



Relationships Among Adverse and Benevolent Childhood Experiences, Emotion Dysregulation, and Psychopathology Symptoms

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Accepted: 7 March 2023

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Abstract

This cross-sectional study sought to examine adverse childhood experiences (ACEs), benevolent childhood experiences (BCEs), and emotion dysregulation as they relate to psychopathology symptoms (posttraumatic stress disorder [PTSD], anxiety, depression) in university students in emerging adulthood. Students at a United States university ($N = 1,498$) completed an online survey during the fall 2021 and spring 2022 semesters. Measures include the Adverse Childhood Experiences Questionnaire, Benevolent Childhood Experiences Scale, Difficulties in Emotion Regulation Scale—Short Form, PTSD Checklist for the Diagnostic and Statistical Manual of Mental Disorders 5th edition, Patient Health Questionnaire 8, and Generalized Anxiety Disorder 7 Scale. ACEs significantly related to greater symptoms and positive screens for PTSD, depression, and anxiety. BCEs significantly related to fewer symptoms and positive screens for PTSD, depression, and anxiety. Emotion dysregulation was a significant mediator of relationships between ACEs and all symptom types (direct and indirect effects were both significant, supporting partial mediation). Emotion dysregulation was a significant partial mediator of relationships between BCEs and all symptom types (direct and indirect effects were both significant, supporting partial mediation). Results showed significant small moderation effects of BCEs on the relationships of ACEs-emotion dysregulation, ACEs-depression symptoms, ACEs-anxiety symptoms, and emotion dysregulation-PTSD symptoms. Implications for colleges and universities are discussed.

Keywords Adverse childhood experiences · Benevolent childhood experiences · Emotion dysregulation · Psychopathology

Concerns regarding the mental health of university students were growing prior to the COVID-19 pandemic (Cusack et al., 2019) and have been elevated by emerging studies demonstrating a significant negative impact of the pandemic on their mental health (Kecojevic et al., 2020; Wood et al., 2022). Childhood experiences have been shown to be predictors of various mental health outcomes in this population, with negative or adverse experiences increasing risk and positive or benevolent experiences decreasing risk for poor mental health outcomes (e.g., Doom et al., 2021). Investigating the relationship between childhood experiences and a range of mental health outcomes in adulthood, as well as mechanisms accounting for how these relationships occur, is critical to promote resilient outcomes across the lifespan.

The term adverse childhood experiences (ACEs) was coined to refer to types of abuse (physical, emotional, sexual), neglect (physical, emotional), and household dysfunction (e.g., drug use in the home) that are potentially traumatic experiences occurring between birth and age eighteen (Dube et al., 2001; Felitti et al., 1998). Approximately 60% of adults in the United States (US) have experienced at least one ACE, more than a third have experienced two or more ACEs, about a quarter have experienced three or more, and approximately 15% have experienced four or more (Merrick et al., 2018). The average number of ACEs ranges from 1.86 to 2.67 in college student and other adult samples in the US (Crandall et al., 2019; Doom et al., 2021; Rodriguez et al., 2021). Childhood adversities have been consistently associated with multiple types of psychopathology in adulthood, such as depression, anxiety disorders, post-traumatic stress disorder (PTSD), and eating disorders (Herzog & Schmahl, 2018; Kessler et al., 2010), including among university students (Chi et al., 2020; Doom et al., 2021). This points to the possibility that childhood adversities are a transdiagnostic

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risk factor for mental disorders, i.e., a factor that occurs across multiple disorders and contributes to the etiology and/or maintenance of a range of disorders (Dalglish et al., 2020).

In order to fully comprehend the effects of childhood experiences on adult psychological wellbeing, it is important that researchers study positive, or benevolent, childhood experiences in addition to adverse ones. Recently, research on positive or benevolent childhood experiences has emerged, based on resilience research identifying experiences that enabled children to withstand/recover from adversity. The term benevolent childhood experiences (BCEs) was coined to refer to favorable experiences that occur between birth and age eighteen which are marked by positive qualities of life (e.g., perceived safety, security, and support), and include both internal (e.g., positive self-esteem, comforting beliefs) and external (e.g., having a safe caregiver, other adults who were caring and supportive, regular home routines) resources and experiences (Narayan et al., 2018). BCEs are common, with the average number ranging from 8.15 to 8.97 in college student and other adult samples in the US (Crandall et al., 2019; Doom et al., 2021; Rodriguez et al., 2021). In contrast to ACEs, BCEs have been associated with better mental health in adulthood, including fewer PTSD symptoms in pregnant women with histories of childhood adversity (Narayan et al., 2018), and fewer symptoms of depression (Doom et al., 2021; Xu et al., 2022; Zhang et al., 2021) and anxiety (Rodriguez et al., 2021; Xu et al., 2022) in university students. While this is a newer research area than ACEs, studies show an opposite pattern of relationship with various psychopathological symptoms, raising the possibility BCEs are a transdiagnostic protective factor for mental disorders, i.e., a factor that decreases the likelihood of experiencing a range of disorders (Lynch et al., 2020).

Given that the relationship between ACEs and psychopathology has been documented by numerous studies since the original study's first wave of findings (Felitti et al., 1998), researchers have been examining mechanisms through which these negative mental health outcomes may occur. One possible mechanism that could explain the process through which childhood adversity and psychopathology are related is emotion regulation. Emotion regulation is conceptualized as one's ability to identify, understand, accept, and regulate emotional responses in order to meet individual goals and situational demands (Gratz & Roemer, 2004). ACEs may lead to difficulties with these emotion regulation processes due to maladaptive social learning (e.g., absence of caregivers who can model emotion regulation strategies) or premature activation of biological stress systems (e.g., the hypothalamic–pituitary–adrenal axis; Miu et al., 2022). Miu and colleagues' (2022) meta-analysis found supporting evidence for an indirect effect of emotion regulation on the relationship between childhood adversity and a wide

range of psychopathology symptoms. This is consistent with other research, suggesting emotion regulation may be a transdiagnostic mediator (i.e., a variable that accounts for the relationship between a risk factor and a range of disorders) on the pathway from childhood adversity to a range of disorders (Hoppen & Chalder, 2018; Panagou & MacBeth, 2022). Research examining mediators of the relationship of positive childhood experiences with outcomes has started to emerge; however, none has examined emotion regulation as a potential mediator, and most has focused on positive outcomes such as well-being (Shaw et al., 2022) and resilience (Kocatürk & Çiçek, 2021).

BCEs have also been examined with regard to main/direct effects on outcomes, conceptualized as promotive factors that have favorable main effects on outcomes independent of level of ACEs (e.g., Doom et al., 2021; Narayan et al., 2018; Zhang et al., 2021). In addition, researchers have investigated the neutralizing or protective or buffering role of BCEs on the negative mental health effects of ACEs; however, findings were inconsistent in studies of US university students during the pandemic. One study found BCEs moderated (weakened) the relationships of ACEs to depression and anxiety symptoms (Rodriguez et al., 2021), and another found BCEs did not moderate those relationships (Doom et al., 2021). Given the aforementioned evidence supporting emotion regulation as a mediating mechanism through which ACEs lead to mental health outcomes, BCEs could possibly buffer against the negative affect of ACEs on emotion regulation, or those of emotion regulation on mental health outcomes. Whereas there are mixed findings regarding BCEs moderating ACEs-mental health relationships, to date, no research has examined BCEs as a moderator of the ACEs-emotion regulation relationship or emotion regulation-mental health outcome relationships.

Support for investigating ACEs as a risk factor and BCEs as a promotive factor in relation to a range of mental health outcomes (e.g., anxiety, depression, PTSD), with emotion dysregulation as a mediator of those relationships, can be understood based on a developmental psychopathology (DP) perspective, which encompasses normal and abnormal development. DP theorists propose that ACEs create an environment in which children's sense of safety and security are undermined and interfere with the development of adaptive abilities such as emotion regulation, which contribute to the emergence of mental health problems (Almeida et al., 2021). In contrast, BCEs create a secure, predictable, and nurturing environment that promotes children's sense of safety and security and facilitates the development of adaptive abilities, which reduces the risk for mental health problems (Almeida et al., 2021).

Emerging adulthood is a key developmental transition for investigating relationships among childhood experiences, emotion regulation, and psychopathology. Emerging

adulthood is a period of development from adolescence to adulthood spanning from ages 18–29, and is marked by unique challenges of identity formation, instability (e.g., in relationships, work, and residence), navigating the responsibilities of adulthood, and making decisions about the future (Arnett, 2004, 2016). Many emerging adults are also college students, and college itself involves a transition that increases financial, academic, and social stressors (D'Amico et al., 2016). It is also during emerging adulthood that the risk for the onset of many mental disorders reaches a peak, with 75% of those who will have a mental disorder in their lifetime having their first onset by age 25 (Adams et al., 2014; Kessler et al., 2007). Prior to and during the pandemic, anxiety disorders and depression have been consistently reported as the most common mental disorders experienced by this group, with PTSD being in the top five most common (American College Health Association [ACHA] 2020, 2021, 2022), and having a history of ACEs increases the risk of developing all three (Koenen et al., 2007; Levitan et al., 2003). COVID-19 can meet PTSD criterion A for some people (i.e., direct or indirect exposure to, witnessing of, or learning of loved one's exposure to actual or threatened death or serious injury), making pandemic-specific PTSD a newer concern. Prior trauma has been shown to be a risk factor for pandemic-specific PTSD in college students (Feiler et al., 2022). In contrast, BCEs have been associated with better mental health outcomes in college students (Doom et al., 2021; Xu et al., 2022; Zhang et al., 2021). Given emerging adulthood starts where childhood experiences end, studying this population enables researchers to gain a greater understanding of a more proximal impact of childhood experiences on adult emotion regulation and mental health, specifically depression, anxiety, and PTSD.

The Current Study

As described previously, evidence supports ACEs as a transdiagnostic risk factor increasing the likelihood of experiencing a range of psychopathology, with emotion regulation as a transdiagnostic mediating mechanism through

which ACEs lead to distinct types of psychopathology. The current study seeks to replicate these findings in a sample of emerging adult university students. The emerging area of BCEs research points to the possibility BCEs may also be a transdiagnostic factor in relation to mental health outcomes, but one that relates to a reduced likelihood of experiencing a range of disorders. Studies of promotive main effects of BCEs in relation to mental health outcomes independent of level of ACEs reveal consistent results (e.g., Doom et al., 2021; Narayan et al., 2018; Zhang et al., 2021), however, researchers have yet to examine emotion regulation as a potential mediator of the BCEs-mental health outcome relationships. The current study seeks to replicate findings of promotive main effects of BCEs, and add to the literature by examining emotion regulation as a mediator of any BCEs-mental health outcome relationships observed. Thus, the first two aims of the current cross-sectional study are to examine: 1) ACEs as a potential transdiagnostic risk factor and BCEs as a potential transdiagnostic protective factor for several types of psychopathology symptoms (PTSD, depression, anxiety) in university students; and 2) emotion dysregulation as a plausible transdiagnostic mediator of the observed relationships of ACEs and BCEs with several types of psychopathology symptoms (PTSD, depression, anxiety). The conceptual model for research aims 1 and 2 is shown in Fig. 1.

BCEs have also been examined as a moderator that acts upon the relationships between ACEs and mental health outcome, but not as a mediator as BCEs are not theorized to be caused by low ACEs, and ACEs and BCEs have been found to have little overlap (Narayan et al., 2018). Studies of moderation/buffering of BCEs on ACEs-mental health outcome relationships have found mixed results (Doom et al., 2021; Rodriguez et al., 2021). In addition, researchers have yet to examine BCEs as a potential moderator of the established relationships of either ACEs and emotion regulation or emotion regulation and mental health outcomes. Thus, as shown in the conceptual model in Fig. 2, the third aim of the current study is to add to the literature by examining BCEs as a potential moderator of observed relationships of: 1) ACEs and emotion regulation (moderation A), 2) ACEs and several types of psychopathology symptoms (PTSD,

Fig. 1 Conceptual model for direct relationships of ACEs and BCEs and emotion dysregulation mediation

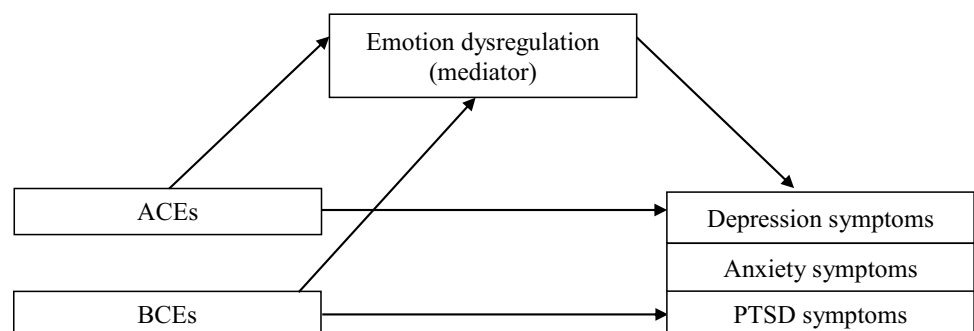
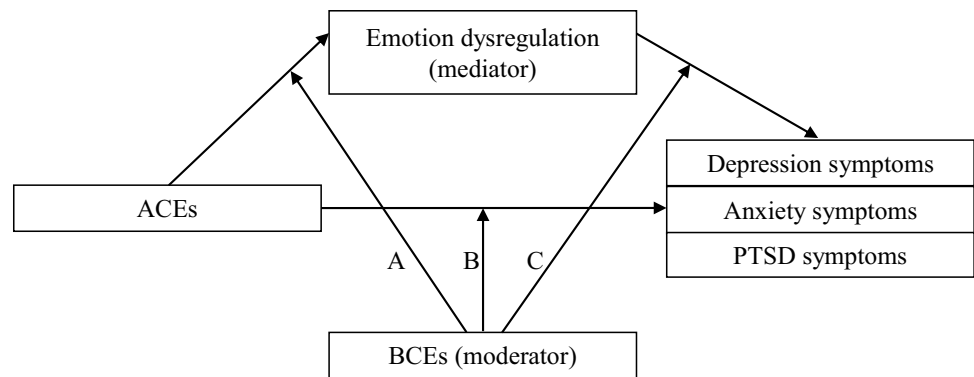


Fig. 2 Conceptual model for moderated mediation



depression, anxiety) (moderation B), and 3) emotion regulation and several types of psychopathology symptoms (PTSD, depression, anxiety) (moderation C). This study hopes to elucidate the roles of emotion dysregulation and BCEs in the context of ACEs and psychopathology symptoms in university students in emerging adulthood, when many mental health disorders emerge. Study findings can help inform interventions to prevent the emergence or worsening of mental health symptoms and reduce symptoms as they continue into adulthood.

Method

Participants and Procedures

The research aims addressed in this report are part of a larger cross-sectional online survey study of mental health and coping during the pandemic that took place at a large Southeastern public university from November 2021 through April 2022. Approval for this study was granted by the university's Institutional Review Board. Students were recruited from introductory psychology courses, a random sample of 10,000 students (provided by the university's institutional assessment division after approval of the survey), student organizations, and help from faculty and staff. Eligibility criteria included being between the ages of 18–29 and a currently enrolled undergraduate student. Interested students were provided the survey website, and those who provided electronic informed consent and met eligibility criteria were advanced to the survey. Participants who passed a survey completion and engagement check were included in analyses ($N = 1,498$) and received research credit or were entered into a gift card raffle.

Measures

The survey measures pertaining to the research questions/hypotheses in this report included previously established psychometrically sound scales of ACEs, BCEs, emotion dysregulation, depressive symptoms, generalized anxiety symptoms, and pandemic-specific PTSD symptoms. For

each scale, items were summed to create total scores unless noted otherwise. Survey items also assessed demographic/background variables (age, gender, race, ethnicity, student year, highest parental education, sexual orientation, and mental health history).

Childhood Experiences

ACEs ACEs were assessed with the 10-item Adverse Childhood Experience Study Questionnaire (ACESQ) (Felitti et al., 1998). This scale was designed to assess the occurrence of ten potentially traumatic events that occur in childhood (birth–18 years): 1) emotional abuse, 2) physical abuse, 3) sexual abuse, 4) physical neglect, 5) emotional neglect, 6) loss of a parent due to divorce, death, abandonment, or other reason, 7) household member substance abuse, 8) household domestic violence, 9) household member mental illness, and 10) household member incarceration (Felitti et al., 1998). Respondents indicate “yes” or “no” for each event.

BCEs BCEs were assessed with the 10-item Benevolent Childhood Experiences Scale (Narayan et al., 2018). Items on this scale assess the occurrence of ten positive events that occur during childhood (birth–18 years): 1) having at least one safe caregiver, 2) having at least one good friend, 3) having beliefs that gave comfort, 4) enjoying school, 5) having at least one teacher who cared, 6) having good neighbors, 7) having an adult (not parent/caregiver) who could provide support or advice, 8) having opportunities to have a good time, 9) having a positive self-concept, and 10) having a predictable home routine. Respondents indicate “yes” or “no” for each event.

Emotion Dysregulation

Emotional dysregulation was assessed with the Difficulties in Emotion Regulation Scale—Short Form (DERS-SF; Kaufman et al., 2016). This measure contains 18 of the 36 items included in the original Difficulties in Emotion Regulation Scale (Gratz & Roemer, 2004), one of the most widely used

self-report measures of this construct. The DERS-SF contains six subscales with three items each: clarity, strategies, non-acceptance, awareness, goals, and impulse. Sample items include “I pay attention to how I feel” and “I have difficulty making sense out of my feelings.” Respondents rate how often the items apply to themselves (1 = almost never to 5 = almost always). Total DERS-SF scores range from 18–90, with higher scores reflecting emotion dysregulation as positively worded items are reverse scored. Cronbach’s alpha for the DERS-SF in the current study was 0.92.

Psychopathology Symptoms

PTSD PTSD symptoms were assessed with the 20-item PTSD Checklist for the Diagnostic and Statistical Manual of Mental Disorders Fifth Edition (DSM-5) (PCL-5; Weathers et al., 2013) with reference to very stressful experience(s) resulting from the COVID-19 pandemic. Respondents rate how often they were bothered by these symptoms (e.g., “Repeated, disturbing dreams of the stressful event”) over the last month (0 = not at all to 4 = extremely). Although there are no empirically derived PTSD severity ranges for the PCL-5, current psychometric work supports a cut-point score of 31–33 as indicative of probable PTSD diagnosis (Veterans Affairs, 2020). Cronbach’s alpha for the PCL-5 in the current study was 0.96.

Depression Depressive symptoms were assessed with the 8-item Patient Health Questionnaire (PHQ-8; Kroenke et al., 2009). This measure contains eight of the nine criteria on which the DSM-IV diagnosis of depressive disorder is based (APA, 1994). The PHQ-8 does not include the item about suicidal ideation (PHQ-9; Kroenke et al., 2001). Participants rate how often they have been bothered by eight symptoms over the last two weeks (e.g., “Little interest or pleasure in doing things”) (0 = not at all to 3 = nearly every day) (Kroenke et al., 2009). A total score of 0 to 4 reflects no significant depressive symptoms, 5 to 9 indicates mild, 10 to 14 moderate, 15 to 19 moderately severe, and 20 to 24 severe symptoms (Kroenke et al., 2009). Like the PHQ-9, the PHQ-8 can be used to predict a possible diagnosis for DSM-5 depressive disorder using a cutoff score of 10 (e.g., Corson et al., 2004; Kroenke et al., 2009). Cronbach’s alpha in the current study was 0.90.

Anxiety Generalized anxiety disorder (GAD) symptoms were assessed with the 7-item Generalized Anxiety Disorder Scale (GAD-7; Spitzer et al., 2006). The scale was designed to reflect the DSM-IV symptom criteria for GAD (APA, 1994) and is consistent with the DSM-5 symptom criteria for GAD (Spitzer et al., 2006). Respondents rate how often they have been bothered by seven symptoms (e.g., “Feeling nervous, anxious, or on edge”) over the last two weeks (0 = not at all to

3 = Nearly every day). A total score of 0 to 4 reflects minimal symptoms, 5 to 9 indicates mild, 10 to 14 moderate, and 15 to 21 severe symptoms (Spitzer et al., 2006). The GAD-7 can be used to predict a possible diagnosis for DSM-V GAD using a cutoff score of 10 (Löwe et al., 2008; Spitzer et al., 2006). Cronbach’s alpha for the GAD-7 in the current study was 0.91.

Data Analysis

Data were analyzed using SPSS version 27, including PROCESS macros v. 4.1 (Hayes, 2022). Of the study’s primary variables (ACEs, BCEs, emotion dysregulation, symptoms of depression, anxiety, and PTSD), symptoms of depression (0.1%) and PTSD (0.1%) had missing data. Of the demographic/background variables assessed (age, gender, race, ethnicity, student year, highest parental education, sexual orientation, and mental health history), race/ethnicity (4.5%), sexual orientation (1.4%), gender (0.1%), and parental education (0.3%) had missing data. The greater percentages of missing data for race/ethnicity and sexual orientation suggest participants may be more sensitive to answering questions asking about these demographic variables, and thus leave them unanswered on purpose. Descriptive statistics were calculated for study variables. Gender, age, parent education, race/ethnicity, and sexual orientation have been shown to relate to mental health outcomes in college students (e.g., Freibott et al., 2022; Wang et al., 2022). Mental health problems earlier in life have been consistently found to be a risk factor for mental health problems in college students (Sheldon et al., 2021). Therefore, we conducted Pearson correlations and *t*-tests to examine relationships between these demographic/background variables and study variables to identify covariates to control for in subsequent analyses.

The analyses addressing the study’s research aims examine each of the three types of psychopathology outcomes separately rather than forming a composite or latent variable comprised of all three. Although there tends to be overlap in symptoms of major depressive disorder, generalized anxiety disorder, and PTSD (Brady et al., 2000), each of these disorders are still separate and distinct mental health conditions. In addition to enabling an investigation of the transdiagnostic nature of ACEs, BCEs, and emotion dysregulation, examining symptoms of each disorder separately can provide more clinically meaningful information to practitioners.

To address research aim 1 (ACEs as potential transdiagnostic risk factor and BCEs as potential transdiagnostic protective factor for several types of psychopathology symptoms), partial correlations examined linear relationships among continuous study variables (controlling for demographic/background variables). Correlation

coefficients around 0.10 were interpreted as weak, 0.30 as moderate and 0.50 or larger as strong (Cohen, 1988). In addition, a series of logistic regressions were conducted to separately examine the predictiveness of ACEs and BCEs (continuous) for positive screens (dichotomous) of PTSD, depression, and anxiety (controlling for demographic/background variables).

PROCESS models were used to address research aims 2 and 3. These analyses used continuous variables, list-wise deletion for missing data, were based on 5000 bootstrap estimates of 95% confidence intervals (CIs), predictor variables were mean-centered, and demographic/background variables were controlled for. To address research aim 2 (emotion dysregulation as a potential transdiagnostic mediator of observed relationships of ACEs and BCEs with psychopathology symptoms), we used PROCESS model 4 to test: 1) three mediation models of ACEs on each psychopathology outcome (PTSD, depression, and anxiety symptoms) through emotion dysregulation; and 2) three mediation models of BCEs on each psychopathology outcome through emotion dysregulation. The multiple regressions test how the significance of the direct effect of ACEs (and separately, BCEs) on each psychopathology outcome is affected after the indirect effect of emotion dysregulation is included in the model. Mediation effects are determined to be significant if the associated 95% CIs for indirect effects do not include zero. Full mediation is supported if the direct effect becomes non-significant after the indirect effect is included in the model. Partial mediation is supported if direct and indirect effects are both significant.

To address research aim 3 (BCEs as a potential moderator of observed relationships among ACEs, emotion dysregulation, and symptoms), we used PROCESS model 59 to test moderated mediation models of ACEs on each psychopathology outcome through emotion dysregulation with BCEs as a moderator of three different paths. For the path of ACEs to emotion dysregulation (see Fig. 2, moderation A), the multiple regressions tested for the significance of ACEs, BCEs, and the interaction term (ACEs x BCEs) as predictors of emotion dysregulation. For the path of ACEs to psychopathology outcomes (see Fig. 2, moderation B), the multiple regressions tested for the significance of ACEs, BCEs, and the interaction term (ACEs x BCEs) as predictors of each psychopathology outcome. For the path of emotion dysregulation to psychopathology outcomes (see Fig. 2, moderation C), the multiple regressions tested for the significance of emotion dysregulation, BCEs, and the interaction term (emotion dysregulation x BCEs) as predictors of each psychopathology outcome. Significance of the interaction term (e.g., ACEs x BCEs) indicates moderation.

Results

Sample Characteristics

Descriptive statistics for the sample's categorical demographic/background variables can be seen in Table 1. The majority of the sample identified as women, White, not Hispanic or Latino/a/x, heterosexual, continuing generation college students without a history of mental health disorder pre-pandemic. Approximately half the sample were freshmen, with an average age of 19.8 years ($SD=2.4$, range 18–29). Average parental education equated to a bachelor's degree.

Study Variable Descriptive Statistics

Descriptive statistics for study variables are reported in Table 2. The majority (59.4%) of participants reported experiencing at least one ACE, 25.3% reported two or more, 15.9% three or more, and 10.6% four or more. Just over half (52.4%) of participants reported experiencing all 10 BCEs, with 19.6% reporting nine, 12.0% reporting eight, and 16.0% reporting seven or fewer. Mean ACEs and BCEs scores were very similar to those reported by Doom et al. (2021) who administered an 8-item ACEs Scale and the BCEs Scale to a sample of US university students during the pandemic ($M_{ACEs}=1.86$, $M_{BCEs}=8.70$). On average, participants scored in the middle range of the DERS-SF, reflecting moderate emotion regulation difficulties, and mild levels of PTSD, depressive, and anxiety symptoms. Mean anxiety and depression symptoms scores were slightly lower (about a third of a standard deviation) than that reported by Doom et al. (2021) who administered the GAD-7 and PHQ-9 to a sample of US university students during the pandemic ($M_{anxiety}=8.70$, $M_{depression}=8.70$). Just under a quarter (23.7%) met the clinical cut-off for PTSD, 35.9% met the clinical cut-off for depression, and 32.2% met the clinical cut-off for anxiety. The positive screen for PTSD was higher than that reported by Wathélet et al. (2021) who administered the PCL-5 to a sample of French university students during the pandemic (19.5%).

Relationships between Demographic/background and Study Variables

Participants who identified as female had significantly greater mean symptoms of PTSD, $t(1011.33)=6.21$, $p<0.001$, depression, $t(923.71)=8.44$, $p<0.001$, and anxiety, $t(985.88)=9.86$, $p<0.001$, as well as greater mean ACEs, $t(967.61)=4.77$, $p<0.001$ and emotion dysregulation $t(948.91)=4.11$, $p<0.001$ compared to those who did not. Participants who identified as people of color had

Table 1 Categorical demographic/background variables

Variable	<i>n</i>	%
Gender		
Woman	1045	69.8
Man	430	28.7
Non-binary or gender fluid	17	1.1
Do not identify as male, female, transgender man or woman, non-binary, or gender fluid	4	0.3
Transgender woman	1	0.1
Missing	1	0.1
Race/ethnicity		
White or European	868	57.9
Black or African American	229	15.3
Latina/o/x or Hispanic	179	11.9
Multiple race/ethnicity	87	5.8
Asian	49	3.3
Native American, American Indian, or Alaska Native	7	0.5
West Asian, Middle Eastern, or North African	8	0.5
Native Hawaiian or Other Pacific Islander	3	0.2
Chose not to disclose	11	0.7
Missing	57	0.4
Student Status		
Freshman (1–29 h)	741	49.5
Sophomore (30–59 h)	326	21.8
Junior (60–89 h)	175	11.7
Senior (90 or more hours)	138	9.2
Graduate or professional student	111	7.4
Other	7	0.5
Missing	0	0
Sexual Orientation		
Heterosexual/straight	1207	80.6
Bisexual	103	6.9
Lesbian	33	2.2
Questioning/unsure	32	2.1
Asexual	48	3.2
Pansexual	27	1.8
Gay	11	0.7
Queer	10	0.7
Other	6	0.4
Chose not to disclose	18	1.2
Missing	3	0.2
First/continuing generation college student		
First generation	485	32.4
Continuing generation	1009	67.4
Missing	4	0.3
Mental health disorder before the pandemic		
Yes	487	32.5
No	1011	67.5
Missing	0	0

significantly greater mean ACEs, $t(1428)=2.40$, $p=0.017$ and fewer mean BCEs, $t(1019.76)=4.43$, $p<0.001$ compared to those who identified as White. Older age significantly related to greater ACEs ($r=0.08$, $p=0.002$) and fewer BCEs ($r=-0.13$, $p<0.001$).

Participants who identified as LGBTQ+ had significantly greater mean symptoms of PTSD, $t(365.43)=5.94$, $p<0.001$, depression, $t(374.12)=8.68$, $p<0.001$, and anxiety, $t(1475)=7.99$, $p<0.001$, as well as greater mean ACEs, $t(350.28)=8.13$, $p<0.001$ and emotion dysregulation, $t(1475)=7.72$, $p<0.001$, and fewer mean BCEs, $t(331.52)=8.54$, $p<0.001$ compared to those who identified as heterosexual/straight. Higher parental education significantly related to fewer symptoms of PTSD ($r=-0.07$, $p=0.007$) and depression ($r=-0.07$, $p=0.005$), fewer ACEs ($r=-0.16$, $p<0.001$) and emotion dysregulation ($r=-0.05$, $p=0.038$), and greater BCEs ($r=0.13$, $p<0.001$). Participants who reported having a mental health disorder before the pandemic had significantly greater mean symptoms of PTSD, $t(792.05)=8.91$, $p<0.001$, depression, $t(864.15)=11.53$, $p<0.001$, and anxiety, $t(884.80)=11.43$, $p<0.001$, as well as greater mean ACEs, $t(768.83)=9.76$, $p<0.001$ and emotion dysregulation, $t(913.97)=9.59$, $p<0.001$, and fewer mean BCEs, $t(780.51)=6.79$, $p<0.001$ compared to those who did not.

Aim 1: Relationships of ACEs and BCEs with Psychopathology Outcomes

All continuous study variables were significantly correlated with each other in expected directions while controlling for demographic/background variables (see Table 2). Moderate strength positive correlations were found between ACEs and emotion dysregulation, PTSD, depression, and anxiety symptoms. Moderate strength negative correlations were observed between BCEs and emotion dysregulation, PTSD, depression, and anxiety symptoms. Strong positive correlations were observed between emotion dysregulation and all symptom outcomes. Strong positive correlations were found among PTSD, depression, and anxiety symptoms. ACEs and BCEs had a moderate negative correlation. When demographic/background variables were not controlled for, the correlations were all still significant and in the same direction, and stronger (but still in the same ranges of interpretation as moderate or strong).

Logistic regressions with ACEs and BCEs separately predicting positive screens of PTSD, depression, and anxiety, while controlling for demographic/background variables, were all significant (see Table 3). ACEs was significantly predictive of a greater likelihood of positive screens for PTSD, depression, and anxiety, and BCEs was significantly predictive of a lower likelihood of positive screens for PTSD, depression, and anxiety. Being female, LGBTQ+,

Table 2 Study variables: Descriptive statistics and partial correlations

Variable	<i>M (SD)</i>	Missing <i>n</i>	1	2	3	4	5
1. ACEs	1.64 (2.02)	0	-				
2. BCEs	8.89 (1.62)	0	-.43*	-			
3. Emotion dysregulation	43.76 (14.34)	0	.30*	-.37*	-		
4. PTSD symptoms	18.56 (18.37)	2	.34*	-.35*	.59*	-	
5. Depression symptoms	7.90 (6.02)	1	.31*	-.39*	.65*	.69*	-
6. Anxiety symptoms	7.45 (5.69)	0	.27*	-.33*	.60*	.66*	.74*

* $p < .001$, partial correlations controlled for gender, race/ethnicity, sexual orientation, mental health history, age, parental education

Table 3 Logistic regressions for ACEs and BCEs predicting positive screens for PTSD, depression, and GAD

	X^2	<i>df</i>	<i>p</i>	<i>B</i>	<i>SE</i>	<i>Wald</i>	<i>p</i>	<i>OR</i>	95% CI
ACEs → PTSD positive screen	202.13	7	<.001	.30	.03	78.72	<.001	1.34	1.26, 1.43
ACEs → depression positive screen	251.45	7	<.001	.28	.03	72.81	<.001	1.32	1.24, 1.41
ACEs → GAD positive screen	233.22	7	<.001	.24	.03	56.71	<.001	1.27	1.20, 1.36
BCEs → PTSD positive screen	228.53	7	<.001	-.43	.04	95.94	<.001	0.65	0.60, 0.71
BCEs → depression positive screen	329.01	7	<.001	-.53	.05	124.17	<.001	0.59	0.53, 0.64
BCEs → GAD positive screen	270.76	7	<.001	-.40	.04	84.99	<.001	0.67	0.62, 0.73

Controlled for gender, race/ethnicity, sexual orientation, mental health history, age, parental education

and having a history of a mental health disorder were significant covariates across almost all logistic regressions, relating to a greater likelihood of positive screens. When not controlling for demographic/background variables, all logistic regressions were still significant and the ACEs and BCEs odds ratios were all slightly stronger. In summary, results from these partial correlation and logistic regression analyses indicated that: a) ACEs significantly related to greater symptoms and positive screens for PTSD, depression, and anxiety; and b) BCEs significantly related to fewer symptoms and positive screens for PTSD, depression, and anxiety.

Aim 2: Emotion Dysregulation as a Mediator of Relationships of ACEs and BCEs with Psychopathology Outcomes

The results of PROCESS model 4 in testing for emotion dysregulation mediation of the relationship between ACEs and each outcome (PTSD, depression, and anxiety symptoms) can be seen in Table 4, and for emotion dysregulation mediation of the relationship between BCEs and each outcome can be seen in Table 5. All analyses controlled for demographic/background variables and used continuous variables. The total effects models of direct and indirect effects of ACEs and BCEs on each symptom outcome were significant, and direct effect models predicting each outcome were significant. Significant mediation effects were observed for each symptom outcome, as demonstrated by each 95% CI for the indirect effect (of ACEs and BCEs on each outcome through emotion dysregulation) not including zero. That both direct

and indirect effects are both significant support partial mediation. Across these analyses, being younger, LGBTQ+, and having a history of a mental health disorder were significant predictors of greater emotion dysregulation; and being female and having a history of a mental health disorder were significant predictors of greater PTSD, depression, and anxiety symptoms. When not controlling for demographic/background variables, all total effects and direct effects models were still significant, path coefficients were still significant and stronger, and R^2 values for the total effects and direct effects models were lower. In summary, results from these mediation analyses indicated that: a) greater ACEs related to greater emotion dysregulation and greater PTSD, depression, and anxiety symptoms; b) greater BCEs related to less emotion dysregulation and fewer PTSD, depression, and anxiety symptoms; c) greater emotion dysregulation related to greater PTSD, depression, and anxiety symptoms; and d) ACEs and BCEs had significant indirect effects on PTSD, depression, and anxiety symptoms being partially mediated by emotion dysregulation.

Aim 3: BCEs as a Moderator of Relationships of ACEs with Emotion Regulation and Psychopathology Symptoms and Emotion Dysregulation and Psychopathology Symptoms

Table 6 shows the results of PROCESS model 59 in examining three moderation mediation models of ACEs on PTSD, depression, and anxiety symptoms through emotion dysregulation (mediator) with BCEs as a moderator of the

Table 4 Results of emotion dysregulation mediation of ACEs on symptom outcomes

Effect	Path	<i>B</i>	<i>SE</i>	<i>t</i>	95% CI
<i>Outcome: PTSD symptoms (n = 1403)</i>					
Total effect	ACEs → PTSD	3.13	0.23	13.34*	2.67, 3.60
Direct effect	ACEs → emotion dysregulation	2.17	0.19	11.59*	1.80, 2.53
	Emotion dysregulation → PTSD	0.69	0.03	24.53*	0.63, 0.74
	ACEs → PTSD	1.64	0.21	7.97*	1.24, 2.04
Indirect effect	ACEs → emotion dysregulation → PTSD	1.49	0.15	-	1.20, 1.81
Total effects model: $F(7, 1395) = 48.98, p < .001, R^2 = .20$ (.17 without covariates)					
Direct effects model: $F(8, 1394) = 136.55, p < .001, R^2 = .44$ (.43 without covariates)					
<i>Outcome: Depression symptoms (n = 1404)</i>					
Total effect	ACEs → depression	0.91	0.08	12.12*	0.77, 1.06
Direct effect	ACEs → emotion dysregulation	2.16	0.19	11.56*	1.79, 2.53
	Emotion dysregulation → depression	0.25	0.01	28.78*	0.23, 0.26
	ACEs → depression	0.38	0.06	6.11*	0.26, 0.50
Indirect effect	ACEs → emotion dysregulation → depression	0.53	0.05	-	0.43, 0.64
Total effects model: $F(7, 1396) = 60.48, p < .001, R^2 = .23$ (.16 without covariates)					
Direct effects model: $F(8, 1395) = 187.80, p < .001, R^2 = .52$ (.49 without covariates)					
<i>Outcome: Anxiety symptoms (n = 1405)</i>					
Total effect	ACEs → anxiety	0.75	0.07	10.37*	0.61, 0.89
Direct effect	ACEs → emotion dysregulation	2.16	0.19	11.57*	1.79, 2.53
	Emotion dysregulation → anxiety	0.22	0.01	25.38*	0.20, 0.23
	ACEs → anxiety	0.28	0.06	4.47*	0.16, 0.40
Indirect effect	ACEs → emotion dysregulation → anxiety	0.47	0.05	-	0.38, 0.57
Total effects model: $F(7, 1397) = 50.86, p < .001, R^2 = .20$ (.13 without covariates)					
Direct effects model: $F(8, 1396) = 145.50, p < .001, R^2 = .45$ (.42 without covariates)					

Controlled for gender, race/ethnicity, sexual orientation, mental health history, age, parental education. *B* = standardized coefficient; *SE* = standard errors; *CI* = confidence interval. * $p < .001$

ACEs-emotion dysregulation relationship, ACEs-symptom relationship, and emotion dysregulation-symptoms relationship (controlling for demographic/background variables and using continuous variables). In testing BCEs as a moderator of the relationship between ACEs and emotion dysregulation, the interaction effect between ACEs and BCEs was statistically significant. As shown in Fig. 3, those with high BCEs (even in parallel with high ACEs) had less emotion dysregulation than those with low BCEs and any level of ACEs. The unstandardized simple slope for participants 1 *SD* below the BCEs mean was 1.01 ($p < 0.001$) and for participants 1 *SD* above the BCEs mean was 1.77 ($p < 0.001$).

In testing BCEs as a moderator of the relationships between ACEs and symptom outcomes, the ACEs x BCEs interaction effects on symptoms of depression and anxiety were significant but on PTSD symptoms was not significant. As shown in Fig. 4, those with high BCEs (even in parallel with high ACEs) had fewer depression symptoms than those with low BCEs and any level of ACEs. The unstandardized simple slope for participants 1 *SD* below the BCEs mean was 0.18 ($p = 0.010$) and for participants 1 *SD* above the BCEs mean was 0.35 ($p < 0.001$). As shown in Fig. 5, those with high BCEs (even in parallel with high ACEs) had fewer

anxiety symptoms than those with low BCEs and any level of ACEs. The unstandardized simple slope for participants 1 *SD* below the BCEs mean was 0.13 ($p = 0.066$) and for participants 1 *SD* above the BCEs mean was 0.29 ($p = 0.001$).

In testing BCEs as a moderator of the relationships between emotion dysregulation and symptom outcomes, the emotion dysregulation x BCEs interaction effect was significant for PTSD symptoms but not depression or anxiety symptoms. As shown in Fig. 6, those with high BCEs and low emotion dysregulation reported fewer PTSD symptoms than those with low BCEs and high emotion dysregulation. The unstandardized simple slope for participants 1 *SD* below the BCEs mean was 0.71 ($p < 0.001$) and for participants 1 *SD* above the BCEs mean was 0.60 ($p < 0.001$).

For all of the significant interactions, the additional variance accounted for in outcomes by the interactions was less than 1%, reflecting small effects. The covariates performed the same in these analyses in relation to emotion dysregulation and symptoms as they did in the mediation analyses reported previously. When not controlling for demographic/background variables, the models were still significant with slightly smaller R^2 values, and the same direct path coefficients were significant (with ACEs and emotion

Table 5 Results of emotion dysregulation mediation of BCEs on symptom outcomes

Effect	Path	<i>B</i>	<i>SE</i>	<i>t</i>	95% CI
<i>Outcome: PTSD symptoms (n = 1403)</i>					
Total effect	BCEs → PTSD	-4.07	0.29	13.98*	-4.64, -3.50
Direct effect	BCEs → emotion dysregulation	-3.38	0.23	14.90*	-3.82, -2.93
	Emotion dysregulation → PTSD	0.68	0.03	23.52*	0.63, 0.74
	BCEs → PTSD	-1.76	0.27	6.63*	-2.28, -1.24
Indirect effect	BCEs → emotion dysregulation → PTSD	-2.31	0.21	-	-2.73, -1.92
Total effects model: $F(7, 1395) = 51.73, p < .001, R^2 = .21$ (.16 without covariates)					
Direct effects model: $F(8, 1394) = 132.36, p < .001, R^2 = .43$ (.42 without covariates)					
<i>Outcome: Depression symptoms (n = 1404)</i>					
Total effect	BCEs → depression	-1.45	0.09	15.97*	-1.63, -1.27
Direct effect	BCEs → emotion dysregulation	-3.37	0.23	14.89*	-3.82, -2.93
	Emotion dysregulation → depression	0.23	0.01	26.99*	0.22, 0.25
	BCEs → depression	-0.66	0.08	8.30*	-0.81, -0.50
Indirect effect	BCEs → emotion dysregulation → depression	-0.79	0.07	-	-0.94, -0.66
Total effects model: $F(7, 1396) = 78.65, p < .001, R^2 = .28$ (.19 without covariates)					
Direct effects model: $F(8, 1395) = 195.77, p < .001, R^2 = .53$ (.50 without covariates)					
<i>Outcome: Anxiety symptoms (n = 1405)</i>					
Total effect	BCEs → anxiety	-1.17	0.09	13.27*	-1.34, -1.00
Direct effect	BCEs → emotion dysregulation	-3.37	0.23	14.89*	-3.82, -2.93
	Emotion dysregulation → anxiety	0.21	0.01	23.95*	0.19, 0.23
	BCEs → anxiety	-0.46	0.08	5.77*	-0.62, -0.30
Indirect effect	BCEs → emotion dysregulation → anxiety	-0.71	0.07	-	-0.84, -0.58
Total effects model: $F(7, 1397) = 62.24, p < .001, R^2 = .24$ (.14 without covariates)					
Direct effects model: $F(8, 1396) = 148.51, p < .001, R^2 = .46$ (.42 without covariates)					

Controlled for gender, race/ethnicity, sexual orientation, mental health history, age, parental education. *B* = standardized coefficient; *SE* = standard errors; *CI* = confidence interval. * $p < .001$

dysregulation paths being slightly stronger and BCEs paths being slightly weaker). In addition, the same moderation effects were significant (with the exception of the interaction of ACEs x BCEs in relation to anxiety symptoms only approaching significance at $p = 0.059$), with changes in R^2 values being slightly smaller. In summary, results from these moderated mediation analyses indicated: a) a small moderation effect of BCEs on the relationship of ACEs-emotion dysregulation, b) small moderation effects of BCEs on the relationships of ACEs-depression symptoms and ACEs-anxiety symptoms, and c) a small moderation effect of BCEs on the relationship of emotion dysregulation-PTSD symptoms.

Discussion

The current study sought to examine relationships among ACEs, BCEs, and emotion dysregulation as they relate to psychopathology (PTSD, anxiety, depression) symptoms in university students in emerging adulthood. Emerging adulthood is a key developmental period for examining these relationships as it starts when childhood experiences end and the risk of onset of many mental health disorders reaches a

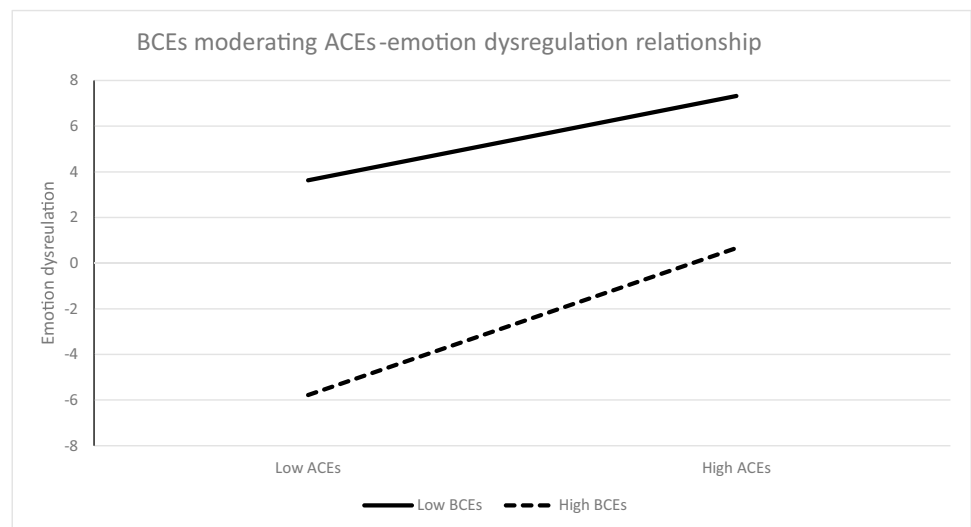
peak during this period, making this stage of life one that is ripe for mental illness prevention and intervention. Findings replicated the positive relationships of ACEs with three types of psychopathology symptoms and positive screens (PTSD, depression, anxiety), showing these relationships have been found in samples older than emerging adults, and emotion dysregulation being a mediator in those relationships (Miu et al., 2022). BCEs negatively related to the three types of psychopathological symptoms and positive screens, adding further support for its promotive role. Emotion dysregulation was found to mediate those relationships, adding to this literature. The protective (moderating) role of BCEs in relationships among ACEs, emotion dysregulation, and symptoms demonstrated a small effect size.

The first aim of this study was to examine the relationships of ACEs and BCEs with various types of psychopathology symptoms to determine if there is further support for their roles as transdiagnostic risk and protective factors in relation to mental health problems. Previous research has found that greater ACEs relate to poorer mental health, including higher levels of depressive and anxiety symptoms (Doom et al., 2021), PTSD (Zarse et al., 2019), as well as other mental health conditions (e.g., borderline personality

Table 6 Results of moderated mediation modeling

Predictor	<i>B</i>	<i>SE</i>	<i>t</i>	95% CI	<i>R</i> ²	<i>F</i>	ΔR^2
<i>Outcome: Emotion dysregulation (n = 1405)</i>							
ACEs	1.46	0.21	6.97**	1.05, 1.86	.24 (.20 without covariates)	50.18**	
BCEs	-3.02	0.26	11.51**	-3.53, -2.50			
ACEs x BCEs	0.28	0.08	3.34**	0.11, 0.44			.0060
<i>Outcome: PTSD symptoms (n = 1403)</i>							
ACEs	1.43	0.23	6.12**	0.97, 1.89	.45 (.44 without covariates)	102.84**	
Emotion dysregulation	0.65	0.03	22.21**	0.59, 0.71			
BCEs	-0.96	0.32	3.00*	-1.58, -0.33			
ACEs x BCEs	0.13	0.10	1.36	-0.06, 0.32			.0007
Emotion dysregulation x BCEs	-0.04	0.02	2.40*	-0.07, -0.01			.0023
<i>Outcome: Depression symptoms (n = 1404)</i>							
ACEs	0.28	0.07	3.98**	0.14, 0.42	.54 (.51 without covariates)	146.20**	
Emotion dysregulation	0.23	0.01	25.92**	0.21, 0.25			
BCEs	-0.69	0.10	7.15**	-0.87, -0.50			
ACEs x BCEs	0.06	0.03	2.13*	0.01, 0.12			.0015
Emotion dysregulation x BCEs	0.01	0.01	1.33	-0.01, 0.02			.0006
<i>Outcome: Anxiety symptoms (n = 1405)</i>							
ACEs	0.22	0.07	3.13*	0.08, 0.36	.46 (.43 without covariates)	109.68**	
Emotion dysregulation	0.20	0.01	22.95**	0.19, 0.22			
BCEs	-0.45	0.10	4.65**	-0.64, -0.27			
ACEs x BCEs	0.06	0.03	1.98*	0.01, 0.12			.0015
Emotion dysregulation x BCEs	0.01	0.01	0.03	-0.01, 0.01			< .0000

Controlled for gender, race/ethnicity, sexual orientation, mental health history, age, parental education. *B* = standardized coefficient; *SE* = standard errors; CI = confidence interval. * $p < .05$, ** $p < .001$

Fig. 3 BCEs moderation of ACEs-emotion dysregulation

disorder, substance use; Herzog & Schmahl, 2018). Consistent with much accumulated research, we found that greater ACEs significantly related to greater symptoms of and positive screens for PTSD, depression, and anxiety. Although BCEs is a newer area of interest, research

has found that greater BCEs relate to fewer symptoms of depression and anxiety (Doom et al., 2021; Rodriguez et al., 2021) and PTSD, as well as less perceived stress and exposure to fewer stressful life events (Narayan et al., 2018). Consistent with this research, we found greater

Fig. 4 BCEs moderation of ACEs-depression symptoms relationship

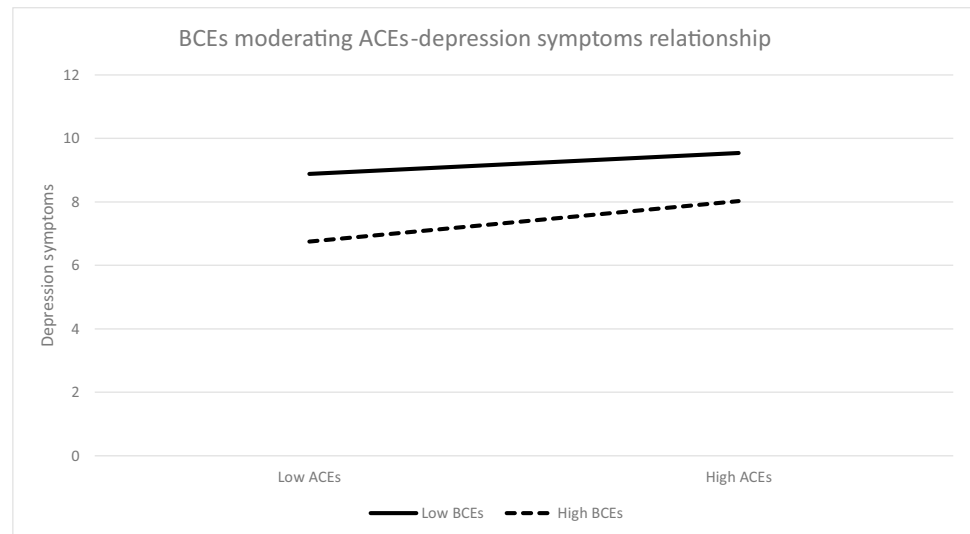
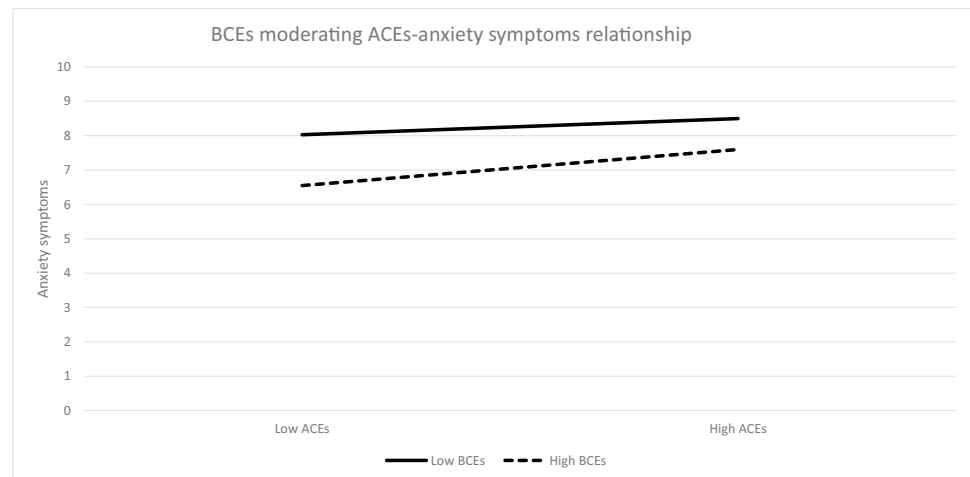


Fig. 5 BCEs moderation of ACEs-anxiety symptoms relationship



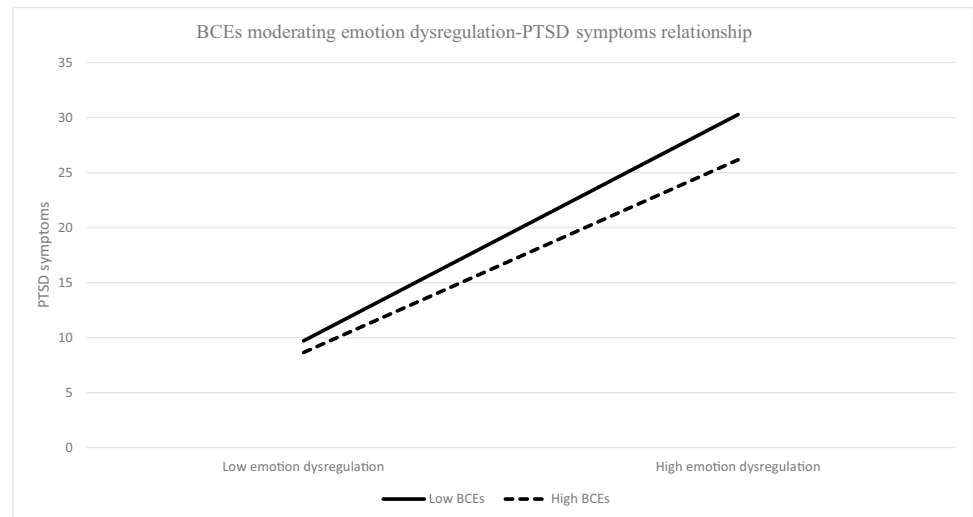
BCEs significantly related to fewer symptoms of and positive screens for PTSD, depression, and anxiety. Compared to ACEs, BCEs showed comparable but slightly stronger relationships with symptoms of and positive screens for psychopathologies. In addition, even though ACEs were common (59% with at least 1 ACE), BCEs were more common (84% with 8–10 BCEs). Thus, our findings indicate that for multiple types of psychopathology symptoms in emerging adult university students, ACEs are a moderate and common risk factor and BCEs are a slightly stronger and more common promotive factor.

In addressing the second aim, we investigated emotion regulation as a plausible mechanism through which both ACEs and BCEs may affect a variety of types of psychopathology symptoms. Emotion regulation has been well established as a mediator between ACEs and mental health outcomes, including symptoms of depression and anxiety (Miu et al., 2022). Our results showing emotion dysregulation

mediated relationships of ACEs to PTSD, depression, and anxiety symptoms in university students in emerging adulthood further add to that knowledge base. To date, no research has examined emotion regulation as a mediator of the relationship of BCEs to mental health outcomes. Our finding that emotion regulation mediates relationships of BCEs to PTSD, depression, and anxiety symptoms contributes to our understanding of one of the processes through which BCEs may benefit mental health. Thus, our results point to emotion regulation being a plausible transdiagnostic mechanism through which ACEs and BCEs contribute to a variety of types of psychopathology symptoms.

In addition to BCEs being a promotive factor, with main/direct effects on mental health outcomes as addressed in aim one, we were interested in further elucidating the potential protective role of BCEs on relationships among ACEs, emotion dysregulation, and psychopathological symptoms. We examined BCEs as a moderator of three pathways: ACEs to

Fig. 6 BCEs moderation of emotion dysregulation-PTSD symptoms relationship



psychopathology symptoms, ACEs to emotion dysregulation, and emotion dysregulation to psychopathology symptoms. Results showed BCEs moderated relationships of ACEs-emotion dysregulation, ACEs-depression symptoms, ACEs-anxiety symptoms, and emotion dysregulation-PTSD symptoms. While these analyses did show some significance of the interaction terms, the amount of variance accounted for in the outcomes by the interaction terms was small in all instances ($<1\%$). In comparing our findings with studies of US university students during the pandemic, they are consistent with one but not another. What seems to account for the inconsistency is how ACEs and mental health outcomes were measured. We used the same or very similar measures to those used by Doom et al. (2021), who found the interaction terms were not significant when examining BCEs as a moderator of the relationships of ACEs to depression and anxiety symptoms. We used different measures from those used by Rodriguez et al. (2021), who found the interaction terms were significant when examining BCEs as a moderator of the relationships of ACEs to depression and anxiety symptoms; however, changes in R^2 were not reported in the Rodriguez et al. (2021) study, so we are unable to tell how much of the variance in outcomes is accounted for by the interaction terms.

There are several explanations for the finding that BCEs was a significant but weak protective factor in relationships among ACEs, emotion dysregulation, and psychopathology symptoms in the current study. One is that BCEs primarily play a promotive role in relation to mental health outcomes (supported by moderate negative correlations between BCEs and symptom outcomes) that is independent of ACEs (supported by moderate negative correlation between BCEs and ACEs and chi square test result). Our results show there is some overlap in the occurrence of ACEs and BCEs, but there is more differentiation than commonality. Students with a high level of ACEs were less likely to also experience a high level of BCEs (and vice versa).

Other explanations relate to the timing and type of childhood experiences. Evidence suggests that adversity in early childhood is most strongly associated with adult psychopathology symptoms (e.g., Dunn et al., 2017). All ten ACEs assessed may be experienced as early as birth, but several BCEs assessed are not likely to be experienced until middle childhood or adolescence. Therefore, an individual may experience a high number of early childhood ACEs without the protective support of BCEs. Other research has shown that different types of childhood experiences relate to different adult outcomes. For instance, ACEs categorized as childhood maltreatment related to PTSD symptoms, and those categorized as family dysfunction related to stressful life events (e.g., Merrick et al., 2020). It may be that BCEs do protect against the negative effects of specific types of ACEs on specific types of psychopathology symptoms. Further research is needed to gain greater clarity regarding how the type and timing of ACEs and BCEs in conjunction with each other relate to the development of emotion dysregulation and mental health problems.

Implications

A key implication of the study findings for colleges and universities is to ensure the sufficiency of victim-centered services to help students with a history of ACEs and those who continue to experience adverse situations of abuse, neglect and/or household dysfunction. To help students recognize they may need help, information campaigns can enhance student awareness of ACEs and their negative effects on mental health. Another option is to implement ACEs screening to help identify students who may already be experiencing symptoms or be at risk for worsening mental health. This screening can be part of the

intake assessment for new clients at college/university counseling centers (Watt et al., 2022), which is important information to have when determining the best approach to treatment for the student. Screening could also be at the college level. As Karatekin (2018) points out, this would entail substantial methodological and ethical challenges; however, some universities already develop programs for at-risk groups such as first-generation college students.

For students with a history of ACEs, services could focus on helping them recover from potential trauma and preventing or reducing already existing psychopathology symptoms. Evidence indicates that students with ACEs may present with more complex and severe symptoms (Watts et al., 2022), and our results support this. Screening clients for ACEs would enable providers to discern when treatment designed to address potential underlying trauma and its impacts is warranted (e.g., trauma-focused cognitive behavioral therapy, prolonged exposure therapy, cognitive processing therapy, and skills training in affective and interpersonal regulation) (Kirlic et al., 2020). For students with a history of ACEs that does not include trauma, interventions that help them learn adaptive emotion regulation skills may be helpful (e.g., dialectical behavior therapy skills training, ACE overcomers program; Cameron et al., 2018; Tobon et al., 2020) given our findings that emotion regulation was a mediator of ACEs-psychopathology relationships. Additionally, some students may continue to be exposed to adverse situations during college. For these students, services focused on reducing abuse and household dysfunction could include providing trauma-informed individual or group therapy (Watts et al., 2022), information for local and national resources for ACEs survivors, and evidence-based strategies aimed at modifying the conditions that give rise to ACEs (Centers for Disease Control & Prevention, 2019) to help lessen or prevent intergenerational transmission of ACEs.

Many students experiencing distress do not seek mental health services (Cunningham et al., 2017), largely due to attitudinal barriers reflecting stigma-related concerns and perceptions that treatment is not needed (Ennis et al., 2019). In addition, there may be an overload of counseling center capacity to meet student mental health needs (Xiao et al., 2017). To address these challenges, universities/colleges can (and do) consider offering services that are supplemental to traditional mental health service, including brief online or course-based emotion regulation training (Gatto et al., 2022; Van Doren et al., 2021), mindfulness-based interventions (Jia-Yuan et al., 2022), and stress reduction programs that may help disrupt the developmental cascade between ACEs and emerging mental health problems (Kalmakis et al., 2020; Karatekin, 2018).

Our findings also highlight BCEs as mental health promoting. Colleges and universities may consider screening for BCEs alongside ACEs, while providing supplemental

programs (e.g., peer support programs; Watt et al., 2022) to strengthen students' social networks and develop new relationships (Sippel et al., 2015). Because BCEs are a newer area of research than ACEs, informational campaigns may also be particularly helpful in promoting positive outcomes by raising student awareness of BCEs and the importance of cultivating positive life experiences among youth in their families and communities.

Limitations

Several limitations of this study should be noted. First, because this is a cross-sectional study, we cannot conclude causal relationships of childhood experiences and emotion dysregulation with psychopathology symptoms. While the mediation analyses allowed for theoretical inferences about plausible causality and underlying mechanisms, it is possible that there are other mechanisms besides emotion dysregulation that could account for the relationships of ACEs and BCEs with psychopathology symptoms that were observed in this study. Second, ACEs and BCEs were retrospectively reported. Therefore, it is possible that recall bias affected the results. Third, this study was conducted during the COVID-19 pandemic, and we used the pandemic as the index event (i.e., Criterion A) for the PCL-5. Because the PCL-5 measured pandemic-specific PTSD symptoms, this study may not have captured PTSD symptoms related to other types of trauma. In addition, the PCL-5 results may not generalize outside of the context of the COVID-19 pandemic. Lastly, the majority of our sample identified as women and were White. Thus, although we controlled for gender and race/ethnicity in analyses, study findings may not generalize to individuals of other gender identities and students of color. This limitation is important given research that ACEs are experienced differentially by race and ethnicity, with Black, Latinx, and multiracial individuals experiencing greater exposure to certain types of ACEs and greater total number of ACEs compared to White individuals (Maguire-Jack et al., 2019; Merrick et al., 2018). In order to address these limitations, future researchers should consider utilizing a longitudinal study design and increasing diversity in their sample.

Conclusion

The findings from this study contribute to a growing body of research examining relationships of childhood experiences with adulthood mental health outcomes. Findings show ACEs are common and increase the risk for various psychopathologies in university students in emerging adulthood, pointing to the need for colleges/universities to screen

for ACEs and provide services to help students exposed to trauma recover and help reduce distress in students with a history of non-traumatic ACEs. It is also important to recognize and address the need to help stop or lessen the impact of ongoing adverse experiences in students. Emotion regulation was found to be a mechanism through which ACEs and BCEs may affect a variety of mental health outcomes. Thus, colleges/universities may consider offering mental health services and supplemental interventions/programs aimed at developing effective emotion regulation skills to students with a history of ACEs. Our results showing BCEs to be mental health promoting provide support for BCEs screening and creating informational campaigns for university students to enhance awareness of BCEs and their relationship to resilient outcomes in adulthood. Universities/colleges are in a prime position to access, screen, and intervene to help prevent the emergence of mental health problems or reduce their severity as students continue into adulthood. In order to better understand the relationship between ACEs, BCEs, emotion dysregulation, and psychopathology, future studies should consider using a longitudinal design, increasing sample diversity, and examining differential effects of the type of ACEs and BCEs and when they occur during childhood.

Acknowledgements This research was supported by funds from the Department of Psychology at East Carolina University.

Data Availability The data are available from the corresponding author, TF, upon reasonable request.

Declarations

Conflict of Interest None.

Competing Interests The authors report there are no competing interests to declare.

Ethics Declaration The University and Medical Center Institutional Review Board at East Carolina University approved this study (approval number: UMCIRB 20–001928).

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