Research Statement for RPT 2024-2025 review | Monika Lohani

For optimal functioning in the real world, people must constantly adapt to a fluctuating environment that imposes cognitive demands on them. While tightly controlled lab-based assessments can offer important insights, a more generalizable understanding of cognitive processing can be gained by examining individuals in their personally relevant and naturally occurring contexts. My research program integrates basic and applied perspectives to understand *how* people can optimally adapt to the cognitive demands present in real-world contexts. I study cognitive challenges presented in three kinds of contexts – socioemotional daily stressors [1, 4, 6, 12, 16-17, 29, 30, 32, 36-37, 40, F4, F5, F7, F8, F10, F11, F12, F17-18], climate change distress [3, F1, F2, F6, F9, F13, F14-16], and interactions with technology [2, 5, 7-11, 13-15, 18-28, 34, 35, 38, 39, F3]. The overarching goal of my research is to facilitate healthy self-regulation, performance, and wellbeing. To this end, I currently direct the *Applied Cognitive Regulation (ACR) Lab* in the Department of Psychology at the University of Utah, where I am currently pursuing the following lines of research:

Cognitive and behavioral regulation in the face of real-world stressors. Difficulty with adaptation to socio-emotional stressors predicts several significant outcomes, including health and wellbeing [1,4, 16, 17, 37, F10]. Thus, it is important to understand what kind of cognitive and behavioral regulation strategies can be used to facilitate adaptation to daily and chronic stressors[17, 29, 32, 40]. In recent work, I have examined the underlying effects of cognitive and behavioral strategies to facilitate adaptation to ongoing affective challenges in real-world contexts[F7, F8]. For example, using ecological momentary sampling with my students, I investigated how people regulated naturally occurring daily stressors during the COVID-19 pandemic[6]. Extending previous work [17, 29, 32], certain adaptive cognitive and behavioral strategies (e.g., reappraisal, acceptance, savoring, social sharing, calming, and problem-solving) were associated with better affective experiences and provided consistent emotional relief from daily stressors during the COVID-19 pandemic. These findings suggest that how people regulate their real-world emotional challenges has implications for their mental health outcomes.

***Training emotion regulation skills*.** In addition to understanding and assessing affect regulation, my research also focuses on evaluating evidence-based interventions to promote effective mental health regulation[12]. For instance, in the context of suicide prevention, timely interventions are necessary so that high-risk individuals get help to identify their personal warning signs and adopt coping strategies to manage emotional dysregulation. To that end, I received an intramural grant (PI: Lohani) to conduct a longitudinal study to examine the effect of collaborative activities between therapists and high-suicide-risk individuals on their suicide ideation and behavior. We found that interventions designed to facilitate client-therapist collaboration reduced suicidal ideation to a larger degree than the group with no collaborative activities[2]. Furthermore, this study examined the suitability of suicide prevention intervention provided via telehealth[F4]. In ongoing analysis, I am examining how collaborative interventions impact specific emotion regulation efforts.

Emotion regulation specifically in the climate change context. Climate change is a divisive topic that elicits a wide range of responses among people [3, F7], which can ultimately inform climate-friendly actions or inaction[3]. While a growing body of literature has started to examine individual differences in emotional responses, there is still limited understanding of how people cope with the reality of climate change, particularly in their personal lives. To address this gap in knowledge, I have led the development and validation of the Eco-SHADO (N = 548)[a, F14], a comprehensive inventory that measures diverse emotion regulation strategies to deal with climate change. Eco-SHADO is based on eight scales that emerged through factor analysis: Eco-consciousness, Spiritual-bodily practices, Humor, Apathy, Denial, Despair, Doom, and Optimism. Ongoing iterative data collection will continue to improve this measure. Currently, this measure was used in two projects within naturalistic settings of a climate change exhibit at the Natural History Museum of Utah (NHMU) called *A Climate of Hope*.

Insights from a climate change museum exhibit. Museums are trusted public institutions that provide open and informal spaces that are well-situated to engage the public in learning about climate change [F9, F13]. In a recent study [a, F2], a museum exhibit was used to explore how 183 visitors' emotional responses relate to their emotion regulation approaches to current climate change realities. Consistent with previous suggestions, people who adopted more apathy and avoidance as emotion regulation strategies experienced

[F] The citations utilize paper numbered in my CV, where # is a published and F# is a Forthcoming paper (Addendum).
[a] The data collection started in or after the Fall of 2023

subdued emotions, implying the value of emotions in motivating climate action. In fact, across several studies [a, 3, F1-2, F14-16], we found that understanding how people manage their emotional reactions to climate change is crucial for both maintaining wellbeing and fostering openness to climate action, thus advancing sustainability efforts. Furthermore, in an ongoing study, I am leading the effort to utilize mobile eye tracking to study how museum visitors attend to emotion-provoking climate crisis information and how this is linked to recalling this information and climate action one month later.

Insights from students of climate science. In a related line of inter-department collaborations [C], I led efforts to study how students learning about the climate crisis are coping with climate change. Climate anxiety and distress are highest in young adults, making students an important target population. Undergraduates (N = 548) [a, F15] taking courses offered by the School of the Environment, Society & Sustainability with a focus on global climate change reported their emotions and coping mechanisms. An important finding was that eco-conscious behaviors (e.g., advocacy), self-care (e.g., exercise), and social support were reported as the most frequent strategies for dealing with climate distress. In a follow-up study (N = 71) [a, F16], students were asked which coping strategies were most effective after completing lectures and discussions on climate change. In addition to replication findings [F15], we found that most students struggled to find effective ways of regulating their emotions around climate distress and shared the need for better mental health resources.

Insights from historically marginalized communities. Historically marginalized communities are experiencing the worst effects of climate change; however, their experiences and needs remain unheard, thereby imposing disparities in initiating a socially-just transition to a post-carbon society. To address this gap, I led the effort to conduct small group discussions with 38 members from underserved communities of Utah[a, F1,] to capture environmental stressors and barriers experienced first-hand by marginalized communities directly impacted by climate change challenges. Their apprehensions and barriers to engaging in sustainable actions highlighted the need to build educational outreach efforts to highlight the urgency of climate change and develop coping protocols to support historically marginalized communities at the forefront of climate change who otherwise would have negligible resources to engage in climate-related dialogue and action [G].

Applying reliable multi-method approaches to understand cognitive regulation in the real world. Understanding and measuring cognitive challenges requires methods that can capture rapid and dynamic interactions in real-world contexts[7,10,34,35]. Physiological methods (such as heart rate) are sensitive to dynamic near-real-time changes in relevant psychological domains (e.g., stress and workload) and can be assessed without disrupting ongoing mental processes, making them strong candidates for real-world assessments. In two projects, I have extended lessons learned from controlled lab-based measures and adapted them to real-world contexts to assess attention, emotion, and stress. First, in a project funded by a VPR grant (PI: Lohani), I examined the feasibility of a psychophysiological data collection 'in the wild'— that is, in real-world and personally relevant contexts. To assess stressors, I integrated hourly ambulatory physiological (e.g., heart rate and skin conductance) and ecological momentary sampling from young adults who experienced work or academic stressors over the course of a day [F5]. I found that in response to real-life stress events, self-reported stress levels were linked to changes in physiology, highlighting the value of adopting such ambulatory and ecologically valid methods in daily life.

Second, in the context of real-world automated driving, I have discussed the benefits of adopting psychophysiological measures to evaluate cognitive demands outside controlled lab-settings[15]. The adoption of ecologically valid measures will help assess cognitive demands in applied settings such as driving on the highway. I developed a multi-method approach to assess cognitive demands while motorists operated partially automated vehicles on highways. This protocol was successfully implemented in a series of studies [5,9,13] to investigate cognitive demands in near-real time by synchronizing data collection from peripheral (heart rate and its variability) and central nervous system (electroencephalogram alpha power) measures with behavioral (reaction time) performance. Furthermore, I led an effort[2] that addressed concerns regarding the reliability of these multi-modal measures in assessing cognitive demand in real vehicles on highways, as acceptable test-retest reliabilities were found across all measures for drivers across occasions. The findings highlight that a combination of psychophysiological and behavioral methods can reliably capture multi-faceted cognitive demand in real-world cognitive research. Given my interest in adaptation to real-world stressors in ongoing work, my students and I are also exploring effective emotion regulation in stressful driving contexts[F3].

[C] Collaboration with the School of the Environment, Society & Sustainability, Educational Psychology, Communication
[G] Grant submitted to pursue this with faculty from the College of Nursing, Educational Psychology, Atmospheric Sciences