, Dailey, NS, Esbit, S, & **Killgore, WD**. Reduced information processing speed: A dynamic deficit in mild traumatic brain injury. Abstract presented at the American Speech-Language-Hearing Association Annual Convention, Boston, MA, November 15-17, 2018.

502. Raikes, AC, Dailey, NS, & **Killgore, WD**. Neural and neurocognitive correlates of responsiveness to blue light therapy following mild traumatic brain injury. Abstract presented at

the American Speech-Language-Hearing Association Annual Convention, Boston, MA, November 15-17, 2018.

503. Burns, AI, Ozcan, M, Shepard, KC, Alkozei, A, & **Killgore, WD**. The association between PTSD severity and life satisfaction is mediated by trait gratitude. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.

504. Burns, AI, Shepard, KC, Ozcan, M, Alkozei, A, Vanuk, JR, & **Killgore, WD**. The association between morningness-eveningness and nightmares in PTSD. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.

505. Dailey, NS, Meinhausen, C, & **Killgore, WD**. Self-initiated recall strategies in mild traumatic brain injury: Identifying the neural correlates. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.

506. Esbit, S, Dailey, NS, & **Killgore, WD**. Making a list and checking it twice: Episodic verbal recall in mild traumatic brain injury. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.

507. Esbit, S, LaFollette, K, Botello, R, Satterfield, BC, Alkozei, A, & **Killgore, WD**. High self-perceived adroitness: An altered perception of reality during sleep deprivation. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.

508. **Killgore, WD**, Vanuk, JR, & Bajaj, S. Improving executive functioning in mild traumatic brain injury with daily morning blue light therapy. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.

509. **Killgore, WD**, & Nickerson, LA. Vulnerability and resistance to sleep deprivation are associated with measurable differences in brainstem gray matter. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.

510. LaFollette, K, Satterfield, BC, Lazar, M, & **Killgore, WD**. Predicting psychosocial stress reactivity from ability and trait-based emotional intelligence. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.

511. LaFollette, K, Satterfield, BC, Lazar, M, & **Killgore, WD**. Stay negative? Positive affect is associated with increased psychosocial stress reactivity. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.

512. Meinhausen, C, Dailey, NS, & **Killgore, WD**. Identifying memory retrieval strategies following a mild traumatic brain injury using the CVLT-II. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.

513. Ozcan, M, Shepard, KC, Burns, AI, Alkozei, A, & **Killgore, WD**. Trait gratitude and the impact of daytime sleepiness on daily functioning predict PTSD severity over time. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.

514. Raikes, AC, & **Killgore, WD**. Anterior cingulate gyrus volume predicts changes in post-mTBI daytime sleepiness following blue wavelength light therapy. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.

515. Satterfield, BC, LaFollette, K, Lazar, M, & **Killgore, WD**. Prolonged psychosocial stress impairs cognitive flexibility. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.

516. Shepard, KC, Burns, AI, Ozcan, M, Alkozei, A, & **Killgore, WD**. Racial differences regarding the effectiveness of blue light therapy in reducing PTSD severity. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.

517. Shepard, KC, Ozcan, M, Burns, AI, Alkozei, A, Vanuk, JR, & **Killgore, WD**. Differences in anxiety reduction between minority and majority racial groups participating in morning blue light exposure. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.

518. Vanuk, JR., Smith, R, Raikes, AC, Alkozei, A, Skalamera, J, & **Killgore, WD**. Ability based emotional intelligence is associated with greater cardiac vagal tone. Abstract presented at the Annual Meeting of the International Neuropsychological Society (INS), New York, NY, February 20-23, 2019.

519. Vanuk, JR, Shields, S, Slavich, M, & **Killgore, WD**. Lifetime stress exposure during adulthood is associated with lower trait-based emotional intelligence. Abstract presented at the Annual Meeting of the American Psychosomatic Society, Vancouver, BC, March 6-9, 2019.

520. Raikes, AC, Satterfield, BC, Grandner, MA, & **Killgore, WD**. Daily blue light therapy reduces persistent post-mild traumatic brain injury daytime sleepiness and post-concussion. Abstract presented at the Rocky Mountain Athletic Trainer's Association Annual Meeting, Phoenix, AZ, April 12, 2019.

521. Bajaj, S, Dailey, NS, Raikes, AC, Vanuk, JR, Weber, M, Rosso, IM, Rauch, SL, & **Killgore, WD**. Effect of blue light therapy on cortical volume and reaction time following mild TBI. Abstract presented at the Organization for Human Brain Mapping Annual Meeting, June 9-13, 2019.

522. Bajaj, S, Raikes, AC, & **Killgore, WD**. Water anisotropy within the default mode network predicts mod shifts following sleep deprivation. Abstract presented at the Organization for Human Brain Mapping Annual Meeting, June 9-13, 2019.

523. Bajaj, S, Raikes, AC, Razi, A, & **Killgore, WD**. Blue-wavelength light strengthens default mode

network following mild TBI: A DCM-DTI study. Abstract presented at the Organization for Human Brain Mapping Annual Meeting, June 9-13, 2019.

524. Bajaj, S, & **Killgore, WD**. Sex differences in limbic and risk-taking propensity in healthy individuals. Abstract presented at the Organization for Human Brain Mapping Annual Meeting, June 9-13, 2019.

525. Raikes, AC, Satterfield, BC, Grandner, MA, & **Killgore, WD**. Daily blue light therapy reduces persistent post-mild traumatic brain injury daytime sleepiness and post-concussion. Abstract presented at the Rocky Mountain Athletic Trainer's Association Annual Meeting, Phoenix, AZ, April 12, 2019.

526. Raikes, AC., Athey, A, Alfonso-Miller, P, **Killgore, WD**, & Grandner, MA. Self-reported insomnia and daytime sleepiness increase athletes' sports-related concussion risk. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

527. Raikes, AC, Satterfield, BC, Bajaj, S, Grandner, MA, & **Killgore, WD**. Daily blue light therapy reduces daytime sleepiness and post-concussion symptoms after mild traumatic brain injury. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

528. Burns, AI, Shepard, KC, Ozcan, M, LaFollette, K, Alkozei, A, Vanuk, JR, Raikes, AC, Grandner, MA, & **Killgore, WD**. Gratitude and frequency of naps predict resilience for individuals with PTSD. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

529. Burns, AI, Ozcan, M, Shepard, KC, LaFollette, K, Alkozei, A, Grandner, MA, & **Killgore, WD**. The association between PTSD severity and insomnia is mediated by nightmares. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

530. Bajaj, S, Dailey, NS, Raikes, AC, Vanuk, JR, Grandner, MA, Weber, M, Rosso, IM, Rauch, SL, & **Killgore, WD**. Impact of light therapy on brain structure and simple reaction time following mild traumatic brain injury. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

531. Bajaj, S, Raikes, AC, Grandner, MA, & **Killgore, WD**. Quantitative anisotropy within the default-mode network predicts mood degradation following sleep-deprivation. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

532. Dailey, NS, Satterfield, BC, Raikes, AC, Strong, MJ, Forbeck, B, Grandner, MA, & **Killgore, WD**. Disrupted thalamocortical connectivity following mild traumatic brain injury: Associations with daytime sleepiness. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

533. Shepard, KC, Ozcan, M, Burns, AI, Grandner, MA, & **Killgore, WD**. Use of anger words in

trauma narratives is negatively associated with sleep quality for single individuals with PTSD. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

534. Shepard, KC, Ozcan, M, Burns, AI, Vanuk, JR, Grandner, MA, Alkozei, A, & **Killgore, WD**. The relationships between psychopathology and sleep problems differe between racial minority groups. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

535. **Killgore, WD**, & Kamimori, GH. Can caffeine sustain attention and vigilance under prolonged monotonous conditions during 77 hours of total sleep deprivation? Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

536. **Killgore, WD,** Pace-Schott, Ozcan, M, Shepard, KC, Burns, AI, Grandner, MA, Vanuk, JR, & Alkozei, A. Morning blue light exposure improves sleep and fear extinction recall in PTSD. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

537. LaFollette, K, Satterfield, BC, Esbit, S, Lazar, M, Grandner, MA, & **Killgore, WD**. Negative mood and poor sleep are associated with altered moral reasoning under stress. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

538. LaFollette, KJ, Satterfield, BC, Esbit, S, Lazar, M, Grandner, MA, & **Killgore, WD**. The effects of prior at-home sleep duration on reversal-learning during a “shoot/no-shoot” task. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

539. Ozcan, M, Shepard, KC, Burns, AI, Raikes, AC, Dailey, NS, Alkozei, A, Grandner, MA, & **Killgore, WD**. Individuals with PTSD whose traumatic experiences occurred within the home have worse sleep outcomes. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

540. Ozcan, M, Shepard, KC., Burns, AI, Raikes, AC, Dailey, NS, Alkozei, A, Grandner, MA, & **Killgore, WD**. PTSD severity and use of negative emotion words in trauma narratives predict nightmares in individuals with PTSD. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

541. Satterfield, BC, Silveri, MM, Grandner, MA, & **Killgore, WD**. Baseline GABA levels predict time-on-task performance during sleep deprivation. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

542. Skalamera, J, Huang, YH, Chinkers, M, Richards, MM, & **Killgore, WDS**. The influence of habitual sleep duration on rational thinking ability. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

543. Bliznak, V, Perlis, ML, Ellis, J, Hale, L, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. What is the ideal bedtime? Data from a community sample. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

544. Lane, E, Ellis, J, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. Sociodemographic, socioeconomic, and behavioral correlates of nightmare frequency in a community sample. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

545. Jajoo, A, Taylor-Pilliae, R, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. Types of habitual physical activity associated with habitual sleep duration, sleep quality, and daytime sleepiness. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

546. Khader, W, Fernandez, F, Seizas, A, Knowlden, A, Ellis, J, Williams, N, Hale, L, Perlis, M, Jean-Louis, G, **Killgore, WD**, Alfonso-Miller, P, & Grandner, MA. What makes people want to make changes to their sleep? Assessment of perceived risks of insufficient sleep as a predictor of intent to improve sleep. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

547. Pham, B, Hale, L, St-Onge, M, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. Habitual dietary quality associated with habitual sleep duration, insomnia, daytime sleepiness, and fatigue in a community sample. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

548. Begay, T, Gooneratne, N, Williams, N, Seixas, A, Jean-Louis, G, Gilles, A, **Killgore, WD**, Alfonso-Miller, P, & Grandner, MA. Sleep disparities in the United States and the impact of poverty. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

549. Griffen, N, Hale, L, Jean-Louis, G, **Killgore, WD**, Warlick, C, Alfonso-Miller, & Grandner, MA. Aspects of disordered neighborhoods are associated with insomnia, sleepiness, fatigue and control over sleep. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

550. Liang, O, Seixas, A, Parthasarathy, S, Jean-Louis, G, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. Healthcare financial hardship and habitual sleep duration, impact on sleep disparities, and impact on the sleep-obesity relationship. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

551. Olivier, K, Perlis, ML, Troxel, W, Basner, M, Chakravorty, S, Tubbs, A, Owens, J, Jean-Louis, G, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. Influence of likely nocturnal wakefulness on 24-hour patterns of violent crime in adults and juveniles. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

552. Featherston, B, Perlis, ML, Ellis, J, Williams, N, Jean-Louis, G, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. The concept of "satisfaction with sleep: Associations with sleep continuity, sleep quality, daytime sleepiness, and related concepts of overall health, stress, depression, and anxiety. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

553. Fourte, DA, Patterson, F, Malhotra, A, Seixas, A, **Killgore, WD**, Alfonso-Miller, P, & Grandner, MA. Should habitual sleep duration be added to the American Heart Association's "Life's Simple 7?" Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

554. Wills, C, Athey, A, Robbins, R, Patterson, F, Turner, R, **Killgore, WD**, Tubbs, A, Warlick, C, Alfonso-Miller, P, & Grandner, MA. Chronotype and social support among student athletes: Impact on depressive symptoms. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

555. Ramsey, T, Athey, A, Ellis, J, Tubbs, A, Turner, R, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. Dose-response relationships between insufficient sleep and mental health symptoms I collegiate student athletes and non-athletes. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

556. Quiroz, H, Chakravorty, S, **Killgore, WD**, Warlick, C, Alfonso-Miller, P, & Grandner, MA. Sleep-related determinants of habitual cannabis use, desire to use, and problematic use: Data from a community sample. Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

557. Warlick, C, Williams, N, Hale, L, **Killgore, WD**, Alfonso-Miller, P, & Grandner, MA. Is relationship satisfaction associated with habitual sleep? Abstract presented at the 2019 Annual Meeting of the Associated Professional Sleep Societies (SLEEP) Conference, San Antonio TX, June 8-12, 2019.

558. Ozcan, M, Burns, AI, Shepard, KC, & **Killgore, WD**. The relationship between combat and non-combat trauma and risk-taking propensity in individuals with PTSD. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.

559. Esbit, S, Satterfield, BC, & **Killgore, WD**. Exploration of emotional intelligence and self-perceived invincibility. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.

560. LaFollette, KJ, Satterfield, BC, & **Killgore, WD**. Self-perceived invincibility is associated with greater cognitive flexibility. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.

561. Strong, M, Esbit, S, LaFollette, KJ, Dailey, NS, & **Killgore, WD**. Big Five personality traits and how they relate to self-perceived invincibility. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.

562. Shepard, KC, Ozcan, M, Burn, AI, Alkozei, A, & **Killgore, WD**. Blue light therapy differences in sleep quality improvement in military and civilian populations. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.

563. Raikes, AC, Athey, A, Alfonso-Miller, P, **Killgore, WD**, & Grandner, MA. Moderate-to-severe self-reported insomnia and frequent daytime sleepiness increase athletes' risk for sustaining a sports-related concussion. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.

564. Bajaj, S, Dailey, NS, Raikes, AC, Vanuk, JR, Weber, M, Rosso, IM, Rauch, SL, & **Killgore, WD**. Impact of blue-wavelength light therapy on cortical volume and simple reaction time following mild TBI. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.

565. Raikes, AC, Satterfield, BC, Bajaj, S, Grandner, MA, & **Killgore, WD**. Daily administered blue light therapy reduces daytime sleepiness and improves somatic symptoms following mild traumatic brain injury. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.

566. Burns, AI, Ozcan, M, Shepard, KC, Alkozei, A, Vanuk, JR, & **Killgore, WD**. The relationship between sleep onset latency and gratitude. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.

567. LaFollette, KJ, Satterfield, BC, Esbit, S, Lazar, M, & **Killgore, WD**. Inadequate sleep quality and duration predicts disinhibited shooting on a "shoot/no shoot" task. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.

568. Bajaj, S, & **Killgore, WD**. Sex differences in risk-taking behavior and brain morphometry in healthy individuals. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.

569. Satterfield, BC, Silveri, MM, & **Killgore, WD**. Baseline GABA levels are associated with time-on-task performance during sleep deprivation. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.

570. **Killgore, WD**, Ozcan, M, Shepard, KC, Burns, AI, Vanuk, JR, & Alkozei, A. Blue light exposure enhances sleep and fear extinction recall in PTSD. Abstract presented at the 2019 Military Health System Research Symposium, Kissimmee, FL, August 19-2, 2019.

571. LaFollette, K, Satterfield, BC, Lazar, M., **Killgore, WDS**. Disentangling the Effects of Subjective Task Load and Performance on Neuroendocrine Stress Response. Poster presented at the 49th Annual Society for Neuroscience Meeting, Chicago, IL, October, 2019.

572. Dailey, NS, & **Killgore, WD**. Disrupted thalamocortical connectivity following mild traumatic brain injury: Associations with daytime sleepiness. Oral presentation at the American Speech-Language Hearing Association Conference, Orlando, FL, November, 2019.

573. Dailey, NS, & **Killgore, WD**. Reading fluency in mild traumatic brain injury. Poster presented at the American Speech-Language Hearing Association Conference, Orlando, FL, November, 2019.

574. Raikes, AC, Alkozei, A, Vanuk, JR, Bajaj, S, Satterfield, BC, & **Killgore, WD**. Blue light therapy reduces daytime sleepiness as well as depressive and somatic post-concussive symptoms following mild traumatic brain injury. Abstract accepted for Oral presentation at the 48th Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020. ***[*Winner of Nelson Butters Research Award for Best Paper by a Post-Doctoral Fellow]***.

575. Raikes, AC, Bajaj, S, Dailey, NS, Vanuk, JR, Alkozei, A, & **Killgore, WD**. Vestibular and emotional symptoms are associated with altered large-scale network resting stated functional connectivity after mild traumatic brain injury. Abstract accepted for Poster presentation at the 48th Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.

576. Esbit, S, Satterfield, BC, LaFollette, K, Lazar, M, & **Killgore, WD**. Gender differences and overriding misleading impulses. Abstract accepted for Poster presentation at the 48th Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.

577. Esbit, S, Raygoza, D, Meinhausen, C, Dailey, NS, & **Killgore, WD.** Exploring verbal recall throughout mild traumatic brain injury recovery. Abstract accepted for Poster presentation at the 48th Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.

578. Meinhausen, C, Esbit, S, Dailey, NS, & **Killgore, WD**. Self-initiated verbal recall strategies following mild traumatic brain injury. Abstract accepted for Poster presentation at the 48th Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.

579. Anlap, I, Esbit, S, Alkozei, A, Satterfield, BC, & **Killgore, WD**. The effects of gratitude on wellbeing are mediated by social support. Abstract accepted for Poster presentation at the 48th Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.

580. Dailey, NS, Raikes, AC, Bajaj, S, Alkozei, A, Sanasac, S, & **Killgore, WD**. Frontal cortical surface area is associated with lexical-semantic knowledge in adults with mild traumatic brain injury. Abstract accepted for Poster presentation at the 48th Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.

581. **Killgore, WD**, Burns, AI, Shepard, KC, Vanuk, JR, & Alkozei, A. Enhancing fear extinction recall in PTSD using blue light therapy. Abstract accepted for Poster presentation at the 48th Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.

582. **Killgore, WD**, & Kamimori, GH. The effects of caffeine under monotonous conditions during prolonged total sleep deprivation. Abstract accepted for Poster presentation at the 48th Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.

583. **Killgore, WD**, & Kamimori, GH. Trait extraversion is associated with increased suicidal ideation during sleep deprivation. Abstract accepted for Poster presentation at the 48th Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.

584. Bullock, A, Burns, AI, Shepard, KC, Alkozei, A, & **Killgore, WD**. Alterations in cognitive symptoms of PTSD are correlated with somatic symptoms. Abstract accepted for Poster presentation at the 48th Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.

585. Taylor, E, & **Killgore, WD**. Caffeine and emotional control. Abstract accepted for Poster presentation at the 48th Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.

586. Taylor, E, & **Killgore, WD**. Emotionally intelligent early birds. Abstract accepted for Poster presentation at the 48th Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.

587. Alkozei, A, Dailey, NS, Bajaj, S, Vanuk, JR, Raikes, AC, & **Killgore, WD**. The effects of blue wavelength light on subsequent amygdala-DLPFC connectivity at rest. Abstract accepted for Poster presentation at the 48th Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.

588. Vanuk, JR, Raikes, AC, Alkozei, A, Shields, GS, Slavich, GM, & **Killgore, WD**. Lifetime stress exposure during adulthood is associated with lower emotional intelligence. Abstract accepted for Poster presentation at the 48th Annual Meeting of the International Neuropsychological Society, Denver CO, February 5-8, 2020.

589. LaFollette, K, Satterfield, BC, Lazar, M., **Killgore, WD**. (February, 2020) The propensity for model-based control is associated with individual differences in risk behavior. Abstract submitted for presentation at the Computational and Systems Neuroscience (Cosyne) 2020 Meeting, Denver, CO, February, 2020.

590. **Killgore, WD**, Burns, AI, Bullock, A, Vanuk, J, Taylor, E, Alkozei, A. Using blue light to consolidate fear extinction memory in PTSD. Abstract accepted for Poster presentation at the 40th Annual Conference of the Anxiety and Depression Association of America, San Antonio, TX, March 19-22, 2020.

591. **Killgore, WD**, & Kamimori, GH. Can caffeine sustain cognitive resilience during 77 hours of stressful total sleep deprivation? Abstract accepted for Poster presentation at the 40th Annual Conference of the Anxiety and Depression Association of America, San Antonio, TX, March 19-22, 2020.

592. **Killgore, WD**, Skalamera, J, Vanuk, J, Woods-Lubert, R, Cloonan, S, Alkozei, A, Dailey, N, Lane, R, Weihs, K, Allen, J, and Smith, R. Abstract accepted for Poster presentation at the 40th Annual Conference of the Anxiety and Depression Association of America, San Antonio, TX,

March 19-22, 2020.

593. **Killgore, WD,** & Kamimori, GH. Extraverts show increased suicidal ideation during sleep deprivation. Abstract accepted for Poster presentation at the 40th Annual Conference of the Anxiety and Depression Association of America, San Antonio, TX, March 19-22, 2020.

594. **Killgore, WD**, Cloonan, S, Woods-Lubert, R, Taylor, E, & Skalamera, J. Political perspective is associated with differences in trait anxiety and depression. Abstract accepted for Poster presentation at the 40th Annual Conference of the Anxiety and Depression Association of America, San Antonio, TX, March 19-22, 2020.

595. Alkozei, A, Dailey, NS, Bajaj, S, Vanuk, JR, Raikes, AC, & **Killgore, WD.** Acute blue wavelength light exposure influences functional brain connectivity. Abstract accepted for Poster presentation at the 40th Annual Conference of the Anxiety and Depression Association of America, San Antonio, TX, March 19-22, 2020.

596. Burns, A, Shepard, KC, Bullock, A, Esbit, S, Alkozei, A, Satterfield, B, & **Killgore, WD**. The association between life history strategy and anxiety is mediated by trait gratitude. Abstract accepted for Poster presentation at the 40th Annual Conference of the Anxiety and Depression Association of America, San Antonio, TX, March 19-22, 2020.

597. Bullock, A, Shepard, KC, Burns, A, Raikes, A, Alkozei, A, & **Killgore, WD**. Use of family words in trauma narratives predicts a higher risk of insomnia in individuals with PTSD. Abstract accepted for Poster presentation at the 40th Annual Conference of the Anxiety and Depression Association of America, San Antonio, TX, March 19-22, 2020.

598. **Killgore, WD**. Blue light therapy enhances sleep and fear extinction recall in PTSD. Symposium abstract accepted for presentation at the 75th Annual Meeting of the Society of Biological Psychiatry, New York, NY, April 30-May 2, 2020.

599. **Killgore, WD**, & Kamimori, GH. Extraversion and caffeine intake relate to suicidal ideation during sleep deprivation. Abstract accepted for Poster presentation at the 75th Annual Meeting of the Society of Biological Psychiatry, New York, NY, April 30-May 2, 2020.

600. **Killgore, WD**, Burns, AI, Bullock, A, Vanuk, JR, Taylor, E, & Alkozei, A. Morning blue light improves consolidation of fear extinction memory in PTSD. Abstract accepted for Poster presentation at the 75th Annual Meeting of the Society of Biological Psychiatry, New York, NY, April 30-May 2, 2020.

601. **Killgore, WD**, & Kamimori, GH. Effects of repeated dosing of caffeine on cognitive performance during prolonged sleep deprivation. Abstract accepted for Poster presentation at the 75th Annual Meeting of the Society of Biological Psychiatry, New York, NY, April 30-May 2, 2020.

602. Alkozei, A, Dailey, NS, Bajaj, S, Vanuk, JR, Raikes, AC, & **Killgore, WD**. Blue wavelength light and its effects on functional brain connectivity. Abstract accepted for Poster presentation at the 75th Annual Meeting of the Society of Biological Psychiatry, New York, NY, April 30-May 2, 2020.

603. Lucas, DA, Dailey, NS, & **Killgore, WD.** Implications for targeted interventions following mild traumatic brain injury: Post-concussion symptom severity predicts cognitive flexibility. Abstract accepted for Poster presentation at the 75th Annual Meeting of the Society of Biological Psychiatry, New York, NY, April 30-May 2, 2020.

604. Jecmen, D, King, R, Gould, J, Mitchell, J, Ralston, K, Alkozei, A, & **Killgore, WD**. The effect of blue light therapy on functional brain responses to masked fearful stimuli in post-traumatic stress disorder. Abstract accepted for Poster presentation at the 75th Annual Meeting of the Society of Biological Psychiatry, New York, NY, April 30-May 2, 2020.

605. King, R, Jecmen, D, Mitchell, J, Ralston, K, Gould, J, Burns, A, Bullock, A, Alkozei, A, & **Killgore, WD**. Co-morbid depressive symptoms are associated with reduced functional brain responses within the insula and visual cortex in response to masked happy faces in individuals with PTSD. Abstract accepted for Poster presentation at the 75th Annual Meeting of the Society of Biological Psychiatry, New York, NY, April 30-May 2, 2020.

606. Dailey, NS, Raikes, AC, Alkozei, A, Grandner, MA, & **Killgore WD**. Reduced cortical thickness as a biomarker of daytime sleepiness in mild traumatic brain injury. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

607. Dailey, NS, Raikes, AC, Wager, ME, Grandner, MA, Alkozei, WD. The compounding impact of daytime sleepiness and brain injury on sustained vigilance. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

608. Anlap, I, Taylor, E, Grandner, MA, & **Killgore, WD**. Gray matter volume of the rostral medial prefrontal cortex is associated with resilience to mood decline during overnight sleep deprivation. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

609. Raikes, AC, Dailey, NS, Alkozei, A, Vanuk, JR, Grandner, MA, & **Killgore, WD**. Daytime sleepiness, depression, and post-concussive symptoms improve following prescribed morning exposure to blue light. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

610. Raikes, AD, Dailey, NS, Vanuk, JR, Alkozei, A, Grandner, MA, **Killgore, WD**. Improved daytime sleepiness following daily morning blue light therapy is associated with altered resting-state network connectivity. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

611. Satterfield, BC, Anlap, I, Esbit, S, & **Killgore, WD**. Corticotropin-releasing hormone receptor 1 gene polymorphism modulates cognitive flexibility following acute stress and total sleep deprivation. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

612. Jecmen, D, King, R, Gould, J, Mitchell, J, Ralston, K, Burns, AI, Bullock, A, Grandner, MA, Alkozei, A, & **Killgore, WD**. The effects of morning blue light therapy on insomnia severity and PTSD symptoms in a clinical sample. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

613. Taylor, E, Grandner, MA, & **Killgore, WD**. Later bedtime is associated with differences in prefrontal gray matter volume and executive function deficit. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

614. Taylor, E, & **Killgore, WD**. Meta-analysis on the effects of caffeine on neurodegenerative cognitive decline. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

615. LaFollette, KJ, Satterfield, BC, Esbit, S, Lazar, M, Grandner, MA, & **Killgore, WD**. Emotion regulation during sleep deprivation and repeadted physiological stress: Implications for motor skill learning and production. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

616. King, R, Jecmen, D, Mitchell, J, Ralston, K, Gould, J, Burns, AI, Bullock, A, Grandner, MA, Alkozei, A, & **Killgore, WD**. Habitual sleep duration is negatively correlated with emotional reactivity within the rostral anterior cingulate cortex in individuals with PTSD. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

617. King, R, Jecmen, D, Alkozei, A, Raikes, A, Grandner, MA, & **Killgore, WD**. Hippocampal gray matter volume in healthy adult population is associated with habitual sleep duration. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

618. Burns, AI, Bullock, A, Taylor, E, Grandner, MA, Alkozei, A, & **Killgore, WD**. The association between sleep problems and risk-taking behavior differs between racial majority and minority groups. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

619. Burns, AI, Bullock, A, Raikes, AC, Dailey, NS, Grandner, MA, & **Killgore, WD**. Daytime sleepiness correlates with increased gray matter volume in the right middle temporal gyrus in healthy young individuals. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

620. **Killgore, WD**, Dailey, NS, Raikes, AC, Vanuk, John R, Taylor, E, Grandner, MA, & Alkozei, A. Blue light exposure enhances neural efficiency of the task positive network during a cognitive interference task. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

621. **Killgore, WD**, Dailey, NS, Raikes, AC, Vanuk, JR, Taylor, E, Grandner, MA, & Alkozei, A. Resilience to inhibitory deficits during sleep deprivation is predicted by gray matter volume in the ventromedial and ventrolateral prefrontal cortex. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

622. Bullock, A, Burns, A, Taylor, E, Grandner, MA, Miller, MM, Alkozei, A, & **Killgore, WD**. Self-referential language in trauma narratives predicts shorter sleep duration in women with PTSD. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

623. Vanuk, JR, Raikes, AC, Dailey, NS, Grandner, MA, & **Killgore, WD**. Grey matter volumetric differences are predictive of attentional lapses during sleep deprivation. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

624. Meinhausen, CE, Vanuk, JR, Grandner, MA, & **Killgore, WD**. Gray matter volume correlates of psychomotor vigilance speed during sleep deprivation. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

625. Kapoor, A, Perlis, M, Bastien, C, Williams, N, Hale, L, Branas, C, Barrett, M, **Killgore, WD**, Wills, CC, & Grandner, MA. Disassembling Associations between Insomnia and Anxiety Symptoms: Which Elements of Insomnia are Associated with Which Elements of Anxiety? Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

626. Ramsey, T, Athey, A, Auerbach, A, Turner, R, Williams, N, Jean-Louis, G, **Killgore, WD**, Wills, CC, & Grandner, MA. Sleep Duration and Symptoms Associated with Race/Ethnicity in Elite Collegiate Athletes. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

627. Piro, B, Garland, S, Jean-Pierre, P, Gonzalez, B, Seixas, A, **Killgore, WD**, Wills, CC, & Grandner, MA. Sleep Duration and Sleep Timing Associated with History of Breast, Prostate, and Skin Cancer: Data from a Nationally-Representative Sample. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

628. Bombarda, A, St-Onge, M, Seixas, A, Williams, N, Jean-Louis, G, **Killgore, WD**, Wills, CC, & Grandner, MA. Sleep Duration and Timing Associated with Eating Behaviors: Data from NHANES 2015-2016. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

629. Abdi, H, Athey, A, Auerbach, A, Turner, R, **Killgore, WD**, Wills, CC, & Grandner, MA. College Football Players Compared to Other Collegiate Athletes: Symptoms of Insufficient Sleep Duration, Insomnia, and Sleep Apnea. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

630. Holbert, C, Bastien, C, Chakravorty, S, **Killgore, WD**, Wills, CC, & Grandner, MA. Hallucinogen Use Among College and University Students: Associations with Insufficient Sleep and Insomnia. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

631. Onyeonwu, C, Nowakowski, S, Hale, L, Branas, C, Barrett, M, **Killgore, WD**. Wills, CC, & Grandner, MA. Menstrual Regularity and Bleeding Associated with Sleep Duration, Sleep Quality, and Daytime Sleepiness in a Community Sample. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

632. Ghani, S, Delgadillo, ME, **Killgore, WD**, Wills, CC, & Grandner, MA. Culturally Consistent Diet Among Individuals of Mexican Descent at the US-Mexico Border Is Associated with Sleep Duration and Quality. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

633. Mason, B, Tubbs, A, Hale, L, Branas, C, Barrett, M, **Killgore, WD**, Wills, CC, & Grandner, MA. Use of Mobile Devices at Night Associated with Mental Health in Young Adults. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

634. Gozar, A, Seixas, A, Hale, L, Branas, C, Barrett, M, **Killgore, WD**, Wills, CC, Grandner, MA. Mobile Device Use in Bed and Relationships to Work Productivity: Impact of Anxiety. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

635. Barker, M, St-Onge, M, Seixas, A, **Killgore, WD**, Wills, CC, & Grandner, MA. Dietary Macronutrients and Sleep Duration, Sleep Disturbance, and Daytime Fatigue. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

636. Phan, S, Perlis, ML, Hale, L, Branas, C, **Killgore, WD**, Wills, CC, & Grandner, MA. Reconsidering Stimulus Control: Activities in Bed Differentially Associated with Sleep-Related Outcomes. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

637. Grandner, MA, Tubbs, A, Jean-Louis, G, Seixas, A, Hale, L, Branas, C, **Killgore, WD**, & Wills, CC. Daytime Sleepiness in the Community: Implications for Sleep Health, Circadian Health, and Overall Physical Health. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

638. Begay, T, Tubbs, A, Jean-Louis, G, Hale, L, Branas, C, **Killgore, WD**, Wills, CC, & Grandner, MA. Demographic and Socioeconomic Implications of Excessive Daytime Sleepiness in the Community. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

639. Khader, WS, Tubbs, A, Fernandez, F, Chakravorty, S, Hale, L, Branas, C, Barrett, M, **Killgore, WD**, Wills, CC, & Grandner, MA. Community-Level Daytime Sleepiness and Substance Use: Implications of Sleep Time and Mental Health. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

640. Jajoo, A, Tubbs, A, Perlis, ML, Chakravorty, S, Seixas, A, **Killgore, WD**, Wills, CC, & Grandner, MA. Population-Level Suicide Ideation: Impact of Combined Roles of Sleep Duration, Sleep Disturbance, and Daytime Sleepiness. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

641. Clay, MA, Athey, A, Charest, J, Auerbach, A, Turner, R, **Killgore, WD**, Wills, CC, & Grandner, MA. Team-Based Athletes Sleep Less than Individual Athletes, But Do Not Report More Insomnia or Fatigue. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

642. Grandner, MA, Fernandez, F, Khader, S, Jean-Louis, G, Seixas, A, Williams, N, **Killgore, WD**, & Wills, CC. Decline in Habitual Sleep Duration over 10 Years and Worsening Sleep Disparities: Data From NHIS 2006-2015. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

643. Villalobos, KM, Seixas, A, Williams, N, Jean-Louis, G, **Killgore, WD**, Wills, CC, & Grandner, MA. Disparities in Sleep Timing in the US: Data from the National Health and Nutrition Examination Survey 2015-2016. Abstract submitted for Poster presentation at the 34th Annual SLEEP Conference, Philadelphia, PA, June 13-17, 2020.

AWARDED GRANTS AND CONTRACTS

Completed

2001-2003 fMRI of Unconscious Affect Processing in Adolescence.
NIH, 1R03HD41542-01
PI: **Killgore** ($79,000.)

2003-2006 The Effects of Sleep-Loss and Stimulant Countermeasures on Judgment and Decision Making.
U.S. Army Medical Research and Materiel Command (USAMRMC) Competitive Medical Research Proposal Program (CMRP); Intramural Funding,

PI: **Killgore** (Total Award: $1,345,000.)

2004-2005 Sleep/wake Schedules in 3ID Aviation Brigade Soldiers.
Defense Advanced Research Projects Agency (DARPA)
PI: **Killgore** (Total Award: $60,000.)

2005-2006 Functional Neuroimaging Studies of Neural Processing Changes with Sleep and Sleep Deprivation.
U.S. Army Medical Research and Materiel Command (USAMRMC); Intramural Funding Task Area C (Warfighter Judgment and Decision Making) Program Funding
PI: **Killgore** (Total Award: $219,400.)

2006-2007 Establishing Normative Data Sets for a Series of Tasks to Measure the Cognitive Effects of Operationally Relevant Stressors.
U.S. Army Medical Research and Materiel Command (USAMRMC); Intramural Funding Task Area C (Warfighter Judgment and Decision Making) Program Funding,
PI: **Killgore** (Total Award: $154,000.)

2006-2007 Military Operational Medicine Research Program (MOM-RP), Development of the Sleep History and Readiness Predictor (SHARP).
U.S. Army Medical Research and Materiel Command (USAMRMC); Intramural Funding
PI: **Killgore** (Total Award:$291,000.)

2009-2014 The Neurobiological Basis and Potential Modification of Emotional Intelligence through Affective Behavioral Training (W81XWH-09-1-0730).
U.S. Army Medical Research and Materiel Command (USAMRMC),
PI: **Killgore** (Total Award: $551,961.)
Major Goal: To identify the neurobiological basis of cognitive and emotional intelligence using functional and structural magnetic resonance imaging.

2011-2016 Effects of Bright Light Therapy on Sleep, Cognition, and Brain Function following Mild Traumatic Brain Injury (W81XWH-11-1-0056).
U.S. Army Medical Research and Materiel Command (USAMRMC),
PI: **Killgore** (Total Award: $941,924)
Major Goal: To evaluate the effectiveness of morning exposure to bright light as a treatment for improving in sleep patterns among individuals with post-concussive syndrome. Effects of improved sleep on recovery due to this treatment will be evaluated using neurocognitive testing as well as functional and structural neuroimaging.

2012-2014 Neural Mechanisms of Fear Extinction Across Anxiety Disorders
NIH NIMH
PI: Milad, M. Site Subcontract PI: **Killgore** (Subcontract Award: $505,065)
Major Goal: To examine the neurocircuitry involved in fear conditioning, extinction, and extinction recall across several major anxiety disorders.

2012-2014 Multimodal Neuroimaging to Predict Cognitive Resilience Against Sleep Loss
Defense Advance Research Projects Agency (DARPA) Young Faculty Award in Neuroscience (D12AP00241)

PI: **Killgore** (Total Award: $445,531)
Major Goal: To combine several neuroimaging techniques, including functional and structural magnetic resonance imaging, diffusion tensor imaging, and magnetic resonance spectroscopy to predict individual resilience to 24 hours of sleep deprivation.

2012-2015 Internet Based Cognitive Behavioral Therapy Effects on Depressive Cognitions and Brain function (W81XWH-12-1-0109).
U.S. Army Medical Research and Materiel Command (USAMRMC),
PI: Rauch, SL; Co-PI: **Killgore** (Total Award: $1,646,045)
Major Goal: To evaluate the effectiveness of an internet-based cognitive behavioral therapy treatment program on improving depressive symptoms, coping and resilience skills, cognitive processing and functional brain activation patterns within the prefrontal cortex.

2015 Effects of Blue Light on Melatonin Levels and EEG Power Density Spectrum
Arizona Area Health Education Centers (AHEC) Program
Co-PI: Alkozei, A.; Co-PI: **Killgore** (Total Award: $4,373)
Percent Effort: 0%
Major Goal: Adjunctive intramural funding to add a melatonin collection to an ongoing study of the effects of blue wavelength light on alertness and brain function.

Current

2012-2020 A Model for Predicting Cognitive and Emotional Health from Structural and Functional Neurocircuitry following Traumatic Brain Injury (W81WH-12-0386)
Congressionally Directed Medical Research Program (CDMRP), Psychological Health/Traumatic Brain Injury (PH/TBI) Research Program: Applied Neurotrauma Research Award.
PI: **Killgore** (Total Award: $2,272,098)
Percent Effort: 25%
Major Goal: To evaluate the relation between axonal damage and neurocognitive performance in patients with traumatic brain injury at multiple points over the recovery trajectory, in order to predict recovery.

2014-2019 Bright Light Therapy for Treatment of Sleep Problems following Mild TBI (W81XWH-14-1-0571).
Psychological Health and Traumatic Brain Injury Research Program (PH/TBI RP) Traumatic Brain Injury Research Award-Clinical Trial.
PI: **Killgore** (Total Award: $1,853,921)
Percent Effort: 40%
Major Goal: To verify the effectiveness of morning exposure to bright light as a treatment for improving in sleep patterns, neurocognitive performance, brain function, and brain structure among individuals with a recent mild traumatic brain injury.

2014-2020 A Non-pharmacologic Method for Enhancing Sleep in PTSD (W81XWH-14-1-0570)
Military Operational Medicine Research Program (MOMRP) Joint Program Committee 5 (JPC-5), FY13 Basic and Applied Psychological Health Award (BAPHA)
PI: **Killgore** (Total Award: $3,821,415)
Percent Effort: 35%

Major Goal: To evaluate the effectiveness of blue light exposure to modify sleep in PTSD and its effects on fear conditioning/extinction, symptom expression, and brain functioning.

2016-2020 Refinement and Validation of a Military Emotional Intelligence Training Program (JW150005)
Joint Warfighter Medical Research Program 2015
PI: **Killgore** (Total Award: $5,977,570)
Percent Effort: 45%
Major Goal: To develop and validate a new internet-based training program to enhance emotional intelligence capacities in military Service Members.

2017-2019 Emotional State and Personality: A Proof-of-Concept Model for Predicting Performance Under Stress (DM160347)
USAMRMC 2015
PI: **Killgore** (Total Award: $1,247,290)
Percent Effort: 20%
Major Goal: To develop a statistical model to predict effective cognitive performance under stress using personality and state emotion metrics.

2018-2020 Understanding the Mechanisms of Blue Light Exposure on Cognitive Performance
USAMRDC
PI: Alkozei **Co-I: Killgore** (Total Award: $306,903)
Percent Effort: 4%
Major Goal: To identify the subcortical systems responsible for acute cognitive improvement associated with blue light exposure in the scanner.

2019-2022 Transcranial Magnetic Stimulation of the Default Mode Network to Improve Sleep
USAMRDC
PI: **Killgore** (Total Award: $TBD)
Percent Effort: 5%
Major Goal: Determine whether continuous theta burst stimulation of the default mode network can improve sleep among individuals with insomnia.

Refinement and Validation of a Military Emotional Intelligence Training Program

Opportunity: W81XWH-15-JWMRP

PI: William D. Killgore Ph.D. **Org:** University of Arizona **Award Amount:** $5,978K

Study Aims

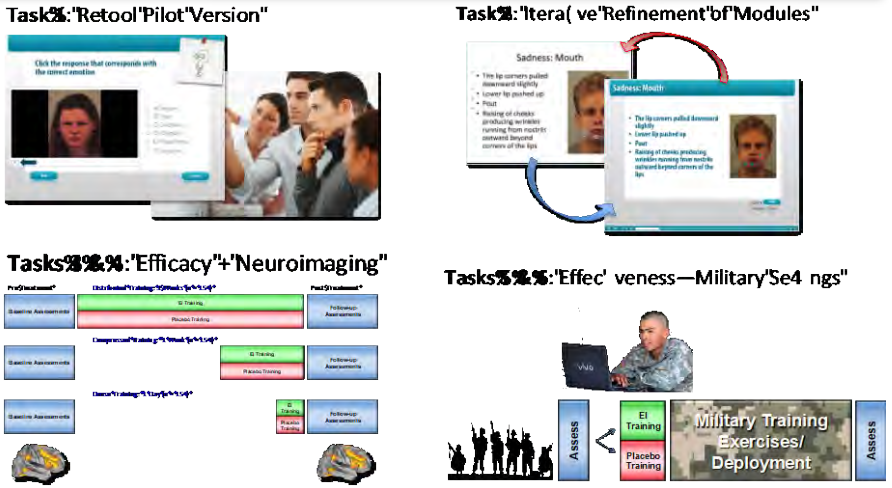
1)Identify key training components (i.e., content, frequency, duration) that lead to the greatest improvement in measured skills across all EI domains

2)Identify the neural mechanisms underlying the observed changes in EI abilities

3)Determine the effectiveness of the EI training program for enhancing military performance and sustaining psychological health during stressful military operations/activities/deployments

Approach

In a prior study, we previously demonstrated the effectiveness of a brief 6-lesson pilot version of a training program to enhance EI skills in military personnel. We plan to enhance the effectiveness of the program through iterative refinement, efficacy testing in healthy samples, neuroimaging of brain mechanisms, and ultimate validation in military samples. The goal is to develop a program that enhances emotional performance and mental health during military training and deployment.



Study involves 5 Tasks: 1) Retooling pilot version of program, 2) refining the materials through an iterative process, 3) testing efficacy, 4) neuroimaging of brain mechanisms, 5) testing effectiveness in ROTC cadets, and 6) effectiveness in deploying Soldiers

Timeline and Cost

Activities CY	16	17	18	19	20
Study Preparation					
Task 1: Retooling					
Task 2: Refinement					
Task 3: Efficacy					
Task 4: Neuroimaging					
Task 5: ROTC Effectiveness					
Task 6: Active Duty Effectiveness					
Estimated *Total* Budget ($K)*	$1,384	$1,659	$1,601	$1,333	$0

*Includes Direct + Indirect Costs

Updated: 14 MAY 2020

Goals/Milestones

Task 1 Goal – Study Preparation, Refine EI Program

☑Complete redesign of basic pilot EI program--**COMPLETED**

Task 2 Goal – Complete Programming/Refinement

☑Complete 4 iterative refinements of programs (*n* ≈ 161)--**COMPLETED**

Task 3 Goal – Demonstrate Efficacy

☐Collect data on *n* = 460 healthy controls--**IN PROGRESS** (n = 326 completed)

Task 4 Goal – Demonstrate Brain Changes with Neuroimaging

☐Collect neuroimaging data on *n* = 60 healthy controls **IN PROGRESS**

Task 5 Goal – Demonstrate Effectiveness in ROTC Cadets

☐Collect ROTC Course data (*n* = 120)--**IN PROGRESS** (n = 74 completed)

Task 6 Goal – Demonstrate Effectiveness in Military Personnel

☐Collect pre- and post treatment data with military units--**PENDING**

Task 7 Goal – Process, Analyze, and Publish Findings

☐Analyze and Publish findings--**PENDING**

Budget Expenditure to date

Projected Expenditure: $5,978K; Actual Expenditure: $3,578K