Journal of Aggression, Maltreatment & Trauma

ISSN: 1092-6771 (Print) 1545-083X (Online) Journal homepage: www.tandfonline.com/journals/wamt20

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To cite this article: D.J. Wen & A. Demutska (2025) The Role of Benevolent Childhood Experiences in the Relationship Between Adverse Childhood Experiences and Complex Post-Traumatic Stress Disorder Symptoms, Journal of Aggression, Maltreatment & Trauma, 34:4, 518-537, DOI: 10.1080/10926771.2025.2494101

To link to this article: https://doi.org/10.1080/10926771.2025.2494101

Published online: 17 Apr 2025.

JOURNAL OF AGGRESSION, MALTREATMENT & TRAUMA
2025, VOL. 34, NO. 4, 518–537
https://doi.org/10.1080/10926771.2025.2494101

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The Role of Benevolent Childhood Experiences in the Relationship Between Adverse Childhood Experiences and Complex Post-Traumatic Stress Disorder Symptoms

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ABSTRACT

Adverse Childhood Experiences (ACEs) are potentially traumatic childhood experiences that are associated with mental health issues such as Complex Post-Traumatic Stress Disorder (CPTSD). There is a lack of studies investigating resilience factors in individuals exposed to ACEs who may potentially develop CPTSD. Benevolent Childhood Experiences (BCEs) are positive childhood experiences that could potentially serve as protective or promotive factors for such individuals. The present study aimed to investigate if BCEs played the role of a 1) protective or 2) promotive factor in the development of CPTSD symptoms in adulthood among individuals exposed to ACEs. In addition, the individual components of CPTSD, namely Post-Traumatic Stress Disorder (PTSD) and Disturbances in Self Organization (DSO) symptoms, were investigated separately to better understand whether BCEs acted as a 1) protective or 2) promotive factor for these components. One hundred seventy-two university students from a psychology program in Singapore were recruited. The data were analyzed using a two-way analysis of covariance. We found trend-level evidence for BCEs as a moderator in the relationship between ACEs and CPTSD symptoms, as well as trend-level evidence for the main effect of BCEs on CPTSD symptoms. We found that BCEs moderated the relationship between ACEs and PTSD symptoms. Additionally, both ACEs and BCEs had significant main effects on DSO symptoms. These results suggests that high levels of BCEs may provide protective benefits for individuals exposed to substantial ACEs, potentially mitigating increases in PTSD symptoms. High levels of BCEs could reduce DSO symptoms regardless of the level of ACEs.

ARTICLE HISTORY
Received 3 June 2024
Revised 4 February 2025
Accepted 23 March 2025

KEYWORDS
Adverse childhood experiences; benevolent childhood experiences; complex post-traumatic stress disorder

Introduction

Multiple studies have investigated the effects of early childhood experiences on mental health in adulthood (Felitti et al., 1998; Maaranen et al., 2004; Mersky et al., 2013; Visser et al., 2014). Indeed, Adverse Childhood Experiences

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(ACEs), including childhood maltreatment (physical abuse, sexual abuse, emotional abuse, physical neglect and emotional neglect) and family dysfunction (household incarceration, mental illness, substance abuse, intimate partner violence and parental separation or divorce), have been shown to be associated with an increased risk of various mental health issues in adulthood (Felitti et al., 1998; Maaranen et al., 2004; Mersky et al., 2013; Visser et al., 2014). One potential outcome of prolonged or repetitive exposure to threatening events from which escape is difficult is Complex Post-Traumatic Stress Disorder (CPTSD), a mental health disorder that is listed in the International Classification of Diseases (11th ed.; ICD-11; World Health Organization, 2019) but not the Diagnostic and Statistical Manual of Mental Disorders (5th ed.; DSM–5; American Psychiatric Association, 2013). Evidence suggests a positive association between ACEs and CPTSD symptoms, indicating that a higher number of ACEs was associated with more symptoms of CPTSD (Frewen et al., 2019; Guo et al., 2021). However, there is a lack of studies investigating the factors that enhance resilience in individuals exposed to ACEs who could potentially develop CPTSD. Understanding these resilience factors could facilitate the development of targeted interventions aimed at preventing CPTSD in individuals with exposure to ACEs.

Adverse childhood experiences

ACEs have been consistently linked to an elevated risk of mental health disorders in adulthood across multiple international studies, including depression (Felitti et al., 1998), anxiety (Mersky et al., 2013), obsessive-compulsive disorder (Visser et al., 2014), and alcohol and substance use disorders (Mersky et al., 2013; Pilowsky et al., 2009). Furthermore, ACEs are strongly associated with an increased likelihood of suicide attempts (Felitti et al., 1998). Specifically, individuals with four or more ACEs were found to have a 4.5 times higher risk of depression and a 12.2 times higher risk of suicide attempts compared to those with no ACEs (Felitti et al., 1998). A recent study in Singapore showed that the lifetime prevalence of ACEs was 63.9%, with 35.6% of respondents experiencing one type of ACEs, 15.2% experiencing two types of ACEs and 13.1% experiencing three or more types of ACEs in their lifetime (Subramaniam et al., 2020). This finding is consistent with previous research, specifically studies involving college and university populations, which indicate that the lifetime prevalence rates of childhood trauma among university students range from 66% to 85% (Frazier et al., 2009; Read et al., 2011; Scarpa et al., 2002).

Neurotoxic stress theory posits that ACEs impact mental health through prolonged exposure to toxic stress, which can alter brain structure, function and connectivity, and subsequently impair behavioral and cognitive abilities, thereby heightening the risk of adverse mental health outcomes in

adulthood (Miller et al., 2011; Sarkar et al., 2019; Shonkoff et al., 2009). A recent review provides support for the diathesis-stress model, highlighting that neurobiological differences often exist prior to trauma exposure (Scheeringa, 2021). Individuals with preexisting neurobiological vulnerabilities, such as genetic predispositions or early developmental factors, are particularly susceptible to developing mental health disorders when exposed to stress (Scheeringa, 2021). However, it is important to note that the review involved adult samples diagnosed with PTSD, whereas the present discussion focuses on the development of CPTSD after exposure to ACEs.

Complex post-traumatic stress disorder

Based on the ICD-11, a diagnosis of CPTSD requires that the diagnostic criteria for Post-Traumatic Stress Disorder (PTSD) be met, including 1) reexperiencing the traumatic event in the here and now, 2) avoidance of reminders related to the traumatic event and 3) persistent perceptions of heightened threat. In addition, a diagnosis of CPTSD requires additional symptoms related to Disturbances in Self Organization (DSO), which include 1) problems with affect dysregulation, 2) negative self-concept, and 3) difficulties with sustaining relationships (World Health Organization, 2019). CPTSD has been found to develop in response to prolonged stress, often beginning in childhood or emerging from consistent abuse during adulthood (Li & Liang, 2023; Maercker et al., 2022). Studies from Canada (Frewen et al., 2019) and China (Guo et al., 2021) provide evidence of a positive association between ACEs and CPTSD symptoms. To our knowledge, there is a lack of studies investigating the prevalence of CPTSD in Singapore. However, a population-based study in the United States of America found a prevalence of CPTSD to be 3.8% in their sample of 1893 adults between 18–70 years of age (Cloitre et al., 2019).

Recently, researchers on childhood adversity have focused on isolating childhood maltreatment ACEs from family dysfunction ACEs (Lane et al., 2023), based on evidence that maltreatment has a greater impact than family dysfunction on mental health outcomes. However, the mental health outcomes investigated in these studies involved depression, anxiety and PTSD (Atzl et al., 2019; Negriff, 2020; Sayyah et al., 2022). CPTSD has been found to be distinct from PTSD, with social factors such as financial difficulties, constant conflicts, and mental illness in the family being more closely associated with CPTSD than with PTSD (Daniunaite et al., 2021). Additionally, both maltreatment-related and family dysfunction ACEs have been directly linked to development of CPTSD (Hyland et al., 2017; Spinazzola et al., 2018). Therefore, considering the cumulative impact of total ACEs, which encompass both maltreatment and family dysfunction

experiences, may be important when examining the underlying factors contributing to CPTSD.

Protective and promotive factors in individuals exposed to adverse childhood experiences

It is noteworthy that not all individuals exposed to childhood adversity develop the same mental health issues as others exposed to similar adversities (Beutel et al., 2017). Resiliency theory provides a framework to understand how some individuals manage to achieve healthy development despite exposure to significant risks. The compensatory and protective factor models are two widely studied resiliency models (Masten & Cicchetti, 2016). The compensatory model indicates that promotive factors counteract exposure to risk through an opposite, direct, and independent effect on outcomes and are associated with better functioning in individuals at both high and low levels of risk. For example, a study of low-income pregnant women found that more positive childhood experiences, such as having positive parental relationships, being hugged or complimented, predicted lower levels of PTSD independent of the number of ACEs (Narayan et al., 2018). In contrast, the protective model posits that protective factors attenuate the association between risk factors and negative outcomes. This means that when a protective factor is present, individuals in both high and low-risk groups tend to have similar outcomes. However, when the protective factor is absent, the outcomes for high and low-risk groups differ significantly. For example, older adults with low current perceived social support were found to have higher odds of depressive symptoms as their exposure to ACEs increased. In contrast, older adults with high current perceived social support did not show significantly different odds of depressive symptoms, even with greater exposure to ACEs (Cheong et al., 2017).

Benevolent childhood experiences

One factor that may foster resilience in individuals exposed to childhood adversity is the presence of Benevolent Childhood Experiences (BCEs; Narayan et al., 2018). BCEs refer to positive childhood experiences that are thought to be beneficial, such as supportive relationships (with childhood caregivers, friends, teachers, neighbors, and mentors), positive beliefs about coping, self-esteem, enjoyment of school and home life and predictable home routines (Narayan et al., 2018). BCEs have been found to be associated with fewer mental health problems, lower levels of stress and better adjustment in adulthood (Bellis et al., 2017; Bethell et al., 2019). ACEs and BCEs have been shown to be moderately inversely associated, indicating the coexistence of ACEs and BCEs in individuals (Narayan et al., 2020).

Clinical studies investigating negative childhood experiences have found that positive childhood experiences can exert either protective or promotive effects depending on the mental health outcome measured. For example, positive childhood memories functioned as a protective factor in mothers, moderating the relationship between their experience of maltreatment in childhood and PTSD symptoms in adulthood. Mothers with fewer positive childhood memories experienced more severe PTSD symptoms in adulthood as the level of childhood maltreatment increased. Conversely, mothers with many positive childhood memories did not show a strong relationship between childhood maltreatment and PTSD symptoms in adulthood (Narayan et al., 2017). In another study, BCEs functioned as a promotive factor and were associated with fewer symptoms of Borderline Personality Disorder (BPD) while ACEs were associated with more symptoms of BPD (Gunay-Oge et al., 2020).

Studies utilizing community samples have also found that positive childhood experiences function as both a protective factor and promotive factor. For example, Qu et al. (2022) found that positive childhood experiences moderated the relationship between ACEs and depression and anxiety. Individuals exposed to ACEs exhibited higher levels of depression and anxiety when they had few positive childhood experiences. In contrast, those with many positive childhood experiences did not show increased levels of depression and anxiety, even when exposed to ACEs. Crandall et al. (2019) found that BCEs functioned as a promotive factor and were associated with fewer depressive symptoms, while ACEs were associated with more depressive symptoms. However, there is a lack of studies investigating the potential role of BCEs as either a protective factor or promotive factor in the development of CPTSD among individuals who have been exposed to ACEs. Furthermore, it is unclear whether BCEs serve as protective factor or promotive factor in relation to the specific components of CPTSD, namely PTSD and DSO, in individuals exposed to ACEs. Symptoms of BPD and DSO share significant overlaps, particularly in the domains of emotion regulation difficulties, disrupted self-concept, and challenges in interpersonal relationships (Ford & Courtois, 2021). However, despite the aforementioned role of BCEs as a promotive factor that was inversely associated with symptoms of BPD (Gunay-Oge et al., 2020), there is a lack of studies investigating the role of BCEs in the relationship between ACEs and DSO symptoms. This study advances our understanding of the mechanisms through which positive childhood experiences may buffer against the developmental impact of early adversity, specifically on self-concept, interpersonal relationships, and emotional functioning.

Present study

In the present study, we aimed to investigate if BCEs would have a 1) protective effect or 2) promotive effect on CPTSD symptoms. Given the lack of previous studies on ACEs, BCEs and CPTSD, we investigated in an exploratory analysis whether 1) BCEs would moderate the relationship between ACEs and CPTSD symptoms or 2) BCEs and ACEs would show main effects on CPTSD symptoms. In addition, we examined whether similar patterns emerged when looking at the individual components of CPTSD, namely PTSD symptoms and DSO symptoms. Specifically, we investigated the 1) moderation and 2) main effect relationships with the outcomes of i) CPTSD, ii) PTSD, and iii) DSO symptoms. We conducted this study with a sample of university students, given that previous studies have found that more than half of university students have experienced more than one ACE (Bartolomé-Valenzuela et al., 2024; Hamilton et al., 2024; Muwanguzi et al., 2023).

Methods

Participants

The present study recruited university students from the psychology program who were 1) 19 years old and above, 2) Singapore Citizens or Permanent Residents of Singapore, and 3) able to read English. Participants aged 19 years and older were recruited to ensure they could provide retrospective reports on ACEs and BCEs, as the relevant scales measure experiences from ages 0 to 18. In addition, the sample was restricted to Singapore Citizens and Permanent Residents of Singapore so that the findings could be generalized to the Singapore context. Furthermore, given that the online survey was presented in English, participants were required to read English. Informed consent was obtained from all participants.

One hundred and seventy-two participants were recruited through the University Psychology Research Participation Program. This sample size met the minimum requirement determined by an a priori analysis in G*Power, based on statistical power of .80 (Faul et al., 2007). The mean age of participants in the present study was 21.6 years old. This study included 1) male (n = 48) and female (n = 124); and 2) 4 major ethnic groups: Chinese (n = 120), Malay (n = 4), Indian (n = 21), and Others (n = 27) as participants.

Measures

Adverse childhood experiences

The Adverse Childhood Experiences Questionnaire (Felitti et al., 1998) is a 10-item self-report questionnaire that measures ACEs from childhood to 18 years

of age. The first five items capture childhood maltreatment (physical, sexual and emotional abuse, physical and emotional neglect) and the next five items assess exposure to family dysfunction (parental separation or divorce, domestic violence, substance use, mental illness, and incarceration). Responses for each question were provided on a binary scale, were scored (Yes = 1, No = 0) and summed with a possible range of scores of 0 to 10, with higher scores indicating more types of ACEs experienced in childhood.

Benevolent childhood experiences

The Benevolent Childhood Experiences Scale (Narayan et al., 2018) is a 10-item self-report questionnaire that measures positive childhood experiences from childhood to 18 years of age. It measures positive experiences that include internal and external safety and security (e.g., having at least one caregiver with whom you felt safe, beliefs that provided comfort), supportive relationships (e.g., having at least one caring teacher, a supportive non-caregiver adult), and a positive, predictable quality of life (e.g., enjoyment of school, predictable home routine). Responses for each question were provided on a binary scale (Yes = 1, No = 0), were scored and summed with a possible range of scores of 0 to 10, with higher scores indicating more types of BCEs experienced in childhood.

International trauma questionnaire

The International Trauma Questionnaire (ITQ; Cloitre et al., 2018) was used to measure symptoms of CPTSD. The ITQ first asks respondents to describe an event that troubles them the most and participants are instructed to answer the remaining questions in relation to this event. The ITQ comprises of two subscales measuring PTSD and DSO symptoms. The six items measuring PTSD symptoms are based on the three clusters of "Re-experiencing in the here and now," "Avoidance," and "Sense of Threat," and these items are answered in terms of how bothersome that symptom has been in the past month. The six items measuring DSO symptoms are based on the three clusters of "Affective Dysregulation," "Negative Self-Concept," and "Disturbed Relationships." All ITQ items are rated on a 5-point Likert scale ranging from 0 (Not at all) to 4 (Extremely). PTSD and DSO symptom scores range from 0 to 24 and CPTSD symptom scores range from 0 to 48.

Procedure

Approval from the University Human Research Ethics Committee was obtained. Potential participants were invited to complete the online survey on Qualtrics. Upon completion of the survey, university students were awarded credit points for their participation. Participants were also given the option to enter a lucky draw for three $20 vouchers.

Statistical analysis

Some studies have found that treating ACEs score as a categorical variable provides a better model fit for mental health outcomes compared to treating ACEs score as a continuous variable (LaNoue et al., 2020; Schüssler-Fiorenza Rose et al., 2016). Furthermore, several studies investigating both ACEs and BCEs have categorized these continuous variables into categorical ones for analysis (Bellis, Hughes, et al., 2014; Bellis, Lowey, et al., 2014; Kiburi et al., 2018). In the present study, consistent with previous research (Crandall et al., 2019; Hou et al., 2022), the ACEs and BCEs variables were categorized into two groups rather than multiple groups. This approach was taken to ensure adequate statistical power and simplify result reporting through reducing the number of groups (Bethell et al., 2019; Kuhar & Zager Kocjan, 2021). Previous research dichotomized BCEs based on a mean split and dichotomized ACEs based on a standard score of 4 (Crandall et al., 2019; Hou et al., 2022). In the present study, the BCEs variable was dichotomized into a low BCE group and a high BCE group based on a mean split (<8 vs. ≥8), while the ACEs variable was dichotomized into a low ACE group and a high ACE group based on the same standard score (<4 vs. ≥4).

A two-way analysis of covariance (ANCOVA) was utilized to examine the aforementioned relationships. Outliers on independent variables and dependent variables, defined as values more than two standard deviation from the mean, were removed from the analysis as recommended by Field (2012). The statistical model included the independent variables comprising of the covariates, ACEs, BCEs and the ACEs x BCEs interaction term, which was tested with the dependent variables of 1) CPTSD, 2) PTSD, and 3) DSO in three separate models. Where the ACEs x BCEs interaction effects were significant, a post-hoc analysis was performed, exploring the simple main effects with a Bonferroni correction on the p-values (Abdi, 2007). Where interaction effects were not significant, the main effects of ACEs and BCEs were explored using a reduced model without the interaction term (Lorah, 2020).

Confounding variables

This study considered variables that could potentially account for differences in CPTSD symptoms. Age, ethnicity, and gender were included as common covariates in all models given their known association with CPTSD symptoms (McGinty et al., 2021; Wamser-Nanney et al., 2021).

Assumptions

The assumptions of the two-way ANCOVA were tested for all the models. Given that the assumption of homogeneity of variances was violated, an ANCOVA with heteroscedasticity consistent standard errors HC3 (Long & Ervin, 2000) was run for the model with DSO as the dependent variable.

Results

Descriptive statistics

In the total sample of 172 participants, approximately 32.0% of participants met the criteria for a probable ICD-11 PTSD diagnosis ($n = 55$) based on the recommended scoring rules for the ITQ. Of these, 69.1% additionally met the criteria for a probable ICD-11 CPTSD diagnosis ($n = 38$), resulting in an overall CPTSD prevalence of 22.1%. Out of 172 participants, 6 outliers were found on BCEs and 7 outliers on ACEs variables. Hence, 160 participants were included in the analysis of high and low BCEs and ACEs groups. The low ACE-low BCE group, low ACE-high BCE group, high ACE-low BCE group, and high ACE-high BCE group consisted of 33, 95, 22, and 10 participants respectively. Among these 160 participants, 75.6% of participants had experienced at least one ACE. In addition, 7 outliers were identified for CPTSD scores and 9 outliers for PTSD scores. As such, the analysis involving CPTSD, PTSD and DSO as dependent variables involved 156, 154, and 160 participants respectively. Table 1 presents the descriptive statistics and correlations for the study variables in the sample. An examination of the bivariate correlations revealed significant correlations among variables, all in the expected directions.

Relationship of BCEs and ACEs with CPTSD symptoms

A two-way ANCOVA was utilized to investigate whether the BCEs would moderate the relationship between ACEs and CPTSD symptoms. There was a trend for a significant interaction between BCEs and ACEs on CPTSD symptoms, $F(1,147) = 2.93$, $p = .09$, $\eta_p^2 = .02$. A post hoc analysis of the simple main effects for ACEs and BCEs was performed based on a Bonferroni correction. In the low BCE group, there was a significant difference in CPTSD scores ($p = .005$), where the high ACE group ($M_{adj} = 29.23$, $SE = 2.77$) had higher CPTSD scores than the low ACE group ($M_{adj} = 20.61$, $SE = 2.39$). In the high BCE group, there was no significant difference in CPTSD scores ($p = .85$) between the high ACE group ($M_{adj} = 19.24$, $SE = 3.73$) and low ACE group ($M_{adj} = 18.57$, $SE = 1.71$). Figure 1 provides an illustration of the adjusted means of CPTSD scores for the BCE and ACE groups.

Table 1. Descriptive statistics and correlations for study variables.

	Variable	*M*	*SD*	Range	1	2	3	4	5
1.	Benevolent Childhood Experiences (BCEs)	8.0	1.7	4–10	–				
2.	Adverse Childhood Experiences (ACEs)	2.0	1.8	0–6	−.42*	–			
3.	Complex Post-Traumatic Stress Disorder (CPTSD)	21.5	10.6	0–44	−.33*	.36*	–		
4.	Post-Traumatic Stress Disorder (PTSD)	10.0	5.9	0–23	−.23*	.31*	.86*	–	
5.	Disturbances in Self Organization (DSO)	11.9	6.6	0–24	−.38*	.34*	.87*	.51*	–

*$p < .05$.

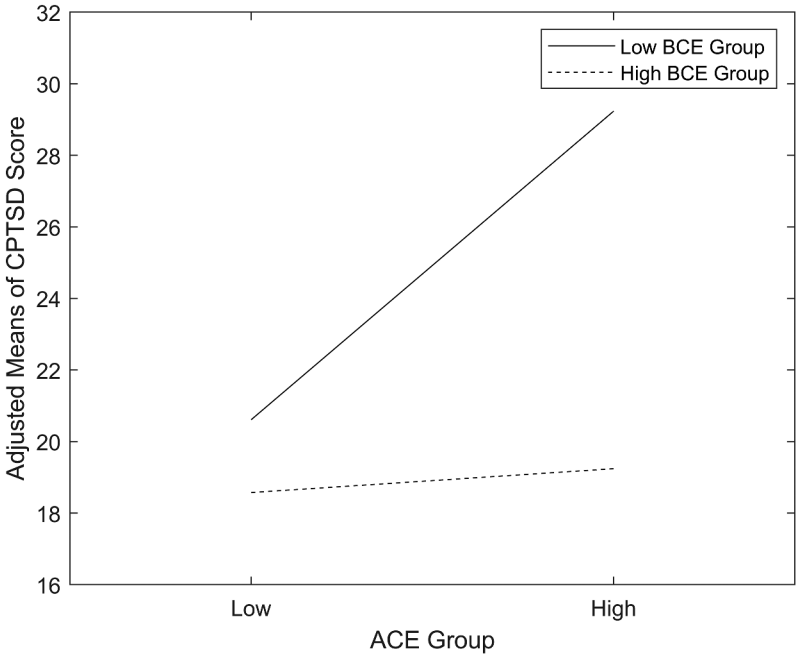

Figure 1. Trend level interaction effect of Benevolent Childhood Experiences (BCEs) and Adverse Childhood Experiences (ACEs) on Complex Post-Traumatic Stress Disorder (CPTSD) symptoms.

Given that the interaction effects were not found to be significant, a reduced model without the interaction term was utilized to explore the main effects. In this model, the main effect of BCEs showed a trend toward significance on CPTSD symptoms, $F(1,148) = 3.73$, $p = .06$, $\eta_p^2 = .03$. The CPTSD scores were lower in the high BCE group ($M_{adj} = 20.91$, $SE = 1.95$) than the low BCE group ($M_{adj} = 24.58$, $SE = 2.11$). The main effect of ACEs on CPTSD symptoms was significant, $F(1,148) = 5.28$, $p = .02$, $\eta_p^2 = .03$, indicating that the CPTSD scores were higher in the high ACE group ($M_{adj} = 25.45$, $SE = 2.46$) than the low ACE group ($M_{adj} = 20.04$, $SE = 1.78$).

Relationship of BCEs and ACEs with PTSD symptoms

A two-way ANCOVA was utilized to investigate whether the BCEs would moderate the relationship between ACEs and PTSD symptoms. There was a statistically significant interaction between BCEs and ACEs on PTSD symptoms, $F(1,145) = 4.29$, $p = .04$, $\eta_p^2 = .03$. A post hoc analysis of the simple main effects for ACEs and BCEs was performed based on a Bonferroni correction. In the low BCE group, there was a significant difference in PTSD scores ($p = .002$), where the high ACE group ($M_{adj} = 13.41$, $SE = 1.55$) had higher PTSD scores than the low ACE group ($M_{adj} = 8.11$, $SE = 1.33$). In the high BCE group, there was no significant difference

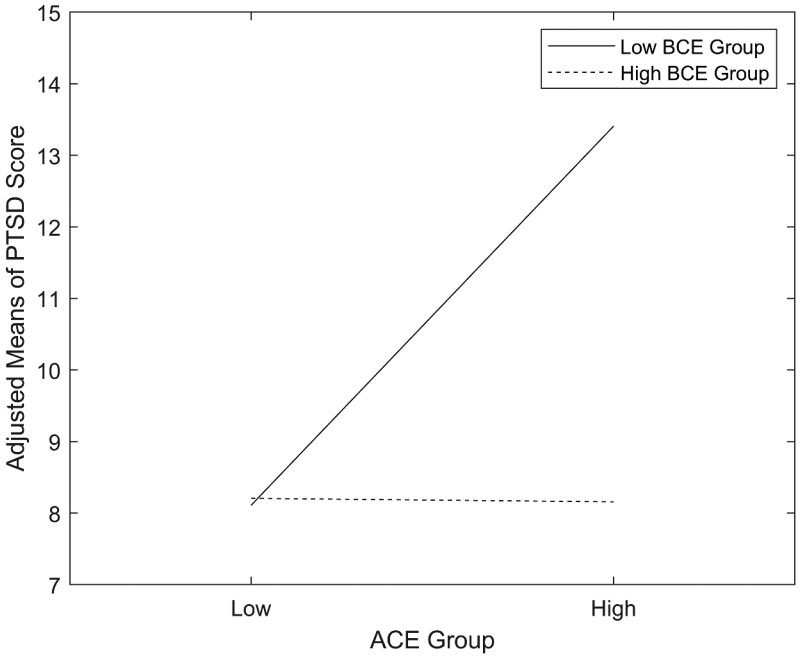

Figure 2. Interaction effect of Benevolent Childhood Experiences (BCEs) and Adverse Childhood Experiences (ACEs) on Post-Traumatic Stress Disorder (PTSD) symptoms.

in PTSD scores ($p = .98$) between the high ACE group ($M_{adj} = 8.16$, $SE = 2.07$) and low ACE group ($M_{adj} = 8.21$, $SE = 0.95$). Figure 2 provides an illustration of the adjusted means of PTSD scores for the BCE and ACE groups.

Relationship of BCEs and ACEs with DSO symptoms

A two-way ANCOVA with heteroscedasticity consistent standard errors HC3 was utilized to investigate whether the BCEs would moderate the relationship between ACEs and DSO symptoms, given that the assumption of homogeneity of variance was violated. There was a non-significant interaction between BCEs and ACEs on DSO symptoms, $B = 1.57$, $p = .53$. Given that the interaction effect was non-significant, a reduced model without the interaction term was utilized to explore the main effects. In this model, the main effect of BCEs on DSO symptoms was significant, $B = -3.13$, $p = .01$. The DSO scores were lower in the high BCE group ($M = 10.15$, $SD = 6.25$) than the low BCE group ($M = 13.98$, $SD = 6.29$). The main effect of ACEs on DSO symptoms was significant, $B = 3.05$, $p = .02$. The DSO scores were higher in the high ACE group ($M = 15.00$, $SD = 5.07$) than the low ACE group ($M = 10.59$, $SD = 6.54$). Figure 3 provides an illustration of the means of DSO scores for the BCE and ACE groups.

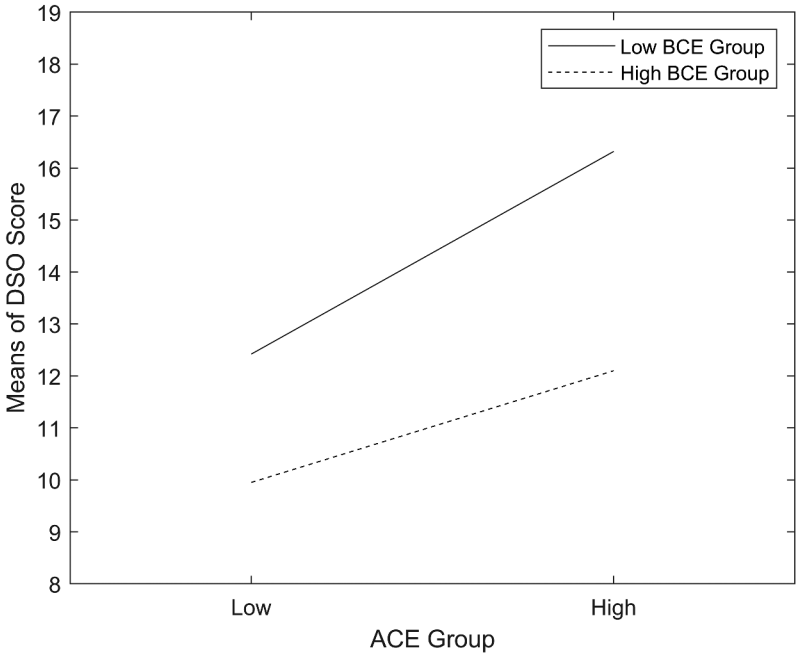

Figure 3. Main effects of Benevolent Childhood Experiences (BCEs) and Adverse Childhood Experiences (ACEs) on Disturbances in Self Organization (DSO) symptoms.

Discussion

In the present study, we investigated how BCEs and ACEs were related to the symptoms of CPTSD. Specifically, we observed that positive childhood experiences can help buffer against negative outcomes, where BCEs played a significant role in weakening the association between ACEs and PTSD symptoms. BCEs might also play a role in reducing CPTSD symptoms, although this trend did not reach full significance. Even though some of our statistical findings were close to the threshold for significance, the overall pattern suggests that people who had difficult childhoods but also experienced positive relationships and support were less likely to develop severe PTSD symptoms as adults.

Potential effects of BCEs on the relationship between ACEs and CPTSD

The findings showed a trend toward significance in how BCEs might influence the link between ACEs and CPTSD symptoms; however, the specific role of BCEs as a resilience factor in protecting against CPTSD symptoms remains unclear. A significant main effect of BCEs on CPTSD symptoms indicates that BCEs play a role in influencing the severity of CPTSD symptoms. Given the marginally significant evidence for the moderating effect of BCEs on CPTSD symptoms, future research with clinical samples is necessary to determine whether BCEs serve as a protective or promotive factor for CPTSD.

The role of BCEs in relationship between ACEs and components of CPTSD

The present study suggests that positive childhood experiences can lessen the impact of adverse experiences on the development of PTSD symptoms in adulthood. Specifically, among those participants who had many positive experiences growing up, there was little difference in PTSD symptoms between those with high and low levels of ACEs. However, for those with fewer positive experiences growing up, individuals who faced more adverse experiences in childhood showed significantly higher PTSD symptoms compared to those with fewer negative experiences. These results are consistent with another study that found that positive childhood memories moderated the relationship between childhood maltreatment and PTSD symptoms in mothers who were reared in foster care (Narayan et al., 2017). In this study, individuals with high positive childhood memories did not show a relationship between childhood maltreatment and PTSD symptoms, whereas for individuals with low positive childhood memories, greater childhood maltreatment was associated with more PTSD symptoms. The present findings highlight the protective effect of BCEs in mitigating PTSD symptom development among individuals exposed to ACEs. It is possible that memories of feeling loved and cared for during childhood create a positive memory network, helping to protect against the detrimental effects of traumatic childhood experiences and the development of PTSD in adulthood (Lieberman et al., 2005).

Our study found a clear relationship between ACEs, BCEs, and DSO symptoms. Specifically, individuals with higher ACEs exhibited more DSO symptoms, regardless of their exposure to BCEs; while those with higher BCEs showed fewer DSO symptoms, regardless of their exposure to ACEs. These results suggest that BCEs exert a promotive effect on DSO symptoms, such that BCEs reduce the development of DSO symptoms in adulthood independent of the number of ACEs. To our knowledge, there is a lack of previous studies investigating the role of BCEs in the relationship between ACEs and DSO symptoms. Although BPD is distinct from CPTSD, the two conditions share overlapping symptoms, such as difficulties with emotion regulation, self-concept, and interpersonal relationships (Ford & Courtois, 2021). The present results are similar to the study that found that ACEs and BCEs displayed main effect relationships with symptoms of BPD in adults (Gunay-Oge et al., 2020) where higher ACEs were associated with more BPD symptoms and higher BCEs were associated with less BPD symptoms. The present study adds to the mental health literature by demonstrating that BCEs not only help reduce BPD symptoms but also have a similar promotive effect on DSO symptoms in CPTSD.

Taken together, these results suggest that in individuals exposed to ACEs, the presence of BCEs could be more effective in protecting individuals from developing symptoms of PTSD but less effective for protecting individuals from developing symptoms of DSO. Past literature has indicated that the effect of

lifetime interpersonal trauma on symptoms of both PTSD and DSO in adulthood is mediated by adult attachment anxiety (Sandberg & Refrea, 2022). Experiencing interpersonal trauma can lead an individual to feel frightened and unprotected, which can lead to increased vigilance, fear of abandonment, efforts to avoid awareness of unmet attachment needs (George & West, 2012) and rumination, which could ultimately contribute to PTSD symptoms (Mikulincer & Shaver, 2007). Interpersonal trauma can also contribute to DSO symptoms through causing a person to feel unlovable and unworthy of care and protection, have difficulty regulating painful emotions and encounter problems developing and maintaining healthy relationships (Mikulincer & Shaver, 2007). As such, BCEs may offer protective effects on mental health outcomes by providing alternative sources of attachment from non-abusive caregivers, or social support from friends, teachers and neighbors. BCEs may provide alternative attachment figures or social support to children, potentially reducing ACEs' impact on stress response and PTSD symptoms development. However, social support might not sufficiently mitigate the effect of ACEs on DSO symptoms (emotion dysregulation, negative self-concept and difficulty sustaining relationships) which are less directly related to stress response mechanisms. While evidence supports social support's stress-buffering effect on PTSD symptoms (Cohen & Wills, 1985; McCutchen et al., 2022; Wang et al., 2021), there is limited evidence on its role in preventing DSO symptoms following childhood trauma.

Implications

The present findings suggest that incorporating BCEs into preventive interventions for children exposed to ACEs could help reduce symptoms of PTSD in adulthood. Strengthening positive childhood experiences may prevent PTSD symptom development and curb the intergenerational transmission of mental health issues (Narayan et al., 2021). Furthermore, parents could be educated on how to increase BCEs in their children, such as fostering positive peer interactions, to build psychological resilience against major life stressors later in life (Doom et al., 2021). In addition, BCEs reduce the amount of adulthood DSO symptoms in children regardless of ACEs exposure. However, further research is needed to identify protective factors that specifically prevent the development of DSO symptoms in children exposed to ACEs.

Strengths and limitations

To our knowledge, this study is the first to investigate the protective and promotive effects of BCEs on the relationship between ACEs and CPTSD symptoms in a Singaporean university sample. However, the present study's limitations included the use of self-report questionnaires to obtain information about ACEs, BCEs and CPTSD symptoms. The study's reliance on self-

report questionnaires may introduce recall bias, as participants were asked to reflect on experiences from many years ago (Althubaiti, 2016). Future research should use longitudinal designs to obtain more accurate reports. In addition, this study measured CPTSD symptoms using a questionnaire, not a formal diagnosis. Future research should explore these relationships in clinical samples to ensure findings are generalizable to clinical populations. The present study was limited by the use of the Adverse Childhood Experiences Questionnaire, which measured only the types of ACEs experienced by participants, but did not assess the frequency, intensity, or chronicity of exposure to ACEs (Anda et al., 2020). Future research could explore whether the frequency, intensity, or chronicity of ACEs influences the outcomes observed in this study. Lastly, the study's sample was limited to English-speaking participants, which may limit the generalizability of the results.

Conclusion

The present study found that the role of BCEs as a resilience factor for CPTSD symptoms was not fully established in the current non-clinical sample. BCEs demonstrated protective effects with PTSD symptoms and promotive effects with DSO symptoms. Interventions that strengthen BCEs in children may help them manage stressors and prevent PTSD symptoms in adulthood. Further research should explore the role of protective factors for DSO symptoms in children exposed to ACEs.

Acknowledgments

We thank Dr Kunchana Chouynuu (James Cook University) and Dr Peter H.K. Chew (James Cook University) for their statistical advice.

Disclosure statement

No potential conflict of interest was reported by the author(s).

Availability of data and material

The data that support the findings of this study are available from the corresponding author, D. J. Wen, upon reasonable request.

Ethics approval

The study was approved by the James Cook University Human Ethics Committee (Approval number: H8640).

Consent to participate

Informed consent was obtained from the participants of the study.

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