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The Impact of Stress on Resilience: Examining the Moderated Effects of a Savoring Intervention

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THE IMPACT OF STRESS ON RESILIENCE: EXAMINING THE MODERATED EFFECTS OF A SAVORING INTERVENTION

by

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(Under the Direction of Jeff Klibert)

ABSTRACT

Resilience is characterized by the ability to bounce back from stress (Bonanno, 2004; Ong et al., 2006; Smith et al., 2008). Research suggests resilience is a personal resource that helps individuals effectively cope with stress and provides protection from negative outcomes (Loh, Schutte, & Thorsteinsson, 2013). Exposure to stress is a prerequisite to building resilience across many different contexts (Graber et al., 2015; Hennessey & Levine, 1979; Rutter, 2006). Interestingly, a high accumulation of stress detracts from an individual's abilities to build resilience (Ong et al., 2006; Tuguade & Frederickson, 2007). However, it is unknown what types of interventions explicitly lead to increases in resilience, especially in the face of stress. Positive emotions are associated with resilience, however the mechanisms by which positive emotions boost resilience remain unclear (Folkman, 2008; Tuguade & Frederickson, 2007). One possibility is that savoring, an individual's ability to generate, sustain, and extend positive emotions, may play an important role in building resilience, especially after experiencing a stressor (Bryant & Veroff, 2007). Thus, the current study's primary purpose was to experimentally examine whether a savoring intervention could buffer the effects of stress on resilience. One hundred and eighteen undergraduate students participated in the study, and valid data were collected from 84 individuals. Participants were randomly assigned to an induction

task (stress induction vs. neutral induction) and an intervention task (savoring vs. control). A 2 (induction task) x 2 (intervention task) x 2 (time) mixed ANOVA was used to analyze the data. Results revealed a non-significant main effect for induction task and intervention task on resilience scores. Results also highlighted a non-significant interaction effect for resilience scores. These findings are inconsistent with my hypotheses. Additionally, these results call into the question the efficacy of different positive psychological theories in buffering the effects of stress on resilience.

INDEX WORDS*:* Resilience, Stress, Savoring, Positive emotions

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CHAPTER 1: INTRODUCTION

Resilience is the ability to "bounce back" or recover from stress (Bonanno, 2004; Ong et al., 2006; Smith et al., 2008). The process of resilience includes a system of recovery-based thoughts, behaviors, and actions that can be developed by anyone rather than a stable quality an individual possesses (Bonanno & Mancini, 2008; Loh, Schutte, & Thorsteinsson, 2013). About 50% of individuals display resilience across various types of stressful situations (Bonanno & Mancini, 2008). An individual's capacity for resilience varies throughout the lifespan depending on a number of intrapersonal, environmental, and circumstantial factors (Graber et al., 2015). For example, increases in resilience are often associated with high quality relationships, social support, high self-esteem, and emotional complexity (Moskowitz, 2010; Smith & Hollinger-Smith, 2015; Uchino, 2006; Zautra, Hall, & Murray, 2010). Features of resilience include positively reappraising stressful stimuli, enhanced abilities to regulate emotions, and superior executive functioning control (Chmitorz et al., 2018; Graber, Pichon, & Carabine, 2015).

Generating high levels of resilience often serves as a great psychological resource. Specifically, high levels of resilience are related to positive outcomes including life satisfaction, well-being, self-efficacy, motivation, happiness, and positive affect (Cohn et al., 2009; Graber, Pichon, & Carabine, 2015; Masten, 2011; Smith & Hollinger-Smith, 2015; Yi et al., 2008). The benefits of resilience derive from stress reduction capabilities. Specifically, resilience helps individuals scaffold the experience of stress in a way that reduces the risk of developing negative stress-related outcomes (Pengilly & Dowd, 2000). Resilience aids in a quicker return to pre-stress physiological and psychological levels (Pereira, Campos, & Sousa, 2017) by decreasing the subjective experience of the stressor (Tuguade & Fredrickson, 2004). Resilience also helps individuals cognitively re-evaluate the purpose and function of stress, while bolstering an

individual's level of efficacy in managing stressful circumstances (Tuguade & Frederickson, 2007). Ultimately, the process of resilience leads to reductions in poor behavioral outcomes stemming from an accumulation of stressful experiences (Campbell-Sills, Cohan, & Stein, 2006; Obradovic, 2010; Rutter, 2006). Consistent with this position, resilience serves as a protective factor against depression and other negative psychological outcomes (Loh, Schutte, & Thorsteinsson, 2013). Overall, there is a confluence of research suggesting resilience increases the likelihood of positive outcomes, while diminishing risk to poor health outcomes.

In light of the emerging benefits of resilience, there are numerous gaps within the resilience literature. Importantly, research is needed to clarify how resilience is activated in the face of stress. During times of stress, positive psychological resources become less accessible (Tuguade & Frederickson, 2007). Yet, despite this effect, people are still able to activate resilience. This paradoxical pattern needs to be explored further to better understand how people activate resilience under varying levels of stressful circumstances. In particular, the Broaden and Build model of positive emotions (Fredrickson, 2001) may be especially useful in clarifying how individuals increase resilience in the face of stress. Of note, positive emotions help replenish physiological and psychological resources (Folkman, 2008) to reduce the effects of stress on important outcomes (Bryant & Veroff, 2007). Given this effect, it may be important to evaluate the moderating effects of variables associated with positive emotions to clarify the effects of stress on resilience.

Savoring, a positive psychological resource, is defined as the capacity to generate, maintain, and enhance positive emotions (Bryant & Veroff, 2007). Savoring interventions are used to generate, prolong, and sustain positive emotions in different contexts (Bryant, 1989). Because positive emotions are a significant factor in explaining resilience (Tuguade,

Fredrickson, & Barrett, 2004), an intervention aimed at increasing savoring may be important in explaining how stress affects resilience.

Purpose

Overall, the purpose of the current study was to clarify the effects of stress on resilience through a positive psychological framework, particularly the Broaden and Build model. In the current study, I experimentally investigated the effects of stress and savoring on resilience. I aimed to answer three questions. As a replication, I attempted to determine whether stress negatively impacts resilience. In terms of extending the literature, I investigated whether (a) a savoring intervention contributed to higher levels of resilience and (b) if a savoring intervention moderated the effects of stress on resilience.

The Effects of Stress on Resilience

Psychological stress is depicted as a person-environment relationship in which an individual perceives the environment to be demanding of his/her currently available resources (Lazarus & Folkman, 1984). The experience of stress is universal and concerns surrounding this issue are growing from a mental health perspective. Research consistently indicates minor and major stressors negatively impact physical and psychological health functioning (Almeida, 2005; Lazarus, 1999; Serido, Almeida, & Wethington, 2004). Specifically, exposure to acute and chronic stressors is associated with substance abuse, depression, anxiety, and unhealthy changes in personal behaviors (Hamer, 2012; McEwen, 2008; Sinha, 2008). Moreover, chronic stress is associated with negative health related outcomes including cardiovascular disease, high blood pressure, and weakened immune system (Baum & Posluszny, 1999). For example, chronic exposure to stress hormones, regardless of developmental time period, impacts brain structures involved in cognition to an extent where individuals find it difficult to recall information and

perform cognitive tasks (Lupien, McEwen, Gunnar, & Heim, 2009). Personal, environmental, and stressor characteristics are important in determining the effects of stress on a specific individual (Dolbier, Jaggars, & Steinhardt, 2010). Importantly, higher levels of resilience dictate the extent to which individuals experience negative stress-related outcomes (Rutter, 2006).

However, resilience can be difficult to access during highly stressful experiences or after experiencing a large number of stressors sequentially. Stress inhibits resilience by depleting cognitive and psychological resources, thereby amplifying the experience of negative, stressful emotions (Ong et al., 2006; Tuguade & Frederickson, 2007). Stress also disrupts allostatic systems important for physiological adaptation to stressful experiences (Karatsoreos & McEwen, 2011). When stress is experienced, allostatic systems (HPA axis, autonomic nervous system, cardiovascular, and immune system) are activated to maintain homeostasis, but when stress overloads these systems they fail to respond sufficiently for adaptation (McEwen & Gianaros, 2011). For example, the stress of sleep deprivation results in heightened levels of cortisol, blood pressure, insulin, and blood glucose, which creates more barriers for recovery efforts (McEwen, 2008).

A number of studies support the position that stress can impact resilience activation. Several studies note stress to be a negative correlate of resilience and hardiness (Hou et al., 2017; Pengilly & Dowd; Smith et al., 2008). Stress is also a negative predictor of resilience (Lui et al., 2016). Additionally, following a stress induction task, participants report lower resilience during a physiological stress response (Tuguade & Fredrickson, 2004). Given these findings, it is important for future research to replicate the debilitative effects of stress on resilience, especially using causal designs.

Overcoming Stress to be Resilient

Despite the negative effects of stress on resilience, stress is paradoxically an antecedent to resilience. For instance, exposure to some adversity over the life course results in more resilience as opposed to no exposure at all (Seery, 2011). A number of comparative and human-based studies demonstrate the importance of stress exposure as a prerequisite for building environmental, biological, and psychological resistance to adversity (Graber et al., 2015; Hennessey & Levine, 1979; Rutter, 2006). For example, monkeys exposed to stress during maternal separation generate lower levels of stress hormones and display higher cognitive control when confronted with stress across time than those not exposed (Lyons, Parker, Katz, & Schatzberg, 2009; Parker, Buckmaster, Schatzberg, & Lyons, 2004). Additionally, people experience greater increases in resilience when exposed to short bouts of stress than those not exposed (Tuguade & Frederickson, 2004). Ultimately, the relationship between stress and resilience is complex and this dynamic needs to be examined in more depth to obtain a clearer picture of how one affects the other.

Not everyone who experiences stress reports reductions in resilience (Pengilly & Dowd, 2000; Pereira, Campos, & Sousa, 2017). In fact, to be resilient individuals must be able to manage different cognitive and emotional systems effectively in the face of stress. For example, emotion regulation interventions increase worker resilience in the context of chronic stress (Klatt, Steinberg, & Duchemin, 2015). Positive emotions help replenish physiological and psychological coping resources (Folkman, 2008). Research suggests that experiencing positive emotions can help build resilience resources depleted by stress (Tuguade & Frederickson, 2007). Thus, interventions aimed toward managing positive emotions may be an effective method of helping people navigate stress to activate resilience.

Savoring as a Moderating Mechanism

Savoring is the ability to acknowledge, amplify, and direct attention to positive experiences and emotions (Bryant & Veroff, 2007). Savoring is an emotion regulation process whereby individuals learn to create and capitalize on positive emotions and experiences to bring about greater personal resources (Bryant & Veroff, 2007). Savoring processes involve directing awareness and attention toward a positive stimulus. Responding to a specific stimulus with a savoring strategy produces heightened positive emotional experiences, which sharpen the value of these positive feelings on personal well-being (Bryant & Veroff, 2007). Savoring strategies regulate the impact of positive events on positive emotions by strengthening the intensity and lengthening the duration of positive feelings (Bryant & Veroff, 2007). For example, people often share personally meaningful achievements with others to prolong the benefits of their achievements. In this example, sharing with others is a means of savoring. Effective savoring strategies also include anticipating, planning, celebrating, and reflecting on one' positive experiences or emotions (Bryant & Veroff, 2007; Gentzler, Kerns, & Keener, 2010). Savoring can manifest through self-reward and strength highlighting (Gentzler, Pamler, & Ramsey, 2016). Overall, savoring strategies are associated with positive outcomes including greater happiness, perceived self-control, well-being, and optimism (Bryant, 2003; Feldman, Joorman, & Johnson, 2008; Jose, Lim, & Bryant, 2012). Experimentally, savoring interventions increase positive affect and life satisfaction and decrease negative affect and depressive symptoms (Bryant, Smart, & King, 2005; Hurley & Kwon, 2013; Lambert et al., 2012).

Savoring processes are integral in building important psychological resources, like resilience (Bryant, 1989; Bryant & Veroff, 2007). Consistent with the Broaden and Build model, savoring broadens the scope by which people think about the world (Tugade & Fredrickson,

2007). Specifically, savoring expands one's thought-action repertoire to include flexible, open, integrative, and creative perspectives when dealing with a given situation (Fredrickson & Branigan, 2005; Isen & Daubman, 1984; Isen, Daubman, & Nowicki, 1987; Isen, Rosenzweig, & Young, 1991). These cognitive patterns are instrumental in helping individuals develop a sense of resilience. Resilient individuals are characterized by openness to experiences, optimism, and curious thinking, which help them adapt and flourish in the face of adversity (Block & Block, 1980; Klohnen, 1996; Masten, 2001). Without these broadened mindsets individuals would likely become entangled in the negative features associated with stress (e.g., cognitive strain, rumination, despair). Savoring in this context provides the necessary resources for individuals to adapt to challenging situations. For example, when faced with a failure, a broadened mindset helps people find a silver lining (e.g., past successes), which is a needed resource in helping people overcome adversity. Armed with these new perspectives, high savoring individuals are more likely to build positive psychological resources, especially resilience.

There is a small sample of research that confirms a link between savoring processes and resilience. Savoring processes are positively related to self-reported resilience (Smith & Hollinger-Smith, 2015; Merino & Privado, 2014). Using experimental designs, research indicates that savoring interventions can increase positive adaptation to difficulties with chronic pain (Zautra et al., 2005). Finally, in some subpopulations (e.g., older adults), participating in savoring training programs can increase levels of resilience (Salces-Cubero et al., 2018). Taken together, these studies provide support for the idea that savoring can increase resilience. However, research utilizing experimental designs with younger samples is needed to further clarify the effects of savoring on resilience.

Can savoring buffer the effects of stress on resilience? Theoretical frameworks argue that savoring can weaken the effects of negative emotional experiences by increasing the experience of positive emotions (Folkman, 2008). Savoring interventions can be effective stress-relief approaches when an individual is able to direct attention toward a positive stimulus and away from impinging pressures (Bryant & Veroff, 2007). During times of stress, the presence of negative emotions increases, steering cognitive resources toward a narrow range of behaviors (e.g., fight, flight) and emotions (Folkman, 2008). If an individual can direct attention away from social pressures and refocus attention toward savoring processing, he/she is less likely to be overwhelmed with negative emotions and more activated toward the building blocks (e.g., efficacy, hope) of resilience (Bryant & Veroff, 2007). For example, after a long stressful day at work, an individual may, during the car ride home, look forward to positive opportunities to connect with family as a means to minimize the negative effects of stressful emotions, like frustration. In this instance, savoring processing (anticipating positive experiences with family) widens an individual's scope of thinking and behaving by directing attention away from stressful emotions (frustration) and inducing positive emotions (joy of connecting with family). In turn, positive emotions generated should increase the activation of important resources, like resilience. Thus, at a theoretical level, savoring interventions seemingly possess the capacity to ameliorate the negative effects of stress on resilience (Fredrickson, 2000).

There is sparse empirical evidence concerning the moderating role of savoring on the relationship between stress and positive psychological outcomes. However, a handful of studies provide some evidence for the moderating effects of savoring. For instance, in different clinical and non-clinical samples, savoring moderated the effects of stress on depression; higher levels of savoring reduced the associated effects of stress on depression scores (Ford, Klibert, Tarantino,

& Lamis, 2017; Hou et al., 2017). Additionally, savoring buffers the effects of stressful emotions on different suicide outcomes (Klibert, Luna, & Miceli, in press). Over a two week period, a study also found that the use of a savoring intervention moderated the effect of depression in young samples with dysphoric symptoms (McMakin, Seigel, & Shirk, 2011). Overall, these studies suggest savoring can mitigate the effects of stress on different mental health outcomes. However, it is important that research examine whether savoring can ameliorate the effects of stress on important psychological resources, like resilience, using experimental designs.

Current Study

Overall, examining the effects of savoring on stress on different health outcomes is an emerging line of inquiry. Yet, there are still a number of gaps that need to be addressed within the literature to confirm whether savoring can serve as a stress buffer. Importantly, no study, to date, has yet to determine whether savoring can buffer the negative effects of stress on resilience. Moreover, a significant amount of the literature regarding the buffering effects of savoring is correlational. There is a need for models that determine whether savoring interventions directly reduce the effects of negative psychological outcomes using experimental designs. Results stemming from experimental designs may provide more clinical utility for the use of savoring in psychological service and a framework for new models to use savoring as a means of prevention and intervention for various outcomes. Specifically, by manipulating savoring interventions following induced stress and examining changes in resilience, the study hopes to add experimental evidence for the moderating role of savoring on positive psychological outcomes.

In line with the direction of the field, the current study aimed to address gaps within the savoring literature. Guided by the framework of the Broaden and Build model (Fredrickson, 2001), I expected that (a) stress would negatively impact self-reports of resilience, (b) savoring

interventions would positively impact self-reports of resilience, and (c) savoring interventions would moderate the association between stress and resilience. Specifically, I expected the effects of stress on resilience to be minimal when a savoring intervention was employed.

CHAPTER 2: METHODOLOGY

Participants

A total of 118 students participated in the study. Thirty-four individuals' responses were excluded due missing data or concerns of motivation or attention noted by the researcher. The final sample included 84 individuals. The average age of participants was 19.56. Sixty-four identified as women (76.2%), and 19 as men (22.6%). Forty-five participants identified as White/Non-Hispanic (53.6%), 32 as African American (38.1%), 4 as Mexican American/Latino (4.8%), and 3 as Multiracial (3.6%). Regarding socioeconomic status (SES), 2 participants described themselves as "poor/impoverished" (2.4%), 42 as having "some financial resources" (50%), 38 as having "substantial financial resources" (45.2%), and 2 as "affluent/rich" (2.4%).

Two check questions were included in the experiment, and participants missing at least 1 check question were excluded from analyses. Participants who failed to complete the stress measure at time 1 and 2 were also excluded from analyses. Participants with administrator observed concerns of validity were excluded from analyses (priming effects, misdirection of attention, awareness of manipulation). In total, 34 participants were removed from the analysis due to validity concerns. Of the 34 individuals, 17 individuals failed to complete any aspect of the study, 6 did not respond to the stress measure at Time 1 or Time 2, 6 demonstrated non-responsiveness (i.e., sleeping, distracted by smart watch, etc.) during the experiment, and 5 failed at least one check question.

Less than 5% of the final sample recorded missing data. As such, mean imputation was chosen as the method for managing missing data. Participants who skipped prompts and item failed to answer between 1-2 survey questions. Considering the low levels of missing data, I decided to use a participant mean-imputation method to address missing data at the item level.

First, we calculated a mean score based on non-missing items of a single participants responses to the scale with missing data, and then replaced the missing value with the mean score. Using mean imputation is a reasonable method to choose when reliability is $\alpha > .70$ and groups of items form a singular and well-defined domain (Schafer & Graham, 2002). For the current study, internal reliability estimates for the BRS ranged from $\alpha = .87$ to .90, and the BRS is a well-defined construct with over 50 studies reporting a valid definition and singular structure. Considering these aspects of the BRS combined with the low prevalence of missing data in the current study, the decision to use mean imputation is warranted.

Research Design

The current study employed an experimental mixed-subjects design. All participants were randomly assigned to a stress induction (see Appendix 1) or neutral induction (see Appendix 2) task. After completing an induction task, participants were then randomly assigned to an intervention task, a savoring intervention (see Appendix 3) or control intervention (see Appendix 4). Between and within groups comparisons across conditions were analyzed.

Procedure

Students who were registered in SONA and interested in participating signed up for a designated time slot. Those who signed up were provided with the date, time, and location of the study. Upon arrival, participants were given an informed consent that explained possible risks and benefits associated with the study, confidentiality, compensation, resources available, and participation withdrawal guidelines. Participants read over the informed consent document and indicated their consent to participate by providing their signature. After completing the informed consent form, participants were asked to keep any personal belongings in a secure location for the remainder of the study and prompted to use the restroom if needed.

Once participants settled in the designated area, participants completed a baseline measure of resilience and stress. Next, participants were randomly assigned to either a stress induction task or a neutral induction task. The tasks are similar to ones employed by Tugade and Fredrickson (2004). Participants completed the induction tasks in 5 minutes. Stress ratings were taken after participants completed either the stress or neutral induction tasks.

Participants were then randomly assigned to either a savoring or control intervention. Participants completed the intervention task in 10 minutes. After participants finished one of the two intervention tasks, they completed the final measures of resilience and stress and a demographic information sheet. Participants were then given a debriefing form containing available low to no cost resources to utilize if they were distressed by participating in the study.

Measures

Stressometer. Stress was measured using a single item self-report measure that asks participants to report their level of stress in the current moment. The item is rated on a slider scale ranging from 0 (*No Stress*) to 100 (*Most Stress*). Other designs utilizing this global stress measure demonstrate its validity with other stress measures and stress-related constructs (Keegan et al., 2015).

Brief Resilience Scale (BRS). The BRS is a 6 item instrument designed to measure resilience, the ability to bounce back or recover from stress (Smith et al, 2008). Items are measured on a 5-point rating scale from 1 (*Strongly Agree*) to 5 (*Strongly Disagree*). For the purposes of this study, participants were asked to respond how they perceived their level of resilience in the current moment. Total scores range from 6 to 30 with higher scores indicating higher levels of resilience. The BRS has good internal consistency (α=.80-.91; Smith et al, 2008) and great validity with other measures of resilience, life purpose, social support, optimism, and

positive coping and reframing (Smith et al, 2008). For the current study, internal reliability estimates ranged from α=.87-.90.

Ego Resiliency Scale (ERS-). The ERS is a 14 item instrument that measures ego resilience, our ability to adapt to stressful environmental stimuli (Block & Kremen, 1996). Items are measured on a 4-point rating scale from 1 (*Does not apply to me at all)* to 4 *(Applies to me very strongly).* Participants were asked to respond how they perceived their level of resilience in the current moment. Total scores range from 14 to 56. The ERS demonstrates good internal consistency (α = .70 to .80; Block & Kremen, 1996) and convergent validity with different measures of personality (Block & Kremen, 1996). The internal reliability estimate for the current study was α=.79.

Planned Analyses

The current study used multiple analyses to investigate the research questions associated with this study. A preliminary and primary analysis were conducted. As a manipulation check for the stress induction task, I ran a 2 (Time 1, Time 2) x 2 (Stress, Neutral) mixed ANOVA to examine the main effect and interaction effects of time and induction task on self-reported stress.

For the primary analysis, I ran a 2 (Stress; Neutral) x 2 (Savoring; Control) x 2 (Time 1; Time 2) mixed ANOVA to examine the main and interaction effects of the induction task, intervention task, and time on self-reports of resilience. Follow-up independent t-tests were used to further deconstruct relevant main and interaction effects.

CHAPTER 3: RESULTS

Preliminary Analyses

Differences Between Valid and Removed Participants. We ran a MANOVA to determine if groups (valid vs. removed participants) differed on measures of baseline stress, baseline state resilience, and trait resilience. Results indicated a non-significant difference in state resilience for individuals included (M = 19.76, SD = 4.70) and those excluded (M = 19.69, SD = 3.33) from the analyses $F(1, 93) = .003$, $p = .959$, $\eta_p^2 = .000$. There was also a non-significant difference with regard to trait resilience $F(1, 93) = .068$, $p = .795$, $\eta_p^2 = .001$ between those included (M = 34.42, SD = 7.47) and excluded (M = 33.85, SD = 6.28). Finally, no significant differences were detected for baseline stress scores between those included (M = 43.19, SD = 29.22) and excluded (M = 43.15, SD = 20.88) from analyses $F(1, 93) = .000$, p = .997, $\eta_p^2 = .001$. Overall, these results confirm no significant differences in the study's variables between those included and excluded from analyses.

Manipulation Checks. As a manipulation check for the stress induction task, a 2 x 2 (Time x Induction Condition) mixed ANOVA was used to analyze the data. Means and standard deviations are reported in Table 1. We hypothesized that stress would increase significantly from time 1 to time 2 for those in the stress induction condition. There was a non-significant main effect for Time $F(1, 82) = .642$, $p = .425$, $\eta_p^2 = .01$, indicating that self-reported stress did not significantly change from time 1 to time 2 across induction groups. We expected induction condition to significantly affect reported stress from time 1 to time 2. Alternatively, there was a significant main effect of induction condition $F(1, 82) = 15.1$, $p = .00$, $\eta_p^2 = .16$, indicating that stress scores significantly changed depending on induction condition. We expected those in the stress induction to report significantly higher stress at time 2 than those in the neutral induction

condition. There was a significant (Time x Induction Condition) interaction $F(1, 82) = 25.8$, $p = .00$, $\eta_p^2 = .24$, such that those completing the stress induction task reported higher stress at time 2 than those completing the neutral induction task. To deconstruct the interaction effect, post-hoc independent t-tests were analyzed. We expected induction groups to have similar baseline levels of reported stress. The tests revealed a non-significant difference in self-reported stress at time 1 between those in the Neutral Induction ($M = 39.12$, $SEM = 3.99$) and Stress Induction ($M = 47.07$, $SEM = 4.14$), indicating that both groups had comparable baseline levels of self-reported stress $t(96) = -.611$, $p = .838$. However, post-hoc analyses indicated a significant difference in self-reported stress at Time 2 between those in the Neutral ($M = 32.18$, $SEM = 3.71$) and Stress Induction ($M = 59.94$, $SEM = 4.15$). In line with our hypothesis, individuals in the Stress Induction condition reported significantly higher self-reported stress than those in the Neutral induction condition $t(95) = -4.99$, $p = .00$, indicating that the stress induction manipulation was effective in increasing stress. Figure 1 depicts the deconstructed interaction effect.

There are two important patterns of findings within these analyses. First, groups reported comparable levels of stress at baseline. This finding suggests there were few differences between participants randomly assigned to the Stress Induction vs. the Neutral Induction conditions regarding stress. Second, these findings indicate that self-reported stress significantly increased for those in the induction condition from Time 1 to Time 2 consistent with the anticipated effect.

I also examined the data for baseline differences in resilience between individuals randomly assigned to the Stress Induction vs. Neutral Induction groups using a between subjects ANOVA. I ran this analysis to ensure there were no pre-existing differences in resilience between induction groups prior to random assignment. Self-reported resilience was examined at Time 1 for the Neutral Induction ($n = 41$) and Stress Induction ($n = 43$) groups. Results indicated

a non-significant main effect of induction condition on Time 1 Resilience, $F(1, 82)= .059$, $p = .425$, $\eta_p^2 = .001$. These results indicate that self-reported resilience was comparable across induction groups at baseline.

Primary Analysis

A 2 (Induction task; Stress, Neutral) x 2 (Intervention task; Savoring, Control) x 2 (Resilience, Time 1; Time 2) mixed ANOVA was used to examine the main and interaction effects of time, induction task, and intervention task on resilience scores. Table 2 provides marginal means and standard deviations for resilience among induction tasks and intervention groups at Time 1 and Time 2. Results did not support the proposed predictions. We expected unique changes in resilience scores based on induction and intervention group. However, there was a significant main effect of Time $F(1, 80)= 21.41$, $p = .00$, $\eta_p^2 = .21$, where resilience scores increased for all members across induction and intervention groups. We hypothesized that the stress induction task would decrease resilience scores. However, there was a non-significant main effect for induction task $F(1, 80) = .01$, $p = .939$, $\eta_p^2 = .00$, such that self-reported resilience did not significantly differ for those in the Stress Induction ($M = 21.49$, $SD = 5.07$) vs. Neutral Induction ($M = 21.56$ $SD = 4.50$) groups at Time 2, $t(82) = .07$, $p = .95$. This indicates that the stress experience did not negatively impact reported resilience. We expected that a savoring intervention would increase reports of resilience, however, there was also a non-significant main effect of intervention task $F(1, 80) = .73$, $p = .395$, $\eta_p^2 = .01$, such that self-reported resilience did not significantly differ between individuals randomly assigned to the Savoring Intervention ($M = 21.87$, $SD = 4.92$) vs. Control Intervention ($M = 21.13$, $SD = 4.62$) groups at Time 2, $t(82) = -.71$, $p = .48$. Finally, we expected the effects of stress on resilience to be minimized when a savoring intervention was employed. Contrary to our hypothesis, there was an non-significant

three-way (Time x Induction Task x Intervention Task) interaction $F(1, 80)= .114$, $p = .736$, $\eta_p^2 = .00$ indicating that participants in the stress induction and savoring intervention group did not experience unique changes in resilience compared to the other groups.

Controlling for Trait Resilience. As an exploratory analysis we re-ran the main analysis with trait resilience as a covariate**,** given the unexpected findings associated with the first analysis. I wanted to control for the effects of trait resilience scores to better determine whether the brief induction and intervention tasks can affect change in state resilience scores. In other words, I wanted to make sure that the natural predisposition for resilience did not affect changes in state resilience scores. A 2 (Induction Task; Stress, Neutral) x 2 (Intervention Task; Savoring, Control) x 2 (Resilience; Time 1, Time 2) mixed ANOVA was used to analyze the data. We anticipated that participants reporting higher levels of trait resilience to report higher levels of state resilience. In line with our expectations, there was a significant main effect of trait resilience as a covariate, $F(1, 79) = 21.22$, $p = .00$, $\eta_p^2 = .21$, where individuals with high trait resilience scores reported elevated state resilience scores at Time 1 and Time 2. We did not expect resilience to increase for all groups. In line with that hypothesis, there was a non-significant main effect of time $F(1, 79) = 1.83$, $p = .18$, $\eta_p^2 = .02$, indicating that resilience did not significantly increase across time for all groups. We expected the experience of stress to negatively impact resilience, however, there was a non-significant main effect of Induction Task $F(1, 79) = .02$, $p = .898$, $\eta_p^2 = .00$, indicating that resilience did not significantly decrease for those in the stress induction condition. We expected a savoring intervention to boost resilience scores from time 1 to time 2. However, there was a non-significant main effect of Intervention Task $F(1, 79) = .07$, $p = .799$, $\eta_p^2 = .00$, indicating that those completing the savoring intervention did not report higher levels of resilience compared to those completing the control

intervention task. We expected a savoring intervention to negate the effects of stress on resilience scores. Contrary to our hypothesis, results showed a non-significant three-way (Time x Induction Task x Intervention Task) interaction $F(1, 79)= .12$, $p = .728$, $\eta_p^2 = .00$, indicating that those completing the savoring intervention and stress induction did not experience unique changes in resilience compared to other groups even when controlling for trait resilience.

CHAPTER 4: DISCUSSION

Review of Purpose

The current study aimed to investigate the effects of stress and savoring on change in state resilience scores. I sought to answer 3 main questions: (a) whether stress decreases state resilience scores, (b) whether a savoring intervention increases state resilience scores, and (c) whether savoring interventions moderate the effects of stress on state resilience scores. Experiencing hassles and stressors is a part of everyday life. However, knowing how people use strategies to increase positive emotions in the face of everyday stress to build resilience is important for increasing wellness and well-being (Cohn et al., 2009; Graber, Pichon, & Carabine, 2015; Masten, 2011; Smith & Hollinger-Smith, 2015; Tuguade & Frederickson, 2004; Yi et al., 2008).

Effectiveness of Stress Induction Task

I ran a 2 (Time 1, Time 2) x 2 (Stress Induction, Neutral Induction) mixed ANOVA to examine fluctuations in reported stress scores, as a manipulation check. I ran this analysis to make sure that those receiving the stress induction task reported significantly higher levels of stress at time 2 when compared to those receiving the neutral induction task. There were no pre-group differences in reports of stress. Results from the analysis indicated that those who completed the stress induction task reported significantly higher stress scores at time 2 compared to those who completed the neutral induction task. This finding indicates that the induction manipulation produced the expected effects. It also provides additional support for use of the adapted Trier Social Stress Test (Tuguade & Frederickson, 2004) as a viable method of inducing moderate amounts of stress, consistent with the experience of a daily hassle, in college student samples. In order to expand upon my finding, in the future, studies may benefit from including

more objective measures of stress such as heart rate and galvanic skin response as a means to evaluate whether my induction and neutral tasks are effective in eliciting the intended effects. This could provide more accurate insights on how long the intended effects last, as well as if the neutral task has any physiological impacts on stress. Future studies may also benefit from modifying the task to induce a greater intensity of stress consistent with the experience of an acute stressor. For example, the current task induces stress in the form of a minor daily hassle, it is important for future to determine if this task can be modified further to reflect different types of stress.

Changes in Resilience Scores across Time

In the primary analysis, I ran a 2 (Time 1, Time 2) x 2 (Induction task, Neutral task) x 2 (Intervention task, Control task) mixed ANOVA to determine the effects of time, induction task and intervention task on state resilience scores. Results revealed a significant main effect for time, such that state resilience scores increased across time for all groups. This effect was not expected. Specifically, based on the literature, I expected more fluctuations in state resilience scores depending upon the groups participants were randomly assigned. This unique effect may be due to several factors. First, priming may have affected how participants responded to the state resilience measures. Specifically, completing the resilience measure multiple times during the procedures may have provided unique insights into the nature of the study, which in turn may have resulted in more socially desirable responding. For instance, if individuals thought the goal of the study was to increase their scores after each task, they might have altered their responses to fit this pattern, resulting in the pattern of findings highlighted in Figures 2 and 3. In fact, I included a free response item asking participants what they thought the study was about after they completed all study elements. Of the participants that responded (N = 100), 41 guessed that

the study involved measuring stress and stress-based processes before and after different tasks across time. This finding suggests participants were aware, in some part, of the nature of the study and supports the notion that social desirability may have played a significant role in explaining why all groups' resilience scores increased across time.

Another explanation for the increase in state resilience scores across groups may be due to unintended therapeutic benefits underlying the control intervention task. In the control task, participants were asked to write a story about a typical trip to the grocery store. Based on the available literature (Ford, Klibert, Tarantino, & Lamis, 2017; Hou et al., 2017; McMakin, Seigel, & Shirk, 2011; Salces-Cubero et al., 2018; Zautra et al., 2005), the intended purpose behind the control intervention task was to not elicit positive or negative emotions and have an identical structure (i.e., guided imagery) to the intervention task. However, despite the intended effects, the control intervention task is still a guided imagery procedure. It is possible that guided imageries constructed around bland stimuli (trip to the grocery store) may still promote positive effects that may increase perceptions of in the moment resilience. For example, the control intervention task may have distracted participants from the stressor resulting in positive emotional coping or self-soothing efforts that resemble how people activate resilience. It is important that future studies re-evaluate my findings with a more reliable control intervention task. One option for the control intervention task would be using a true control where participants spend the amount of time equivalent to the intervention task doing nothing (Price, Jhangiani, & Chiang, 2015). This type of control would provide insights into whether changes in resilience are due to the passage of time or the distracting nature of the control task.

Stress and Resilience

Consistent with the goals of the current study, I examined the effects of a stress induction task on changes in state resilience**.** Results did not highlight stress as a significant component in altering participants' state resilience scores. This finding is not consistent with the literature, where stress is an influential factor in terms of how people activate and express resilience (Hou et al., 2017; Lui et al., 2016; Pengilly & Dowd; Smith et al., 2008; Tuguade & Fredrickson, 2004). There may be multiple reasons why my findings were dissimilar from the predominant literature. First, I did not measure resilience directly after the induction tasks. It is possible that the stress induction task may have generated small but meaningful fluctuations in state resilience scores. However, I was unable to assess these fluctuations because I did not measure for state resilience immediately after participants completed one of the two induction tasks. Also, it is possible that any fluctuations in resilience scores due to stress may have been extremely time limited. This may explain why stress did not impact resilience at time 2, which was measured after participants completed all behavioral tasks in the study. In the future it would be wise to include a midpoint measure of resilience to more completely detect the effects of stress induction tasks on changes in state resilience.

Second, I chose to manipulate stress in a manner consistent with a daily hassle. Given that hassles are irritants rather than consistent and chronic forms of physiological strain, they may have less of an effect on changes in resilience, especially when compared to acute and persistent stressors. In the future it may be more beneficial to set up the induction task similar to a more pervasive stressor as to better account for changes in resilience. For example, instead of having participants prepare to give a speech to a video camera, they could meet "judges" who are confederates prior to preparing their speech as a means to make the task more real and induce

higher levels of stress. Another option is to add an additional stress induction task to induce different types of stress such as the Stroop test. Overall, the relationship between stress and resilience still needs clarification, and the recommendations above may be a good next step for research to extend our understanding of the impact of stress on resilience.

Savoring Intervention and Resilience

I also examined whether a savoring intervention could affect change in state resilience scores. Results showed a non-significant effect for intervention task on resilience scores, which was inconsistent with the expected outcome. Specifically, research shows that savoring interventions can increase positive adaptation to intense and persistent stressors, like chronic pain (Zautra et al., 2005), and that participating in savoring training programs can increase levels of resilience (Salces-Cubero et al., 2018). In total, these findings suggest savoring interventions could be a promotional factor to resilience. However, my findings are not in line with this position. There are many possible reasons for the disconnect between my findings and the one's offered in the literature. For instance, my results may highlight natural holes in the theoretical framework, given that there is little experimental research demonstrating how savoring affects resilience. It is possible that savoring interventions may not directly relate to how college students increase resilience. The unique features of college students, i.e., high psychological resources, suggests college student samples report fairly high if not maximum levels of resilience as measured by the BRS. Because college students are reporting extremely high levels of resilience at baseline, there may be few interventions that could produce significant increases. This pattern of scores is consistent with a ceiling effect, which underestimates variability and negatively affects estimates of validity for a specific measure (Uttl, 2005). In order to maximize variability in resilience reports, future researchers may need either develop a new measure or

adapt existing measures of state resilience. Then, it would be prudent to re-analyze the study's main questions to determine whether savoring interventions can increase changes in state resilience scores in college student samples.

Another possible reason for my findings may be due to another methodological flaw associated with the BRS. The BRS only examines recovery aspects of resilience (bounce back), and fails to capture thriving elements, such as how one grows and enhances their well-being. It is quite possible that savoring may be important for increasing thriving aspects of resilience and not recovery aspects of resilience. Future studies would benefit from using a broader measure that captures both elements of resilience independently and collectively. In this way, research may be able to better clarify how savoring impacts fluctuations in resilience.

Moderated Effect

The primary question of the current study was whether a savoring intervention could moderate the effects of stress on state resilience scores. Results did not reveal a significant interaction effect. Participants who experienced stress and were randomly assigned to the control versus intervention task did not report significant differences in resilience at time 2. This finding is inconsistent with the literature, which suggests that savoring constructs mitigate the effects of stress on different well-being outcomes (Ford, Klibert, Tarantino, & Lamis, 2017; Hou et al., 2017; Klibert, Luna, & Miceli, in press; McMakin, Seigel, & Shirk, 2011). Again, there are a few explanations for why my findings are discordant from those in the literature. For example, there may be some theoretical and methodological explanations worth exploring further. First, savoring may not be a great coping or mitigating factor to stress. For savoring to be effective, individuals have to identify and capitalize on positive emotions that can be drawn out from a stressful experience. Without training, this may be a difficult and even a counterintuitive action

for most people. For example, most people focus on negative emotions after experiencing a stressor (Rutter, 2006) and may have difficulty sorting through those negative emotions to find positive emotions (Ong et al., 2006; Tuguade & Frederickson, 2007). Without identifying these positive emotions, it may be difficult for people to even to engage in savoring, a process of generating, prolonging, or extending positive emotional responses. In the future, it may be important to evaluate the buffering effects of savoring in samples that have been trained to identify positive emotions during and after a stress experience. These results would provide useful information on if and when savoring strategies can be employed to mitigate effects of stress on various positive outcomes.

Second, positive interventions are more effective for those with low psychological resources (Hurley & Kwon, 2013). Therefore, the sample used in a current study may have been a confounding variable. For instance, college students usually report higher psychological resources (Peterson, 2001). Because students may possess high resources, like resilience, positive psychological interventions may have less of an impact. Specifically, savoring is most effective for those who experience few positive events, so with a population that is typically not lacking in positive events, a savoring intervention may have little to no detectable effect. Ultimately, the effects of savoring on resilience may be minimized in a college student sample. In the future, it would be beneficial to reexamine the current study using a sample people who report fewer psychological resources.

Implications

The savoring model advocates for the inclusion of savoring into everyday forms of psychological treatment options. However, the findings of the current study indicate further evaluation is needed to determine if savoring is an important factor in terms of increasing

resilience. In the current study, a savoring intervention did not increase resilience nor moderate the effects of stress on resilience. Researchers and clinicians should be cautious of attempting to use savoring to increase resilience. Before savoring interventions can be utilized as a practical approach to increasing positive psychological resources like resilience, more research is needed. Specifically, future research should re-evaluate my procedure with diverse populations rather than college samples, focus on growth aspects of resilience in addition to recovery aspects, and aim to generate more experimental evidence to shed light on the relationship between these constructs.

Limitations

The current study included a few additional limitations worth noting. One issue encountered with the current study included a large number of participants (28.8%) who no-showed. It is unknown whether participants who completed the study were different than those who no-showed. Moreover, it is unknown if any these potential differences may have affected the findings of the study. It is important that future researchers consider creative methods of increasing attendance from participants. Another limitation was lack of demographic diversity in the sample. For instance, the majority of the participants identified as relatively young, Caucasian women. It is important that future studies re-examine my procedure with more diverse samples including older participants who identify as ethnic, gender, and sexual minorities. Additionally, four experimenters ran participants during the course of the study, which increases experimenter bias due to potential differences in interpersonal style, communication tone, or even the ethnicity of the experimenters. In the future, research may want to work on automating the tasks to exclude experimenter-participant interaction. Finally, the control intervention included positive language, such as “good stories should” and “good stories

outline" that may have primed participants to respond positively to the control stimuli. This language may have compromised the intended effect of the control intervention, which was to not elicit positive or negative emotions. In the future, researcher should consider the language in forming a control intervention when measuring for different emotional constructs.

Overall Conclusions

The current study revealed a few interesting findings to inform future work in this area. First, I was able to induce stress; however, stress did not have a significant impact on resilience. Future studies examining stress and resilience should utilize different stress manipulations and more comprehensive resilience measures to gain more insight to this relationship. Additionally, a savoring intervention did not increase resilience nor buffer the effects of stress on resilience. More research on savoring must be conducted before acknowledging the practical use of savoring interventions on different populations. Resilience increased across time for all participants, which could mean that a large aspect of resilience involves directing attention away from stressors more so than toward positive emotions. Though the findings of the current study did not align with the expected outcomes, they provide insight on future research directions involving resilience, stress, and savoring.

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APPENDIX 1

Stress Induction Task

Stress Induction Task: *Please read the response below directly to the participant.*

> "We would now like to ask you to participate in a verbal task. Please mentally prepare yourself to give a three minute speech on a to-be-determined topic. Your speech may be video recorded. Your recorded speech may be shown to peers in another study for evaluation. I am going to leave the room for a few minutes to prepare the video recording equipment and get the topic of your speech. While I am away please prepare yourself mentally to give a three minute speech. When I return, I will give you the topic of the speech you are to give."

*After giving these instructions, the research assistant will leave the room for approximately **2 minutes**. When the research assistant returns to the participant, he/she will give the participant the following instructions:*

> "I have identified the chosen topic for your speech. I would like for you to discuss "Why you are an attractive person" in your speech. I am going to give you a few more minutes to collect your thoughts. I am going to leave the room to complete a few more things. While I am away, please think about your attractive qualities and how you can incorporate them in a three minute speech. When I come back I will give you the go-ahead to give your speech. When you give your speech, please look into the camera and speak very clearly about why you are an attractive person. Again, I will let you know when to begin when I come back."

The research administer will leave for 2 minutes When the two minutes are up the research assistant will enter the room and use the following prompt.

> "Before giving your speech, please answer one survey question."

After the participant responds to the survey question, please relay the following info:

> "Okay, given certain time constraints, we have decided to discontinue the speech. We will no longer ask you to give the speech. Please stay seated and we will proceed to the next task shortly."

APPENDIX 2

Neutral Induction Task

Neutral Induction Task: *Please read the response below directly to the participant.*

> "I am going to ask you to review a written speech on a to-be-determined topic. I am going to give you a paper in which the speech is written on. All you need to do is read it and mentally review it. I am going to retrieve the speech now. You will not be evaluated in anyway on your knowledge of the speech. I would just like for you to read it silently to yourself a couple of times. While I am away please prepare yourself mentally to read the speech. When I return, I will give you the topic of the speech you are to read."

After giving these instructions, the research assistant will leave the room for approximately 2 ***minute****. The research assistant will turn the video camera on (this will be indicated to the participant by either a flashing red or green light). When the research assistant returns to the participant, he/she will give the participant the following instructions:*

> "I am going to ask you to read over and review a three minute speech "How a Bill Becomes a Law." Please prepare yourself read over this speech *(hand speech to participant)*. I am going to give you a few more minutes to collect your thoughts. Do not begin reading the speech until I return. Just prepare yourself to read over a speech about how a bill becomes a law. When I return, I will give you the green light to begin reading the speech. When you do get the green light to read the speech, please read over it carefully. Also, please read over the speech multiple times. I will be back shortly.

The research administer will leave for 2 minutes When the two minutes are up the research assistant will enter the room and use the following prompt.

> "Before reading the speech, please answer one survey question."

After the participant responds to the survey question, please relay the following info:

> "Okay, given certain time constraints, we have decided to discontinue this part of the study. We will no longer ask you to read this speech. Please stay seated and we will proceed to the next task shortly."

How a Bill Becomes a Law

Creating laws is the U.S. House of Representatives' most important job. All laws in the United States begin as bills. Before a bill can become a law, it must be approved by the U.S. House of Representatives, the U.S. Senate, and the President. Let's follow a bill's journey to become law.

1. The Bill Begins

Laws begin as ideas. These ideas may come from a Representative—or from a citizen like you. Citizens who have ideas for laws can contact their Representatives to discuss their ideas. If the Representatives agree, they research the ideas and write them into bills.

2. The Bill Is Proposed

When a Representative has written a bill, the bill needs a sponsor. The Representative talks with other Representatives about the bill in hopes of getting their support for it. Once a bill has a sponsor and the support of some of the Representatives, it is ready to be introduced.

3. The Bill Is Introduced

In the U.S. House of Representatives, a bill is introduced when it is placed in the hopper—a special box on the side of the clerk's desk. Only Representatives can introduce bills in the U.S. House of Representatives.

When a bill is introduced in the U.S. House of Representatives, a bill clerk assigns it a number that begins with H.R. A reading clerk then reads the bill to all the Representatives, and the Speaker of the House sends the bill to one of the House standing committees.

4. The Bill Goes to Committee

When the bill reaches committee, the committee members—groups of Representatives who are experts on topics such as agriculture, education, or international relations—review, research, and revise the bill before voting on whether or not to send the bill back to the House floor.
If the committee members would like more information before deciding if the bill should be sent to the House floor, the bill is sent to a subcommittee. While in subcommittee, the bill is closely examined and expert opinions are gathered before it is sent back to the committee for approval.

5. The Bill Is Reported

When the committee has approved a bill, it is sent—or reported—to the House floor. Once reported, a bill is ready to be debated by the U.S. House of Representatives.

6. The Bill Is Debated

When a bill is debated, Representatives discuss the bill and explain why they agree or disagree with it. Then, a reading clerk reads the bill section by section and the Representatives recommend changes. When all changes have been made, the bill is ready to be voted on.

7. **The Bill Is Voted On**

There are three methods for voting on a bill in the U.S. House of Representatives:

1. Viva Voce (voice vote): The Speaker of the House asks the Representatives who support the bill to say "aye" and those that oppose it say "no."
2. Division: The Speaker of the House asks those Representatives who support the bill to stand up and be counted, and then those who oppose the bill to stand up and be counted.
3. Recorded: Representatives record their vote using the electronic voting system. Representatives can vote yes, no, or present (if they don't want to vote on the bill).

If a majority of the Representatives say or select yes, the bill passes in the U.S. House of Representatives. The bill is then certified by the Clerk of the House and delivered to the U.S. Senate.

8. The Bill Is Referred to the Senate

When a bill reaches the U.S. Senate, it goes through many of the same steps it went through in the U.S. House of Representatives. The bill is discussed in a Senate committee and then reported to the Senate floor to be voted on.

Senators vote by voice. Those who support the bill say "yea," and those who oppose it say "nay." If a majority of the Senators say "yea," the bill passes in the U.S. Senate and is ready to go to the President.

9. The Bill Is Sent to the President

When a bill reaches the President, he has three choices. He can:

1. Sign and pass the bill—the bill becomes a law.
2. Refuse to sign, or veto, the bill—the bill is sent back to the U.S. House of Representatives, along with the President's reasons for the veto. If the U.S. House of Representatives and the U.S. Senate still believe the bill should become a law, they can hold another vote on the bill. If two-thirds of the Representatives and Senators support the bill, the President's veto is overridden and the bill becomes a law.
3. Do nothing (pocket veto)—if Congress is in session, the bill automatically becomes law after 10 days. If Congress is not in session, the bill does not become a law.

10. The Bill Is a Law

If a bill has passed in both the U.S. House of Representatives and the U.S. Senate and has been approved by the President, or if a presidential veto has been overridden, the bill becomes a law and is enforced by the government.

APPENDIX 3

Savoring Condition Script

General Instructions: I am going to give you a scenario to imagine yourself in. During the task, please take your time and be aware of the feelings that the task evokes. After you recall yourself in the scenario, I will ask you some questions at the end.

Prompt A: Narrative Task

Verbal Instructions: Take a few minutes and recall one of your most pleasurable life experiences. Choose an experience in which you felt exceptionally satisfied, delightful, and content. Take a minute or two to choose your most pleasurable experience. Let me know when you have it.

With your chosen experience in mind, I would like you to engage in a small writing task. Specifically, I would like you to write a small story highlighting your most pleasurable experience on this computer. Remember, a good story should have a beginning, middle and an end. Also, good stories outline how the main characters take pleasure and celebrate different aspects of the story. When ready type up the story of your most pleasurable experience and how it came about. Please write at least 400 words. Please let me know when you are finished**.**

Prompt B: Extension Task

Verbal Instructions: Now that you have written your story. I would like to ask you a few questions about it.

1) Please name the one thing that contributed most to your feelings of pleasure within your story? (Let the participant name the thing) → How did (name thing) extend your feelings of pleasure?

2) How has this experience impacted the person you are?

APPENDIX 4

Control Condition Script

General Instructions: I am going to give you a scenario to imagine yourself in. During the task, please take your time and be aware of the feelings that the task evokes. After you recall yourself in the scenario, I will ask you some questions at the end.

Prompt A: Narrative Task

Verbal Instructions: Take a few minutes and think about a typical trip to the grocery store. Think about the complete process of making a trip to the grocery story. Think about things you need to do before making the trip, things you do while at the grocery store, and things you need to complete when you return home. Let me know when you have a complete story in your head.

With your grocery process in mind, I would like you to engage in a small writing task. Specifically, I would like you to write a small story about your typical trip to the grocery store. Remember, a good story should have a beginning, middle and an end. Also, good stories outline how the main characters perform each step of their experience. When ready type of the story of going to the grocery store. Please write approximately 400 words. Please let me know when you are done and please do not close out the document when you are done."

Prompt B: Extension Task

Verbal Instructions: Now that you have written your story. I would like to ask you a few questions about it.

1) Please name the one thing that you need most in making a trip to the grocery store? (Let the participant name the thing) → How does (name thing) help you?

2) How does going to the grocery store affect your day?

TABLE 1

Table 1: The Means and Standard Deviations of Stress by Time and Induction Task.

Time	Induction Task	Mean	Standard Deviation	N
Time 1 Self-Report Stress	Neutral	39.12	30.22	41
	Stress	47.07	28.04	43
	Total	43.19	29.22	84
Time 2 Self-Report Stress	Neutral	27.85	24.42	41
	Stress	62.56	28.50	43
	Total	45.62	31.67	84

TABLE 2

Table 2: The Means and Standard Deviations of Resilience by Time, Induction Task, and Intervention Task.

Time	Induction Condition	Intervention Group	Mean	Standard Deviation	N
Resilience Time 1	Neutral	Control	19.32	5.33	19
		Savor	19.91	4.68	22
		Total	19.63	4.99	41
	Stress	Control	19.20	5.01	20
		Savor	20.48	4.06	23
		Total	19.88	4.52	43
	Total	Control	19.26	5.10	39
		Savor	20.20	4.33	45
		Total	19.76	4.70	84
Resilience Time 2	Neutral	Control	21.21	4.29	19
		Savor	21.86	4.75	22
		Total	21.56	4.50	41
	Stress	Control	21.05	5.03	20
		Savor	21.87	5.18	23
		Total	21.49	5.07	43
	Total	Control	21.13	4.62	39
		Savor	21.87	4.92	45
		Total	21.52	4.77	84

TABLE 3

Table 3: The Means and Standard Deviations of Resilience by Time, Induction Task, and Intervention Task with Trait Resilience as a Covariate.

Time	Induction Condition	Intervention Group	Mean	Standard Deviation	N
Resilience Time 1	Neutral	Control	19.32	5.33	19
		Savor	19.91	4.68	22
		Total	19.63	4.94	41
	Stress	Control	19.20	5.01	20
		Savor	20.48	4.05	23
		Total	19.88	4.52	43
	Total	Control	19.26	5.10	39
		Savor	20.20	4.33	45
		Total	19.76	4.70	84
Resilience Time 2	Neutral	Control	21.21	4.29	19
		Savor	21.86	4.75	22
		Total	21.56	4.50	41
	Stress	Control	21.05	5.03	20
		Savor	21.87	5.18	23
		Total	21.49	5.07	43
	Total	Control	21.13	4.62	39
		Savor	21.87	4.92	45
		Total	21.52	4.77	84

FIGURE 1

Figure 1. The Main and Interaction Effects of Time and Induction Task on Stress

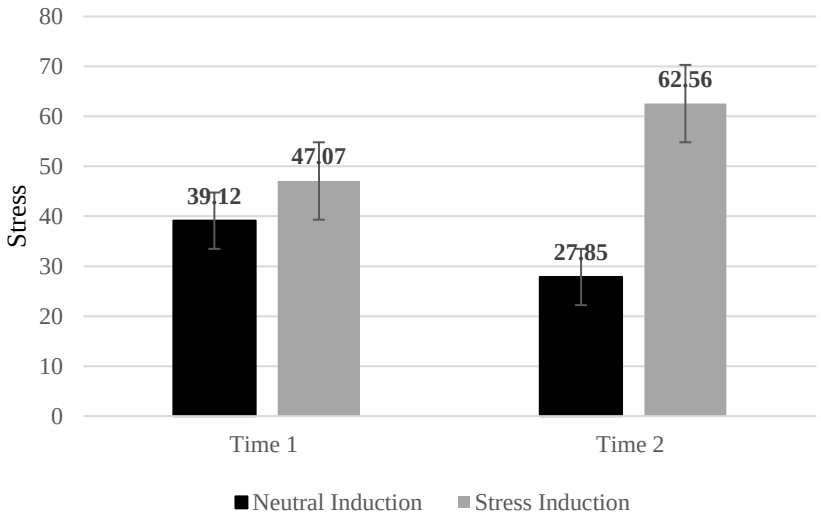

FIGURE 2

Figure 2. The Main and Interaction Effects of Time, Induction Task, and Intervention Task on Resilience Scores

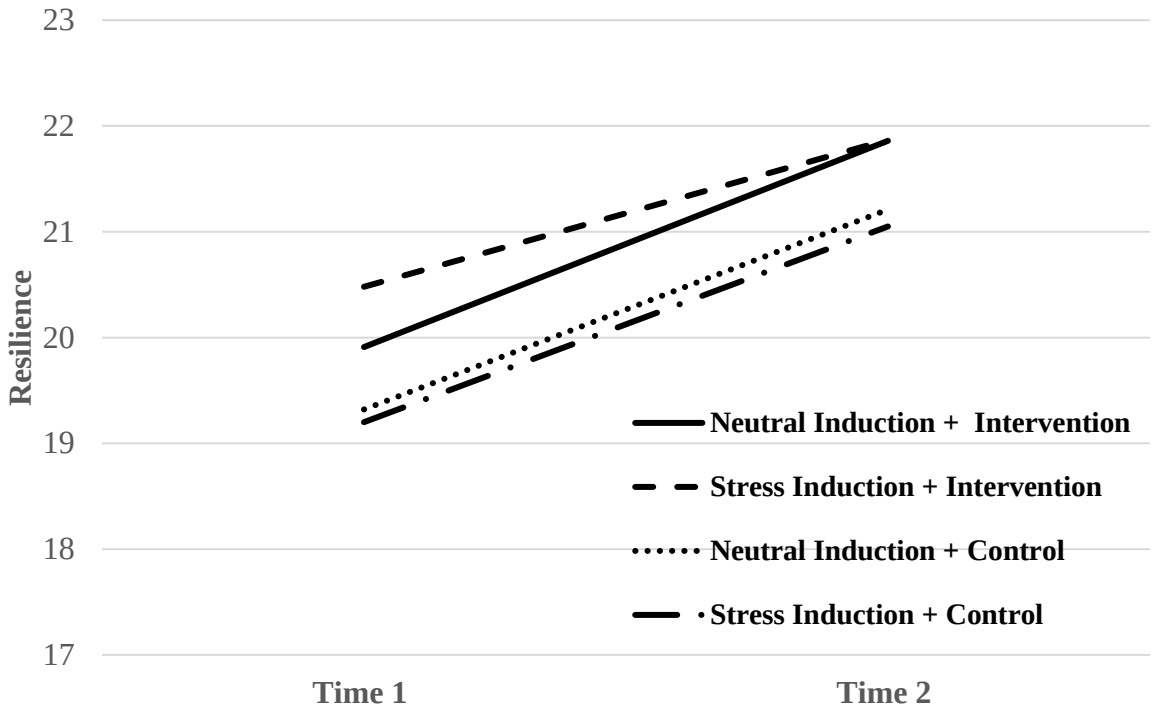

FIGURE 3

Figure 3. The Main and Interaction Effects of Time, Induction Task, and Intervention Task on Resilience Scores with Trait Resilience as a Covariate