AUM Research Protocol Review Form

Institutional Review Board for Research Involving Human Subjects

Office of Sponsored Programs (OSP), 114 Administration Bldg 334.244-3250

For IRB use only:
Date received in OSP: _____ PROTOCOL #_____
Date assigned IRB review: _____ Reviewed by: _____ Date of IRB approval: _____
Type of review: ___ Expedited, ___ Full Board, ___Exempt Interval for Continuing Review: _____

ONLY TYPEWRITTEN FORMS WILL BE ACCEPTED

1. **Proposed dates of study: from 10/01/2017 to 10/01/2018**
2. **Project Title: The Effects of Exercise on Person Memories and Stereotype Association**
3. **Principal Investigator:** [redacted]
4. **Title: Graduate Student Dept: Psychology Phone** [redacted] **Email:** [redacted]**aum.edu**
5. **Source of Funding/Project Support:** ☒ **Internal** ☐ **External (list)** ☐
6. **Status of Funding/project support:** ☐ **received** ☐ **approved** ☐ **pending** ☒ **n/a**
7. **General research characteristics:**

A. Research Methodology	**B. Participant Information**
Please identify the descriptors that best apply to the research methodology. **Data collection will be:** ☒ **Prospective*** ☐ **Retrospective*** ☐ **both** **Data will be recorded so that participants can be directly or indirectly identified:** ☐ **Yes** ☒ **No** **Data collection will involve the use of:** ☐ Educational Tests (cognitive, diagnostic, aptitude, achievement) ☒ Surveys/Questionnaires ☐ Private Records/Files ☐ Interview/Observations ☐ Audiotaping ☐ Videotaping ☒ Physical/Physiologic Measurements or Specimens ☐ Other (explain Q.12a)	**Check all descriptors that apply to the participant population:** ☒ Males ☒ Females **Vulnerable Populations:** ☐ Pregnant Women ☐ Age 18 & under ☐ Prisoners ☐ Elderly ☐ Economically Challenged ☐ Physically Challenged ☐ Mentally Challenged **Do you plan to recruit AUM Students?** ☒ **Yes** ☐ **No** **Do you plan to remunerate participants?** ☐ **Yes** ☒ **No**
C. Research Content Area	**D. Risks to Participants**
Identify (list) 3 or 4 keywords to identify this research project. **Exercise** **Memory** **Consolidation** **Stereotypes**	**Please identify all risks that may reasonably be expected as a result of participating in this research:** ☒ Breach of Confidentiality ☒ Deception ☐ Social ☐ Psychological ☐ Coercion ☐ Physical ☐ Other (explain)

***(Prospective** data collection involves new or original data. ***Retrospective** data involves the use of existing data.)*

8. **INVESTIGATORS:**
Identify each individual involved with the conduct of this project and describe his or her roles and responsibilities related to this project.

Principal Investigator (PI): the PI must have completed IRB-approved human research protections training through CITI. IRB staff must verify training before approval is granted. The CITI training site is available through the following link www.citiprogram.org ☒CITI completion report attached	
Name: [redacted]	[redacted]
Department: Psychology	
☐Faculty ☐Staff ☒Graduate Student ☐Undergraduate Student	
Role/Responsibility: Organizing, training, mentoring, leading, accumulating, and interpreting data.	

Investigator: must have completed IRB-approved human research protections training through CITI. IRB staff must verify training before approval is granted. The CITI training site is available through the following link www.citiprogram.org ☒CITI completion report attached	
Name: [redacted]	[redacted]
Department: Psychology	
☒Faculty ☐Staff ☐Graduate Student ☐Undergraduate Student	
Role/Responsibility: Mentoring, overseeing, analyzing, & interpreting data	

Researcher: must have completed IRB-approved human research protections training through CITI. IRB staff must verify training before approval is granted. The CITI training site is available through the following link www.citiprogram.org ☒CITI completion report attached	
Name: [redacted]	Email: ckincey@aum.edu
Department: Psychology	Phone:
☐Faculty ☐Staff ☐Graduate Student	☒Undergraduate Student
Role/Responsibility: Running sessions	

Research: must have completed IRB-approved human research protections training through CITI. IRB staff must verify training before approval is granted. The CITI training site is available through the following link www.citiprogram.org ☒CITI completion report attached	
Name: [redacted]	Email: [redacted]
Department: Psychology	Phone:
☐Faculty ☐Staff ☐Graduate Student	☒Undergraduate Student
Role/Responsibility: Running sessions	

9. **LOCATION OF RESEARCH: List all locations where data collection will take place and analyzed. Be as specific as possible.**
   Data will be collected on the campus of Auburn University of Montgomery, in [redacted] Goodwyn Hall.

10. **BACKGROUND: Briefly discuss the relevant literature and research findings that lead to the development of this project. Please cite relevant sources and include a "Reference List" as Appendix A.**

As the country has grown increasingly diverse, first impressions of individuals often rely on each other's memberships in social categories such as race, religion, and sex instead of individual behavior. This information that shapes our impressions has been differentiated by social psychologists into two major categories: stereotypes and individuating information. While stereotypes associate traits and behavior to membership in social categories, individuating information refers to any information known about the individual (Kunda & Thagard, 1996). Early theorists maintain that impressions of individuals reflect an integration of all the information known to characterize that person (Anderson, 1968; Asch, 1946; Kunda & Thagard, 1996). However, recent models of impression formation assume that individuals first and automatically rely on stereotypes when forming an impression because stereotypic memories consist of stronger associations and are well learned whereas individuating memories are, at first, recalled with effort (Fiske & Neuberg, 1990). Furthermore, it has been argued that stereotypes are the core to one's beliefs about the likely traits and behaviors of individuals about whom no additional individuating information is available. Thus, social categorization leads to automatic activation of stereotypes associated with that social category which then potentially guides prejudicial attitudes (Brewer, 1988; Fazio, Jackson, Dunton, & Williams, 1995; Fiske & Neuberg, 1990, Zárate & Smith, 1990).

However, other research has found that the reliance on stereotypes can be changed over time with experience (Wheeler & Fiske, 2005). Even though stereotypes affect impressions of individuals about whom nothing else is known, later impressions of familiar individuals may proceed differently due to the previous individuating experiences. Stereotypes typically have no effect when individuating information is obtained and this information goes beyond group membership or contradicts stereotypes (Kunda & Thagard, 1996). More importantly, research has begun to show the malleability of stereotype activation through memory consolidation of individuating information (Brebner et. al, 2009; Kawakami et. al, 2000; Macrae et. al, 1997; Quinn et. al, 2009; Reder et. al, 2013) and that exposure to individuating information may lead to more trait-based impressions. For instance, research has found that previous exposure to an individual (without individuating information) can increase rates of stereotyping (Smith, Miller, Maitner, Crump, Garcia-Marques, & Mackie, 2006). Other research has found that forming and reporting impressions over time (e.g., a semester) may lead to more trait-based impressions (Park, 1986). Still, although a significant proportion of social interactions occur over time, we know little about the mechanisms of how impressions of others are influenced by memory consolidation. To address this question, the proposed research works to extend and merge previous work on social perception and memory consolidation to demonstrate that memory consolidation may lead to a faster association with individuating information over stereotypes.

11. **PURPOSE & SIGNIFICANCE:**
    a. **Clearly state the objectives, goals, or aims of this project.**
       The purpose of the current study is to investigate the effect of memory consolidation on the automatic activation of racial stereotypes and the facilitation of individuating information about social targets. Specifically, we will investigate whether an acute high intensity bout of cycling exercise could facilitate memory consolidation of individuating information.

b. How will the results of this project be used? (e.g., presentation? Publication? Thesis? Dissertation?)

Thesis

12. **PARTICIPANTS:**

a. Describe the participant population you have chosen for this project.

Undergraduate students attending Auburn University Montgomery

What is the minimum number of participants you need to validate the study? 70
What is the maximum number of participants you will include in the study? 150

b. Describe the criteria established for participant selection. (If the participants can be classified as a "vulnerable" population, please describe additional safeguards that you will use to assure the ethical treatment of these individuals.)

Participants must currently be enrolled at Auburn University Montgomery. Participants must be 18 years of age or older only and bring a government issued ID to verify age. Participants will not be allowed to complete the study without the proper ID. Exclusion criteria for participation were self-reported history of medical diseases as well as current intake of medications and/or recreational drugs affecting the central nervous system and/or the ability to learn.

c. Describe all procedures you will use to recruit participants. Please include a copy of all flyers, advertisements, and scripts and label as <u>Appendix B.</u>

Participants will be recruited in their undergraduate psychology courses via the PREP website (aum.sona-systems.com). The study will be titled *Exercise & Memory* and will have the following description:

> *This is a three-session study. You will sign up for the first and second session here. Session 3 will be scheduled in person during the session 1 and will be held two days after session 2. Session 1 is always held on a Monday and will last approximately 30 minutes. Session 2 is always held on a Tuesday and will last approximately 60 minutes. Finally, session 3 is always held on a Thursday and will last approximately 15 minutes. Participants MUST attend all three sessions to earn the two credits. Participants that fail to attend all three sessions will earn 0 credits for the experiment. Participants will not be awarded partial credit for partial attendance. Furthermore, participants will not be allowed to make-up for a lost session at a later time.*
>
> *During the experiment, participants will be asked to provide demographic information and complete various memory tasks on a computer. Participants will also be asked to engage in 20 minutes of exercise on a cycle ergometer during the first two sessions.*

d. Describe how you will determine group assignments (e.g., random assignment, independent characteristics, etc.)

Random assignment will be used within this study.
The study is a mixed design with between and within-subject variables.
Within-subject variables include: test time, target type, and trait type.
Between-subject variables include: consolidation type.

e. Describe the type and amount and method of compensation for participants.
Students will earn 2 participation credits to be applied to the participant's undergraduate Introductory to Psychology course at the completion of the experiment.

13. **PROJECT DESIGN AND METHODS:**
Describe the procedures you will plan to use in order to address the aims of this study. (NOTE: use language that would be understandable to a layperson. Without a complete description of all procedures, the AUM IRB will not be able to review the protocol.

a. Project overview (Briefly describe the scientific design.)
2 (Consolidation Type: exercise vs. control) X 2 (Test Time: short delay test vs. long delay test) X 2 (Target Type: learned vs. novel) X 2 (Trait Type: stereotypic vs. individuating) repeated measures ANOVA in which test time, target type, and trait type are within-subject variables and consolidation type as a between-subject variable. The participant's reaction time being the dependent variable.

B. Describe all procedures and methods used to address the purpose.
Materials and Procedure

Photo stimuli. A total of 32 male (16 Black and 16 White) frontal head and neck stimulus color photos will be used within the experiment. Each stimulus photo will be approximately 7 cm high and 6 cm wide. All photos are pilot-tested to ensure that the targets in the photos were not perceived as intimidating and have an average attractiveness rating. The individuals in the stimulus photos will be from the same approximate age group (18-25) and will not have any major distinguishing features (e.g., glasses, facial hair).The photos will be randomly divided into 3 groups: 16 learned targets (8 Black males, 8 White males), 8 novel targets for the short delay test (4 Black males, and 4 White males), and 8 novel targets for the long delay test (4 Black males, 4 White males).

Trait stimuli. A total of 16 White male stereotypic traits, 16 Black male stereotypic traits, and 32 individuating traits will be used in the experiment. All traits were pilot-tested to ensure that they are perceived as either racially stereotypic or neutral. During this pilot test, participants rated a number of personality traits as strongly associated with Black males, strongly associated with White males, or not strongly associated with either. In addition, 64 non-words (e.g., ciern, losri) will be used within the experiment (32 in the short delay test and 32 in the long delay test). Traits and non-words will be divided into 2 equivalent groups (i.e., 8 White male stereotypic traits, 8 Black male stereotypic traits, 16 individuating traits, and 32 non-words) and used as counter-balancing stimuli. Both sets of traits will include an equal number of positive and negative traits. The order in which the two sets of traits will be used within the short and long delay tests will be counter-balanced to ensure that participants will not be exposed to the same word stimuli between the short and long delay tests.

Sentence stimuli. The 32 individuating (stereotype neutral) traits will also be used to create 64 sentences (2 sentences per individuating trait) for use in the exposure task, split across two stimuli sets and counter-balanced. All of the sentences will be structured in the first-person as if written by the targets themselves. Each sentence will describe how a target exemplifies each individuating trait and will be pilot-tested to ensure that the sentences accurately describe each individuating trait. For example, a target paired with the trait of honest will include the sentence, "I never cheat on exams".

Questionnaires. Six questionnaires will be administered within the current study: a demographic questionnaire, sleep check questionnaire, caffeine intake questionnaire, impression formation questionnaire, PAR-Q, and IPAQ.

PAR-Q. The PAR-Q is a physical readiness questionnaire comprised of 7-questions. This questionnaire is designed to identify adults for whom physical activity may be inappropriate or those who should have medical advice concerning the type of activity most suitable for them. When a person responds positively to 1 or more questions, they are referred to a physician for clearance. The PAR-Q has been shown to have sensitivity and specificity to criteria such as

medical examination, hypertension, and exercise induced ECG abnormalities compare well with self-administered procedures (Warburton et. al., 2011).

IPAQ. The IPAQ is an instrument used to monitor physical activity and inactivity among 18- to 65-year-old adults in diverse settings. This questionnaire asks about the participant's time spent engaging in physical activity within the previous seven days. The IPAQ has undergone many tests to establish: test-retest reliability, concurrent validity, and criterion validity (Marshall et. al., 2003). Overall, the IPAQ questionnaire produced repeatable data (Spearman's ρ clustered around 0.8), with comparable data from the short and long forms. Criterion validity had a median ρ of about 0.30, which was comparable to most other self-report validation studies. The short form of the questionnaire will be used in the current study. The questionnaire will provide information on the time spent walking, sitting, and in moderate and vigorous intensity activity. The short form will be used because of its feasibility, and has been shown to have no difference in reliability and validity as compared to the long IPAQ form.

Procedure

Participants will be recruited via an online system to participate in an experiment investigating the role of exercise on memory. All recruitment information will inform participants that the experiment will involve 20 minutes of exercise. However, each experimental session will be randomly assigned to one of the two consolidation group types (i.e., exercise vs. control). Furthermore, all sessions will be limited to one participant per session.

At least 24 hours before the main experiment participants will report to the laboratory to undertake a maximal graded exercise protocol on an electronically braked cycle ergometer. Upon arrival, participants will be asked to provide government issued identification to verify that they are 18 or older. Participants will then be asked to write down their age, birth month, and street name of their home address on the experiment information sheet. The age will be used to calculate the maximum heart rate needed for the exercise protocol. The birth month and street name information will be used as identifying information to ensure the subject numbers remain consistent throughout the three experimental sessions. Participants will first complete an informed consent. Next, the participant will complete the online demographic questionnaire. This demographic questionnaire will consist of the IPAQ as well as questions pertaining to the participant's age, gender, race, height, weight, overall level of health, and tobacco usage. The participant will then complete the printed PAR-Q questionnaire. Participants who answer "yes" to any of the questions on the PAR-Q will be excluded from participating. Once the participant is finished with the beginning questionnaires, they will begin the graded exercise protocol.

The graded exercise protocol will be used to determine the wattage at which the participant reaches 70% of his or her maximum heart rate. Exercise will start with a 5-min warm-up at a workload of 75W. After warm-up, the workload of the cycle ergometer will be set at 100W and then increased by 25W every 3 min until exhaustion. A Borg scale, ranging from 6 (no exhaustion) to 20 (complete exhaustion), will be used to record the subjective level of perceived exertion at the end of each 3-min block by the participant indicating how hard they feel their body is working. The participant's heart rate will be monitored every 30 seconds. Blood pressure will be measured every 3 minutes. A 3-min cool-down at 50 W will immediately follow the exercise test. After the graded exercise protocol, the participant will be dismissed and reminded to return for their previously scheduled second session approximately 24 hours later.

Exposure task. Participants will complete the computer-based portion of the experiment in a private computer lab. The exposure task will consist of a SuperLab presentation and an impression formation questionnaire. The presentation will include 16 learned target individuals (8 Black males and 8 White males) with one target presented per stimulus view. Each view will include a target photo, the target's name, a sentence specifying the individuating trait paired with that target, and two sentences that serve as examples of how the target exhibits the individuating trait. The individuating traits and sentences paired with the learned targets will be counter-balanced. Each view will be shown three times: once initially for 30 seconds and then twice for 15 seconds for a total of 1 minute of exposure per target. Overall, the exposure task will take a total of 16

minutes and the order of the views will be randomized within each exposure sequence. During the exposure task, participants will be asked to study the information presented on each view and to form an impression of each target. Participants will also be instructed to fill out the impression formation questionnaire about each learned target during the initial 30 seconds of exposure. The impression formation questionnaire will consist of the participants indicating how much they liked the targets and the degree to which they feel the target is honest**.** After the exposure task, participants will complete short delay filler tasks.

Short Delay Filler Tasks. In order to eliminate any short-term memory effects, participants will complete two short and completely unrelated scales as a filler task. During this time, participants will complete the Rosenberg Self-Esteem Scale (Rosenberg, 1965) and the Facebook Intensity Scale (Ellison, Steinfeld, & Lampe, 2007). Participants will be told, however, that the scales are related to memory.

Short delay test. The short delay test will take place immediately following the filler task. The short delay test will be completed in SuperLab 4.0 software. Within this task, a blank screen will be presented for 1000 ms. A fixation point (X) will then be presented centrally on the screen for 500 ms. Next, a photo will be presented centrally on the computer screen for 400 ms. A blank screen will then be presented for 50 ms, and finally, the participants will be presented with a letter string for 1500 ms or until the participant responds. Using a response pad, participants will be instructed to decide whether the presented letter string is a word or non-word as quickly and accurately as possible, by pressing the appropriately labeled keys. The short delay test will consist of 1 practice block and 2 separate blocks of test trials with a 30 second break between each block. Within the practice block, a photo of either a banana or an apple will be shown, followed by a letter string. The letter strings within the practice block will be either a non-word or a non-trait word (i.e., school and house). Within the two testing blocks, half of the learned target photos will be used (i.e., 8 of the learned 16 target photos) along with 8 novel target photos. Each target photo will be tested with 4 trials: an individuating trait trial, a racial stereotype consistent trial, and two non-word trials. The individuating trait trials will be traits that have been presented previously in the exposure task and will be paired only with the matching learned target photos. Therefore, if a learned target photo was paired with the individuating trait of “driven” during the exposure task, the same target photo will only be tested with the individuating trait of “driven”. The remaining individuating trait trials will include 8 novel individuating traits and will be randomly paired with novel target photos. The racial stereotype consistent trials will include 16 novel racial stereotypic terms that will be randomly paired with both learned and novel target photos. All racial stereotypic terms will be randomly paired with the corresponding race target photos. Finally, the non-word trials will consist of 32 randomly presented non-words. The third block will be a replication of the second block with all trials in each block randomized. The short delay test will consist of 136 trials (including the 8 practice trials). fter the short delay test is completed, participants will then either complete the exercise protocol or the control protocol depending on which group the session was previously randomly assigned.

Control Group Protocol. Within the control group sessions, participants will be asked to complete two working memory tasks for 20 minutes. These tasks will ensure that mental rehearsal of the information found within the exposure task is impossible. After 20 minutes, control group participants will then be dismissed and reminded to return 48 hours later for the previously scheduled long delay test.

Exercise Group Protocol. After the participants complete the short delay test, participants within the exercise group will be instructed to complete a 20-mintue block of exercise on a cycle ergometer in an adjacent room. The 20-minute block of exercise will include a 2-minute warm-up at a workload of 75W. After warm-up, the workload of the cycle ergometer will be set to 100W and then gradually increase by 25W over approximately 3 minutes to the wattage at which the participant reached 70% of his or her maximal heart rate during the graded exercise test. The workload is adjusted by an electronically braked cycle ergometer. The protocol will consist of three 3-minute segments of high intensity cardiovascular exercise at the wattage that corresponds to 70% of maximal heart rate with three two-minute segments of low intensity exercise at a workload of 50W mixed between the high intensity segments. During the last 3 minutes of the exercise protocol the

participant will be allowed to cool down. Heart rate will be monitored throughout the exercise protocol and recorded every 30 seconds. A Borg scale, ranging from 6 (no exhaustion) to 20 (complete exhaustion), will also be used to record the subjective level of perceived exertion at the end of each 3-min block. After the 20-minute exercise protocol, the participant will be dismissed and reminded to return for their previously scheduled final session approximately 48 hours later.

Long delay test. Approximately 48 hours after the exposure task, all participants will return for the final test session. The methods for the long delay test will remain the same as used within the short delay test. However, the long delay test will use the second half of the learned target photos along with 8 additional novel target photos. Due to the fact that the long delay test will include different learned target photos, the 8 individuating traits that were matched with these targets during the exposure task will be used within the individuating trait trials. As in the short delay test, the long delay test will also randomly pair the 8 novel individuating traits within the individuating trait trial with only novel target photos. The racial stereotype consistent trials will include 16 novel racial stereotypic terms that will be paired randomly with both learned and novel target photos, and the non-words trials will consist of 32 randomly presented non-words. The testing stimuli that will be used within the long delay test will not overlap or repeat any of the items used within the short delay test. The long delay test also will consist of 136 trials.

After completing the long delay test, participants will complete the sleep check questionnaire and caffeine consumption questionnaire. The sleep check questionnaire will consist of the participants reporting whether they slept between sessions and, if so, rating the quality of their sleep. The caffeine consumption questionnaire will consist of the participants self-reporting their consumption of caffeinated items between sessions, including cola, diet cola, pepper soda, citrus soda, other soda, tea (hot), iced tea, instant coffee, brewed coffee, other coffee, store-bought coffee, energy drink, other drink, food, and medications. After completion of the final questionnaires, participants will be debriefed and dismissed.

b. List all instruments used in data collection. (e.g., surveys, questionnaires, educational tests, data collection sheets, outline of interviews, scripts, audio and/or video methods, etc.) Please include a copy of all data collection instruments that will be used in this project and label as *Appendix C*.

Six questionnaires will be administered within the current study: a demographic questionnaire, sleep check questionnaire, caffeine intake questionnaire, impression formation questionnaire, PAR-Q, and IPAQ. A Lexical Decision Task will also be administered.

c. Data Analysis: Explain how the data will be analyzed.

The primary analysis within the LDT will consist of a 2 (Consolidation Type: exercise vs. control) X 2 (Test Time: short delay test vs. long delay test) X 2 (Target Type: learned vs. novel) X 2 (Trait Type: stereotypic vs. individuating) repeated measures ANOVA, with participant's reaction times serving as the dependent variable.

14. **RISKS AND DISCOMFORTS:**

List and describe all of the reasonable risks that participants might encounter if they decide to participate in this research. If you are using deception in this study, please justify the use of deception and be sure to attach a copy of the debriefing form you plan to use and label as *Appendix D*.

The notable risk factors are the risk of breach of confidentiality, the use of deception, over-exertion during the exercise protocol. Deception is required in order to obtain true results. If subjects are aware of the independent variables that are being tested, their answers are likely to be biased which would lead to inaccurate results.

15. **PRECAUTIONS:**
Describe all precautions you have taken to eliminate or reduce risks that were listed in #14.
Participants will be given a debriefing form at the end of the experiment with an explanation of what was truly being tested. Any questions participants may have will be answered by the experimenter.

There will be an individual CPR trained in attendance to every experimental session. During exercise, participants' perceived exertion and blood pressure will be monitored every 3-minutes, and their heart rate will be monitored every 30 seconds. Additionally, participants will complete the PAR-Q before participating in any exercise testing. Participants who answer "yes" to any questions on the PAR-Q will not be allowed to participate. If the participant is disqualified from the remainder of the study due to answering "yes" on the PAR-Q, the participant will not receive credit for the experiment. Participants will not be awarded partial credit for partial attendance.

16. **BENEFITS:**
    a. **List all realistic benefits participants can expect by participating in this study.**
    Participants receive an appreciation for the research process and how their personal biases may affect their behavior.

    b. **List all realistic benefits for the general population that may be generated from this study.**
    Understanding certain stigmas one may possess.

17. **PROTECTION OF DATA:**
    a. **Will data be collected as anonymous?** ☒ Yes ☐ No
    b. **Will data be collected as confidential?** ☐ Yes ☒ No
    c. **If data is collected as confidential, how will the participants' data be coded or linked to identifying information?**

    Upon arrival, participants will be asked to write down their birth month and street name of their home address on the experiment information sheet. The birth month and street name information will be used as identifying information to ensure the subject numbers remain consistent throughout the three experimental sessions. No other identifying information will be kept or linked with their data in any way.

    d. **Justify your need to code participants' data with identifying information.**

    e. **Where will code lists be stored?**
    The code list will be stored on a password encrypted computer in room [redacted] the Goodwyn Hall building on the campus of Auburn University Montgomery.

    f. **Will data collected as "confidential" be recorded and analyzed as "anonymous"?** ☒ Yes ☐ No

    g. **Describe how the data will be stored (e.g. hard copy, audio recording, electronic data, etc), where the data will be stored, and how the location where data is stored will be secured in you absence.**

    The data will remain on a password encrypted computer in room [redacted]. of Goodwyn Hall on the campus of Auburn University Montgomery. Data will also be stored on the research managers password encrypted USB drive.

    h. **Who will have access to participants' data?**

[redacted]

i. When is the latest date that the data will be retained? 5 years

j. How will the data be destroyed?

Deletion of information

PROTOCOL REVIEW CHECKLIST
All protocols must include at least items 1 &2.
Items 3-10 as applicable.

1. ☐ Completed Protocol Form
2. ☐ IRB Assurances Form with signatures
3. ☐ Informed Consent Form/s
4. ☐ *Appendix A* "Reference List"
5. ☐ *Appendix B* if flyers, advertisements, generalized announcements or scripts are used for data collection.
6. ☐ *Appendix C* if data collection sheets, surveys, tests, or other recording instruments will be used for data collection. Be sure to mark each of the data collection instruments as they are identified in section #13 , part c.
7. ☐ Verification of CITI Training (completion reports) for all researchers.
8. ☐ *Appendix D* if debriefing form is used.
9. ☐ If research is being conducted at sites other than AUM or in cooperation with other entities, a letter from the site/program director must be included indicating their cooperation or involvement in the project. NOTE: if the proposed research is a multi-site project, involving investigators or participants at other academic institutions, hospitals or private research organizations, a letter of IRB approval from each entity is required prior to initiating the project.
10. ☐ Written evidence of acceptance by the host country if research is conducted outside of the United States (approval by host country IRB).

Principal Investigator's Assurance

1. I certify that all information provided in this application is complete and correct.
2. I understand that, as Principal Investigator, I have ultimate responsibility for the conduct of this study, the ethical performance for this project, the protection of the rights and welfare of human subjects, and strict adherence to any stipulations imposed by the AUM IRB. I certify that all individuals involved with the conduct of this project are qualified to carry out their specified roles and responsibilities and are in compliance with AUM IRB policies regarding the collection and analysis of the research data. I have completed CITI training.
3. I certify that all individuals involved with the conduct of this project are qualified to carry out their specified roles and responsibilities & are in compliance with AUM IRB policies regarding the collection & analysis of the research data.
4. I agree to comply with all AUM IRB policies and procedures, as well as with all applicable federal, state, and local laws regarding the protection of human subjects, including, but not limited to the following:

a. Conducting the project by qualified personnel according to the approved protocol
b. Implementing no changes in the approved protocol or consent form without prior approval from the Office of Sponsored Programs (OSP) (except in an emergency, if necessary to safeguard the well-being of human subjects)
c. Obtaining the legally effective informed consent from each participant or his or her legally responsible representative prior to their participation in this project using only the currently approved, stamped consent form.
d. Promptly reporting significant adverse events and/or effects to the OSP in writing within 5 working days of the occurrence.

5. If I will be unavailable to direct this research personally, I will arrange for a co-investigator to assume direct responsibility in my absence. This person has been named as co-investigator in this application, or I will advise OSP, by letter, in advance of such arrangements.
6. I agree to conduct this study only during the period approved by the AUM IRB**.**
7. I will prepare and submit a renewal request and supply all supporting documents to OSP before the approval period has expired if it is necessary to continue the research project beyond the time period approved by the AUM IRB.
8. I will prepare and submit a final report upon completion of this research project.

_____ _____ _____

Principal Investigator (Please type or print) Principal Investigator Signature Date

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Faculty Sponsor's Assurance

1. By my signature as sponsor on this research application, I certify that the student or guest investigator is knowledgeable about the regulations and policies governing research with human subjects and has sufficient training and experience to conduct this particular study in accord with the approved protocol. This requirement includes CITI training.
2. I certify that the project will be performed by qualified personnel according to the approved protocol using conventional or experimental methodology.
3. I agree to meet with the investigator on a regular basis to monitor study progress.
4. Should problems arise during the course of the study, I agree to be available, personally, to supervise the investigator in solving them.
5. I assure that the investigator will promptly report significant adverse events and/or effects to the OSP in writing within 5 working days of the occurrence. If I will be unavailable, I will arrange for an alternate faculty sponsor to assume responsibility during my absence, and I will advise the OSP by letter of such arrangements.
6. I have read the protocol submitted for this project for content, clarity, and methodology

_____ _____ _____

Faculty Sponsor (Please type or print) Faculty Sponsor Signature Date

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Department Head's Assurance

By my signature as department head, I certify that every member of my department involved with the conduct of this research project will abide by all AUM policies and procedures, as well as with all applicable federal, state, and local laws regarding the protection and ethical treatment of human participants.

_____ _____ _____

Department Head (Please type or print) Department Head Signature Date

Concerning Participation in a Research Study
for Memory and Social Perception
Auburn University at Montgomery
Psychology Department

You are invited to participate in a study of memory and social perception. We hope to learn how memory processes may influence how we perceive individuals. You are being asked to volunteer to be in this study because you are in the enrolled in an Introductory Psychology course. If you agree to take part in this study, your involvement will last no longer than 2 hours over a period of 3 sessions. If you agree to take part in this study, you will be asked to complete two computerized tasks as well as complete a small demographic questionnaire and five separate questionnaires. On the first day, you will be asked to complete a graded exercise protocol. On the second day, you will be asked to complete the first computerized task and complete 20 minutes of exercise. Then, you will be asked to return 48 hours later to complete a second computerized task. There are no known risks associated with this research. While there will be no direct benefits to you for taking part in this study, it is anticipated that you will gain some educational benefit from participating in this study. At the end of the study, an explanation will be offered to you. You should gain a greater understanding of how psychological research is conducted, and types of research conducted at AUM.

You have the option not to take part in this study. There will be no penalties involved if you choose not to take part in this study. If you choose to take part, you have the right to stop at any time.

Your part in this study is anonymous. None of the information will identify you by name. All records are maintained in locked filing cabinets or secure internet servers. Anonymity will be maintained by ensuring that there is no way to connect participant's responses with their personal information. Results will be reported as an aggregation of data and there will be no way to connect individual responses with participants in any way. Upon completion of the study the informed consent and debriefing forms will be stored in a locked file cabinet.

Your decision whether to participate will not prejudice your future relations with Auburn University at Montgomery. If you decide to participate, you are free to withdraw your consent and to discontinue participation at any time without penalty. If you decide later to withdraw from the study, you may also withdraw any information that has been collected about you. Before you decide whether to accept this invitation to take part in the study, please ask any questions that might come to mind now. Later, if you have questions about the study, you can contact the investigator, Dr. [redacted], by phone [redacted]) or via email ([redacted]). If you have any questions about your rights as a volunteer in this research, contact Debra Tomblin, Research Compliance Manager, AUM, by phone (334-244-3250) or via email (dtomblin@aum.edu). A copy of this informed consent can be provided upon request.

Authorization Statement

I have read each page of this paper about the study (or it was read to me). I know that being in this study is voluntary and I choose to be in this study. I know I can stop being in this study without penalty. I will get a copy of this consent form now and can get information on results of the study later if I wish.

YOU ARE MAKING A DECISION WHETHER TO PARTICIPATE. YOUR SIGNATURE INDICATES THAT YOU HAVE DECIDED TO PARTICIPATE, HAVING READ THE INFORMATION PROVIDED ABOVE.

Participant Name: _____ Date: _____

Participant Signature: _____ Time:_____

Appendix A

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Appendix B

Graded Exercise Protocol Script

Researcher (*to participant*): Please provide government issued identification to verify that you are 18 or older. Also, please write down your age, birth month, and street name of your home address on the experiment information sheet. Your age will be used to calculate your maximum heart rate needed for the exercise protocol. Your birth month and street name information will be used as identifying information to ensure your subject number remains consistent throughout the three experimental sessions. Once you have written down your age, birth month, and street name of your home address on the experimental information sheet, please read through the informed consent and if you are comfortable with proceeding with the study, please sign the bottom of the form. Once I collect your informed consent, please have a seat at a computer session and begin the online demographic questionnaire. Once you have completed the questionnaire, please let me know so that you can begin the printed PAR-Q questionnaire.

Now that you have completed the beginning questionnaires, we will walk over to the next room and begin the graded exercise protocol.

(*Upon entering the second room*) We will first begin with a 5-minute warm-up set at a workload of 75W. After warm-up, the workload of the cycle ergometer will be set at 100W and then gradually increased by 25W every 3 min until exhaustion. At the end of every 3-minute block, please indicate your perceived level of exhaustion using the Borg scale. I will also be monitoring your heart rate every 15 seconds.

(*After completing the graded exercise protocol*) You have now completed your first day of the study. Please remember to return for your previously scheduled second session approximately 24 hours later.

Main Experiment- Day 1 Script

Researcher (*to participant*): Please have a seat at a computer and begin by following the instructions on the screen. Also, please fill out the impression formation questionnaire during the initial 30 seconds of exposure.

(*After completing the computer presentation*) Now you will complete two scales related to memory.

(*After completing the short delay filler tasks*) Please have a seat at a computer and begin by following the instructions on the screen.

(*After completing the short delay test: Control Group*) Please complete the two working memory tasks provided for a total of 20 minutes. I will let you know when the 20 minutes are complete.

(*After completing the short delay test: Exercise group*) Now you will complete a 20-minute block of exercise on a cycle ergometer in the adjacent room. The exercise protocol will begin with a two-minute warm-up at a workload of 75W. After warm-up, the workload of the cycle ergometer will be set to 100W and then gradually increased by 25W over approximately 3 minutes until your target heart rate is reached. After the three-minute segment, the workload will be set at 50W for two minutes. In total, there will be three-three-minute segments and two-two-minute segments mixed between. During the last three minutes, you will be allowed to rest. At the end of each three-minute block, you will indicate your perceived level of exertion. Also, your heart rate will be monitored every 30 seconds.

(*After participation in either consolidation type*) You have now completed your second experimental session. Please remember to return for your previously scheduled final session approximately 48 hours later.

Main Experiment- Day 2 Script

Researcher (*to participant*): Please have a seat at a computer and begin by following the instructions on the screen.

(*After completing the computer presentation*) Please complete the sleep check questionnaire. After completing the sleep check questionnaire, I will provide you with the caffeine consumption questionnaire for completion.

Now that you have completed the final questionnaires, please view your computer for the debriefing. You have now completed your final experimental session and participation in this study. You will receive your earned credit within 48 hours.

Appendix C

Demographic Questionnaire

1. What is your gender?

2. What is your age?

3. What is your race?
    a. White, White non-Hispanic, African-American, Hispanic, Asian-Pacific Islander, Native American, Other (specify)

4. What state were you primarily raised in?

5. Indicate your overall level of health:
    a. Excellent
    b. Good
    c. Fair
    d. Poor

6. Do you now or have you ever used tobacco? Yes❑ No ❑

    How long? _____ Quantity _____/day

    Years since quitting _____

****

INTERNATIONAL PHYSICAL ACTIVITY QUESTIONNAIRE (IPAQ)

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.
Think about all the **vigorous** activities that you did in the **last 7 days**. **Vigorous** physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think *only* about those physical activities that you did for at least 10 minutes at a time.

1. During the **last 7 days**, on how many days did you do **vigorous** physical activities like heavy lifting, digging, aerobics, or fast bicycling?

_____ days per week
No vigorous physical activities ***Skip to question 3***

2. How much time did you usually spend doing **vigorous** physical activities on one of those days?

_____ hours per day
_____ minutes per day
Don't know/Not sure

Think about all the **moderate** activities that you did in the **last 7 days**. **Moderate** activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the **last 7 days**, on how many days did you do **moderate** physical activities like carrying light loads, bicycling at a regular pace, or doubles tennis? Do not include walking.

_____ days per week

No moderate physical activities ***Skip to question 5***

4. How much time did you usually spend doing **moderate** physical activities on one of those days?

_____ hours per day
_____ minutes per day
Don't know/Not sure
Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, walking to travel from place to place, and any other walking that you have done solely for recreation, sport, exercise, or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?
_____ days per week

No walking ***Skip to question 7***

6. How much time did you usually spend **walking** on one of those days?

_____ hours per day
_____ minutes per day
Don't know/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include time spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend **sitting** on a **week day**?

_____ hours per day
_____ minutes per day
Don't know/Not sure

This is the end of the questionnaire, thank you for participating.

Appendix C
PAR-Q

Regular physical activity is fun and healthy, and increasingly more people are starting to become more active every day. Being more active is very safe for most people. However, some people should check with their doctor before they start becoming much more physically active.

If you are planning to become much more physically active than you are now, start by answering the seven questions in the box below. If you are between the ages of 15 and 69, the PAR-Q will tell you if you should check with your doctor before you start. If you are over 69 years of age, and you are not used to being very active, check with your doctor.

Common sense is your best guide when you answer these questions. Please read the questions carefully and answer each one honestly: check YES or NO.

YES	N	
☐	☐	1. Has your doctor ever said that you have a heart condition and that you should only do physical activity recommended by a doctor?
☐	☐	2. Do you feel pain in your chest when you do physical activity?
☐	☐	3. In the past month, have you had chest pain when you were not doing physical activity?
☐	☐	4. Do you lose your balance because of dizziness or do you ever lose consciousness?
☐	☐	5. Do you have a bone or joint problem (for example, back, knee or hip) that could be made worse by a change in your physical activity?
☐	☐	6. Is your doctor currently prescribing drugs (for example, water pills) for your blood pressure or heart condition?
☐	☐	7. Do you know of any other reason why you should not do physical activity?

If you answered YES to one or more questions:

- Talk with your doctor by phone or in person BEFORE you start becoming much more physically active or BEFORE you have a fitness appraisal. Tell your doctor about the PAR-Q and which questions you answered YES.
- You may be able to do any activity you want — as long as you start slowly and build up gradually. Or, you may need to restrict your activities to those which are safe for you. Talk with your doctor about the kinds of activities you wish to participate in and follow his/her advice.
- Find out which community programs are safe and helpful for you.

If you answered NO to all questions

- If you answered NO honestly to all PAR-Q questions, you can be reasonably sure that you can:
    - Start becoming much more physically active – begin slowly and build up gradually. This is the safest and easiest way to go.
    - Take part in a fitness appraisal – this is an excellent way to determine your basic fitness so that you can plan the best way for you to live actively. It is also highly recommended that

you have your blood pressure evaluated. If your reading is over 144/94, talk with your doctor before you start becoming much more physically active.

NAME _____

SIGNATURE _____

DATE _____

WITNESS _____

Appendix C
Rating of Perceived Exertion (RPE) Category Scale

6

7 Very, very light

8

9 Very light

10

11 Fairly light

12

13 Somewhat hard

14

15 Hard

16

17 Very hard

18

19 Very, very hard

20

Appendix C
Impression Formation Questionnaire

Carol

1. How friendly do you think **Carol** is?

1	2	3	4	5
Not at all Friendly	*Slightly Friendly*	*Moderately Friendly*	*Mostly Friendly*	*Extremely Friendly*

2. How personable do you think **Carol** is?

1	2	3	4	5
Not at all personable	*Slightly*	*Moderately*	*Mostly*	*Extremely personable*

3. How much do you like **Carol**?

1	2	3	4	5
Not at all	*Slightly*	*Moderately*	*Mostly*	*Extremely*

4. How willing would you be to hang out with **Carol**?

1	2	3	4	5
Not at all	*Slightly*	*Moderately*	*Mostly*	*Extremely*

****

David

1. How friendly do you think **David** is?

1	2	3	4	5
Not at all Friendly	*Slightly Friendly*	*Moderately Friendly*	*Mostly Friendly*	*Extremely Friendly*

2. How personable do you think **David** is?

1	2	3	4	5
Not at all personable	*Slightly*	*Moderately*	*Mostly*	*Extremely personable*

3. How much do you like **David**?

1	2	3	4	5
Not at all	*Slightly*	*Moderately*	*Mostly*	*Extremely*

4. How willing would you be to hang out with **David**?

1	2	3	4	5
Not at all	*Slightly*	*Moderately*	*Mostly*	*Extremely*

Appendix C
Rosenberg Self-Esteem Scale

Instructions: Below is a list of statements dealing with your general feelings about yourself. Please indicate how strongly you agree or disagree with each statement.

1. On the whole, I am satisfied with myself.
Strongly Agree Agree Disagree Strongly Disagree

2. At times I think I am no good at all.
Strongly Agree Agree Disagree Strongly Disagree

3. I feel that I have a number of good qualities.
Strongly Agree Agree Disagree Strongly Disagree

4. I am able to do things as well as most other people.
Strongly Agree Agree Disagree Strongly Disagree

5. I feel I do not have much to be proud of.
Strongly Agree Agree Disagree Strongly Disagree

6. I certainly feel useless at times.
Strongly Agree Agree Disagree Strongly Disagree

7. I feel that I'm a person of worth, at least on an equal plane with others.
Strongly Agree Agree Disagree Strongly Disagree

8. I wish I could have more respect for myself.
Strongly Agree Agree Disagree Strongly Disagree

9. All in all, I am inclined to feel that I am a failure.
Strongly Agree Agree Disagree Strongly Disagree

10. I take a positive attitude toward myself.
Strongly Agree Agree Disagree Strongly Disagree

Scoring:
Items 2, 5, 6, 8, 9 are reverse scored. Give “Strongly Disagree” 1 point, “Disagree” 2 points, “Agree” 3 points, and “Strongly Agree” 4 points. Sum scores for all ten items. Keep scores on a continuous scale. Higher scores indicate higher self-esteem.

Appendix C
Facebook Intensity Scale

The Facebook Intensity scale is used to measure Facebook usage beyond simple measures of frequency and duration, incorporating emotional connectedness to the site and its integration into individuals' daily activities. You are free to use the Facebook intensity scale (FBI) as long as correct attribution is used.

Citation:
Ellison, N. B., Steinfield, C., & Lampe, C. (2007). The benefits of Facebook "friends:" Social capital and college students use of online social network sites. *Journal of Computer-Mediated Communication, 12*, 1143-1168.

Scale Items:
1. Facebook is part of my everyday activity
2. I am proud to tell people I'm on Facebook
3. Facebook has become part of my daily routine
4. I feel out of touch when I haven't logged onto Facebook for a while
5. I feel I am part of the Facebook community
6. I would be sorry if Facebook shut down

** Response categories (for items 1 – 6) range from 1 = strongly disagree to 5 = strongly agree

7. Approximately how many TOTAL Facebook friends do you have?
   - 10 or less
   - 11-50
   - 51-100
   - 101-150
   - 151-200
   - 201-250
   - 251-300
   - 301-350
   - 351-400
   - More than 400

8. In the past week, on average, approximately how much time PER DAY have you spent actively using Facebook?
   - Answers in 15 minute intervals ("0-15" to "More than 1 hour and 30 minutes")

Computing the Scale
The Facebook Intensity score is computed by calculating the mean of all of the items in the scale.

Appendix C
Sleep Check and Physical Activity Questionnaire

Your answers to the following questions will not affect your participation in the study, so please answer them honestly.

1. **During the 2 day break, how many hours (approximately) did you sleep the FIRST night?**

0 1 2 3 4 5 6 7 8 9 10+

1a. On a scale from 0 to 100, 0 being not at all refreshing/restorative and 100 being very refreshing/restorative, <u>please circle</u> how refreshing/restorative this sleep was.

0 10 20 30 40 50 60 70 80 90 100

Not at all Restorative — Very Restorative

2. **During the 2 day break, how many hours (approximately) did you sleep the SECOND night?**

0 1 2 3 4 5 6 7 8 9 10+

2a. On a scale from 0 to 100, 0 being not at all refreshing/restorative and 100 being very refreshing/restorative, <u>please circle</u> how refreshing/restorative this sleep was.

0 10 20 30 40 50 60 70 80 90 100

Not at all Restorative — Very Restorative

3. During the 2 day break, how much time did you usually spend exercising on one of those days?

_____ hours per day
_____ minutes per day

Appendix C
Caffeine Consumption Questionnaire

Please complete the questionnaire below concerning your caffeine usage. List the number of times you consume the following substances during a -week. You will be provided with the number of milligrams of caffeine per substance for calculating your weekly caffeine intake.

	Average number of ounces/doses/tablets per day	**Average total per day**
Beverages		
Coffee (6 oz.)		
Decaf Coffee (6 oz.)		
Coffee (6 oz.)		
Decaf Coffee (6 oz.)		
Espresso (1 oz.)		
Tea (6 oz.) Green		
Tea (6 oz) Black		
Cocoa (6 oz.)		
Energy drinks (12 oz.)		
Caffeinated Soft Drinks (12 oz.)		
Chocolate candy bar		
Over-the-Counter Medications		
Anacin		
Appetite-control pills		
Dristan		
Excedrine		
Midol		
NoDoz		
Triaminicin		
Vanquish		
Vivarin		

*Caffeine content of energy drinks vary. They also include a number of stimulating herbs. > 250 milligrams a day, if taken after noon, may interfere with deep sleep ® John Preston (2014)

Appendix D
Debriefing Form

Debriefing form: Memory & Social Perception

First of all, the names and traits that you have learned for the photographed individuals are not necessarily true. We have no knowledge as to their true names and personalities.

Within this experiment, we were testing the effects of exercise and memory on social perception. You were asked to come in three separate times over a period of three days in order to test this effect. During the process of memory consolidation, your brain will switch the short-term memory into a long-term memory store. So, over the 48 hour break, we gave your brain time to switch the information you had learned about the target individuals to a long-term memory store. We have found in previous research that memory consolidation slows social categorization. Therefore, when people learn some individuating or unique information about an individual and this information is given time to consolidate people are slower to categorize that individual solely as an African-American or European American because they've become familiar with them. Your participation in the current research will help us learn more about the influence of time and memory on social perception. In addition, your participation will help us better understand this important social phenomenon.

It is important to remember that your data is kept completely anonymous and there will be no way for us to associate your responses with you individually. It is a part of an aggregation of data. Nonetheless, if you prefer that your data be excluded from the experiment, please notify the researcher right now.

If, at a later time, you would like more information about the topics covered in this research, or an opportunity to talk about the feelings and thoughts brought up by participating in this research, you may contact Dr. [redacted] ([redacted]echavez@aum.edu or [redacted]).

Do you have any questions for me now? If so, please ask!

Since the true purpose of this study was masked for experimental purposes, please do not share any information about this experiment with anyone else as this could hurt our results. Thank you.