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Classification: Junior

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Area of Study: Psychology/Sociology

Title of Project: “Am I Overthinking it or Am I Just Tired?” An Experimental Study of the Interplay between Sexual Assault, Rumination, and Sleep Deprivation

Summary of Project:

Rumination is a maladaptive emotion regulation strategy characterized by repetitively and passively focusing on negative self-referential thoughts with no goal orientation (Nolen-Hoeksema, 1991; Johnson & Whisman, 2013; Smith & Alloy, 2009; Szabo 2017). Literature suggests that individuals who experience traumatic events are more likely to engage in rumination than non-trauma exposed individuals, indicating that this process may be important in the context of posttraumatic stress (Hughes, Alloy, & Cogswell, 2008). However, very little is known about factors that influence ruminative processes following traumatic event exposure. Traumatic event exposure, particularly sexual assault (SA), is alarmingly common among collegiate women (Khan et al. 2020; Muehlenhard, 2016) with an array of pernicious effects. These include depression, anxiety, substance abuse, sexual dysfunction, and posttraumatic stress disorder (PTSD; Preston & Gorday, 2021). Relative to other types of traumas (e.g., natural disasters), the interpersonal nature of SA poses an elevated risk (e.g., PTSD development) to survivors; however, whether SA is uniquely linked to rumination is unclear. The first goal of the current study is to address this gap in literature. Furthermore, given sleep is significantly disrupted following trauma exposure and disruption in emotion regulatory processes, it is important to consider whether sleep difficulties exacerbate ruminative processes among SA survivors. Previous studies indicate associations between rumination and sleep disturbances, but further research is needed to explore the interplay between sleep and rumination within trauma-exposed samples (Thomsen et al., 2003). The current study also aims to address this dearth in literature. Specifically, I hypothesize that 1) Individuals who have experienced SA will report higher engagement in rumination compared to individuals with previous exposure to non-interpersonal trauma index event after a rumination induction task, and 2) SA survivors randomly assigned to an acute sleep deprivation condition will report engaging in more rumination relative to SA survivors in a sleep-as-usual condition. Conducting this study and taking part in associated trainings will forward my long-term goal of pursuing a career within the field of forensic psychology. In particular, understanding the psychological impact of traumatic exposure and potential treatment targets to reduce posttraumatic distress (e.g., rumination) will further my knowledge in potential clinical work. Establishing command of the conceptual and methodological foundations of this literature will increase my knowledge and training in research science to date. A detailed training timeline aimed at advancing my progress toward these goals is included.

Background & Significance. Rumination is defined as a maladaptive emotion regulation skill characterized by repetitively and passively focusing on negative self-referential thoughts (Nolen-Hoeksema, 1991; Johnson & Whisman, 2013). Data suggest individuals who experience traumatic events are more likely to engage in ruminative behavior than individuals who are non-trauma exposed. A recent review suggests rumination is a core process in the posttraumatic context (Moulds et al., 2020). Sexual assault (SA) is defined as unwanted sexual acts – ranging from forcible groping to penetration – that involve threats of physical force, intimidation, and deception (Alabi 2019). SA affects 1 in 5 collegiate women (Muehlenhard, 2016). Negative sequelae following SA include depression, anxiety, substance abuse, and posttraumatic stress disorder (PTSD; Preston & Gorday, 2021). Sexual assault compared to non-interpersonal trauma types (e.g., natural disasters) carries an elevated risk of problematic outcomes, such as PTSD. This is theorized to occur partially because this traumatic event involves disruption of normative social bonds (Charuvastra & Cloitre, 2008). It is unknown, however, whether SA is uniquely linked to rumination. The current study is designed to address this gap. A second factor in the posttraumatic stress landscape is sleep disruption. Given sleep plays a key role in emotional reactivity (Minkel et al., 2012; Short et al., 2020) and regulation (Palmer & Alfano, 2017), sleep loss may contribute to ruminative processes among those exposed to traumatic events, although this hypothesis lacks experimental testing. Understanding the degree to which sleep disruption exacerbates ruminative processes following traumatic event exposure is important for constructing effective interventions towards relevant therapeutic topics. Therefore, the second overarching goal of the current study is to address this novel research question using an acute sleep deprivation protocol successfully used by our research team in past work [REDACTED]

[REDACTED] With this backdrop, I hypothesize that 1) relative to survivors of

non-IPT, SA survivors will report elevated rumination in response to a rumination induction task, and 2) relative to those assigned to sleep-as-usual, SA survivors randomly assigned to an acute sleep deprivation condition will report engaging in more rumination following a rumination induction task.

Method. Participants will be 60 women equally split between self-reported history of sexual assault or non-interpersonal trauma. Following eligibility screening, a lab appointment (Day 1) will be scheduled at 9 a.m. (to control for circadian effects). After providing written, informed consent, participants will undergo a rumination induction task, in which they will be asked to intensely focus attention on an unresolved goal or difficulty for 10 minutes and report their ruminative tendencies using a 100-point Subjective Units of Distress Scale (SUDS) indexing whether their current rumination ranges from 0 (*not at all*) to 100 (*extreme*). Participants will be provided with a standard definition of rumination. Participants in the non-IPT group will then be compensated (with course credit) and debriefed. Those in the SA group will be randomly assigned to either a sleep-as-usual or an acute sleep deprivation condition. As in our prior work, compliance with the sleep deprivation protocol will be assessed using a multimodal check system, utilizing actigraphy watches and hourly overnight surveys (Campbell et al., 2022). After the sleep manipulation, participants will return to the lab (Day 2) to complete a set of procedures nearly identical to Day 1. They will then be debriefed and compensated with course credits.

Data Analytic Plan. Data will be evaluated for normality, assumptions checked, and descriptive statistics computed. Hypotheses will be addressed using analyses of variance to evaluate whether rumination levels differ between the SA and non-IPT group (hypothesis 1) and as a function of sleep condition within the SA group (hypothesis 2).

Project Timeline:

Prior to Project Funding: Given timeline constraints on the SURF mechanism, some activities were targeted for the period prior to the award. Specifically, an Institutional Review Board (IRB) approval for the proposed activities will be submitted and appropriate research ethics and compliance training via the Collaborative Institutional Training Initiative program completed in the Fall, 2023. In October 2023, I presented a first author poster submission to the Arkansas Psychological Association based on archival laboratory data. The proposed timeline builds on these preliminary activities.

Professional Development (3-5 hours/week, project duration): Throughout the project, I will attend weekly meetings with my faculty mentor, Dr. [REDACTED]. These meetings will be structured to enhance my knowledge and skillset as a researcher. In addition, weekly meetings with my graduate mentor, Anna Marie Nyguen, M.A., will be used to track study progress and obtain further training in applied methods. I will receive guidance on conceptual, methodological, and ethical foundations and limitations related to the proposed research. This will be supplemented by training in scientific writing, data analysis, running the study protocol, and maintaining participant records. I plan to disseminate my work in several ways 1) the development, submission, and presentation of a first-author poster to the Arkansas Psychological Association in October 2024, 2) presenting my research at the U of A Department of Psychological Science Undergraduate Research Conference in May 2024, and 3) presenting findings at the Anxiety and Depression Association of America's conference in April 2025. I also plan to submit my findings from the current study for publication.

January 2024: Data collection. Demonstrate mastery on all study procedures, including obtaining informed consent, ensuring adherence to study procedures, randomization of assigned

sleep conditions, conducting deception checks, and debriefing. In addition to project administration (e.g., tracking participant progress through the study), in-lab time for each participant ranges from 2 hours (non-IPT participants) to 4 hours (SA participants). I will therefore coordinate data collection for 12 participants monthly; a feasible target based on similar protocols conducted in Dr. [REDACTED] laboratory (Campbell et al., 2022).

February 2024: Data collection. Collect data from 12 participants. Complete data entry and cleaning. Additional research assistants will be trained as needed to help other study-related administrative activities (e.g., phone screenings, scheduling participants, etc.).

March 2024: Data collection. Collect data from 12 participants. Complete data entry and cleaning. Evaluate researcher drift and update quality control procedures as necessary. Further, I aim to submit preliminary study findings in response to the call for poster submissions for the U of A Department of Psychological Science Undergraduate Research Conference.

April 2024: Data collection. Collect data from 12 participants. Complete data entry and cleaning.

May 2024: Data collection. Collect data from 12 participants. Finalize the remaining data entry and work with the team to close out the study. I will oversee the checking of 100% of the data during this time. Data cleaning will involve running frequencies in Excel or SPSS, and checking assumptions for statistical tests to omit possible outliers. I will present study findings at the U of A Department of Psychological Science Undergraduate Research Conference.

August 2024: Statistical Training. Using R and SPSS, Dr. [REDACTED] and Anna Marie Nyguen will facilitate training so I can conduct the proposed analyses. These meetings, which take place over a series of months, will also involve independent practice with RStudio for 5 hours per week.

September 2024: Statistical Training. Continued didactic and applied statistical training. I also will re-review the relevant literature to identify any new findings to be incorporated into the Introduction for my final project manuscript (to be submitted for publication).

October 2024: Statistical Training, Analyze Data, and Dissemination. Continued didactic and applied statistical training, with a focus on writing the necessary R code to run analyses for the primary hypotheses. Additionally, I will submit a poster presentation based on the current project to the Arkansas Psychological Association's October 2024 meeting. This will also allow me to refine the Method and Data Analytic sections of my final manuscript (to be submitted for publication).

November 2024: Manuscript development. Under supervision, I will draft the Results and Discussion for my final manuscript. This will take place via iterative exchanges with Dr. [REDACTED] and Anna Marie until the paper is ready for submission. Additionally, I will submit my research in December 2024 for presentation at the Anxiety and Depression Association of America in April 2025 in Las Vegas, Nevada.

December 2024: Manuscript Development and Dissemination. I plan to submit my manuscript to one of the following journals: *Anxiety, Stress, & Coping*; *Journal of Anxiety Disorders*; or *Behavior Research Therapy*.

Summary. This award would help me achieve my academic aspirations, which include practical training in conducting scientific research. I believe strongly in advocacy, especially among women's health issues. Findings from the proposed project have the potential to inform best intervention practices for this population. Finally, gaining insight into the effects of traumatic experiences on the human condition is central to my long-term goal of pursuing studies in the field of forensic psychology.

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