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Isidro Landa

*Washington University in St. Louis*

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WASHINGTON UNIVERSITY IN ST. LOUIS

Department of Psychological & Brain Sciences

Emotion Regulation Variability and Adjustment Among College Students

by

Isidro Landa

A thesis presented to  
The Graduate School  
of Washington University in  
partial fulfillment of the  
requirements for the degree  
of Master of Arts

December 2018  
St. Louis, Missouri

# Table of Contents

List of Tables .....	iii
List of Figures .....	iv
Acknowledgements .....	v
Chapter 1: Introduction .....	1
1.1 Emotional Experience and Adjustment .....	2
1.2 Emotional Variability and Adjustment .....	4
1.3 Emotion Regulation Variability .....	6
1.4 The Present Study .....	10
Chapter 2: Methods .....	13
2.1 Sample .....	13
2.2 Procedure .....	13
2.3 Measures .....	14
2.3.1 Daily Emotion Experience .....	14
2.3.2 Daily Emotion Regulation .....	14
2.3.3 College Adjustment .....	15
Chapter 3: Results .....	17
3.1 Analysis overview .....	17
3.2 Descriptive Analyses .....	18
3.3 Does Emotion and Emotion Regulation Variability predict Adjustment? .....	19
3.3.1 Bivariate Correlations .....	19
3.3.2 Emotion Regulation Variability of all Strategies .....	20
3.3.3 Adaptive and Maladaptive Emotion Regulation Variability .....	20
3.4 Ancillary Analyses .....	22
Chapter 4: Discussion .....	24
4.1 Main Findings .....	24
4.2 Limitations and Future Directions .....	29
References .....	33
Tables .....	40
Figures .....	43

## List of Tables

Table 1:	Means, standard deviations, and correlations.....	37
Table 2:	Emotion regulation strategies assessed in daily diaries.....	38
Table 3:	Emotion regulation variability (categorical and temporal variability), emotional variability, and ethnicity predicting adjustment in college.....	39

## List of Figures

Figure 1:	Social Adjustment Predicted by the Interaction Between Temporal Variability and Ethnicity.....	41
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## Chapter 1: Introduction

Adjusting well to the new college environment requires a variegated and flexible set of responses to the changing demands. Students face several new challenges such as interacting with an unfamiliar physical space, taking on new social roles, and navigating cultural norms. In addition, the curriculum and extra-curriculars are likely less structured and more variable from day-to-day than what students experienced pre-college. Given the transitional changes, students often experience setbacks that are frustrating or overwhelming, prompt homesickness, or invite feelings of anger or regret for deciding to leave the familiarity and comfort of home. In fact, these emotional experiences can predict students' academic performance and intentions to dropout (Respondek, Seufert, Stupnisky, & Nett, 2017).

Nonetheless, students likely vary their attempts to modify their emotional experiences that arise from challenges in college. In order to be most effective, students' emotion regulation tactics need to be responsive to changing contextual demands. However, little research has investigated the role of dynamic regulatory emotional processes—the variability in how people respond to the ongoing demands of their environment. Emotion regulation variability, the extent to which people vary their emotion regulation strategy use across contexts, is thought to have important implications for adjustment (Aldao, Sheppes, & Gross, 2015).

The present study examines how emotion regulation variability is associated with various aspects of adjustment in college. The college context is one where identity and social concerns as well as a more demanding curriculum and varying social interactions makes for an emotionally volatile context. Moreover, it provides a context that is optimal for understanding how emotion is linked to more specific forms of adjustment (e.g., emotional, social, academic).

## 1.1 Emotional Experience and Adjustment

It is well established that emotion experience is linked to adjustment. Lay views of emotion suggest that adjustment is a function of meeting hedonic goals—feeling more positive and less negative emotion. In fact, there is support for the idea that people who experience more positive emotion and less negative emotion function more optimally (e.g., Diener, Sandvik, & Pavot, 1991; Fredrickson, 1998; Larsen, 2009; Lyubomirsky, King, & Diener, 2005; Watson, Clark, & Carey, 1988). In recent work, social adjustment has been studied in the college context (in which it is often called sense of belonging) and researchers have found that on days when perceived stressors are high students experience lower social adjustment (Walton & Cohen, 2007). The emotions students experience are also at times due to pre-college factors. For example, students experience homesickness in the transition to a new college environment. Although common, homesickness is a type of grief experienced at the loss of close others that can be debilitating (for a review see Stroebe, Schut, & Nauta, 2015). One recent study collected self-reports from college students each week of the first term, including homesickness and different types of adjustment, and found that experiencing homesickness predicted declines in social adjustment (i.e., satisfaction with social life and perceived belongingness) from week to week, but did not predict academic adjustment (English, Davis, Wei, & Gross, 2017). In the same vein, other work has found a link between familial conflict and emotional distress, which, in turn, predicts decreased social assertiveness and relationship intimacy in college (Rhoades & Wood, 2014). Notably, negative experiences are often more psychologically impactful than positive ones because they elicit stronger reactions in people that are longer-lasting (for a review see Larsen, 2009).



Despite the benefits of hedonic experiences, having a persistent and inflexible desire to feel more positivity and less negativity suggests a different pattern of associations between emotion experience and adjustment than the one's described above. Placing a high value on happiness has been shown to paradoxically decrease happiness (Mauss, Tamir, Anderson, & Savino, 2011; Mauss et al., 2012). Mauss and colleagues (2011), for example, conducted a study among an ethnically diverse group of women in college. In an experimental condition, participants were made to believe that achieving high levels of happiness confers unrestricted benefits whereas in the control condition participants read about the benefits of making accurate judgments. Those in the experimental condition responded less positively to a positive emotion induction than those in the control condition. The authors argued that this occurred because of the disappointment in how participants actually felt versus their anticipated feelings. More broadly, persistently seeking positive emotion is associated with worsened adjustment and it is thought that a lack of discrimination in responding to emotional stimuli across contexts is also problematic (Gruber, 2011). That is, experiencing positive emotion in response to all stimuli is linked to poor adjustment. Further, positive emotion is thought to directly correlate with wellbeing up to a point where it then backfires and the association reverses (Grant & Schwartz, 2011).

Similarly, seeking to avoid all negative experiences does not always result in optimal adjustment. Attending to negative experiences rigidly might be reflective of phenomena such as experiential avoidance where one attempts to avoid one's private experiences—including negative emotion—regardless of time and place (Wolgast, Lundh, & Viborg, 2013). Research studies demonstrate that there is utility in (seeking) both positive and negative emotional experiences. For example, Tamir and Ford (2012) surveyed college students on their emotional

preferences in general and within specific contexts (i.e., how much they prefer to feel happy or angry). Although happiness and anger were generally associated with better adjustment, the associations were stronger within appropriate contexts—happiness during collaboration and anger during confrontation. The reverse, however, was not true. That is, those who reported greater happiness during confrontation and greater anger during collaboration reported poor adjustment in domains such as satisfaction with life, social functioning, academic performance, and self-reported health. These findings for both positive and negative emotional experience inform the idea that emotions have instrumental properties that people can capitalize on depending on the context (English, Lee, John, & Gross, 2017; Tamir, 2009). Accordingly, emotional experience that is neither extremely persistent nor indiscriminately variable across contexts and time may be important for adjustment. Thus, the variability with which students respond to the challenges in their environment to achieve a balanced, rather than a persistent or indiscriminate, state of emotional experience is likely important for their adjustment.

## 1.2 Emotional Variability and Adjustment

Increasingly in the past few decades, researchers have argued for the importance of examining the variability in emotional experiences to provide a fuller picture of the link between emotion and adjustment (Larsen, Augustine, & Prizmic, 2009; Scherer, 2009). Across theories of emotion, emotional experience is typically thought to be fleeting and temporally dynamic rather than long-lasting and static (for review see Kuppens & Verduyn, 2017). Emotional variability captures the pattern of change in a person's emotional experiences across time (e.g., minutes, hours, days, etc.). Specifically, it reflects the amplitude, or range of a person's emotional experiences, with greater variability capturing more extreme ratings and greater deviations from a person's average. People differ in this pattern of variability and the pattern maintains a level of

stability across time (Eid & Diener, 1999; Larsen, 1987; Scherer, 2009). Although emotional variability might also result from adjustment-related factors, it is more accurately conceptualized as a driver of adjustment, as an early signal of functioning going awry (Kuppens & Verduyn, 2017). Moreover, emotional variability is inversely predicted by a person's level of emotional clarity, or ability to understand and discriminate among emotional categories (Thompson, Dizén, & Berenbaum, 2009). That is, the less one can understand their experience and label it, the more one experiences an extreme range of emotion which has been found to be associated with poorer adjustment outcomes. People with low clarity would likely have difficulty influencing their own experience, resulting in greater variability for positive and negative emotion.

There is a distinct pattern of association between mean levels of emotion experience, compared to emotional variability, and their associations with adjustment. As previously described, mean levels are inversely related; positive emotion experience is typically linked to better adjustment and negative emotion with poor adjustment. However, in terms of emotional variability, both positive and negative emotional variability seem to be linked with adjustment in similar directions. For example, Kuppens, Van Mechelen, Nezlek, Dossche, & Timmermans (2007) found that emotional variability, in either valence, is associated with poorer adjustment, including greater neuroticism, pessimism, and depressive symptoms. When considering the interrelations between positive and negative emotion variability, the two constructs are directly, not inversely, correlated ( $r = .67$ ; Kuppens, et al., 2007).

In a recent meta-analysis, Houben, Van Den Noorgate, and Kuppens (2015) compiled 79 empirical studies to test the association between emotion variability, among other emotion dynamics, and wellbeing. They found that emotional variability is detrimentally associated with a variety of indices of wellbeing. Importantly, the association between emotional variability and

well-being depends on valence such that the association is stronger for negative emotional variability, on average. Well-being indices that were included primarily focused on emotional wellbeing such as depressive and anxiety symptoms, neuroticism, and negative and positive emotionality. Thus, high emotional variability is thought to signal a maladaptive pattern of emotional change. However, people have the ability to regulate their emotions, and often do so. While emotional variability is adversely associated with wellbeing, there is a dearth of studies examining variability in emotion regulation. Thus, it is unclear whether emotion regulation variability is reliably associated with adjustment or how the potential link between emotion regulation variability and adjustment depend on emotional variability.

### 1.3 Emotion Regulation Variability

Emotion regulation is a collection of processes people use in response to emotional experience. It is defined as processes by which people to modify the emotional experiences they have, when they have them, and how intensely they are experienced. According to the process model of emotion regulation (Gross, 1998, 2015), there are multiple ways a person can regulate their emotional experience. A person can intervene early on before full emotional experiences are set in motion using *antecedent-focused* strategies (e.g., avoiding a situation to prevent undesired emotion). Or a person might only be able to respond to a demand in the environment after the emotional experience has fully taken place, referred to as *response-focused* (e.g., suppressing facial expressions of emotion). Several studies have detailed the link between emotion regulation and various outcomes such as emotional and social wellbeing, memory, and (mental) health outcomes (Butler, Egloff, Wilhelm, Smith, Erickson, & Gross, 2003; English John, Srivastava, & Gross, 2012; Gross & John, 2003; Gross & Muñoz, 1995; Richards & Gross 2000; Srivastava, Tamir, McGonigal, John, & Gross, 2009). However, in recent work the

variability with which people select and implement strategies has been argued to be more important for adjustment than overall use of emotion regulation strategies (Westphal, Seivert, & Bonanno, 2010).

Moreover, as previous researchers have pointed out (e.g., Bonnano & Burton, 2013), although the idea that people's regulatory efforts are variable depending on situations they encounter, most work to date has focused on decontextualized effects of emotion regulation. Moreover, although people tend to use multiple strategies in response to unpleasant experiences, as opposed to solely relying on one (e.g., Nolen-Hoeksema, Wisco, & Lyubomirsky, 2008), most work has focused on understanding the effects of regulatory strategies independently of one another. Accordingly, researchers have begun to move beyond studying specific strategies and started to consider how variability in the breadth of strategies used contributes to adjustment, especially across time. Yet, little is still known about 1) how to best conceptualize and operationalize emotion regulation variability and 2) how this variability is associated with adjustment—particularly in less studied domains (e.g., academic adjustment). While studying individual and contextualized strategies in depth is important, broadly investigating how variability in strategy use relates to adjustment can provide a general and quick sense of how people are adjusting to volatile environments.

Emotion regulation variability is expected to be associated with better adjustment, particularly when the people are navigating their environment in such a way that they are responsive to the changing demands. Variability in this sense can be explained with an analogy of a toolbox. Individual emotion regulation strategies can be thought of as diverse but related tools wherein some people might use multiple or fewer tools to complete similar woodwork projects, for example. Moreover, people might vary in how much they use their tools over time

for these kinds of projects. In fact, these are two components of emotion regulation variability: *categorical variability* and *temporal variability*. Categorical variability (i.e., the range of tool usage) is thought of as the range, or breadth of diverse strategies people might use within and across occasions (Bonanno & Burton, 2013). It is possible to obtain a within-person index that reflects the number of emotion regulation strategies used at each occasion (e.g., daily assessment). Additionally, this within-person index can be collapsed across said occasions for an average number or range of strategies used. For example, a person on day one might only use expressive suppression. On the second day, the same person might instead use a combination of expressive suppression, acceptance, and distraction, resulting in greater categorical variability. Moreover, people also vary temporally in their use of strategies (i.e., fluctuation in extent of use of tools over time). Temporal variability reflects the fact that on some occasions people might regulate their emotions using a specific strategy more so than on other occasions.

Recent studies find preliminary evidence for how variability in the use of emotion regulation is relevant to important adjustment outcomes. Categorical variability has been linked with lower distress (Bonanno, Pat-Horenczyk, & Noll, 2011; Galatzer-Levy, Burton, & Bonanno, 2012). For example, Bonanno and colleagues (2011) developed a scale to assess various strategies that people might use post a traumatic experience. These strategies were more broadly categorized as two types of coping—forward focus and trauma focus—and scoring high in both types of coping (i.e., using multiple, diverse strategies to cope) was associated with lower traumatic stress among Israeli students exposed to terrorist violence. Another study using the same scale found that greater facility in the use of both types of strategies to be associated with better management of stressors among college students (Galatzer-Levy et al., 2012). Other studies have used somewhat different approaches to tap into emotion regulation variability. For

example, the ability to flexibly express and suppress emotional experience when prompted to has been linked to better adjustment among college participants (Bonanno Papa, Lalande, Westphal, & Coifman, 2004;). In a within-subjects design, Bonanno and colleagues (2004; 2011) prompted participants to enhance or suppress their emotional expressions or to behave normally. They were made to believe that another participant was in another room to decode their emotional experience via a webcam. They found that responsiveness to being prompted was linked to lower distress De France and Hollenstein (2017) used latent profile analysis—a person-centered versus variable-centered analysis—to specify which participants had a propensity towards a given strategy and which used a more even mix of strategies. Supporting adaptive value of categorical variability, they found that having a propensity towards greater than average use of suppression was associated with lower familial interpersonal adjustment compared to using all strategies. Similarly, in a community sample of adolescents categorical variability was associated with lower internalizing problems (i.e., social anxiety, depression, and general anxiety; Loughheed & Hollenstein, 2012). Given these promising findings, it is imperative to replicate prior results and begin to identify boundary conditions.

Defining the boundaries of these associations will help ascertain when emotion regulation variability is reflective of responsiveness to the environments versus haphazard (attempts) to regulate emotional experience. Variability in the range of strategies used or degree to which multiple strategies are used could indicate that people are intentionally utilizing the tools in their toolbox as in our analogy, but it could also indicate that people are cycling through the variety of tools they have hoping one of the tools is appropriate for any given context. While guessing might inadvertently work in some cases by chance, it is likely to be the exception rather than the rule given the social and motivational underpinnings of emotion regulation (English, Lee, et al.,

2017; Tamir, 2009). Ideally, researchers would capture or manipulate context directly, but it is not fully understood what types or combination of emotion regulation strategies are most effective in which contexts. For this reason, we chose to examine emotional variability as an indirect indicator of emotion regulation ineffectiveness (Kuppens & Verduyn, 2015). While regulatory efforts are typically be linked to adjustment, this might not be the case for those who continue to experience a wide range of emotion. In sum, although it is known how emotional experience and variability are associated with adjustment, less work has investigated emotion regulation variability. It would be important to know whether utilizing fewer or a greater number of strategies is optimal for adjustment and whether it depends on emotional variability.

#### 1.4 The Present Study

The present study used a daily diary design to test the possible link between emotion regulation variability and adjustment in emotional, social, and academic domains among college students. Given that emotion regulation variability is less studied, this approach extends prior work in three important ways. First, while previous work provides preliminary insights into the link between categorical variability and adjustment, prior work has yet to investigate the association between temporal variability and adjustment. The daily diary design of the present study allows us to compute indices of both aspects of emotion regulation variability. This is important because emotion regulation is, at its essence, a dynamic concept that fluctuates over different intervals of time. Along the same lines, we include a more comprehensive range of strategies whereas prior has only included a select few. This approach allows us to generalize across a diverse set of possible strategies (although the presented range of strategies is, by no means, intended to be exhaustive). Lastly, we investigate associations within three important domains in college contexts (i.e., emotional, social, and academic). Coupled with an



investigation into emotion regulation variability, this approach provides a more comprehensive picture of the role of emotion regulation in adjustment by examining how domains of adjustment are linked with patterns of emotion regulation, rather than specific strategies. The college context is a period in people's lives when emotional volatility is high given the constantly changing demands. This context, therefore, affords an optimal look into the study emotion regulation variability—how people respond to the volatility. Moreover, of the adjustment outcomes, academic adjustment is less studied within an emotion regulation framework but is a domain related to performance that is important and applicable in other fields (e.g., adjustment in a high-stress job).

Emotion regulation variability was expected to be positively associated with adjustment such that individuals with greater categorical variability and temporal variability will report better adjustment in each domain. Moreover, we expected that emotion regulation variability would not be as strongly associated with adjustment when emotional variability was high. A combination of high emotion regulation variability and high emotional variability might reflect a mismatch between the demands of the environment and one's counter to those demands, signaling ineffectiveness of strategy implementation. In other words, high emotional variability coupled with continual use of a variety of strategies was thought of as people regulating haphazardly and suggestive of emotional lability (e.g., Farmer & Kashdan, 2013). As in prior work, we also made a distinction between putatively “adaptive” and “maladaptive” strategies to conduct exploratory analyses (Aldao & Nolen-Hoeksema, 2012). We referred to prior work when categorizing strategies, but also utilized Gross's (1998) process model for the strategies in the present study that have not been studied before within this framework. There is some work to suggest that context might matter more for adaptive, but not maladaptive strategies as the latter

were reportedly used rigidly across contexts (e.g., intensity situations, social situations; Aldao & Nolen-Hoeksema, 2012). Moreover, this finding might suggest that an emotion regulation variability index that collapses across adaptive and maladaptive emotion regulation might mask an interaction with emotional variability—our indirect test of context. Thus, we made the distinction between adaptive and maladaptive emotion regulation variability with the goal of detecting an association with adjustment if it exists.

In secondary analyses, we investigated the possibility of whether ethnicity played an important role in the association between emotion regulation variability and adjustment. Educational interventions have been developed to modify the appraisals of students towards adjustment-related concerns. One consistent finding is that ethnic minorities tend to gain the most in terms of improved sense of belonging from psychological interventions (i.e., social adjustment; Walton & Cohen, 2007). Thus, we expected that emotion regulation variability would be more strongly associated with adjustment in all three domains for ethnic minorities.

## Chapter 2: Methods

### 2.1 Sample

One hundred fifty-two undergraduate students participated in an approved daily diary study and completed an end of day online survey, for 7 days, assessing emotion and emotion regulation. Participants were mostly female (84%) and European American (53%) and Asian/Asian American (31%). There were also a few African American participants (11%), followed by Latino/a (3%); the remainder of participants were either Indigenous to the United States, Middle Eastern, or identified as Other (1% in each category). Several also selected multiple categories and identified as multi-ethnic (12%).

### 2.2 Procedure

Participants demonstrated interest via a departmental psychology subject pool or flyers posted all over the university. They also indicated a date and time that worked for an initial phone call to ensure they understood that the study involved multiple time points in a typical week. For those who wanted to continue in the study, a trained research assistant scheduled a start date and emailed a link with the consent form and a practice survey. The end of day online series of surveys were intended to be approximately 5 min long ( $M = 4.36$  min,  $SD = 1.17$ ). On average, people completed 5.39 surveys ( $SD = 1.28$ ) and most completed at least four surveys ( $n = 138$ ). In addition, on the eighth day, participants ( $n = 135$ ) completed a post-measure assessing time-invariant characteristics such as adjustment and demographic information. They were compensated with \$10 or one course credit, depending on their preference. To increase retention and compliance, participants were eligible for submission to a \$50 raffle if they completed at least five daily assessments and the post-measure.

## 2.3 Measures

### 2.3.1 Daily Emotion Experience

Participants rated their emotion experienced across the day by rating the intensity of various emotion categories on a scale from 1 (*Not at all*) to 5 (*A great deal*). Two composites of *mean emotional* experience (i.e., aggregated across seven days) were created: Positive emotion consisted of excited, enthusiastic, calm, peace, happy, and proud ( $\alpha = .88$ ); Negative emotion consisted of nervous, fearful, hostile, homesick, guilty, shameful, sluggish, sleepy ( $\alpha = .86$ ). Higher scores indicate greater mean emotional experience across the week for each valence category.

We also created indices of *emotional variability* for positive and negative emotion using the composites above. To do so, we computed the standard deviation of positive emotion and negative emotion across occasions, as in prior research (e.g., Eid & Diener, 1999; Kuppens et al., 2007). Higher scores indicate greater fluctuation in positive or negative emotional experience across the week. Refer to Table 1 for descriptive information for both mean emotional experience and emotional variability.

### 2.3.2 Daily Emotion Regulation

At the end of each day, participants indicated the extent to which they used 17 emotion regulation strategies (see Table 2) on a scale from 1 (*Not at all*) to 5 (*A great deal*). These Likert ratings were then used to calculate counts of whether a strategy was used or not, with a rating of 1 (*Not at all*) indicating that the strategy was not used that day and any other rating indicating that it was used. Next, these counts were used to calculate an emotion regulation index of *categorical variability*. First, the average number of strategies used each day was computed (within-person categorical variability). Then, these daily sums were averaged across days

(between-person categorical variability), with higher scores indicating a broader range of strategies used across the week ( $\alpha = .81$ ). A second index, *temporal variability*, was computed by first obtaining standard deviation scores across the seven days for each strategy and then averaging those standard deviations for each person across strategies ( $\alpha = .84$ ). Higher scores indicate greater within-person fluctuation around mean-level emotion regulation strategy use. We focused on the between-person index of categorical variability for consistency across analyses because emotion variability and temporal variability could only be examined at the person level. *Mean strategy use* was calculated similarly to mean emotion experience such that the mean of each emotion regulation strategy was obtained—averaged across days (means and standard deviations are reported in Table 2)—and then all strategies were averaged together within person. See Table 1 for descriptive information for these emotion regulation variability indices. As previous studies have done (e.g., Aldao & Nolen-Hoeksema, 2012), we also constructed categorical and temporal variability indices separately for adaptive ( $\alpha$ s = .73, .75, respectively) and maladaptive ( $\alpha$ s = .72, .75, respectively) strategies. See Table 2 for a list of strategies that were used in each index. Mean strategy use that was treated as a covariate in all models with temporal variability was construct-specific such that all 16 strategies were averaged for the overall emotion regulation variability index, but only nine were used for adaptive and seven for maladaptive.

### 2.3.3 College Adjustment

Adjustment to college was assessed in three domains: emotion, social, and academic. Emotional adjustment was assessed using the 10-item Short-Stress Overload Scale (Amirkhan, 2016). Participants used a 5-point Likert scale to indicate how they felt in the past week (e.g., “...inadequate” and “...swamped by your responsibilities”;  $\alpha = .93$ ). Social adjustment was

assessed with a 2-item adapted measure of belonging uncertainty (Walton & Cohen, 2007). Participants used a 7-point Likert scale from 1 (*Strongly disagree*) to 7 (*Strongly agree*) to indicate their agreement with the following items: “Sometimes I feel that I belong at University, and sometimes I feel that I don’t belong at University” and “When something bad happens, I feel that maybe I don’t belong at University”. ( $r = .68$ ). Lastly, academic adjustment was captured with a 4-item measure of academic concerns that was created for the purpose of this study, and the items were rated on a 5-point scale from 1 (*Not at all*) to 5 (*Very much*). Sample items include, “How uncertain did you feel of where your academic future/career was headed?” and “How satisfied were you with your academic performance?” ( $\alpha = .67$ ). All adjustment outcomes are coded such that greater scores indicate better adjustment (i.e., lower stress, lower belonging uncertainty, and lower academic concerns).

## Chapter 3: Results

### 3.1 Analysis overview

We first examined group differences to determine whether ethnicity (European Americans = 0, non-European Americans [Asian/Asian American, African American, Latino/a, Middle Eastern, Indigenous, and Other] = 1) would need to be taken into account when examining the associations between emotion regulation variability and adjustment. Given the small number of male participants ( $n = 21$ ), we refrained from examining gender differences due to the uncertainty in reliability of estimates. We also examined bivariate correlations between all study variables (see Table 1).

The primary analyses consisted of a series of multiple regression models predicting each of the adjustment outcomes to determine whether emotion regulation variability predicted adjustment after controlling for emotion mean levels and emotional variability, and to examine potential interactions between emotion regulation variability and emotional variability. Although we present correlations between variables of interest and positive emotional variability, we focused on negative emotional variability in these regression analyses given that prior work has determined it to be most relevant to adjustment (Houben et al., 2015). Moreover, given that negative experiences are more impactful than positive ones as previously described (Larsen, 2009), it is no surprise that the strategies people most commonly implement are aimed at the reduction of negative emotion (e.g., English, Lee, et al., 2017). Thus, it is reasonable to expect that the experience of negative emotion and negative emotion variability will be the emotional states most reflective of whether emotion regulation is working. In a first set of models, we included mean negative emotion and one index of emotion regulation variability (i.e., categorical variability or temporal variability). In the next set of models, we added the interaction terms

between mean negative emotion and each emotion regulation variability index when predicting each adjustment outcome. Mean strategy use was also included in all the models with temporal variability, given that standard deviations tend to be correlated with means (Baird, Le, & Lucas, 2006; Koval, Pe, Meers, & Kuppens, 2013). We conducted similar models for adaptive and maladaptive emotion regulation strategies following the same format. For temporal variability, the mean strategy use variable entered was specific to either adaptive or maladaptive. Ancillary analyses were conducted to test whether ethnicity moderated the effects of emotion regulation variability. We entered both the main effects of ethnicity as well as its interaction with negative emotion variability and, separately, its interaction with emotion regulation variability (both categorical and temporal, separately). Adjustment outcomes were regressed on our predictors separately because they tap into theoretically distinct aspects of college adjustment. All continuous predictors were z-scored for ease of interpretation.

### 3.2 Descriptive Analyses

In terms of group differences for ethnicity, compared to non-European Americans ( $n = 60$ ), European American participants ( $n = 73$ ) reported better emotional adjustment,  $t(129) = 2.46, p = .015, d = .43$  and better academic adjustment,  $t(129) = 2.51, p = .013, d = .44$ . There was no ethnicity difference for social adjustment ( $t(129.99) = 1.10, p = .272$ ) or any of the emotion variables (i.e., mean level and variability of emotion and emotion regulation;  $t_s < 1.14, p_s > .257$ ).

Table 1 contains descriptive statistics and bivariate correlations among study variables. The average number of strategies used (i.e., categorical variability) was slightly more than half of available strategies (about 10 of 17 total possible). The average temporal variability was .73—just under a 1-point Likert scale rating for emotion regulation. Negative and positive emotional



variability were strongly correlated ( $r = .50, p < .001$ ). However, the two emotion regulation variability indices were not ( $r = .05, p = .579$ ). Moreover, temporal variability had a strong positive association with both negative ( $r = .52, p < .001$ ) and positive emotion variability ( $r = .51, p < .001$ ), but categorical variability did not correlate with either. Among the outcome variables, social adjustment was moderately correlated with both emotional adjustment ( $r = .44, p < .001$ ) and academic adjustment ( $r = .36, p < .001$ ). Emotional and academic adjustment were strongly and positively correlated, but somewhat distinct ( $r = .68, p < .001$ ).

### 3.3 Does Emotion and Emotion Regulation Variability predict Adjustment?

#### 3.3.1 Bivariate Correlations

As shown in Table 1, negative and positive emotion mean composites were associated with adjustment and, as expected, the strongest associations were with emotional adjustment ( $r_s = -.57$  and  $.46$ , respectively;  $p_s < .001$ ). Negative emotional variability was significantly associated with poorer adjustment—although to a smaller magnitude than mean-levels ( $r_s = -.20$  to  $-.32$ )—but positive emotional variability was not significantly correlated with any adjustment domain ( $r_s = |.01$  to  $.13$ ). Semi-partial correlations between our negative emotion variability and adjustment were also inspected given that emotional variability indices were constructed from the same items in mean levels of emotion experience and standard deviations tend to correlate with mean levels (Baird, Le, & Lucas, 2006; Koval, Pe, Meers, & Kuppens, 2013). Associations indicated that after controlling for mean-levels of negative emotion, there were no longer associations between negative emotion variability and any of the adjustment outcomes ( $r_s = -.07$  to  $-.12$ ).

Of the emotion regulation variability indices, categorical variability was not significantly correlated with adjustment at the bivariate level ( $r_s = |.01$  to  $.11$ ). Temporal variability, however,

was correlated with two of three adjustment outcomes. Specifically, it was moderately, negatively correlated with emotional adjustment ( $r = -.33, p < .001$ ) and academic adjustment ( $r = -.31, p < .001$ ), and marginally correlated with social adjustment ( $r = -.15, p = .077$ ). After partialing out the effect of mean strategy use, temporal variability was still associated with emotional adjustment ( $sr = -.33, p < .001$ ), academic adjustment ( $sr = -.29, p = .001$ ), and marginally with social adjustment ( $sr = -.15, p = .079$ ).

### 3.3.2 Emotion Regulation Variability of all Strategies

Next, we tested whether emotion regulation variability predicted adjustment when taking into account mean emotional experience and emotional variability (see Table 3 for all regression models). Emotion regulation variability did not have main effects on adjustment when controlling for mean negative emotion experience and negative emotional variability, for either predictors of categorical ( $\beta s = -.06$  to  $-.09, ps > .542$ ) nor temporal variability ( $\beta s = -.01$  to  $-.11, ps > .472$ ). The only significant effects present were those of mean negative emotion experience. Specifically, people who experienced more negative emotion reported lower emotional ( $\beta = -.57, ps < .001$ ) and academic adjustment ( $\beta = -.41, ps < .001$ ). Notably, there was no evidence that negative emotional variability moderated the effect of emotion regulation variability on adjustment outcomes. Also, the patterns were very similar when regressing adjustment on each of the emotion regulation variability indices but while only controlling for mean levels of negative emotion and excluding negative emotional variability—only mean levels of negative emotion experience predicts emotional and academic adjustment.

### 3.3.3 Adaptive and Maladaptive Emotion Regulation Variability

To better understand the associations between emotion regulation variability and adjustment we followed up with additional models for adaptive and maladaptive emotion

regulation variability (see Table 2 for the specific items in each). For adaptive strategies, unlike collapsing across strategies, categorical and temporal variability indices were significantly correlated ( $r = .20, p = .006$ ). Nonetheless, their associations with adjustment mirrored what we found for overall emotion regulation variability. That is, adaptive temporal variability was associated with emotional ( $r = -.25, p = .003$ ) and academic adjustment ( $r = -.20, p = .020$ ), but adaptive categorical variability was not correlated with any adjustment measure. For maladaptive strategies, categorical and temporal variability were also positively associated ( $r = .53, p < .001$ ), and both indices were all inversely associated with each adjustment measure ( $r_s = -.19$  to  $-.37, p_s < .030$ ). Semi-partial correlations, controlling for mean strategy specific to either adaptive or maladaptive, revealed that adaptive temporal variability remained a significant correlate of emotional adjustment after controlling for mean strategy use of adaptive strategies ( $sr = -.20, p = .022$ ), but the same was not true for academic adjustment ( $sr = -.14, p = .124$ ). After controlling for mean strategy use of maladaptive strategies maladaptive temporal variability remained significant for both emotional adjustment ( $sr = -.22, p = .011$ ) and academic adjustment ( $sr = -.22, p = .010$ ) but not social adjustment ( $sr = -.08, p = .361$ ).

We then examined whether adaptive and maladaptive emotion regulation variability predicted adjustment after controlling for mean level negative emotion and negative emotion variability. Consistent with the regression models above that ignore this distinction, emotion regulation variability, whether adaptive or maladaptive, did not predict adjustment. Categorical variability, whether adaptive ( $\beta_s = |.02$  to  $.15|, p_s > .306$ ) or maladaptive ( $\beta_s = -.05$  to  $-.17, p_s > .242$ ), did not predict adjustment in any domain. Temporal variability, whether adaptive ( $\beta_s = |.01$  to  $.06|, p_s > .717$ ) or maladaptive ( $\beta_s = -.004$  to  $-.03, p_s > .800$ ), did not predict adjustment. Again, only mean levels of negative emotion predicted emotional ( $\beta_s = -.54$  to  $-.57, p_s < .001$ )

and academic adjustment ( $\beta$ s = -.35 to -.44,  $p$ s < .002). Lastly, there were no significant interactions between negative emotional variability and any of the emotion regulation variability indices.

### 3.4 Ancillary Analyses

There was little support for the moderating role of ethnicity (see Table 3). There was a significant interaction between ethnicity and temporal variability in predicting social adjustment ( $\beta = .40, p = .004$ ). In this model, temporal variability also exerted a main effect on social adjustment ( $\beta = -.34, p = .021$ ). Inspection of simple slopes revealed that temporal variability predicted lower social adjustment for European Americans ( $\beta = -.30, p = .035$ ), but it did not predict social adjustment among non-European Americans ( $\beta = .25, p = .124$ ). See Figure 1 for the form of the interaction. Ethnicity did not play a moderating role in the association between categorical variability) and any other aspect of adjustment, nor did it moderate the effect of negative emotion variability.

When distinguishing between adaptive and maladaptive emotion regulation variability we find a similar pattern. For adaptive emotion regulation variability, there was now a marginally significant interaction between ethnicity and temporal variability in predicting social adjustment ( $\beta = .25, p = .057$ ). Inspection of simple slopes revealed that temporal variability of adaptive strategies did not significantly predict social adjustment for European Americans ( $\beta = -.17, p = .167$ ), nor for non-European Americans ( $\beta = .16, p = .268$ ). For maladaptive emotion regulation variability, we found a similar marginal interaction between ethnicity and temporal variability in predicting social adjustment ( $\beta = .46, p = .001$ ) such that temporal variability of maladaptive strategies significantly predicted lower social adjustment for European Americans ( $\beta = -.34, p = .045$ ) and higher social adjustment for non-European Americans ( $\beta = .40, p = .020$ ). For

categorical variability, there was only a marginal effect for maladaptive strategies such that maladaptive categorical variability marginally predicted lower social adjustment ( $\beta = -.24, p = .064$ ). There were no other significant effects of categorical variability whether examining all strategies, only adaptive, or only maladaptive.

## Chapter 4: Discussion

### 4.1 Main Findings

Variability in the implementation of emotion regulation is a core aspect of emotion regulation flexibility which has been proposed as essential for wellbeing (Aldao et al., 2015). That is, rather than use of specific strategies and not others, it is argued that a variable and flexible deployment of strategy use is the key for optimal functioning. Few studies have empirically tested this proposition and its contextual boundaries. The present study utilized a daily diary design and a college sample to examine whether and how emotion regulation variability was associated with college adjustment. Further, we tested the hypothesis that emotion regulation variability would be more strongly predictive of adjustment when emotional variability was low, as it was argued that high emotional variability would be indicative of ineffective regulation.

Contrary to expectations, we did not find support for the hypothesis that emotion regulation variability is associated with better adjustment. In fact, both categorical variability (i.e., breadth of strategy use) and temporal variability (i.e., amplitude of strategy use) were unrelated to adjustment in models where we controlled for both mean levels of negative emotion and negative emotion variability across a week. Moreover, although negative emotional variability has been previously shown to be associated with poorer wellbeing outcomes (Houben et al., 2015), it was unrelated to adjustment after accounting for mean negative emotion experience across the week. Further, we expected that the association between emotion regulation variability and adjustment would be weaker for those with greater variability in the experience of negative emotion—indicative of ineffective variation of strategy implementation.

However, variability in negative emotion experience and in emotion regulation use did not interact to predict any adjustment outcome.

Potential interpretations might highlight the importance of adequately capturing contextual features of the environment that prompt regulatory efforts. Absent of the context in which people regulate their emotional experiences, emotion regulation variability appears to either be irrelevant or potentially harmful as temporal variability was correlated inversely with adjustment at the bivariate level, more strongly for maladaptive temporal variability. Thus, varying use of emotion regulation efforts, whether in the number of strategies used or the fluctuation around average levels, might not carry much benefit if efforts are not sensitive to contextual features of the environment. Indeed, some researchers have argued for the importance of responsiveness to changing demands for regulation to be effective (Aldao et al., 2015).

Although daily diary allows researchers to obtain more than just a one-time snapshot into the lives of people, it is possible that the end of the day was experienced similarly in a somewhat homogenous college sample, biasing their retrospective reports. Students were assessed once at the end of the day for seven days and gave a rather broad assessment of how they felt and how they managed how they felt across the entire day. We attempted to capture context indirectly by testing whether the association between emotion regulation variability and adjustment was different depending on levels of negative emotional variability.

It was thought that greater emotional variability serves as a signal that a person is not regulating effectively (Farmer & Kashdan, 2013). Therefore, we hypothesized that the association between emotion regulation variability and adjustment would be weaker along higher levels of emotional variability, particularly for adaptive emotion regulation variability (Aldao & Nolen-Hoeksema, 2012). This was not the case, however, and emotional variability did not

predict adjustment when controlling for mean levels of negative emotion and for emotion regulation variability. Mean levels of negative emotion seem to predict a big chunk of the variance in adjustment measures. Even at the bivariate level where negative emotional variability was associated with poor adjustment, once accounting for mean negative emotion, those associations disappeared. These findings, however, do not suggest that emotional and emotion regulation variability are not important for adjustment. It is likely that the implications of these associations point to potentially having excessive statistical control in our models. That is, if negative emotion experience is thought of as an outcome of emotion regulation, one might ask whether it is reasonable to partial it out. In the present study, adjustment was assessed at one time-point and it might also be possible that our design capitalized on the shared variance between mean negative emotion experience and adjustment. Negative mean emotion were aggregated scores across the seven days. Students filled out a post-measure at the end of the week that asked them to report adjustment in the past week for emotional and academic adjustment (e.g., “In the past week, have you felt?”) and about what they experience typically for social adjustment. Collecting assessments of how students feel emotional, socially, and academically at more than one time-point could help determine whether the effects of emotional and emotion regulation variability are lagged and not necessarily experienced immediately, in the same week.

Furthermore, we also examined whether associations between emotion regulation variability and adjustment by distinguishing between adaptive and maladaptive strategies with the goal of indirectly tapping into contextual features. Aldao and Nolen-Hoeksema (2012) previously found that adaptive strategies (e.g., acceptance, problem-solving, cognitive reappraisal) are more frequently used in certain contexts (e.g., high intensity situations)



compared to maladaptive strategies (e.g., suppression, worry/rumination) that were reportedly used rigidly across all contexts. In the present study, our categorical variability index of emotion regulation variability mirrors their approach most closely. That is, we were also interested in the frequency with which people used different strategies. Although we did not find that emotion regulation variability indices uniquely predicted adjustment, we found a similar pattern of bivariate associations between temporal variability and adjustment for both adaptive and maladaptive, but stronger associations for maladaptive strategies. Moreover, only maladaptive categorical variability was associated with adjustment at the bivariate level. This is consistent with previous findings that show maladaptive emotion regulation to be more strongly associated with psychopathology than adaptive strategies (Aldao & Nolen-Hoeksema, 2010, 2011, 2012). Aldao and Nolen-Hoeksema (2012) make a strong case for the lack of sensitivity to context being the reason that we see a stronger association between maladaptive strategies and negative outcomes. Therefore, it is no surprised that there was no interaction between maladaptive emotion regulation variability and negative emotional variability—our indirect indicator of context. However, the fact that the present study also finds a null interaction between adaptive emotion regulation variability and negative emotional variability is inconsistent with Aldao and Nolen-Hoeksema’s finding. Of the contextual characteristics they examined the intensity of situations most closely aligns with our contextual marker of negative emotional variability. But it is possible that the variability in negative emotion provides additional information not captured by intensity. That is, while it is possible that adaptive strategies generally provide relief in high intensity situations, this might be untrue where intensity intersects with other contextual features. For example, contexts in which students are working to resolve a disagreement signal high intensity, but also imply social goals. In this case, cycling between suppressing one’s frustration

and avoiding mention of a prior transgression (i.e., categorical variability of two “maladaptive” strategies) might be particularly useful.

Nonetheless, there were noteworthy findings that suggest avenues for future work. Recent work suggests that people tend to use multiple strategies to attempt to modify their emotional experience (Brans et al., 2013; Eldesouky & English, 2018; Heij & Cheavens, 2014). We replicated this pattern since people in the present study reported using a wide range of strategies (~ 9 daily on average) across a single day. In contrast, people have been typically asked to employ one or a few strategies in laboratory settings. In the present study, we included 16 strategies across the range of strategies recommended by the process model (Gross, 1998), more than twice as many strategies as previous investigations (e.g., Aldao & Nolen-Hoeksema, 2012; Bonanno et al., 2004; Eldesouky & English, 2018). Given the daily diary design of the study, we were also able to examine associations with temporal variability in emotion regulation, a new index of emotion regulation variability that captures fluctuation in the use of strategies. Interestingly, this temporal variability seemed to function similarly to negative emotion variability and the two indices had a strong association ( $r = .52$ ).

In addition to emotional variability, ethnicity was also examined as a potential moderator in ancillary analyses. It was expected that emotion regulation variability would be more strongly associated with adjustment for non-European American students given the advantage of familiarity with cultural norms. Universities in the United States tend to promote cultural values that do not align with the values of many ethnic minority students (Stephens, Fryberg, Markus, Johnso, & Covarrubias, 2012). And subtle psychological interventions to modify students' appraisal of adjustment concerns find that ethnic minority students benefit the most (e.g., Walton & Cohen, 2007). We found a marginal effect consistent with this narrative such that temporal

variability was associated with greater social adjustment, but only for non-European American students. The reverse was true for European American students—temporal variability was associated with significantly poorer social adjustment. Moreover, this moderation effect was also significant when examining the association between adaptive and maladaptive emotion regulation variability and adjustment separately. These findings seem to suggest that fluctuations in one's strategy use was harmful, but only for European American students. This might suggest that excessive variability in emotion regulation is unnecessary when cultural structures are less likely to present changing demands. That is, greater familiarity with the college environment might indicate that lower variability in regulatory efforts is optimal. Nonetheless, this finding should be taken with a grain of salt given that it was only found for social adjustment. Future studies should attempt to replicate this finding with larger sample sizes and by more directly capturing perceptions of the college environment and the differential demands placed on groups of students.

#### 4.2 Limitations and Future Directions

There are several ways to capture emotion regulation variability and we focused on two of them—categorical and temporal variability. Categorical variability has been examined with different methodological approaches in recent theories (e.g., Bonanno et al., 2004; De France & Hollenstein, 2017). In the present study we asked students to report on several strategies and our daily diary design allowed us to tap into a new index of temporal emotion regulation variability—the fluctuation in use of strategies from typical utilization. Nonetheless, there are other indices of emotion and emotion regulation dynamics that capture different aspects of variability not captured in this study such as temporal dependency—the correlation of temporally successive data points. We only asked participants to report on their emotional experience and

emotion regulation once at the end of the day. Other approaches to modeling the dynamics of emotion and emotion regulation have examined change across time (Ebner-Priemer & Trull, 2012; Houben et al., 2015; Larsen, 1987). For example, mean squared successive differences has been used to examine stability and correlating a raw score with a lagged score of the same variable has been used to capture how persistent a phenomenon is across time points. We focused on variability because these alternative indices of change in emotion might be best captured by assessments that are temporally closer in time to each other rather than a day apart to reduce noise that might especially confound temporal dependency. The concern with interval influencing our variability scores might be less concerning since a variability index cannot tell us anything about temporal dependency (see Ebner-Priemer & Trull, 2012). Moreover, Kuppens and colleagues (2007) found evidence comparing two time-intervals relevant to this discussion. They compared hour-to-hour experience sampling with daily diary methods and found that emotional variability related similarly to personality and adjustment measures. It is less certain that the change captured in successive changes or persistence would be similar in their association with adjustment comparing hourly change to change across entire days. Nonetheless, future work could encompass experience sampling designs that would allow one to best capture frequency, variability, and temporal dependency while staying true to the different daily social contexts people experience.

The use of experience sampling methods might also be useful in better capturing aspects of the context that we failed to capture indirectly in the present study through our test of emotional variability as a moderator, such as social aspects of the college environment that students navigate. This would be particularly important early on as the need to make new friends in the transition to college is especially salient. In this vein, the discrepancies between the

present study and prior work on categorical variability (e.g., Aldao & Nolen-Hoeksema, 2012) might point towards the need to consider intersectional contextual features of the environment rather than in isolation. Moreover, intensive short-term longitudinal designs could also be used to capture college adjustment outcomes over time to determine whether the effects of emotion regulation variability better examined concurrently over multiple assessments or by examining delayed effects that can only be seen after some time. There is still a lot to be known about how both emotional and adjustment unfold over time. Understanding how these processes occur over time may be particularly important given the plethora of recent interventions that have been developed to attenuate belonging uncertainty and other social and academic barriers (e.g., Walton & Cohen, 2011). It will be important to determine how long the effects of these interventions are sustained and where educators and student service program administrators can step in to facilitate adjustment.

The present study is one among a few to examine emotion regulation variability in relation to college adjustment. It serves as a reminder of the importance of context for emotion regulation given that emotion regulation variability, absent of context, did not predict adjustment. Although we tried to account for context indirectly, by including the variability students experience in a given week, the association between emotion regulation variability and adjustment did not depend on emotional variability. Future work is needed to refine an approach for best capturing emotion regulation variability. Moreover, we concur with prior recommendations (e.g., Bonanno, Pat-Horenczyk, & Noll, 2011) regarding the importance of determining contexts in which emotion regulation variability can be helpful or harmful. This is a feat that might be particularly amenable to intensive longitudinal studies to both capture

difference indices of emotion regulation variability and to concurrently assess adjustment over time.

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## Tables

Table 1

*Means, standard deviations, and correlations*

	<i>M</i>	<i>SD</i>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. M Negative Emotion	1.93	0.51															
2. M Positive Emotion	2.57	0.54	-.26**														
3. Negative Emotional Variability	0.36	0.21	.47**	-.08													
4. Positive Emotional Variability	0.52	0.25	.08	.19*	.50**												
5. M ER Strategy Use	2.4	0.48	.38**	.41**	.18*	.11											
6. Categ Var of ER	8.97	2.8	.10	.15	0.07	.00	.36**										
7. Temp Var of ER	0.73	0.22	.41**	-.01	.52**	.52**	.31**	.02									
8. Adapt M ER Strategy Use	2.6	0.56	.10	.61**	0.05	.14	.91**	.36**	.19*								
9. Adaptive Categ Var of ER	7.52	1.84	-.09	.26**	.00	.01	.27**	.94**	-.07	.39**							
10. Adapt Temp Var of ER	0.76	0.22	.29**	.02	.38**	.49**	.21*	-.03	.92**	.16*	-.06						
11. Maladapt M ER Strategy Use	2.13	0.53	.65**	-.04	.30**	.04	.78**	.23**	.38**	.45**	-.01	.20*					
12. Maladapt Categ Var of ER	5.31	1.63	.34**	-.03	.17*	.00	.42**	.89**	.14	.25**	.69**	.03	.53**				
13. Maladapt Temp Var of ER	0.7	0.28	.47**	-.04	.50**	.37**	.39**	.02	.88**	.19*	-.11	.61**	.53**	.20*			
14. Emotional Adjustment	2.06	0.99	-.57**	.46**	-.32**	-.10	-.07	.00	-.32**	.13	.15	-.24**	-.35**	-.21*	-.34**		
15. Social Adjustment	3.94	1.71	-.21*	.33**	-.20*	.01	-.03	-.09	-.15	.11	.00	-.09	-.23**	-.20*	-.18*	.44**	
16. Academic Adjustment	3.05	0.77	-.46**	.27**	-.29**	-.13	-.15	-.12	-.30**	.03	.03	-.20*	-.37**	-.29**	-.34**	.68**	.36**

*Note.* *M* and *SD* are used to represent mean and standard deviation, respectively. ER = Emotion Regulation. Adapt = Adaptive. Maladapt = Maladaptive. Negative and Positive Emotion Means are composites of rated emotion categories. Negative and Positive Emotion Variability were calculated from mean composites by extracting the within-person standard deviation for each valence type across days. Categorical Variability (Categ Var) of ER was calculated by summing number of strategies used each day for each person then averaging across days. Temporal Variability (Temp Var) of ER was calculated by extracting the within-person standard deviation for each strategy across days then averaging across strategies. For all adjustment variables, higher scores indicate better adjustment. Values at  $|\text{.00}|$  are  $< |\text{.01}|$ .

Table 2

*Emotion regulation strategies assessed in daily diaries*

Strategy	M	SD	TV	Item
1. Acceptance*	2.79	0.68	0.69	I accepted the situation and/or my emotions
2. Distraction*	2.68	0.79	0.76	I found an activity to keep myself busy and distracted
3. Rumination	2.26	0.81	0.75	I thought over and over again about the situation and my feelings
4. Problem-solving*	2.50	0.79	0.74	I made a plan to make the situation better
5. Social support seeking*	2.52	0.80	0.84	I found a friend or family member to talk to
6. Benefit-finding*	2.35	0.82	0.71	I thought about how I could become stronger or learn from this situation
7. Consequence focus	2.23	0.76	0.75	I thought about all the different things in my life that this situation would impact
8. Self-blame	1.92	0.71	0.74	I thought about how the situation was my fault
9. Other-blame	1.62	0.65	0.56	I thought about how the situation was someone else's fault
10. Positive focus*	2.91	0.77	0.75	I concentrated on upcoming positive events in my life
11. Socializing*	2.59	0.79	0.83	I sought out activities and socializing
12. Savoring*	2.34	0.74	0.82	I tried to revel in the moment and concentrate on how good I felt
13. Perspective-taking*	2.75	0.84	0.73	I reminded myself of my goals and aspirations
14. Web-browsing	2.72	0.81	0.75	I spent time on online (e.g., social media, Netflix)
15. Suppression	2.41	0.81	0.70	I controlled my emotions by not expressing them
16. Reappraisal	2.26	0.74	0.70	I controlled my emotions by changing the way I thought about the situation I was in
17. Avoidance	1.93	0.75	0.64	I avoided putting myself in a situation or being around certain people

*Note.* Stem for all items: "How did you manage your emotions today?" Likert scale ratings: 1 (*Not at all*) to 5 (*A great deal*). TV = Mean variability for each emotion regulation strategy. TV scores were averaged to construct an overall temporal variability of emotion regulation index that reflects within-person fluctuations in the use of emotion regulation strategies. \* Items indicate "adaptive" strategies whereas items with no asterisk indicate "maladaptive" strategies.

Table 3.

*Emotion regulation variability (categorical and temporal variability), emotional variability, and ethnicity predicting adjustment in college*

	Emotional Adjustment		Social Adjustment		Academic Adjustment	
	$\beta$	$p$	$\beta$	$p$	$\beta$	$p$
Model 1						
Mean Negative Emotion	<b>-.57</b>	<b>&lt; .001</b>	-.13	.186	<b>-.41</b>	<b>&lt; .001</b>
Negative Emotional Variability	-.33	.164	-.15	.597	-.12	.648
Categorical Variability	-.10	.497	-.08	.636	.05	.765
Negative Emotional Variability x Categorical Variability	.36	.187	.02	.943	-.23	.425
Model 2						
Mean Negative Emotion	<b>-.58</b>	<b>&lt; .001</b>	-.16	.152	<b>-.42</b>	<b>&lt; .001</b>
Negative Emotional Variability	.01	.874	-.11	.342	-.02	.849
Mean Strategy Use	.15	.059	.05	.568	.05	.562
Temporal Variability	-.08	.600	-.01	.962	-.13	.634
Negative Emotional Variability x Temporal Variability	-.03	.868	-.03	.860	-.04	.807
Model 3						
Mean Negative Emotion	<b>-.58</b>	<b>&lt; .001</b>	-.13	.224	<b>-.43</b>	<b>&lt; .001</b>
Negative Emotional Variability	-.07	.569	-.27	.088	-.19	.168
Ethnicity	-.26	.341	-.29	.379	-.46	.121
Ethnicity x Negative Emotional Variability	.12	.508	.27	.217	.27	.167
Categorical Variability	.07	.474	-.07	.535	-.08	.452
Ethnicity x Categorical Variability	-.07	.777	-.01	.965	-.00	.998
Model 4						
Mean Negative Emotion	<b>-.60</b>	<b>&lt; .001</b>	-.11	.314	<b>-.51</b>	<b>&lt; .001</b>
Negative Emotional Variability	.01	.965	-.09	.613	-.17	.272
Ethnicity	-.31	.067	-.02	.912	<b>-.51</b>	<b>.005</b>
Ethnicity x Negative Emotional Variability	.07	.729	-.10	.693	.34	.131
Mean Strategy Use	<b>.16</b>	<b>.037</b>	.01	.902	.07	.395
Temporal Variability	-.11	.356	<b>-.32</b>	<b>.027</b>	-.06	.622
Ethnicity x Temporal Variability	-.00	.982	<b>.40</b>	<b>.004</b>	-.09	.483

*Note:* Ethnicity (European American = 0, non-European American = 1). Values are standardized estimates. Values in bold are statistically significant at  $p = .05$ .

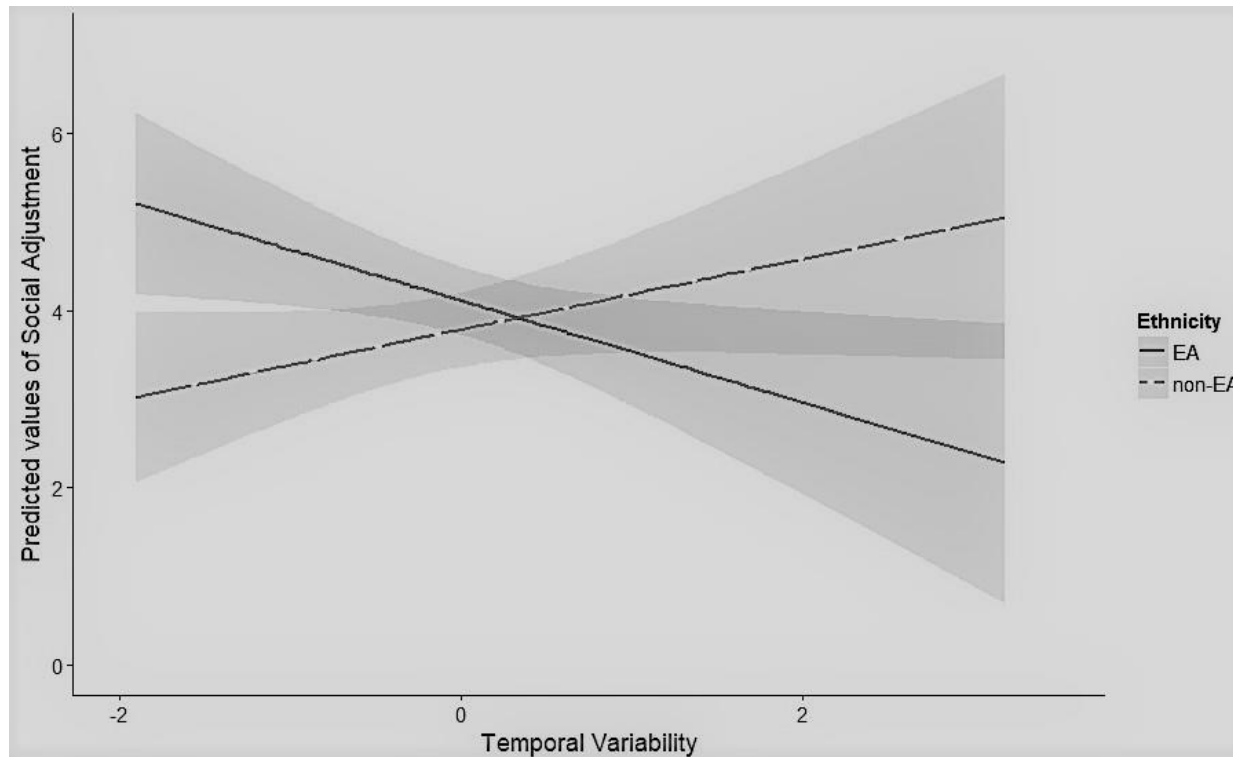
Values at  $|\beta| \geq .10$  are  $p < .01$ . All continuous predictors were z-scored.



## Figures

Figure 1

*Social adjustment predicted by the interaction between temporal variability and ethnicity*



*Note.* EA = European American and non-EA = non-European American (i.e., African American, Latino/a, Middle Eastern, Indigenous American, Other). Bands around fitted line represent confidence bands at the 95% level.