Lean on Me: The Impact of Interpersonal Emotion Regulation on Mood as a Function of Binary Gender

Gabrielle Sands

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LEAN ON ME:
THE IMPACT OF INTERPERSONAL EMOTION REGULATION ON MOOD AS A
FUNCTION OF BINARY GENDER

by

Gabrielle Sands

A Thesis Submitted in Partial Fulfillment
of the Requirements for a Degree with Honors
(Psychology)

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ABSTRACT

Interpersonal Emotion Regulation (ER) refers to the use of social resources to influence the emotional response to stimuli. Given the novelty of the field and potential clinical applications, greater research is needed in this sub-field of Emotion Regulation. For this study, we investigated whether aspects of Interpersonal ER is related to an individual’s mood over a seven-day period. Furthermore, the study explored whether tendency (i.e., engagement) levels and efficacy (i.e., belief) levels would result in a change in overall emotional affect (either positive or negative). Lastly, the study added a binary gender moderating variable (i.e., men and women) to see whether there were differences in tendency and efficacy levels as a function of gender. Results demonstrated that there was no significant relationship in either positive or negative affect change with Interpersonal ER. Investigating between the binary gender groups, women reported higher levels of negative efficacy and positive tendency compared to men. Lastly, the individual groups difference showed that women have an inverse trending significance with negative tendency and positive affect.

Keywords: Interpersonal Emotion Regulation, Emotion Regulation, Binary Gender, Affect
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for your time, your questions, your encouragement, and your laughter.
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<tbody>
<tr>
<td>Emotion Regulation (ER)</td>
<td>An umbrella term used to reflect the cognitive/emotional/behavioral processes by which individuals influence their emotions in terms of how and when they experience and express them (Gross, 2014).</td>
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<tr>
<td>Intraperonal Emotion Regulation</td>
<td>A form of ER which focuses on the internal cognitive and emotional processes that affect mood.</td>
</tr>
<tr>
<td>Interpersonal Emotion Regulation</td>
<td>Defined as “an individuals’ tendency to make use of other individuals to get a sense of safety or reduce the severity of distress,” (Altan-Atalay, 2019, p. 379).</td>
</tr>
<tr>
<td>The Process Model of Emotion Regulation (PMER)</td>
<td>A model that conceptualizes Emotion Regulation from an interpersonal perspective; Developed by James Gross and colleagues. The model is comprised of five families of Emotion Regulation strategies (i.e., Situation Selection, Situation Modification, Attentional Deployment, Cognitive Change, and Response Modulation), which can be applied to four potential stimuli-processing stages (i.e., Situation, Attention, Appraisal, and Response).</td>
</tr>
<tr>
<td>Situation Stage (PMER)</td>
<td>When the individual begins to experience either environmental or internal stimuli.</td>
</tr>
<tr>
<td>Attention Stage (PMER)</td>
<td>The individual has been exposed to the stimuli and has begun to cognitively process the situation.</td>
</tr>
<tr>
<td>Appraisal Stage (PMER)</td>
<td>The individual’s interpretation of the stimuli.</td>
</tr>
<tr>
<td>Response Stage (PMER)</td>
<td>The individual’s cognitive, emotional, and behavioral outcome.</td>
</tr>
<tr>
<td>Situation Selection Strategies</td>
<td>The individual engages in situation selection by choosing whether to avoid the situation or attend to the situation.</td>
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<td>--------------------------------</td>
<td>--------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Situation Modulation Strategies</td>
<td>The individual can choose to take direct action to change the situation.</td>
</tr>
<tr>
<td>Attentional Deployment Strategies</td>
<td>The individual can choose either distraction or rumination (i.e., deeply thinking about the situation)</td>
</tr>
<tr>
<td>Cognitive Change Strategies</td>
<td>The individual can choose between either cognitive reappraisal (i.e., reinterpreting the situation in a different way) or acceptance of the situation</td>
</tr>
<tr>
<td>Response Modulation Strategies</td>
<td>The individual can choose between expressive suppression (e.g., preventing the physical expression of their emotion) or physiological intervention (i.e., modulating physical aspects of oneself to attempt to modify the emotional response, such as deep breathing)</td>
</tr>
<tr>
<td>Antecedent-focused processes</td>
<td>Refers to the “things we do before the emotion response tendencies have become fully activated and have changed our behavior and peripheral physiological responding” (Gross &amp; John, 2003, p. 348).</td>
</tr>
<tr>
<td>Response-focused emotion regulation</td>
<td>Refers to “things we do once an emotion is already underway, after the response tendencies have already been generated” (Gross &amp; John, 2003, p. 348).</td>
</tr>
<tr>
<td>Suppression</td>
<td>Refers to, “a form of response modulation that involves inhibiting ongoing emotion-expressive behavior,” (Gross &amp; John, 2003, p. 349).</td>
</tr>
<tr>
<td>Two-Dimensional/Two-Valence Model (TD/TV Model)</td>
<td>A method of modeling Interpersonal Emotion Regulation. Developed by Zaki &amp; Williams, this model consists of two dimensions (tendency and efficacy) and two valences (decreasing negative affect or increasing positive affect).</td>
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</tr>
<tr>
<td>Tendency (TD/TV Model)</td>
<td>Refers to how often an individual used an Interpersonal ER strategy.</td>
</tr>
<tr>
<td>Efficacy (TD/TV Model)</td>
<td>Refers to how well they believe the Interpersonal ER strategy helped them regulate their emotions.</td>
</tr>
<tr>
<td>Decreasing Negative Affect (TD/TV Model)</td>
<td>When an individual experiences a stressful/emotionally negative situation and wishes for the comfort and support of others to reduce these negative emotions.</td>
</tr>
<tr>
<td>Increasing Positive Affect (TD/TV Model)</td>
<td>When an individual experiences a joyous/emotionally positive situation and wishes to share the feelings of joy/happiness with others to continue the positive emotions.</td>
</tr>
<tr>
<td>Social Baseline Theory</td>
<td>Developed by Lane Beckes and James Coan (2011), Social Baseline Theory (SBT) “proposes that the primary ecology to which human beings are adapted is one that is rich with other humans” (Beckes &amp; Coan, 2011). Comparable to Interpersonal ER.</td>
</tr>
<tr>
<td>Intrinsic Interpersonal ER (Expanded Interpersonal ER Theory)</td>
<td>Refers to the “episodes in which an individual initiates social contact in order to regulate his own experience” (Zaki &amp; Williams, 2013, p. 804).</td>
</tr>
<tr>
<td>Extrinsic Interpersonal ER (Expanded Interpersonal ER Theory)</td>
<td>Refers to “episodes in which a person attempts to regulate another person’s emotion” (Zaki &amp; Williams, 2013, p. 804).</td>
</tr>
<tr>
<td>Response-Dependent Interpersonal ER Processes</td>
<td>Refers to “processes that rely on the particular qualities of another person’s feedback” (Zaki &amp; Williams, 2013, p. 804-</td>
</tr>
<tr>
<td>(Expanded Interpersonal ER Theory)</td>
<td>805).</td>
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<tr>
<td>Response-Independent Interpersonal ER Processes (Expanded Interpersonal ER Theory)</td>
<td>Occurs in “the context of social interactions, … does not require that another person respond in any particular way” (Zaki &amp; Williams, 2013, p. 805). Meaning, another person’s emotional response doesn’t affect the individual’s own emotion regulation.</td>
</tr>
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</table>
INTRODUCTION

Overview

Emotion regulation (ER) is an umbrella term used to reflect the cognitive, emotional, and behavioral processes by which individuals influence their emotions (i.e., how and when emotions are experienced and expressed) (Gross, 2014). Research on ER has significant implications and applications for individual well-being. Indeed, a large body of research has examined the relationship between ER and various forms of psychopathology. The majority of this research has primarily focused on how intrapersonal or internal cognitive and emotional processes affect mood. Relatively few studies have examined how interpersonal (i.e., the utilization of social resources) influences a person’s emotions (Hofmann et. al., 2016). The goal of the current study is to fill this gap by examining the impact of an individuals’ interpersonal emotion regulation use on positive and negative affect during a one-week period. Additionally, this study will examine whether binary gender is related to differences in perceived interpersonal emotion regulation use.

Emotion Regulation Background

Early theories of emotion postulated that emotions were either evolutionarily unnecessary, personally detrimental, or only experienced passively (Keltner & Gross, 1999). Over time, an increased understanding of stress and coping gave way to the notion that emotions are necessary, adaptive, and capable of change (Gross, 1999). James Gross, a leading researcher on the study of emotion regulation, proposed the Process Model of Emotion Regulation, an intrapersonal framework to conceptualize how people process,
control, and direct their own emotions. Emotions are considered, “time-limited, situationally bound, and have valenced (positive or negative) states” (McRae & Gross, 2020). According to this model, ER is intrinsically focused and often driven by conscious decision making. Meaning, individuals perceive environmental stimuli, decide whether to engage with the situation, appraise the situation, and develop an emotional response.

The Process Model of Emotion Regulation

The Process Model of Emotion Regulation conceptualizes ER from an intrapersonal perspective. In fact, owing to the field’s emphasis on internal processes, the terms Intrapersonal ER and ER are often used interchangeably. The Process Model suggests that ER is comprised of five families of Emotion Regulation strategies (i.e., Situation Selection, Situation Modification, Attentional Deployment, Cognitive Change, and Response Modulation), which can be applied to four potential stimuli-processing stages (i.e., Situation, Attention, Appraisal, and Response). Gross postulates that Intrapersonal ER is a process that involves evaluating environmental stimuli (i.e., emotional cues) and engaging cognitive processes both prior (antecedent-focused) to and during an emotion (response-focused). Antecedent-focused processes refers to the, “things we do before the emotion response tendencies have become fully activated and have changed our behavior and peripheral physiological responding” (Gross & John, 2003, p. 348). Antecedent-focused processes are anticipatory cognitive decisions made to impact a specific emotional response (either positive or negative). For example, consider an individual who plans to attend an event knowing that someone who is typically disrespectful towards them will be present. This individual can employ cognitive/behavioral processes to avoid (e.g., don’t speak to them) or defuse (e.g., pre-
picked topics for quick pleasant small talk) the potentially negative emotional situation. Response-focused emotion regulation refers to “things we do once an emotion is already underway, after the response tendencies have already been generated” (Gross & John, 2003, p. 348). Within the Process Model, these are ER strategies that are utilized during the Response stage (i.e., when the emotional response has occurred). If the disrespectful person makes a disparaging remark and the individual becomes upset (i.e., the person is experiencing a negative emotional response), the individual may choose to employ a response-focused emotion regulation strategy, such as suppression (e.g., choose not to express emotions). Regardless of whether the individual engages in antecedent-focused or response-focused processes, ER processes are responsible for both the down- and up-regulation of positive and negative emotions.

The Process Model of ER describes how the five families of Emotion Regulation strategies (i.e., Situation Selection, Situation Modification, Attentional Deployment, Cognitive Change, and Response Modulation) relate to the four stimuli-processing stages (i.e., Situation, Attention, Appraisal, and Response) (McRae & Gross, 2020). The model begins when an individual encounters either external or internal stimuli (situation stage), such as entering the workplace and noticing their irate boss (attention stage). When the worker began to process the environmental stimuli (i.e., the situation stage), they may employ emotion regulation strategies related to situation selection by choosing to avoid the situation (e.g., leave the main office area) or attend to the situation (e.g., give active attention to the situation). By removing themselves from the situation, the worker was likely able to reduce the potential negative emotional response. However, if the worker decided to attend the situation, they can potentially engage in the other ER strategies
throughout the other three stimuli-processing stages (i.e., attention, appraisal, and response). While in the situation phase, the worker can engage in situation modification, where they decide to take direct action (e.g., talk to their boss). In the attention phase, the individual directs their attention to key points of the situation that are emotionally relevant. Meaning, the worker has the opportunity to internally recognize the boss’ upset mood. From here, the individual can engage in attentional deployment strategies, which involves choosing either distraction (e.g., focusing on work-related documents, to shift the worker’s attention away from experiencing a potentially negative emotion) or rumination (e.g., persistently thinking about the boss’s negative mood, which results in the individual continuing to engage in the situation). Now, let’s propose the worker interprets the irritability as indignation towards them (appraisal stage). The individual appraises the situation to determine how the situation relates to their emotional goals. During the appraisal stage an individual compares their current emotional state to their desired emotional state (i.e., what emotion(s) they want to be feeling). Then, the individual can engage in cognitive change strategies to attempt to reach their desired emotional state, which include cognitive reappraisal (e.g., reinterpreting their boss’s negative mood as being a result of something else) or acceptance (e.g., embracing that their boss may be mad at them). All of these processes lead to an emotional response from the worker, which can be further expressed through physical actions. In the response phase, the worker can engage response modulation strategies, which include expressive suppression (e.g., preventing the boss from seeing their anxiety or fidgety behavior) or physiological intervention (e.g., taking deep breaths to prevent their anxiousness from manifesting into fidgeting behaviors). For instance, after interpreting
irritability as anger directed towards them (appraisal), the worker becomes anxious, fearful, and fidgety (emotional response). Broadly, the Process Model of Emotion Regulation reflects four key factors of emotional processing - 1) Identification (receiving and recognizing the environmental stimuli), 2) Selection (choosing an ER strategy), 3) Implementation (enact the ER strategy decision(s)), and 4) Monitoring (ensure that choices match the individual’s internal emotional goals).

Among the various ER strategies, two of the most widely studied are cognitive reappraisal and suppression. Cognitive reappraisal refers to, “changing the way one thinks about a potentially emotion-eliciting event,” (John & Gross, 2004, p. 1301). In this sense, an individual will attempt to change how they think about a situation, without actually changing the situation. For instance, an individual may reframe a stressful situation as a personal challenge with potential for personal growth (i.e., positive cognitive reappraisal) or believe the situation will have severe damaging consequences (i.e., negative cognitive reappraisal). ER strategies can have both maladaptive and adaptive outcomes depending on their context with an understanding that the flexible use of adaptive ER strategies can “prevent, reverse or alleviate mental illness as well as promote well-being,” (Gross, Uusberg, & Uusberg, 2019, p. 130). Generally, reappraisal is associated with positive adaptation results, which include greater physical health, more positive adamic and social outcomes, and fewer symptoms of psychopathology (McRae & Gross, 2020).

Suppression refers to, “a form of response modulation that involves inhibiting ongoing emotion-expressive behavior,” (Gross & John, 2003, p. 349). In this case, a person may repress their feelings about an event and ignore the potential negative
emotional fallout. Suppression is generally considered a maladaptive ER strategy or a strategy that “can increase the risk of mental illness as well as hinder psychological well-being,” (Gross, Uusberg, & Uusberg, 2019, p. 130). For example, an individual who exclusively relies on suppression-based strategies may fail to benefit from important emotion-related information associated with a situation. Corroborating these findings, suppression is often associated with greater psychopathology, fewer positive social outcomes, and lowered well-being (McRae & Gross, 2020). The majority of research examining Gross’ process model of emotion regulation has employed the Emotion Regulation Questionnaire (ERQ, Gross & John, 2003), a 10-item self-report questionnaire comprising two subscales measuring cognitive reappraisal and suppression.

In summary, Intrapersonal ER has been the primary focus of research on ER theory. Antecedent- and response-focused emotion regulation processes imply that an individual engages with both anticipatory emotions and immediate responsorial emotions. The Process Model of Emotion Regulation (which includes the five ER strategy families and four stimuli-processing states) deconstructs how stimuli is individually processed and how, based on the strategy(s) employed, the stimuli results in an individual emotional response. Environmental stimuli from a situation determines whether the individual gives the event attention, reappraisal, and an emotional response. Furthermore, emotion regulation involves both unconscious (e.g., processing the presence of environmental stimuli) and conscious cognitive (e.g., choosing engagement type and strategy type) processes. Emotion regulation has both adaptive and maladaptive applications. Lastly, cognitive reappraisal and suppression are ER strategies associated with psychopathology and well-being.
**Emotion Regulation & Related Disorders/Stress**

Understanding how individuals influence, experience, and express their emotions has important translational implications for clinical settings (McRae & Gross, 2020). Among the many causes of psychopathology, emotion dysregulation often plays a central role. Emotion dysregulation occurs when the ER strategy was either misregulated (i.e., the strategy was inappropriate for the situation) or was an engagement failure (i.e., the individual did not engage at all, despite the benefits engaging) (Gross & Jazaieri, 2014).

A large body of research supports the association between emotion dysregulation and various mood-based disorders, including: eating disorders (Christensen et. al., 2019), post-traumatic stress disorders (Tull, Barrett, McMillan, & Roemer, 2007), depression and anxiety (Vanderhasselt et. al., 2014; Conklin et. al., 2016).

Research on individuals with Post-Traumatic Stress Disorder (PTSD) has revealed a positive association between symptoms and deficits in emotional acceptance, emotional clarity, and positive emotion regulation strategies (Tull, Barrett, McMillan, & Roemer, 2007). Further, lower levels of positive emotion regulation strategies were related to impaired interpersonal relationships. Longitudinal research has shown that ER strategies (adaptive or maladaptive) moderate the relationship between dysfunctional attitudes and depressive symptoms in response to stressful situations (Vanderhasselt et. al., 2014; Bounoua et. al., 2018). Specifically, adaptive ER strategies buffered the relationship between dysfunctional attitudes and depressive symptoms in response to stress. These studies highlight that ER strategies can be associated with either adaptive or maladaptive emotional consequences, including symptoms of psychopathology.
An Interpersonal Perspective on Emotion Regulation

Traditionally, the field of clinical psychology has studied ER from an intrapersonal perspective. More recently, researchers have begun to consider how interpersonal processes may help individuals manage their emotions. Interpersonal ER is defined as, “an individuals’ tendency to make use of other individuals to get a sense of safety or reduce the severity of distress,” (Altan-Atalay, 2019, p. 379). Essentially, this perspective emphasizes understanding the way that an individual regulates their emotions through others (Hofmann et. al., 2016). Additional research is required to further understand how Interpersonal ER contributes to overall well-being.

Review of the Two-Dimensional/Two-Valence Model (Zaki, Williams, et al., 2018)

Interpersonal ER extends ER theory beyond internal processes to understand how external factors influence emotional experiences. Interpersonal ER is in line with an alternative definition of ER, “processes, either intrinsic or extrinsic, responsible for monitoring, evaluating, and modifying emotional reactions to accomplish one’s goals” (d’Arbeloff et. al., 2018, pg. 1). This definition acknowledges that emotions are not only intrinsically self-regulated but can be externally regulated through the utilization of other people (Hofmann et. al., 2016). Interpersonal ER has important implications for understanding the impact of social situations (e.g., clinical settings, workplaces, educational institutions, community building, etc.) on well-being. It follows that there is a growing interest in understanding how social resources (e.g., friends, family, strangers, etc.) are used to regulate our emotions.

Interpersonal ER was originally represented by a two-dimensional/two-valence (TD/TV) model consisting of tendency, efficacy, and two valence emotional factors.
(Williams et al., 2018). Tendency refers to how often an individual uses an Interpersonal ER strategy. Efficacy refers to how well they believe the Interpersonal ER strategy helps them regulate their emotions. With respect to the two valence factors, the effects of an Interpersonal ER strategy can either decrease negative or increase positive emotions. For example, consider an employer who requests a meeting with their employee. In one scenario, the employer gives the employee a promotion and raise, which elicits a positive emotional response. The employee decides to celebrate with friends. In this sense, the employee is using their social resources to amplify their emotions leading to increased positive affect. In contrast, consider the scenario where the employee is demoted and receives a pay cut. The employee would most likely experience a negative emotional response and may use their social resources to help them decrease their negative affect.

Exploring Related Interpersonal Emotion Regulation Theory

Considering Interpersonal ER’s focus on the utilization of social resources, this theory is frequently compared to Social Baseline Theory (SBT), developed by Lane Beckes and James Coan (2011). SBT, “proposes that the primary ecology to which human beings are adapted is one that is rich with other humans” (Beckes & Coan, 2011, p. 976). Developed from evolutionary constructs, SBT views social resources as a method for humans to reduce energy expenditure that results from interacting with environmental situations. When individuals are in isolation, they have to expend greater amounts of energy to deal with demands. However, social contact, proximity, and interaction reduces the energy expenditure.

SBT proposes two ways to reduce energy costs: risk distribution and load sharing. Risk distribution is defined as “the statistical distribution of environmental risks across
individuals within a group” (Beckes & Coan, 2011 p. 978). In other words, individuals feel reduced threat when interacting with others. Load sharing refers to the distribution of responsibilities within a group. SBT postulates that access and utilization of social resources is an inherent baseline assumption within the brain. Meaning, the usage of social resources is the baseline (i.e., at rest period) for humans, whereas being socially isolated would result in a non-baseline state (i.e., tense, vigilant, etc.) from the evolutionary-based perspective. Interpersonal ER is conceptualized as an active decision to achieve an emotional goal, while SBT (referred to as Interpersonal Modulation by Zaki and Williams, 2013) includes incidental modulation of emotions that occurs beyond an explicit effort to achieve an emotional goal (e.g., for survival purposes). Researchers Zaki & Williams (2013) considered SBT as part of their expanded theoretical framework on Interpersonal ER theory.

Exploring Expanded Interpersonal Emotion Regulation Theory

While the current project focuses on the two-dimensional/two-valence (TD/TV) Interpersonal ER model, the theory was expanded to distinguish Interpersonal ER from Interpersonal Modulation and to recognize that Interpersonal ER can alter one’s or other people's emotional states (Zaki & Williams, 2013). Zaki and Williams (2013) state that “regulation typically refers to the pursuit of a goal to alter one’s affective state, whereas incidental modulation of affect by social presence can occur outside of any such goal” (Zaki & Williams, 2013, p. 804). In this sense, modulation is both affected by social situations and is inherently integrated in interpersonal regulation. Meaning, people are affected by the presence of others and may seek out others in stressful situations. This theory is in line with Gross’s concept of “situation selection” from the Process Model of
Zaki & Williams (2013) further delineate Interpersonal ER according to the following categories: intrinsic vs. extrinsic and response-dependent versus response-independent processes. Intrinsic Interpersonal ER refers to, “episodes in which an individual initiates social contact in order to regulate his own experience” (Zaki & Williams, 2013, p. 804). For example, an individual experiencing large amounts of distress may seek others to mitigate their negative emotions. Extrinsic Interpersonal ER refers to “episodes in which a person attempts to regulate another person’s emotion” (Zaki & Williams, 2013, p. 804). For example, a person notices their friend is “feeling blue” and needs comfort. After processing the social stimuli, the individual decides to listen to their friend’s problems and, subsequently, causes their friend’s mood to improve as a result. The individual was able to regulate their friend’s emotions through the solicitation of social interaction. The model proposes two processes to support either extrinsic or intrinsic motivations - response-dependent and response-independent processes. Response-Dependent processes refers to “processes that rely on the particular qualities of another person’s feedback” (Zaki & Williams, 2013, p. 804-805). Continuing the previous example, the upset friend may experience improved positive affect, but only if the individual perceived the discussion as supportive. Response-Independent processes “occur in the context of social interactions, but do not require that another person respond in any particular way” (Zaki & Williams, 2013, p. 805). For example, the friend could describe their personal issues to someone, and this communication regulates their emotional response regardless of how the individual responds.

Zaki & Williams’ (2013) expanded theoretical model proposes that the intrinsic or
extrinsic and response-independent or response-dependent processes interact. Labeling, which reflects an intrinsic and response-independent process, occurs when the individual defines their affective states and “can reduce the ambiguity of affective states and facilitate coping” (Zaki & Williams, 2013, p. 806). Safety signals affiliation reflects the intersection of intrinsic and response-dependent processes to “allow individuals to reconsider the events that elicited their emotion” (Zaki & Williams, 2013, p. 806). In other words, refers to an individual's ability to internally reappraise a situation utilizing an external source. Warm glow reflects the interaction between extrinsic and response-independent processes such that, “merely engaging in a prosocial act produces a form of positive affect” (Zaki & Williams, 2013, p. 807). This aspect of the Zaki & Williams model is most comparable to the Increasing Positive Affect of the two-dimensional/two-valence (TD/TV) model (Williams et. al., 2018). Lastly, vicarious affect reflects the interaction between extrinsic and response-dependent processes, which occurs when the person who initiated the social interaction is experiencing “the affective consequences of their own prosocial behavior” (Williams et. alia, 2013, p. 807). Meaning, the socially initiating person can experience the positive or negative emotional effects that the opposite person is experiencing (Williams et. al., 2013).

Researchers have attempted to develop a self-report measure to test Zaki and William’s (2013) expanded theoretical framework. Hofmann and colleagues (2016) divided Interpersonal ER into four sub-dimensions - Enhancing Positive Affect, Perspective Taking, Soothing, and Social Modeling (Hofmann et. al., 2016; Dixon-Gordon 2018; Altan-Atalay, 2019). Enhancing positive affect refers to the tendency to seek social resources to increase positive affect (i.e., feelings of joy). An example of this
would be a person hanging out with friends because they received a work promotion. Perspective taking refers to using social resources to advise the individual that other people are having a worse plight. For instance, a person is feeling stressed by a low grade on a school exam and reaches out to a friend. An example of perspective taking would be a friend reminding them that most people performed worse. Soothing involves pursuing others for solace. For instance, a person relying on a friend when a relative passes away. Lastly, social modeling consists of seeking out others to investigate how they handle the situation such as a person modeling how their friend manages stressful work situations.

The focus of the current study is the two-dimensional/two-valence (TD/TV) model of Interpersonal ER. The two dimensions include the tendency to use an interpersonal ER strategy and perceived efficacy. The effects of an Interpersonal ER strategy can be perceived as either decreasing negative or increasing positive emotions. This theory of Interpersonal ER is in its infancy and requires further construct validity. Moreover, to our knowledge, no research has examined gender differences in Interpersonal ER strategies. The current study will examine whether Interpersonal ER strategy is associated with affect and whether the tendency and efficacy of Interpersonal ER strategy use differs by gender.

Interpersonal Emotion Regulation & Related Disorders/Stress

Overall, interpersonal ER theory involves some form of social interaction that elicits an emotional response, with potential implications for mood both in the short- and long-term. Consistent with the Interpersonal ER theoretical frameworks, research suggests that interpersonal ER is associated with psychological disorders. For example, a
theoretical review of individuals with eating disorders (ED) suggests a potential link between interpersonal ER, ED pathology, and potential treatment/intervention strategies (Christensen & Haynos, 2020). Specifically, emotional feeding (a type of interpersonal ER strategy, whereby a person offers food to elicit an emotional response) has been identified as a developmental risk factor for binge-eating disorder for the person receiving the food, due to the association between eating and negative affect reduction (Christensen et. al., 2019). In another study involving substance use disorders (SUD), participants with a SUD experienced greater difficulty with ER (Dingle et. al., 2018). It may be the case that situations involving high emotional intensity are disproportionately affected by a dysregulation of emotions. Corroborating these findings, a study on the interaction between Negative Mood Regulation Expectancies (NMRE, i.e., type of resilience factor defined by the person’s belief of the effectiveness of the strategies they utilize to deal with arduous emotional moments) and Interpersonal ER concluded that those with low NMRE levels (i.e., low belief in the effectiveness of their personal emotion regulation strategies) and low usage of Interpersonal ER strategies reported higher depression levels. Meaning, Interpersonal ER has a potential buffering effect for depressive symptoms and future development of psychopathology (Altan-Atalay & Saritas-Atalar, 2020; Barthel, Hay, Doan, & Hofmann, 2018). Along with disorders, there is research looking at the present-moment effects of Interpersonal ER. Comparably, research using in-lab self-report and physiological measures found that Interpersonal Emotion Regulation was more effective in reducing distress than Intrapersonal Emotion Regulation (Levy-Gigi & Shamay-Tsoory, 2017). All of these investigations reinforce current Emotion Regulation theories and previous research. Interpersonal ER, similar to
Intrapersonal ER, has connections to psychopathological symptom induction and reduction, as well as overall well-being. However, despite current findings, contemporary research has significant gaps with Interpersonal ER. Despite these various studies, the relationship between Interpersonal ER and mood affect requires more in-depth research, as the previously discussed linkages are either correlational or non-longitudinal.

**Measuring Interpersonal Emotion Regulation**

Constructs associated with Interpersonal ER are most commonly measured via self-report questionnaires. The current study will employ the Interpersonal Regulation Questionnaire (IRQ; Williams et. al. 2018), which is comprised of 87 items that cover four content areas. The four content areas are composed of two dimensions and two valence factors relating to interpersonal ER. The scale captures two interpersonal ER dimensions - tendency and efficacy. Tendency refers to an individual’s proclivity to utilize Interpersonal ER to aid in moderating emotions. Efficacy refers to the degree individuals believe that Interpersonal ER ameliorates their emotional responses (Williams, Morelli, Ong, & Zaki, 2018).

The tendency and efficacy dimensions are further distinguished by two valence factors - Increasing Positive Affect (IPA) and Decreasing Negative Affect (DNA). These two valence factors relate to the emotional/mood outcomes that an individual hopes to experience (i.e., the individual’s desired emotional state), which is either to increase positive emotions or decrease negative ones. For the tendency dimension, a positive event will motivate an individual to seek others to spread the positive emotions (i.e., Positive Tendency). An example of this from the IRQ would be, “When things are going well, I just have to tell other people about it” (Williams, Morelli, Ong, & Zaki, 2018, p. 230).
Meanwhile, a negative event will cause an individual to seek out others for comfort (i.e., Negative Tendency). An example IRQ item for Negative Tendency would be, “I just have to get help from someone when things are going wrong” (Williams, Morelli, Ong, & Zaki, 2018, p. 230). Regarding efficacy, an individual will perceive interpersonal ER as effective in one of two ways. One way is that the Interpersonal ER strategy increases positive affect (i.e., Positive Efficacy). An example item from the IRQ is, “I’m happier when I’m with my friends than when I’m by myself” (Williams, Morelli, Ong, & Zaki, 2018, p. 230). The other way an individual will perceive Interpersonal ER as effective is if the strategy decreases negative affect (i.e., Negative Efficacy) (Williams, Morelli, Ong, & Zaki, 2018, p. 230). An example IRQ item is, “It really helps me feel better during stressful situations when someone knows and cares about what I’m going through” (Williams, Morelli, Ong, & Zaki, 2018).

Williams et. al. (2018) conducted five sets of studies to establish the validity of the IRQ. The initial four studies used a cross-sectional design to establish the psychometric properties of the IRQ. The first study determined that tendency and efficacy were independent dimensions. Study two found that individuals with high levels of Interpersonal ER tendency and efficacy were more socially involved and had greater levels of emotional expression and empathy. The following two studies emphasized each dimensions’ behavioral outcomes, as those high in tendency pursued social interaction more and those high in efficacy gained greater benefits following real-world emotion induction. The final study examined whether the IRQ predicts prosocial behavior over time. Results revealed that those high in both tendency and efficacy possessed greater supportive social relationships during the first year of university (Williams, Morelli, Ong,
& Zaki, 2018). While these results provide support that Interpersonal ER is associated with prosocial behavior over time, no research to date has examined whether Interpersonal ER predicts mood over time. For the purposes of this study, the IRQ will be used to validate the two-dimensional/two-valence (TD/TV) model of interpersonal ER.

A Review of Interpersonal Emotion Regulation Studies

Since Interpersonal ER is a relatively new area of study, few studies have investigated the potential outcomes of engaging in Interpersonal ER. Moreover, research has yet to demonstrate whether there is an association between Interpersonal Emotion Regulation and mood over time. Currently, there are two studies relevant to the current investigation. The first study used daily diary methods to study the impact of interpersonal ER on university athlete’s performance (Tamminen, 2019). Using a mobile-app tracker, participants completed the IERQ (a different measurement of Interpersonal ER) on a daily basis over the span of ten days. The results indicated that the effect of Interpersonal ER predicted game performance, such that higher levels of affect-worsening Interpersonal ER predicted losing a game.

While this study focused on Interpersonal ER and utilized a form of daily digital-app self-reporting – there are notable differences between this study and our experiment. The Tamminen et al. (2019) study utilized a different type of mobile-app tracker – our study utilizes BEIWE, whereas their study heavily employs an app referred to as Experience Sampler. The Experience Sampler app is meant to capture ecological data from participants, similar to BEWIE. However, the participants are only alerted for mood-imputation once a day, compared to BEWIE’s multiple mood prompts. Furthermore, the Tamminen et al study considered a specific sample demographic by
concentrating on college athletes. In addition, Tamminen et al. focused on determining Interpersonal ER’s impact on human performance and behavioral outcomes. The current study will focus on the impact of Interpersonal ER on overall mood, as well as consider the role of binary gender (Tamminen, 2019).

The second study examined whether Intrapersonal ER strategies (e.g., cognitive reappraisal and expressive suppression) impact symptoms of depression and anxiety and whether Perceived Social Support (PSS; i.e., “an individual’s perceptions of the general availability and quality of the social support available to them”) moderates this relationship (d’Arbeloff et al., 2018, p. 2). Participants completed self-report questionnaires every three months for a period of three years. Results showed that cognitive reappraisal was associated with lower levels of depression and anxiety symptoms, predominantly when levels of PSS were high. Conversely, expressive suppression was associated with higher levels of depression and anxiety when PSS levels were lower.

**Emotion Regulation & Binary Gender**

Despite the fact that stereotypical gender-based child rearing and socialization has decreased over the years, the effects still linger in modern social and cultural spheres and impacts ER. While prescribing men and women into gender-based societal roles is no longer the dominant approach, research has found that women tend to utilize Emotion Regulation strategies more than men (Nolen-Hoeksema, 2012). Furthermore, women tend to utilize rumination (i.e., the tendency to dwell on the causes and consequences of negative affect) more than men, while men tend to abuse substances (i.e., alcohol) to cope more than women (Nolen-Hoeksema, 2012). To our knowledge, researchers have yet to
examine the impact of gender on interpersonal ER. The current study aims to fill this gap. Despite the lack of studies directly examining whether Interpersonal ER differs by gender, research has examined gender differences in social reliance.

One line of research suggests that there are two main types of situational coping - emotion-focused and problem-focused (Ptacek et. al., 1992). Emotion-focused coping attempts to mitigate emotions that are elicited by situations, while problem-focused coping involves an active attempt to alter the situation. While there are mixed findings with respect to gender differences in problem-focused situational coping, a recent study found that women were more likely to utilize emotion-focused coping than men (Graves et. al., 2021). Further, investigations have noted that it’s possible that women, on average, experience higher levels of stress compared to men (Olff et. al., 2007). Thus, women may need to engage more coping techniques due to experiencing higher levels of negative environmental stimuli. Regarding socialization, men are typically raised to be agentic, and develop characteristics related to independence, control, and leadership (Hentschel, Heilman, & Peus, 2019). Meanwhile, it has been argued that women are often raised to be more communal, which involves emotional attenuation and relationship building (Hentschel, Heilman, & Peus, 2019). Based on these theories, it is reasonable to hypothesize that women are more likely to rely on social resources compared to men. Furthermore, given that women tend to rely on emotion-focused coping more than men it is possible that the use of social resources has a greater impact on women (whether positive or negative).
Study Aims

This study aims to make a meaningful contribution to the psychological literature on Emotion Regulation. First, this research will examine the relationship between interpersonal ER and mood over a period of time. The use of a longitudinal design will allow us to examine whether perceived efficacy and tendency of interpersonal ER is associated with positive and negative mood over time. A second aim is to understand the relationship between binary gender and Interpersonal ER. Therefore, the current study will examine whether binary gender is associated with differences in the perceived use and tendency to engage in Interpersonal ER, differ as a function of gender. Lastly, this study may provide insights into the importance of social resources and interaction for overall well-being. With the recency of the Covid-19 pandemic, humanity was forced into isolation and separation for disease prevention purposes. Thus, if Interpersonal ER was an important mood regulating factor prior to social distancing, it will be important to investigate the potential repercussions of pandemic prolonged isolation and potential mitigation strategies in future research.

Hypotheses

The following are proposed hypotheses for this study:

Hypothesis 1: High tendency and high efficacy levels of Interpersonal ER will be associated with a higher positive affect.

Hypothesis 2: Higher tendency and higher efficacy levels of Interpersonal ER will be associated with lower negative affect.

Hypothesis 3: Women will endorse higher levels of Interpersonal ER tendency and efficacy than men.
Exploratory Hypothesis: Does the relationship between Interpersonal ER and negative/positive affect differ by gender.
METHODS

Participant Information

The data was collected from a pool of college undergraduate students at the University of Maine. The age range of participants consisted of 18- to 22-year-olds. In terms of binary gender, the distribution resulted in 56% (n = 27) of women and 44% (n = 21) of men in the total sample size (N = 48). In terms of race/ethnicity, the sample consisted of 87.5% White (n = 42), 4% Native American (n = 2), 2% Asian (n = 1), 2% Black (n = 1), 2% Multi-Racial (n = 1), and 2% did not report (n = 1).

Experimental Paradigm & Procedure

The experimental data was collected during 2019-2020 as part of the Ecological Validity of Emotion Regulation (EVER) study. The EVER study served as the basis of Colin Bosma’s dissertation, a Ph.D. candidate and graduate student in the Maine Mood Lab. The overall procedure involved two parts. The first part included laboratory sessions where participants completed a battery of self-report responses, and an experimental mood-induction, while physiological data was being collected. The second part involved the collection of ecological data over a 7-day period utilizing the BEWIE app (See Appendices B through F for EVER study materials).

After participants signed up for a timeslot using Sona System, they received an invitation to participate in a laboratory session. Once informed voluntary consent was obtained, participants completed several self-report questionnaires and a mood induction. For the purposes of this study, the data analyzed a subset of these self-report questionnaires, specifically the Interpersonal Regulation Questionnaire (IRQ), which
measures the tendency to use and perceived efficacy of Interpersonal Emotion Regulation (Williams et al., 2018)

At the end of the lab session, participants installed the BEIWE app on their phones to begin the daily dairy portion of the study. BEIWE is an application for collecting active and passive ecological data. The BEIWE app was programmed to prompt participants twice a day to complete various measures of current moods (Onnela & Rauch, 2016), including the PANAS-X Questionnaire. The PANAS-X assesses positive and negative affect (Watson & Clark, 1999). After a seven-day period, participants were sent an email to notify them that the week-long recording period is over, and that they should remove the app from their phones. This ensures that the experiment collects only voluntary data and ensures adherence to ethical experimentation procedures.

### Experimental Measures

#### Demographic Questionnaire

Participants were asked to provide information about their age, gender, race/ethnicity, and level of education. Demographics are especially relevant to this study, as binary gender is a grouping variable.

#### Interpersonal Regulation Questionnaire Scale (Williams, Morelli, Ong, & Zaki, 2018)

The IRQ is designed to measure individuals’ tendency to pursue interpersonal emotion regulation in response to emotional events, and the efficacy with which they perceive interpersonal emotion regulation improves their emotional well-being. The IRQ
is a self-report questionnaire asking participants to rate 16 items on a scale of 1 (strongly disagree) to 7 (strongly agree), with higher scores indicating greater perceived use of interpersonal emotion regulation and efficacy of implementing interpersonal emotion regulation improving well-being.

Positive and Negative Affect Schedule – Expanded Form (PANAS-X; Watson & Clark, 1999)

The PANAS-X assesses the specific, distinguishable affective emotional states that emerge from within the broader general dimensions of positive and negative emotional experience. In addition to the two original higher order scales, the PANAS-X measures 11 specific affects: Fear, Sadness, Guilt, Hostility, Shyness, Fatigue, Surprise, Joviality, Self-Assurance, Attentiveness, and Serenity.
RESULTS

Preparing the Data for Analysis

Prior to analysis, certain participant data was removed for the purposes of this study’s hypothesis testing. Initially, the total study sample size was much larger than what was analyzed (N = 48). Participants did not fill out self-report surveys twice a day, for a seven-day period were removed from analyses.

Statistical Assumption Testing

In order to run the analyses, the data needed to meet the required assumptions involved with running regressions and t-tests. These regression assumptions include independence of observations, a need for a linear relationship, homoscedasticity, multicollinearity, and no significant outliers or residual errors. For the t-test, the assumptions include the need for normal distribution, the need for a simple random sample, the sample is of reasonable size, and the homogeneity of variance. The data has been inspected and has met all necessary assumptions.
Hypothesis 1: High tendency and high efficacy levels of Interpersonal ER will be associated with a higher positive affect.

The first hypothesis examined whether higher levels of Interpersonal ER tendency and efficacy were associated with positive affect during the week. After conducting a multiple regression analysis, there was no significant change in overall positive affect during the week-long period ($R^2 = 0.066$, $MS = 10.215$, $M = 9.32$, $SD = 3.62$, $p = 0.55$). Looking into the individual independent variables, the results for positive tendency ($\beta = -0.13$, $t(4, 43) = 0.80$, $p = 0.42$), negative tendency ($\beta = -0.32$, $t(4, 43) = -1.48$, $p = 0.14$), positive efficacy ($\beta = -0.03$, $t(4, 43) = -0.19$, $p = 0.84$), and negative efficacy ($\beta = 0.32$, $t(4, 43) = 1.37$, $p = 0.17$) did not demonstrate any significant relationship (See Tables 1 and 2).

| Table 1  
**Differences in Tendency and Efficacy on Positive Affect**

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>$R^2 = 0.066$</th>
<th>$MS = 10.215$</th>
<th>$p = 0.55$</th>
<th>$F = 0.764$</th>
<th>$N = 48$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Constant</td>
<td>UnStd. $\beta$</td>
<td>Std. Error</td>
<td>df</td>
<td>$t$</td>
<td>$p$</td>
</tr>
<tr>
<td></td>
<td>9.210</td>
<td>3.789</td>
<td>-</td>
<td>2.374</td>
<td>0.022</td>
</tr>
<tr>
<td>Variable</td>
<td>Std. $\beta$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Tendency</td>
<td>-0.13</td>
<td>0.126</td>
<td>4, 43</td>
<td>-0.80</td>
<td>0.42</td>
</tr>
<tr>
<td>Positive Efficacy</td>
<td>-0.03</td>
<td>0.148</td>
<td>4, 43</td>
<td>-0.19</td>
<td>0.84</td>
</tr>
<tr>
<td>Negative Tendency</td>
<td>-0.32</td>
<td>0.145</td>
<td>4, 43</td>
<td>-1.48</td>
<td>0.14</td>
</tr>
<tr>
<td>Negative Efficacy</td>
<td>0.32</td>
<td>0.200</td>
<td>4, 43</td>
<td>1.37</td>
<td>0.17</td>
</tr>
</tbody>
</table>

| Table 2  
**Positive Affect and Negative Affect Means and Standard Deviations for Total Sample**

<table>
<thead>
<tr>
<th></th>
<th>M</th>
<th>Std. Deviation</th>
<th>$N = 48$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Affect</td>
<td>9.32</td>
<td>3.62</td>
<td></td>
</tr>
<tr>
<td>Negative Affect</td>
<td>5.60</td>
<td>1.99</td>
<td></td>
</tr>
</tbody>
</table>
Hypothesis 2: Higher tendency and higher efficacy levels of Interpersonal ER will be associated with lower negative affect

The second hypothesis investigated whether higher levels of Interpersonal ER tendency and efficacy resulted in a negative affect. After conducting another multiple regression analysis, there was no significant change in overall negative affect during the week-long period ($R^2 = 0.068$, $MS = 3.187$, $M = 5.60$, $SD = 1.99$, $p = 0.54$). Looking into the individual independent variables, the results for positive tendency ($\beta = 0.08$, $t(4, 43) = 0.48$, $p = 0.62$), negative tendency ($\beta = -0.37$, $t(4, 43) = -1.71$, $p = 0.09$), positive efficacy ($\beta = 0.04$, $t(4, 43) = 0.26$, $p = 0.79$), and negative efficacy ($\beta = 0.22$, $t(4, 43) = 0.97$, $p = 0.33$) did not demonstrate any significant relationship (See Tables 2 and 3).

Table 3

<table>
<thead>
<tr>
<th>Differences in Tendency and Efficacy on Negative Affect</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model Summary</td>
</tr>
<tr>
<td>$R^2 = 0.068$</td>
</tr>
<tr>
<td>-------------------------------------------------------</td>
</tr>
<tr>
<td>Constant</td>
</tr>
<tr>
<td>UnStd. $\beta$</td>
</tr>
<tr>
<td>4.288</td>
</tr>
<tr>
<td>Variable</td>
</tr>
<tr>
<td>Std. $\beta$</td>
</tr>
<tr>
<td>Positive Tendency</td>
</tr>
<tr>
<td>Positive Efficacy</td>
</tr>
<tr>
<td>Negative Tendency</td>
</tr>
<tr>
<td>Negative Efficacy</td>
</tr>
</tbody>
</table>

27
Hypothesis 3: Women will report higher tendency and efficacy levels than men.

The third hypothesis examined whether binary gender was associated with different levels of Interpersonal ER tendency and efficacy. To examine this hypothesis, I conducted an independent sample T-Test. Results demonstrated that there was no relationship between negative tendency as a function of binary gender (t(46) = -1.10, p = 0.27), between women (M = 16.59, SD = 5.75) and men (M = 14.86, SD = 4.93) suggesting both genders tend to utilize this type of Interpersonal ER tendency on similar levels. There was also no relationship between binary gender and positive efficacy (t(46) = -1.11, p = 0.27), with women (M = 23.48, SD = 4.37) and men (M = 22.19, SD = 3.38) continuing to have similar utilization levels of Interpersonal ER. However, there was a significant relationship between binary gender and negative efficacy (t(46) = -2.07, p = 0.04), with women (M = 23.22, SD = 3.77) engaging in negative efficacy more than men (M = 20.76, SD = 4.42). Furthermore, there was a significant relationship between binary gender and positive tendency (t(46) = -2.99, p = 0.004), with women (M = 20.14, SD = 4.80) reporting they engage in positive tendency more frequently than men (M = 16.33, SD = 3.77) (See Table 4).

<table>
<thead>
<tr>
<th></th>
<th>Men</th>
<th></th>
<th>Women</th>
<th></th>
<th>df</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive Tendency</td>
<td>16.33</td>
<td>3.77</td>
<td>20.14</td>
<td>4.80</td>
<td>46</td>
<td>-2.99</td>
<td>0.004</td>
</tr>
<tr>
<td>Positive Efficacy</td>
<td>22.19</td>
<td>3.38</td>
<td>23.48</td>
<td>4.37</td>
<td>46</td>
<td>-1.11</td>
<td>0.27</td>
</tr>
<tr>
<td>Negative Tendency</td>
<td>14.85</td>
<td>4.93</td>
<td>16.59</td>
<td>5.75</td>
<td>46</td>
<td>-1.10</td>
<td>0.27</td>
</tr>
<tr>
<td>Negative Efficacy</td>
<td>20.76</td>
<td>4.42</td>
<td>23.22</td>
<td>3.77</td>
<td>46</td>
<td>-2.07</td>
<td>0.04</td>
</tr>
</tbody>
</table>
Exploratory Hypotheses: Examine the relationship between Interpersonal ER and negative/positive affect by gender.

The exploratory hypothesis examined the association between Interpersonal ER and positive/negative affect by binary gender. With respect to men, the results revealed that positive tendency ($\beta = 0.15$, $t(4, 16) = 0.61$, $p = 0.54$), negative tendency ($\beta = -0.40$, $t(4, 16) = -1.08$, $p = 0.29$), positive efficacy ($\beta = 0.16$, $t(4, 16) = 0.59$, $p = 0.55$), and negative efficacy ($\beta = 0.07$, $t(4, 16) = 0.20$, $p = 0.84$) were not significantly associated with negative affect (See Table 5). Similarly, positive tendency ($\beta = 0.16$, $t(4, 16) = 0.63$, $p = 0.53$), negative tendency ($\beta = 0.04$, $t(4, 16) = 0.12$, $p = 0.90$), positive efficacy ($\beta = -0.11$, $t(4, 16) = -0.40$, $p = 0.69$), and negative efficacy ($\beta = 0.09$, $t(4, 16) = 0.23$, $p = 0.81$) were not significantly associated with positive affect. (See Table 6 on pg. 30).

| Table 5 |
| Differences in Tendency and Efficacy on Negative Affect for Men |
| Model Summary | $R^2 = 0.118$ | MS = 2.417 | $p = 0.71$ | $F = 0.534$ | N = 21 |
| Constant | UnStd. $\beta$ | Std. Error | $t$ | $p$ |
| 3.895 | 4.334 | - | 0.90 | 0.38 |
| Variable | Std. $\beta$ |
| Positive Tendency | 0.15 | 0.138 | 4, 16 | 0.61 | 0.54 |
| Positive Efficacy | 0.16 | 0.160 | 4, 16 | 0.59 | 0.55 |
| Negative Tendency | -0.40 | 0.154 | 4, 16 | -1.08 | 0.29 |
| Negative Efficacy | 0.07 | 0.167 | 4, 16 | 0.20 | 0.84 |
Considering women, results revealed that positive tendency ($\beta = 0.00, t(4, 22) = 0.03, p = 0.97$), negative tendency ($\beta = -0.46, t(4, 22) = -1.51, p = 0.14$), positive efficacy ($\beta = -0.09, t(4, 22) = -0.41, p = 0.68$), and negative efficacy ($\beta = 0.52, t(4, 22) = 1.56, p = 0.13$) were not significantly related to negative affect (See Table 7 on pg. 31). For positive affect, there was no relationship with positive tendency ($\beta = -0.12, t(4, 22) = -0.56, p = 0.57$), positive efficacy ($\beta = 0.00, t(4, 22) = 0.03, p = 0.97$), and negative efficacy ($\beta = 0.50, t(4, 22) = 1.52, p = 0.14$). However, the association between negative tendency ($\beta = -0.56, t(4, 22) = -1.89, p = 0.07$) and positive affect approached significance (See Table 8 on pg. 31).
Table 7  
* Differences in Tendency and Efficacy on Negative Affect for Women  

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>$R^2 = 0.116$</th>
<th>MS = 3.063</th>
<th>$p = 0.58$</th>
<th>$F = 0.724$</th>
<th>N = 27</th>
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</thead>
<tbody>
<tr>
<td>Constant</td>
<td>UnStd. $\beta$</td>
<td>Std. Error</td>
<td>df</td>
<td>$t$</td>
<td>p</td>
</tr>
<tr>
<td></td>
<td>2.717</td>
<td>3.041</td>
<td>-</td>
<td>0.893</td>
<td>0.38</td>
</tr>
<tr>
<td>Variable</td>
<td>Std. $\beta$</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Positive Tendency</td>
<td>0.00</td>
<td>0.095</td>
<td>4, 22</td>
<td>0.03</td>
<td>0.97</td>
</tr>
<tr>
<td>Positive Efficacy</td>
<td>-0.09</td>
<td>0.107</td>
<td>4, 22</td>
<td>-0.41</td>
<td>0.68</td>
</tr>
<tr>
<td>Negative Tendency</td>
<td>-0.46</td>
<td>0.107</td>
<td>4, 22</td>
<td>-1.51</td>
<td>0.14</td>
</tr>
<tr>
<td>Negative Efficacy</td>
<td>0.52</td>
<td>0.180</td>
<td>4, 22</td>
<td>1.56</td>
<td>0.13</td>
</tr>
</tbody>
</table>

Table 8  
* Differences in Tendency and Efficacy on Positive Affect for Women  

<table>
<thead>
<tr>
<th>Model Summary</th>
<th>$R^2 = 0.168$</th>
<th>MS = 13.660</th>
<th>$p = 0.37$</th>
<th>$F = 1.110$</th>
<th>N = 27</th>
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</thead>
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DISCUSSION

Study Aim Restatement & Results Summary

The aim of this study was to examine the relationship between Interpersonal ER and affect over time. We also sought to examine whether binary gender impacted the associations between interpersonal ER and affect. As previously defined, tendency refers to how often an individual uses interpersonal ER, while efficacy refers to how well an individual believes the interpersonal strategy helped them regulate their emotions. Positive tendency refers to the use of interpersonal ER to increase positive emotions, while negative tendency occurs when an individual seeks out others to decrease negative emotions. For efficacy, an individual will perceive interpersonal ER as effective if it either increases positive affect (i.e., Positive Efficacy) or decreases negative affect (i.e., Negative Efficacy) (Williams, Morelli, Ong, & Zaki, 2018). The study results did not reveal a significant relationship between Interpersonal ER and affect (either positive or negative) averaged over a one-week period. Furthermore, binary gender was not associated with significantly different levels of negative and positive efficacy. However, women reported significantly higher levels of negative efficacy and positive tendency compared to men. Lastly, looking at individual group differences, women have a slight inverse relationship between positive affect and negative tendency.

Comparison of Experimental Results & Previous Studies

Based on the previously discussed theoretical framework of interpersonal ER, our results are inconsistent with the literature in a few ways. According to the research, previous studies have observed that engaging in Interpersonal ER has positive effects.
For instance, research has shown that interpersonal ER was more effective in reducing distress than intrapersonal ER (Levy-Gigi & Shamay-Tsoory, 2017). Furthermore, our study results showed there was no lowered negative affect resulting from the utilization of Interpersonal ER, which also contradicts the literature. However, the previously discussed studies related to mood and psychopathology were cross-sectional or correlational in nature. Therefore, one potential interpretation of the results could be that the positive and negative effects of interpersonal ER are negligible in the immediate long-term (i.e., seven days). Therefore, while the experiment failed to reject the first two null hypotheses, interpersonal ER may be associated with a delayed impact on affect mood. Perhaps, engagement with interpersonal ER needs a longer observation period to see the collective affect. It is possible that intrapersonal ER provides a more immediate effect on mood since it’s an internal regulation of emotion, while interpersonal ER (either prolonged use or deficient use) needs to persist for a longer period before it has a noticeable effect on an individual’s mood.

With respect to examining the impact of binary gender, our hypotheses regarding the difference of Interpersonal ER utilization between men and women revealed some significant results. There were no significant relationships between the binary gender utilization levels of either negative tendency or positive efficacy. Meaning, men and women both require support during negative life events (i.e., negative tendency) and endorse equivalent levels of efficacy for using others to increase positive affect. However, women reported greater levels of negative efficacy and positive tendency compared to men. Given the research, there are some potential explanations for these results. Considering that women tend to be raised with social relationships in mind, a
utilization difference among binary genders corroborates the literature. Sharing positive emotions with others (i.e., positive tendency) can help strengthen social relationships, which is another reason that women may engage in a form of utilization more than men (Waugh & Fredrickson, 2006). Furthermore, women may require a greater feeling of social support than men during negative events. This can be explained further by women’s propensity to engage in co-rumination techniques together (Schwartz-Mette & Rose, 2012). Knowing or feeling that you have others to rely on or relate to your struggle may be more heavily relied on by women for emotional coping purposes.

**Treatment/Clinical Implications**

While Interpersonal ER may not have a significant effect on mood in an immediate long-term period, there are still important clinical implications that can be gained by this research. For example, this study may have implications for understanding vulnerability to relapse. When client’s complete treatment, there is a period of vulnerability where relapse is possible unless the client has social support (Atadokht, Hajloo, Karimi, & Narimani, 2015). While speculative, it is possible that Interpersonal ER depends upon persistence rather than associated with an immediate response. In other words, the results of engaging with other people are not noticeable in the short-term but build over time. This could be the reason why patients relapse after a certain period of time - due to the overall compounded lack of social support. Furthermore, this insight could be useful not only in clinical settings, but in other areas of social life - e.g., workplace, government organizations, and academic institutions. All these areas of social influence can be impacted by a lack or abundance of social support.
Investigating the binary gender results can also have important implications in clinical settings. For instance, knowing that women need to *feel* they possess higher levels of social support during negative life events (i.e., women engage in higher levels of negative efficacy) can help improve support systems and treatment pathways for women. There may need to be a greater number of social support focused programs for women’s recovery. Furthermore, since women tend to engage in positive tendency more than men, focusing on programs that allow for both feelings of support during negative life experiences and encouragement of sharing positivity may greatly improve women’s recovery prospects.

**Limitations**

Despite the current study’s strengths (e.g., ecological momentary assessment), there are several limitations that should be noted. One limitation is that the ecological data gathered was only collected over a one-week period. Perhaps this length of time was insufficient, or vulnerable to memory decay effects. Additionally, the study relied upon a relatively small sample size as participants were removed due to missing data. The study relied exclusively on self-report, which may be influenced by personal biases. Lastly, there is the issue of lack of generalizability of this study to more diverse populations, as the sample population consisted of primarily white young adult college students from a relatively mid-rural area.
Future Directions

Considering the growing importance of interpersonal ER in the psychology field, there are a variety of potential future directions. To understand the impact of interpersonal ER on mood more accurately, future research should consider incorporating a longer period of data collection. To address potential issues related to generalizability, this study should be replicated with diverse samples, comprised of individuals from different races/ethnicities, sexual orientation, religious/cultural views, and ages. Additionally, research on interpersonal ER should aim to incorporate the perspectives/usage levels of gender non-conforming individuals (e.g., transgender, non-binary, etc.) as well. Additional research could also incorporate personality measures, as it is likely that trait levels of introversion and extroversion impacts interpersonal emotion regulation.

IRQ Measurements Alterations - Trait Measure vs Engagement Measure

Additional research is needed to confirm the validity of the Interpersonal Regulation Questionnaire (IRQ) and should consider both state and trait tendencies to engage in this emotion regulation strategy. The IRQ measures Interpersonal Emotion Regulation as a trait and assesses whether individual has high or low tendency and efficacy levels of Interpersonal ER. The IRQ could be potentially revised and shortened to account for present moment (i.e., state) engagement in Interpersonal ER. This would allow future researchers to have a greater understanding of Interpersonal ER engagement through capturing it in terms of state changes. Similarly, the IRQ could be modified to specify a particular time period. For example, the IRQ can ask “in the past two weeks did you seek others to help improve your mood” rather than relying on the participant to
make a global assessment of Interpersonal ER, which may be subject to memory decay effects (Williams, Morelli, Ong, & Zaki, 2018).

**Social Media & Interpersonal Emotion Regulation**

Finally, given the growing integration of social media into everyday life, research should consider how people engage in Interpersonal Emotion Regulation in virtual settings. For example, how does in-person interpersonal ER differ from online interaction. Results of this research could have potential clinical implications. For instance, a patient could find, given their type of engagement, that virtual therapy is more helpful than in-person. Additionally, insights from this research could provide clinicians meaningful feedback regarding their client’s previous behavioral patterns, current coping mechanisms, and their level adaptivity. Thus, allowing for therapy sessions that can pinpoint noticeable deficits in positive adaptive coping.
REFERENCES


APPENDICES
Appendix A: Self-Report Questionnaires

Interpersonal Regulation Questionnaire (IRQ)

Instructions

For each of the following statements, rate your level of agreement using the following scale:

1 = strongly disagree
2 = disagree
3 = somewhat disagree
4 = neither agree nor disagree
5 = somewhat agree
6 = agree
7 = strongly agree

1. When something bad happens, my first impulse is to seek out the company of others.
2. When I’m having trouble, I cannot wait to tell someone about it.
3. I just have to get help from someone when things are going wrong.
4. I manage my emotions by expressing them to others.
5. I appreciate having others’ support through difficult times.
6. Sometimes I just need someone to understand where I’m coming from.
7. It really helps me to feel better during stressful situations when someone knows and cares about what I’m going through.
8. I really appreciate having other people to help me figure out my problems.
9. When things are going well, I just have to tell other people about it.
10. When something good happens, my first impulse is to tell someone about it.
11. When things are going well, I feel compelled to seek out other people.
12. When I want to celebrate something good, I seek out certain people to tell them about it.
13. I’m happier when I’m with my friends than when I’m by myself.
14. Being with other people tends to put a smile on my face.
15. I find that even just being around other people can help me feel better.
16. I really enjoy being around the people I know.
PANAS-X Questionnaire

This scale consists of a number of words and phrases that describe different feelings and emotions. Read each item and then mark the appropriate answer in the space next to that word. Indicate to what extent you have felt this way during the past two weeks. Use the following scale to record your answers:

1. Very Slightly or not at all
2. A Little
3. Moderately
4. Quite of Bit
5. Extremely

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<th>cheerful</th>
<th>sad</th>
<th>active</th>
<th>angry at self</th>
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<td>calm</td>
<td>guilty</td>
<td>enthusiastic</td>
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<tr>
<td></td>
<td>attentive</td>
<td>afraid</td>
<td>joyful</td>
<td>downhearted</td>
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<td>bashful</td>
<td>tired</td>
<td>nervous</td>
<td>sheepish</td>
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<td></td>
<td>sluggish</td>
<td>amazed</td>
<td>lonely</td>
<td>distressed</td>
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<td>daring</td>
<td>shaky</td>
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<td>blameworthy</td>
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<td></td>
<td>surprised</td>
<td>happy</td>
<td>excited</td>
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<td></td>
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<td>hostile</td>
<td>frightened</td>
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<td>irritable</td>
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<td>loathing</td>
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</tr>
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</table>

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Demographic Questionnaire

To start with, we would like to get some background information from you.

1. What is your age? ___

2. Gender? _____

3. What is your date of birth? ____/ ____/ ____

4. What is your current marital situation (please check one)?
   _____ Married          _____ Separated          _____ Never married/Single
   _____ Common law marriage          _____ Divorced          _____ Widowed

5. Do you consider yourself to be Hispanic or Latino (see definition below)?
   **Hispanic or Latino.** A person of Mexican, Puerto Rican, Cuban, South or Central
   American, or other Spanish culture of origin, regardless of race.

   □ Yes       □ No

6. Do you consider yourself to be Franco-American?

   □ Yes       □ No

7. What is your race? (please check one)

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<tr>
<th></th>
<th>Native American or Alaska Native</th>
<th>A person having origins in any of the original peoples of North, Central, or South America.</th>
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<td></td>
<td>Asian</td>
<td>A person having origins in any of the original peoples of the Far East, Southeast Asia, or the Indian subcontinent including, for example, Cambodia, China, India, Japan, Korea, Malaysia, Pakistan, the Philippine Islands, Thailand, and Vietnam.</td>
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<tr>
<td></td>
<td>Black or African American</td>
<td>A person having origins in any of the black racial groups of Africa.</td>
</tr>
<tr>
<td></td>
<td>Native Hawaiian or Other Pacific Islander</td>
<td>A person having origins in any of the original peoples of Hawaii, Guam, Samoa, or other Pacific Islands.</td>
</tr>
</tbody>
</table>
☐ White

A person having origins in any of the original peoples of Europe, the Middle East, or North Africa.

☐ Multiple races

☐ None of the above

7. What is the highest grade in school you have completed (please check one)?

___ Less than High School (record actual grade)

___ 4 years of college with degree

___ High School

___ Postgraduate, M.D., Ph.D.

___ 1 year of college or technical school

___ A.A. or other degree that is not a B.A. or B.S.

___ 2 or more years of college but did not graduate
Appendix B: EVER IRB Approval

APPLICATION FOR APPROVAL OF RESEARCH WITH HUMAN SUBJECTS
Protection of Human Subjects Review Board, 400 Corbett Hall

PRINCIPAL INVESTIGATOR: Colin Bosma, M.A. EMAIL: colin.bosma@maine.edu
CO-INVESTIGATOR: EMAIL:
FACULTY SPONSOR: Emily Haigh, Ph.D. EMAIL: Emily.a.haigh@maine.edu
(Required if PI is a student):

TITLE OF PROJECT: Individual Differences and Ecological Validity of Parasympathetic and Emotion Flexibility in Response to Sadness.
START DATE: 10/31/2018
PI DEPARTMENT: Psychology
FUNDING AGENCY (if any):

STATUS OF PI: FACULTY/STAFF/GRADUATE/UNDERGRADUATE G (F,S,G,U)

1. If PI is a student, is this research to be performed:
   - [ ] for an honors thesis/senior thesis/capstone? [ ] for a master’s thesis?
   - [ ] for a doctoral dissertation? [ ] for a course project?
   - [ ] other (specify)

2. Does this application modify a previously approved project? [ ] N (Y/N). If yes, please give assigned number (if known) of previously approved project:

3. Is an expedited review requested? [ ] N (Y/N).

Submitting the application indicates the principal investigator’s agreement to abide by the responsibilities outlined in Section I.E. of the Policies and Procedures for the Protection of Human Subjects.

Faculty Sponsors are responsible for oversight of research conducted by their students. The Faculty Sponsor ensures that he/she has read the application and that the conduct of such research will be in accordance with the University of Maine’s Policies and Procedures for the Protection of Human Subjects of Research. REMINDER: if the principal investigator is an undergraduate student, the Faculty Sponsor MUST submit the application to the IRB.

Email this cover page and complete application to UMRIC@maine.edu

******************************************************************************
FOR IRB USE ONLY Application # 2018-09-0 Review (F/E): F Expedited Category:
ACTION TAKEN:
   [ ] Judged Exempt; category Modifications required? [ ] Accepted (date)
   [ ] Approved as submitted. Date of next review: by Degree of Risk:
   [x] Approved pending modifications. Date of next review: by 10/30/2019 Degree of Risk: minimal
   [ ] Modifications accepted (date): 10/31/2018
   [ ] Not approved (see attached statement)
   [ ] Judged not research with human subjects

FINAL APPROVAL TO BEGIN 10/31/2018
Date
Appendix C: EVER Study Informed Consent Form

Emotion in Context Study
The University of Maine
Informed Consent Document (Community Participants)

You are invited to participate in a research project being conducted by Colin Bosma, M.A., in the Department of Psychology at the University of Maine. The faculty sponsor is Dr. Emily Haigh. The purpose of the research is to learn more about how individuals regulate their emotions in different contexts. You must be at least 18 years to participate, fluent in English, and own a smartphone with either the Apple iOS or Android operating system.

What Will You Be Asked to Do?
If you decide to participate, you will complete a series of questionnaires. As part of the survey you will answer questions about how you are feeling (e.g., “to what extent in the last week have you felt nervous?”), and different types of thoughts that people sometimes have (e.g., “to what extent do you think about how you don’t feel up to doing anything”). This portion of the study will take about 30 minutes.

Next, a trained female research assistant will place sensors on your body in order to record electrical activity of the heart, skin. Once the sensors are placed on your body, you will be asked to sit comfortably in front of the computer in a small room. The equipment used for psychophysiological recordings is not medical grade and is not meant to be diagnostic. You will then be asked to complete the following tasks: sit quietly for 5 minutes, answer questions about how you are feeling, watch a short video about a mountain and a short video designed to induce a brief sad mood. This portion of the study will take approximately 20 minutes.

Next, you will be instructed to download and activate the “Beive2” application on your smartphone. The “Beive2” application is free to install and does not require a paid subscription. The application will require the notifications to be enabled and access to location services at all times for the application to work. You will be asked to keep your phone with you during the day for a 7-day period. You will be asked to keep your smartphone charged during the 7-day period. Each day, you will complete two surveys on your smartphone when the application prompts you to do so. The surveys include questions about how you are currently feeling (e.g., rating how sad or happy), about thoughts you were having (e.g., to what extent did you change the way you were thinking to feel more positive emotion?), and about activities you were engaged in (e.g., “are you currently socializing with anyone?”). Each survey will take approximately 5 minutes to complete. In addition, the smartphone application will be collecting data from sensors in your phone, including 1) location, 2) device movement, 3) reachability and phone usage (e.g., number of texts, number of calls, WiFi usage, power state). Actual content of phone calls (i.e., recordings of conversations) and text messages (i.e., text) is not collected through the mobile application. At the end of the 7-day period, you will receive a list of counseling resources and be asked to delete the application from your smartphone.

Risks
The risks involved in this study are minimal. It is possible that you may feel uncomfortable when answering questions about yourself in the lab and via your smartphone for 7 days. At any point during the study, you have the right to skip questions you do not wish to answer or stop the session and choose not to participate in the remainder of the study. You will not need to provide a reason for stopping the session. As part of the psychophysiological recording process, it is possible you will experience skin irritation upon removal of the sensors, similar to the removal of a large band-aid. This irritation may leave initial red marks on the skin, which should go away a few hours after removal. You may experience slightly more (10-20%) battery usage on your phone, meaning you might need to charge your phone earlier in the day than your previous habit. You may experience some worry about a loss of privacy as a result of revealing your location and daily activities during the study or answering survey questions. However, the data from the Beive2 application does not record the content of smartphone usage, nor does it track one’s location in buildings. In addition, both the survey responses and GPS location from the Beive2 app will not be monitored. You will be provided with a list of local counseling resources and hotlines at the end of the study.

University of Maine Institutional Review Board Approved for Use Through 10/30/2019
Benefits
While this study will have no direct benefit to you, this research will help us understand how our ability to regulate our negative emotions is related to well-being.

Compensation
You will receive $15 for your participation during the in-lab portion of the study to compensate you for your time and travel expenses. If you do not complete the session, you will receive compensation pro-rated to the nearest half-hour. You will receive a $25 VISA gift card via email for participating in the 7-day follow-up phase of the study, even if you chose to withdraw from the study at any point.

Confidentiality
To protect your confidentiality, your name will not appear on any of the documents associated with the study. A code number will be used to protect your identity. The code is stored on a file with software designed to provide added security. Data will only be accessible to the principal investigator, graduate students who have been trained to deal with sensitive material, and the sponsoring faculty member, Dr. Emily Haigh. Your name or other identifying information will not be reported in any publications. The key linking your name to the data will be destroyed June 2021, after primary analyses are expected to be completed. All data will be kept indefinitely by the investigators.

Voluntary
Participation is voluntary. If you choose to participate in this study, you may change your mind and stop at any time. You may also skip any questions you do not wish to answer.

Contact Information
If you have any questions about the study, please contact Colin Bosma at colin.bosma@maine.edu. If you have any questions about your rights as a research participant, please contact the Office of Research Compliance, University of Maine, (207) 581-1498 or (207) 581-2657 or email umrc@maine.edu.

Adhesive Allergy
Are you allergic to adhesives?

☐ Yes  ☐ No

Future Studies
Would you be interested in being contacted for future studies conducted in the lab for credit or monetary compensation?

☐ Yes  ☐ No

Your signature below indicates that you have read and understand the above information and agree to participate. You will receive a copy of this form.

______________________________  ______________________
Signature                                      Date

University of Maine Institutional Review Board Approved for Use Through 10/30/2019
Appendix D: SONA Recruitment Language

**Study Name:** Emotion in Context Study

**Study Type:** Multi-Part Standard Study (Two-Part)

**Duration:** 60 minutes (in-lab); 7-day (follow-up period)

**Credits:** 1 (in-lab); 2 (follow-up period)

**Description:** The study will take place at 329 Corbett Hall (near Wells Central Dining and Memoria Gym; map: [https://goo.gl/maps/S54AFjHFm9r](https://goo.gl/maps/S54AFjHFm9r)). First, you will complete a series of surveys asking questions about how you are feeling and different types of thoughts that people sometimes about how they manage their emotions. Next, a trained female research assistant will place sensors on your body in order to record electrical activity of the heart and skin. Once the sensors are placed on your body, you will be asked to sit comfortably in front of a computer in a small room. You will then be asked to complete the following: sit quietly for 5 minutes, answer questions about how you are feeling, watch a short video about a mountain, and a short video designed to induce a brief sad mood. This portion of the study will take approximately 50 minutes.

Next, you will be instructed to download and activate a mobile application on your smartphone. You will be asked to keep your phone with you during the day for a 7-day period. You will be asked to keep your smartphone charged during the 7-day period. Each day, you will complete two surveys on your smartphone when the application prompts you to do so. The surveys include questions about how you are currently feeling (e.g., rating how sad or happy), about thoughts you were having, and about activities you were engaged in. Each survey will take approximately 5 minutes to complete. In addition, the smartphone application will be collecting anonymous data (e.g., GPS, frequency of texting, frequency of calls, WIFI usage) from sensors in your phone. At the end of the 7-day period, you will be asked to delete the application from your smartphone.

**Eligibility Requirements:** You must be at least 18 years or older, fluent in English, and own a smartphone with either the Apple iOS or Android operating system to participate.
Appendix E: EVER Study Debrief

Thank you for participation in our study. Your participation is greatly appreciated.

Purpose of the Study

The purpose of this study is to examine how individual's thoughts, physiological responses, and digital behaviors relate to regulating emotions (i.e., feeling less negative emotion or more positive emotion). This study is important as it may help us understand how emotion regulation is related to well-being, as well as improve our ability to measure individual differences in how people regulate their emotions.

In this study you completed a series of questionnaires about how you think and feel. Using sensors to detect electrical impulses, we measured physiological arousal (e.g., heart rate) as you watched short film clips designed to make you feel sad or no change in mood. You also completed a 7-day follow-up with surveys asking about your current mood, thinking, and your activities. During this period, data was collected from sensors on your smartphone.

We expect to find that participants' behaviors and physiological responses will predict the style of thinking they implement when regulating their emotions in response to emotional stimuli, and that these patterns will be associated with different levels of depressive and anxiety symptoms. Previous research has shown certain emotion regulation strategies and physiological responses to sad mood to be associated with higher levels of depression and anxiety. However, little research has examined how these factors are related to behaviors outside of laboratory settings.

Do you have any questions about the study? When you were doing the study what did you think the study was about? Was there any part of the study that was difficult? How is your mood now? We realize that some of the questions asked may have provoked an emotional reaction.

Confidentiality

You may decide that you do not want your data used in this research. If you would like your data removed from the study and permanently deleted, please email your request to the principal investigator, Colin Bosma at colin.bosma@maine.edu.

Whether you agree or do not agree to have your data used for this study, you will still receive compensation for your participation.

Final Report

If you would like to learn about the results of the study, let the researcher know and we will email you a summary of the results at the end of the study.

Further Reading(s)


**Useful Contact Information**

If you have any questions or concerns regarding this study, its purpose or procedures, or if you have a research-related problem, please feel free to contact the Principal Investigator, Colin Bosma at colin.bosma@maine.edu.

If you have any questions concerning your rights as a research subject, you may contact the University of Maine Institutional Review Board for the Protection of Human Subjects at (207) 581-1498 or (207) 581-2657 (or email umirb@maine.edu).
Appendix F: EVER Study BEWIE Instructions

What am I being asked to do?

For the follow-up portion of the study, you will install a mobile application on your phone called Beiwe2 and register for this study on the application. The application requires that notifications and access to your location are enabled. You will keep the mobile application on your phone for 7 days. Each day, you will be prompted to complete two surveys, one in the morning and one in the evening. The surveys take approximately 5 minutes to complete.

How much space does the app take up?

The Beiwe2 app is a small program and will use 40MB on your phone.

Do I have to respond right away?

You should not respond to prompts from the application when you are driving, taking an exam, or any other activity where it would be detrimental to divert your attention. When prompted, complete the survey as soon as it is safe, or possible, for you to do so.

What if I miss a survey?

If you miss a survey, it will remain in your queue until it is completed. Please complete any surveys you missed and do not fill out several back-to-back. Leave at least one hour between completing each survey.

What data are you collecting?

In addition, the smartphone application will be collecting data from sensors in your phone, including your location, device movement, reachability, and phone usage. For example, number of texts, number of calls, WiFi usage, and power state.

Will you see my personal content (e.g. texts, pictures, emails, photos, web browsing history, tinder etc.)?

The mobile application does not collect private content, such as the actual content of your texts, recordings of your conversations, content of the files stored on your phone, or your internet browsing history. Furthermore, the data collected by the mobile application are secure and will not be shared.

Will my name or any personal identifying information be associated with the data?

No, it will not. We receive a spreadsheet of coded variables and numeric data that have no identifiable information. This data will be analyzed using advanced statistical techniques so that general patterns can be identified and summarized.

What do I do at the end of the study?

After the 7-day period, you will receive an email from us reminding you to delete the Beiwe2 mobile application from your phone. It is important that you delete the application from your phone after the 7-day period, as the application will continue collecting data from the sensors in your smartphone, even if you do not open or actively use the application.
Any questions? [if none] Please provide acknowledgement on the tablet [orient participant to question on Qualtrics survey] that you received and understand the instructions for using the Beiwe2 mobile application. [researcher indicates on Qualtrics that they witnessed the participant's acknowledgment]

**Wording for Qualtrics Questions:**

I have been instructed on the use of the Beiwe2 mobile application as part participating in the follow-up portion of the Emotion in Context Study, including that I should not respond to prompts when I am driving, taking an exam, or any other activity where it would be detrimental to divert my attention.

Yes [ ] No [ ]

Researcher Name: _______________________

Witnessed acknowledgement by the participant?

Yes [ ] No [ ]
Gabrielle Sands was born and raised in Maine, living most of her life in the Plymouth area. After graduating from Nokomis Regional High School, she enrolled in the University of Maine in the fall of 2017. After a little exploration, she ultimately chose to pursue a dual degree program. At the end of her undergraduate career, she will obtain a Bachelor of Arts in Psychology with a concentration in Abnormal/Social Psychology and a Bachelor of Science in Marketing with a concentration in Business Information Systems. During her time at the University of Maine, she has participated in various student involvement endeavors. These include: the Honors Student Advisory Board, the Maine Day Meal Packout Planning Committee, HerCampus, Tennis Club, Phi Mu Sorority, and All Maine Women. She gained experience working as an Undergraduate Research Assistant in the Maine Mood Lab, a Student Ambassador for the Honors College, a Mitchell Center Intern for Food Rescue Maine, and a Peer Advisor at the Career Center.

After graduation, Gabrielle will pursue full-time employment for at least a year before applying for graduate school. During her year off from education, she wishes to gain travel and work experience that’ll prepare her for graduate education. She hopes to pursue a career either in business analytics and research or industrial/organizational psychology.