Moderating effects of emotion regulation difficulties and resilience on students’ mental health and well-being during the COVID-19 pandemic

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Abstract
This study examined whether emotion regulation difficulties and resilience in college students moderated changes in mental health over the course of the COVID-19 pandemic. Participants (N = 321) completed surveys assessing mental health, in addition to levels of emotion dysregulation, and resilience during the pandemic, then utilized an anchoring prompt to recall mental health experiences before the pandemic. Correlations revealed participants with higher levels of emotion dysregulation also reported lower levels of resilience. Analyses using the SPSS Macro MEMORE (Montoya, 2019) revealed participants with higher levels of emotion regulation difficulties had greater increases in depression and insomnia, and greater decreases in well-being over the course of the COVID-19 pandemic, while participants with lower levels of resilience had greater increases in depression, anxiety, and insomnia over the course of the pandemic. These results highlight the importance of additional support services and mental health training at universities to meet college students’ immediate and long-term emotional needs stemming from the pandemic.

Keywords
Emotion dysregulation, resilience, mental health, well-being, COVID-19 pandemic

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Before the onset of the COVID-19 pandemic, college students were already a population vulnerable to various mental health issues (McFarland et al., 2019). Anxiety and depression were common concerns that negatively affected students’ personal lives and academic goals (Hart Abney et al., 2019). Sleep disturbances and insomnia were also common in college students (Schlarb et al., 2017), and were associated with low GPA, a low sense of well-being, and inadequate academic performance such as dropping a course (Fischer et al., 2020; Hartmann & Prichard, 2018; Pagel & Kwiatkowski, 2010).

The stress and social isolation induced by the COVID-19 pandemic have led to an increase in levels of sleep disturbances and insomnia (Babb et al., 2022; Lin et al., 2020), as well as rising rates of depression, anxiety, and stress (Babb et al., 2022; Eysenbach et al., 2020; Kibbey et al., 2021). Social distancing and online classes have resulted in less social and emotional support for students from family, friends, classmates, and instructors (Elmer et al., 2020). As the pandemic stretches indefinitely into the future, these effects will continue to exacerbate mental health struggles, and will result in more students seeking mental health services to cope with their new reality.

Students with good mental health typically exhibit a state of well-being, which includes the ability to recognize their own strengths and limitations, cope with normal life stress, and maintain their social, academic, and personal roles and obligations. In order to cope with the excessive negative experiences associated with the pandemic, students must employ strategies to appropriately manage and respond to stress and negative emotions. Emotion regulation refers to reducing emotional arousal and controlling the emotional experience with the use of both conscious and unconscious strategies to handle stressful situations and adapt to the demands of our environment (Gratz & Roemer, 2004). Some of these strategies are healthy, such as engaging in exercise, talking with a friend, or paying attention to negative thoughts and dealing with them accordingly. However, the inability to use these types of healthy strategies can result in emotion dysregulation, whereby an individual engages in unhealthy strategies, such as substance abuse, self-harm, withdrawal from difficult situations, and aggression, to deal with overwhelming and intense negative emotions (Duggan et al., 2015; Lafrance Robinson et al., 2013; Polk & Liss, 2009). Emotion dysregulation can lead to impulsivity, and prohibit goal-directed behavior, acceptance of emotions, emotional understanding, and effective emotion regulation strategies (Gratz & Roemer, 2004).

The ability to appropriately regulate emotions is a very important characteristic for college students, as emotion dysregulation is correlated with negative behaviors such as internet addiction, binge drinking, substance use, social impairment, depression, eating disorders, self-harm, test anxiety, and gambling (Bo et al., 2016; Davis et al., 2008; Flannery et al., 2014; Gratz et al., 2002; Hormes et al., 2014; Kassel et al., 2000; Torrado et al., 2020; Tsai et al., 2020). It is expected that, when facing a global pandemic, most people will feel a lack of control over their own lives, and healthy coping strategies will be essential. College students had to move out of campus housing, become online students, and isolate themselves from peers, family, and friends, for an indefinite period. In many instances, they had to take on new or more complicated roles in their families and jobs. Previous findings tell us that, when faced with stressful events such as natural disasters and outbreaks of infectious disease, lack of control leads to people experiencing feelings
of sadness, fear, anxiety, and anger, which can affect their long-term well-being, or current state of being healthy, happy, and comfortable (Bai et al., 2004; Bults et al., 2011; Lau et al., 2008; Restubog et al., 2020; Thompson et al., 2017). Studies have already indicated increased levels of stress, anxiety, depression, and insomnia, and lowered well-being and sleep quality in college students due to the current pandemic (Babb et al., 2022); therefore, it is expected that an increased proportion of students will display emotion dysregulation behaviors due to the overwhelming effects of COVID-19.

Emotional resilience refers to an individual’s capacity to cope with stressful situations and maintain constancy in their lives, or the ability to “bounce back” (Martin et al., 2015; Mestre et al., 2017; Waugh et al., 2008). Therefore, emotion regulation is the core of emotional resilience; adults with higher levels of emotion dysregulation typically have lower levels of resilience. Because resilience helps college students cope with everyday academic and personal life stresses in a healthy way, students who lack resilience are more likely to develop depression, anxiety, or other mood disorders (Rogers, 2013).

High levels of resilience are also positively correlated with high levels of cognitive flexibility and emotion regulation; positive emotions can help individuals more effectively deal with stress and adversity (Arici-Ozan et al., 2019; Gloria et al., 2013; Ong et al., 2006). Previous studies have defined emotional intelligence as the ability to problem solve with and about emotions, by perceiving emotions, using emotions to facilitate thought, understanding emotions, and regulating own and other’s emotions (Mayer & Salovey, 1997; Mayer et al., 2016). Artuch-Garde et al. (2017) found that the ability to self-regulate behavior is correlated with high levels of resilience in adolescents. Resilience is also positively correlated with problem-focused coping strategies in college students (de la Fuente et al., 2017; Mestre et al., 2017), as well as with emotion-focused coping strategies (Lee et al., 2017).

Resilience can also be an adaptive, dynamic process, by which an individual develops strategies to deal with ongoing challenges and stress (Mestre et al., 2017). Learning healthy emotion regulation strategies can increase resilience in the face of adversity (Artuch-Garde et al., 2017; Tugade & Fredrickson, 2004; Ong et al., 2006), and increased resilience can lead to better problem-focused coping strategies (Lee et al., 2017).

Resilience will be an important predictor of how well college students mentally cope with the effects of the pandemic (Caston & Mauss, 2011). Individuals with emotion dysregulation are less likely to display resilience, and therefore more likely to exhibit poor mental coping strategies. Previous studies have found that resilience is negatively correlated with anxiety and depression in college students, and positively correlated with well-being (Hartley, 2011; 2012; Wu et al., 2020). Resilience is also negatively correlated with insomnia, wherein individuals with lower levels of resilience experience higher levels of sleep disturbances and insomnia (Cheng et al., 2020; Palagini et al., 2018). During the COVID-19 pandemic, when faced with the threat of the virus and the uncertainty regarding a vaccine or cure, increased levels of resilience correlate with lower levels of anxiety (Kimhi et al., 2020). Resilience, as well as adaptive coping strategies and social support, can also moderate acute stress disorder when faced with increased life stressors associated with the pandemic (Ye et al., 2020). In addition, Barzilay et al. (2020) found that adults with higher resilience scores had fewer worries about COVID-19 and
lower anxiety. College students with a high level of resilience should better understand and attend to their negative emotions regarding COVID-19, and employ healthy strategies for dealing with those emotions.

The purpose of the present study was to determine if difficulties with emotion regulation and resilience moderate the change in anxiety, depression, well-being, and insomnia in college students over the course of the COVID-19 pandemic. It is hypothesized that (1) college students who report higher levels of emotion dysregulation will also report lower levels of resilience, (2) emotion regulation difficulties will exacerbate the change in key study variables, and (3) resilience will mitigate the change in mental health over the course of the pandemic. More specifically, students reporting higher levels of emotion dysregulation will also experience greater increases in levels of depression, anxiety, insomnia, and greater decreases in well-being after the onset of the pandemic. Conversely, participants with higher levels of resilience will experience smaller increases in levels of depression, anxiety, insomnia, and less of a decrease in their well-being after the onset of the pandemic.

Method

Participants

Participants (N = 321) in the present study were recruited from undergraduate psychology classes at a large, urban, non-residential university in the southern United States. The participants ranged in age from 18 to 62 (M = 25.88, SD = 8.29) and were predominantly female (77.7%; n = 249) with 22.4% male (n = 72) and a majority identified as Latinx (53.0%, n = 170), followed by Black/African-American (23.1%, n = 74), and White (13.1%, n = 42). A large majority of participants identified as single (80.1%, n = 257), followed by married (14.6%, n = 47), and divorced (4.4%, n = 14). Participants were split by academic level with the most participants reporting their academic level as senior standing (37.4%, n = 120), followed by junior (29.0%, n = 93), sophomore (16.8%, n = 54), freshman (15.6%, n = 50), and finally graduate students (1.2%, n = 4).

Measures

Depression. The Patient Health Questionnaire (PHQ-9; Spitzer et al., 1999) is a 9-item self-report measure assessing the presence of depressive symptoms in the prior 2 weeks, via four Likert-type answer choices ranging from “not at all” to “nearly every day.” The PHQ-9 includes items that assess sleep, appetite, anhedonia, and self-harm and is considered a reliable and valid measure of depressive symptoms (Löwe et al., 2004). Cronbach’s alpha for the present sample was .91.

Anxiety. The General Anxiety Disorder Scale (GAD-7; Spitzer et al., 2006) is a 7-item self-report measure evaluating anxiety symptoms and severity over the last 2 weeks. Items on the GAD-7 include “Not being able to stop or control worrying,” “Trouble relaxing,” and “Feeling afraid as if something awful might happen.” Participants rated these items on
a Likert-type scale ranging from “Not at all” to “Nearly every day.” Research has shown the GAD-7 as a measure of anxiety is both valid and reliable (Kroenke et al., 2010; Löwe et al., 2008). Cronbach’s alpha for the present sample was .93.

**Insomnia.** The Insomnia Severity Index (ISI; Bastien et al., 2001) is a 7-item self-report measure that assesses insomnia symptoms over the last 2 weeks. The first three items rate difficulty falling asleep, staying asleep, and waking up too early on a four-point scale. Each subsequent item is scored on a 0–4 scale, with total scores ranging from 0–25. A sample item is “To what extent do you consider your sleep problem to INTERFERE with your daily functioning?” with options ranging from 0 for “Not at all Interfering” to 4 for “Very much Interfering.” The ISI has been shown to have adequate test-retest reliability over 3 months and concurrent validity with sleep diaries and polysomnography (Bastien et al., 2001; Savard et al., 2005). Cronbach’s alpha in the present sample was .89.

**Well-being.** The WHO-5 Well-Being Index (WHO-5; Topp et al., 2015) is a five item self-report instrument assessing positive quality of life, in a deliberate attempt to avoid symptom-related terminology. Sample items include “I have felt cheerful and in good spirits” and “My daily life has been filled with things that interest me.” Item statements are rated on a 6-point Likert-type scale with answer choices ranging from “At no time” to “All of the time.” Greater scores indicate greater well-being. Prior research has found support for the psychometric properties of the WHO-5 (Bech et al., 2003). Cronbach’s alpha in the present sample was .93.

**Emotion dysregulation.** The Difficulties in Emotion Regulation Scale (DERS; Gratz & Roemer, 2004) is a self-report measure assessing emotion regulation difficulties. It contains 36 items, and the individual rates how often each statement applies to them on a 5-point Likert-type scale ranging from “Almost never” to “Almost always.” Each item loads onto one of six factors: Nonacceptance of Emotional Responses, Difficulties in Engaging in Goal-Directed Behavior, Impulse Control, Lack of Emotional, Limited Access to Emotion Regulation Strategies, and Lack of Emotional Clarity (Gratz & Roemer, 2004). The instrument developers report high internal consistency and strong predictive validity (Gratz & Roemer, 2004). Cronbach’s alpha for the present sample was .95.

**Resilience.** The Multidimensional Individual and Interpersonal Resilience Measure (MIIRM; Martin et al., 2015) is a 22-item self-report measure designed to assess eight factors (Self Efficacy, Access to Support Network, Optimism, Perceived Economic and Social Resources, Spirituality and Religiosity, Relational Accord, Emotional Expression and Communication, Emotional Regulation) in adults. A sample item includes, “I tend to bounce back after illness or hardship,” with options ranging from 0 for Not True At All to 4 for True Nearly All the Time with greater scores indicative of great resilience. Evidence is strong for validity and reliability in the MIIRM. Cronbach’s alpha for the present sample was .77.
**Procedure**

Students were recruited for participation in their undergraduate psychology courses using the Sona Systems online experiment management system. After reviewing the details of the study, participants were directed to a Qualtrics link to complete the consent form and the questionnaires. This study was approved by the University’s Institutional Review Board. Participation in this study was voluntary, and students were offered compensation of extra credit or completion credit of a research requirement in a psychology course. After providing consent, participants completed a series of demographic questions, followed by questionnaires pertaining to their current state (summer or fall 2020). Next, following an anchoring prompt, which included major events that took place in the fall of 2019, participants were then asked to complete the same measures again pertaining to their recalled experiences in the fall of 2019. At the completion of the study, students were provided with contact information for support services that included both local and national hotlines, as well as information for free counseling services available on campus.

**Data analysis**

All analyses were calculated with SPSS Version 26 and the SPSS Macro MEMORE (Montoya, 2019). MEMORE allows for moderation analysis with the use of two-instance repeated measures. As such, in the present study, analyses were used to determine if difficulties in emotion regulation moderate participant scores on key study variables over the course of the COVID-19 pandemic. Similar analyses were conducted to determine if resilience moderates participant scores on key study variables over the course of the COVID-19 pandemic. This allowed us to examine the interaction between emotion regulation and resilience, respectively, at low, mean, and high levels across time. Additionally, Pearson correlations were conducted between all study variables.

**Results**

Examining the first hypothesis, results revealed a significant negative correlation between emotion dysregulation and resilience ($r = -0.57, p < .001$), suggesting participants high in resilience were low in emotion regulation difficulties (see Table 1 for the remainder of the correlations). Results examining hypothesis two, using emotion regulation difficulties as a moderator of the change in depression scores over the course of the COVID-19 pandemic, revealed that emotion regulation difficulties ($b = .06, p < .001$) were significantly related to change in depression scores ($R^2 = .06, F(1,318) = 21.82, p < .001$). The interaction between emotion regulation difficulties and change in depression scores was significant at low ($b = 2.38, p < .001$), mean ($b = 3.96, p < .001$), and high ($b = 5.54, p < .001$) levels of emotion regulation difficulties such that participants with higher levels of difficulties with emotion regulation had greater increases in depression over the course of the COVID-19 pandemic (see Figure 1).

A similar analysis examining emotion regulation difficulties as a moderator of the change in well-being scores over the course of the pandemic revealed that emotion
regulation difficulties ($b = -0.04, p = .009$) were significantly related to change in well-being scores ($R^2 = .02, F(1,315) = 7.00, p = .009$). The interaction between emotion regulation difficulties and change in well-being scores was significant at low ($b = -3.65, p < .001$), mean ($b = -4.71, p < .001$), and high ($b = -5.77, p < .001$) levels of emotion regulation difficulties such that participants with higher levels of emotion dysregulation had greater decreases in well-being over the course of the pandemic (see Figure 2).

The same analysis was also conducted utilizing emotion regulation difficulties as a moderator of the change in insomnia over the course of the pandemic which revealed that emotion regulation difficulties ($b = .06, p < .001$) were significantly related to change in insomnia scores ($R^2 = .05, F(1,315) = 15.99, p < .001$). The interaction between emotion regulation difficulties and change in insomnia scores was significant at

Table 1. Pearson correlations of key study variables from before the onset of the COVID-19 pandemic.

|       | 1     | 2     | 3     | 4     | 5     | 6     |
|-------|-------|-------|-------|-------|-------|-------|
| 1. Resilience        |     |       |       |       |       |       |
| 2. Emotion dysregulation | -0.57* |       |       |       |       |       |
| 3. Depression        | -0.36* | 0.46* |       |       |       |       |
| 4. Anxiety           | -0.31* | 0.43* | 0.79* |       |       |       |
| 5. Well-Being        | 0.39* | -0.34* | -0.52* | -0.47* |       |       |
| 6. Insomnia          | -0.20* | 0.25* | 0.62* | 0.58* | -0.48* |       |

Note. * = p < .001. Resilience = MIIRM, Emotion Dysregulation = DERS, Depression = PHQ-9, Anxiety = GAD-7, Well-Being = WHO-5, and Insomnia = ISI.

Figure 1. Change in depression moderated by emotion dysregulation.
low (b = 2.00, \( p < .001 \)), mean (b = 3.49, \( p < .001 \)), and high (b = 4.97, \( p < .001 \)) levels of emotion regulation difficulties such that participants with greater difficulties with emotion regulation had greater increases in insomnia scores from before to after the onset of the pandemic (see Figure 3). Finally, the analysis was calculated utilizing emotion regulation difficulties as a moderator of change in anxiety scores; however, the relationship was not significant (\( R^2 = .01, F(1,319) = 3.72, p = .055 \)).

To examine hypothesis three, the same analyses were conducted using resilience as a moderator. Examining change in depression scores over the course of the pandemic revealed that resilience (b = −.13, \( p < .001 \)) was significantly related to change in depression scores (\( R^2 = .05, F(1,318) = 18.26, p < .001 \)). The interaction between resilience and change in depression scores was significant at low (b = 5.41, \( p < .001 \)), mean (b = 3.96, \( p < .001 \)), and high (b = 2.51, \( p < .001 \)) levels of resilience such that participants with lower levels of resilience had greater increases in depression scores over the course of the pandemic (see Figure 4). When examining change in anxiety scores over the course of the pandemic, results revealed that resilience (b = −.07, \( p = .040 \)) was significantly related to change in anxiety scores (\( R^2 = .01, F(1,319) = 4.28, p = .040 \)). The interaction between resilience and change in anxiety scores was significant at low (b = 4.47, \( p < .001 \)), mean (b = 3.75, \( p < .001 \)), and high (b = 3.04, \( p < .001 \)) levels of resilience such that participants with lower levels of resilience had greater increases in anxiety scores over the course of the pandemic (see Figure 5).

The same analysis was also conducted utilizing resilience as a moderator of the change in insomnia over the course of the pandemic which revealed that resilience (b = −.13, \( p < .001 \)) was significantly related to change in insomnia scores (\( R^2 = .05, F(1,315) = 15.18, p < .001 \)). The interaction between resilience and change in insomnia scores was significant at low (b = 4.93, \( p < .001 \)), mean (b = 3.49, \( p < .001 \)), and high (b = 2.04, \( p < .001 \)) levels.
of resilience such that participants with lower resilience had greater increases in insomnia scores over the course of the pandemic (see Figure 6). Finally, the analysis was calculated utilizing resilience as a moderator of change in well-being scores; however, the relationship was not significant ($R^2 = .01$, $F(1,315) = 3.80$, $p = .052$).

**Figure 3.** Change in insomnia moderated by emotion dysregulation.

**Figure 4.** Change in depression moderated by resilience.
Discussion

Results of the present study revealed that students reported both depression and insomnia increased, and well-being decreased, after the onset of the pandemic, particularly in students with high levels of emotion dysregulation, in support of hypothesis two. There was no correlation between emotion regulation and anxiety. However, as expected from...
previous findings, the results showed a negative correlation between resilience and emotion dysregulation in college students, in that students who reported a lower level of resilience were more likely to exhibit emotion dysregulation in support of hypothesis one (Arici-Ozan et al., 2019; Gloria et al., 2013; Ong et al., 2006; Tugade & Fredrickson, 2004). Furthermore, in support of hypothesis three, resilience moderated increases in depression (Hartley, 2011, 2012; Nrugham et al., 2010; Wu et al., 2020), anxiety (Barzilay et al., 2020; Kimhi et al., 2020) and insomnia (Cheng et al., 2020; Palagini et al., 2018) associated with the COVID-19 pandemic. This study found no relationship between resilience and well-being.

These findings are significant, in that they point to an increasing need to offer additional mental health services to meet students’ rising levels of depression, anxiety, and insomnia resulting from the COVID-19 pandemic. Before the pandemic, anxiety and depression were common causes for concern in college students (McFarland et al., 2019), with students reporting that their personal and academic lives were affected by mental health struggles (Hart Abney et al., 2019). Studies have demonstrated that students are reporting increased levels of anxiety, depression, and sleep disturbances due to worries regarding the pandemic (Eysenbach et al., 2020). Because the results of the study found that students with more emotion regulation difficulties reported more mental health problems over the course of the pandemic, it is important that universities ensure their support services for students teach emotion regulation strategies in order to cope with long-term emotional effects from the pandemic. This can include mindfulness, distress tolerance, and even relaxation. Past research has found correlations between outbreaks of disease and elevated levels of depression (Bai et al., 2004) and anxiety (Thompson et al., 2017), and lower levels of well-being (Lau et al., 2008). It will be imperative for universities to meet the mental health needs of students both during and after the pandemic, in order to help students maintain their GPA and enrollment hours, juggle personal, work, and academic demands, and prepare for their future careers. There is a concern that students with low resilience and high emotion dysregulation may cope using unhealthy behaviors such as disordered eating, self-harm, and substance abuse (Gratz et al., 2002; Kassel et al., 2000). One strategy may be to first identify these students, and subsequently increase their resilience through teaching them to regulate their negative emotions and practice mindfulness in order to be successful in this current environment (Finkelstein-Fox et al., 2018; MacDonald & Baxter, 2017). Additionally, university counseling services should focus on teaching emotion regulation strategies and coping skills to ensure students have the effective tools necessary to be academically successful while simultaneously dealing with the mental health effects of the COVID-19 pandemic.

One limitation of this study is that the data was collected at an urban, commuter campus in the southern United States; therefore, although this data provides a good look at how students are affected by the ongoing pandemic, and how resilience can help moderate these effects, the findings may not be generalizable to students enrolled in traditional, non-commuter campuses, or students in other countries. Additionally, students in the present study were often non-traditional, such that they were older, and typically had family and work responsibilities outside of school which could influence the impact of the pandemic on their mental health. Future studies should examine emotion regulation, mental health,
and resilience in students at traditional, residential campuses, as well as at universities outside the United States to examine the more global impact of the pandemic on mental health.

In addition, students were asked on the survey to retroactively analyze their pre-COVID/Fall 2019 rates of anxiety, depression, well-being, and insomnia. Due to the sudden onset of the pandemic, there was no baseline rate of these issues, so the methodology was not ideal, but necessary. This study also would have benefited from surveys regarding pre-COVID and post-onset stress levels. In the future, the authors plan to investigate further short-term effects of the pandemic, as well as long-term effects such as how students’ grades, retention, attrition, graduation, and career goals were affected by their increased levels of depression, anxiety, and insomnia, and decreased levels of well-being. Future research should also determine how to best increase resilience in students, and what other services students need from their university. It is also possible that there were positive consequences from the pandemic, such as the ability to spend more time with family, that were not highlighted in this study, and therefore their correlation with mental health and well-being could not be examined.

In conclusion, this study allowed for a substantial examination of the effects of COVID-19 on college students. It is not surprising that anxiety, depression, and insomnia have increased due to the COVID-19 pandemic, and that feelings of well-being decreased. These results are consistent with previous studies that show students with better emotion regulation will experience fewer mental health issues, and that resilience is positively correlated with emotion regulation, and can help moderate mental health problems. These findings suggest that, despite facing an unprecedented world event with long-reaching health, social, educational, and financial consequences, college students should be able to cope with stressful life events if they have the proper tools. Institutions of higher education should be prepared to increase availability to support services for students, in particular mental health counseling, and focus on utilizing programs designed to increase resilience and coping skills in adults.

**Declaration of conflicting interests**

The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

**Funding**

The author(s) received no financial support for the research, authorship, and/or publication of this article.

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