



The validity and reliability of benevolent childhood experiences scale in Chinese community adults

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ABSTRACT

Background: Several studies have indicated that positive childhood experiences (PCEs) might have important protective effects on adulthood mental health. However, the instruments to assess PCEs are scarce.

Objective: In this study, we assessed the validity and reliability of the Benevolent Childhood Experiences (BCEs) scale, a new instrument of PCEs, in a large sample of Chinese adults. Furthermore, we examined associations of PCEs with symptoms of posttraumatic stress disorder (PTSD) and depression, as well as, prosocial behaviours across different levels of trauma.

Method: Participants were 6929 adults (33% male; mean age 38.04 years, SD = 7.81, ranging from 18 to 81.) recruited from Jiangxi and Hunan provinces in China. Self-administrated questionnaires were used to measure PCEs, childhood trauma, lifetime trauma, PTSD, depression, and prosocial behaviours. Multiple linear regression models were conducted to examine the interdependent and interactive effects of PCEs, lifetime trauma, childhood trauma on symptoms of PTSD and depression and prosocial behaviours.

Results: In the current sample, the Cronbach's α of the BCEs scale was 0.70. PCEs were not related to lifetime trauma, while modestly associated with childhood trauma, demonstrating excellent discriminant validity. PCEs were negatively correlated with severity of PTSD and depression, while positively correlated with prosocial behaviours, indicating good predictive validity. PCEs, lifetime trauma and childhood trauma were independently associated with severity of PTSD and depression and prosocial behaviours. Moreover, the interaction of PCEs and lifetime trauma negatively predicted severity of PTSD and depression, while the interaction of PCEs and childhood trauma negatively predicted prosocial behaviours. PCEs had a protective effect on PTSD and depression in high level of lifetime trauma, and showed a reduced positive effect on prosocial behaviours in high level of childhood trauma.

Conclusions: The Chinese BCEs scale is a reliable and valid instrument. PCEs can buffer adversity and foster positive outcomes in adulthood.

La validez y confiabilidad de la escala de Experiencias Benévolas de la Infancia en adultos de una comunidad China

Antecedentes: Varios estudios han indicado que las experiencias positivas en la infancia (PCEs) podrían tener efectos protectores importantes sobre la salud mental en la edad adulta. Sin embargo, los instrumentos para evaluar PCEs son escasos.

Objetivo: En este estudio, evaluamos la validez y confiabilidad de la escala de Experiencias Benévolas de la Infancia (BCE en sus siglas en inglés), un nuevo instrumento de PCEs, en una muestra grande de adultos chinos. Además, examinamos asociaciones de PCEs con síntomas de trastorno de estrés postraumático (TEPT) y depresión, así como comportamientos prosociales en diferentes niveles de trauma.

Método: Los participantes fueron 6929 adultos (33% hombres; edad media 38,04 años, DE = 7,81, con un rango de 18 a 81) reclutados en las provincias de Jiangxi y Hunan en China. Se utilizaron cuestionarios autoadministrados para medir PCEs, trauma infantil, trauma a lo largo de la vida, TEPT y depresión, y comportamientos prosociales. Se realizaron modelos de regresión lineal múltiples para examinar los efectos interdependientes e interactivos de los PCEs, el trauma a lo largo de la vida, el trauma infantil sobre los síntomas del TEPT y la depresión y las conductas prosociales.

Resultados: En esta muestra, el α de Cronbach de la escala BCE fue de 0,70. Los PCEs no se relacionaron con el trauma a lo largo de la vida, aunque se asociaron modestamente con el trauma infantil, demostrando una excelente validez discriminante. Los PCEs se correlacionaron negativamente con la gravedad del TEPT y depresión, mientras que se correlacionaron positivamente con las conductas prosociales, lo que indica una buena validez predictiva. Los PCEs, el trauma a lo largo de la vida y el trauma infantil se asociaron de forma independiente con la gravedad del TEPT y la depresión y las conductas prosociales. Además, la interacción de los PCEs y el trauma de por vida predijo negativamente la gravedad del TEPT y la depresión,

ARTICLE HISTORY

Received 7 December 2020
Revised 13 May 2021
Accepted 11 June 2021

KEYWORDS

Positive childhood experiences; adversity; PTSD; depression; prosocial behaviour

PALABRAS CLAVES

Experiencias infantiles positivas; adversidad; TEPT; depresión; comportamiento prosocial

关键词

童年期积极经历; 逆境; 创伤后应激障碍; 抑郁; 亲社会行为

HIGHLIGHTS

- The Chinese BCEs scale is a reliable and valid instrument to assess positive childhood experiences (PCEs).
- PCEs have a protective effect on adulthood emotional health and can also foster prosocial behaviours despite co-occurring adversities.

mientras que la interacción de los PCE y el trauma infantil predijo negativamente las conductas prosociales. Los PCEs tuvieron un efecto protector para el TEPT y la depresión en un nivel alto de trauma a lo largo de la vida, y mostraron un efecto positivo reducido sobre las conductas prosociales en un nivel alto de trauma infantil.

Conclusiones: La escala de BCE de China es un instrumento válido y confiable. Los PCEs pueden amortiguar la adversidad y fomentar resultados positivos en la edad adulta.

中国社区成年人积极童年经历量表的信效度研究

背景:研究表明童年期积极经历可能对成年人的心理健康具有重要的保护效应,但是,专门测量童年期积极经历的工具极少。本研究,我们修订国外编制的积极童年经历量表,检验其在中国社区成人人群体中的信度和效度,进一步,我们探索性分析童年积极经历和童年创伤对创伤后应激障碍症状,抑郁症状和亲社会行为的影响。

方法:对中国江西省和湖南省的6929名成年人(男性33%;平均年龄38.04岁,标准差 7.806,年龄范围从18岁到81岁)进行问卷调查,评估童年期积极经历,童年期创伤,终生创伤,创伤后应激障碍症状,抑郁症状和亲社会行为。用多层线性回归模型考查童年期积极经历,终生创伤,童年期创伤对创伤后应激障碍,抑郁和亲社会行为的独立作用和交互作用。

结果:童年期积极经历与终生创伤无显著相关,与童年期创伤存在中等程度的相关,表现良好的区分效度;童年期积极经历与创伤后应激障碍症状,抑郁症状显著负相关,而与亲社会行为显著性正相关,表明良好的预测效度。控制人口学变量后,童年期积极经历,终生创伤和童年期创伤对创伤后应激障碍症状,抑郁症状和亲社会行为分别显示独立的预测作用。此外,童年期积极经历和终生创伤的交互作用对创伤后应激障碍症状和抑郁症状均有负性预测作用,而童年期积极经历和童年期创伤的交互作用对亲社会行为的有正向预测作用。在高终生创伤的情况下,童年期积极经历对成年创伤后应激障碍和抑郁具有保护作用,而在高水平的童年期创伤中对亲社会行为的积极作用降低。

结论:中文版积极童年经历量表信,效度可靠。童年期积极经历可以缓解逆境的负面作用,促进成年心理健康。

1. Introduction

Numerous research over the past decades has confirmed the importance of early life experiences on lifespan development (Cicchetti & Dante, 2016; Waters & Cummings, 2000; Yamaoka & Bard, 2019). Previous studies have found that childhood trauma including maltreatment, neglect, and other forms of dysfunction (e.g. conflicts, violence, and addiction) is associated with higher risk for mental disorders and physical diseases (Belsky, Conger, & Capaldi, 2009; Lynch et al., 2018; Narayan, Englund, Carlson, & Egeland, 2014; Narayan, Englund, & Egeland, 2013; Saleptsi et al., 2004). However, most studies of childhood experiences have focused on traumatic events. Only recently, research has investigated the pivotal role of positive childhood experiences (PCEs) in lifespan development. For example, one study found that PCEs in late childhood predicted less adolescent substance use and better productivity and responsibility in early adulthood (Kosterman et al., 2011). In another study, Jeronimus, Ormel, Aleman, Penninx, and Riese (2013) demonstrated that distant positive life events had a small but long-lasting protective effect on neuroticism. In addition, one recent study indicated that peer support in childhood was associated with both short-term and long-term resilient psychosocial functioning in adolescence and early adulthood (van Harmelen et al., 2017).

As an old proverb goes: 'Fortune and misfortune are two buckets in the same well.' Indeed, PCEs and adversity usually occur together. For example, when individuals are confronted with adversity, family

support and adequate care may be protective factors to buffer the negative outcomes of adversity (Southwick & Charney, 2012). However, few studies have investigated the joint effects of PCEs and childhood trauma on mental health. Resilience is the capacity of successful adaption of different processes that challenge function, survival, or positive development threats. Resilience theory suggests that diverse systems (e.g. individual, family, neighbourhoods) interact to influence life development and resilience itself evolves constantly within individuals and systems (Cicchetti & Dante, 2016). A protective factors model based on resilience theory suggests that promotive assets and resources can moderate the relationships between risk factors and negative outcomes (Zimmerman, 2013). Consistent with the protective factors model, several studies have indicated the protective effects of PCEs on the intergenerational transmission of trauma, emotional deficits and developmental delay risks (Narayan, Ippen, Harris, & Lieberman, 2019).

Although preliminary research has implicated important roles of PCEs on mental health, clear and concise definitions and assessments of PCEs are controversial. Some research utilized the Childhood Experiences Questionnaire-Revised (CEQ-R) (Skodol et al., 2007; Zanarini, Gunderson, Marino, Schwartz, & Frankenburg, 1989) and the Traumatic Antecedents Questionnaire (TAQ) (Herman & Van der Kolk, 1987; Saleptsi et al., 2004) to assess PCEs and adverse childhood experiences together. However, the two instruments are not specific assessments of PCEs, and only contain several components of PCEs. Besides, they are

commonly used in the clinical sample for patients with borderline personality disorder (BDP) (Saleptsi et al., 2004; Skodol et al., 2007). Further, the psychometric validity of the TAQ has also been criticized (*Bessel van der Kolk's Trauma assessment Package*; Saleptsi et al., 2004). Meanwhile, some researchers measured PCEs by independent assessments considering several key favourable early experiences (Hillis et al., 2010; Kosterman et al., 2011; Slopen, Chen, Guida, Albert, & Williams, 2017). For instance, the Positive Childhood Experiences Scores consists of 7 items adapted from 4 subscales (psychological, caregiving, education and peer support subscales) in the Child and Youth Resilience Measure-28 (Bethell, Jones, Gombojav, Linkenbach, & Sege, 2019; Liebenberg, Ungar, & LeBlanc, 2013), and the Positive Influences in Childhood includes 4 items related to family support and self-esteem based on parental education (Chung, Mathew, Elo, Coyne, & Culhane, 2008). Such assessments, however, have failed to consider other possible key positive influences (e.g. proximity attachment, available community and society resources). Therefore, it is necessary to aggregate positive influences into a brief and effective instrument, reflecting more PCEs, which may counterbalance or outweigh the continuing effects of childhood adversity.

Recently, Narayan, Rivera, Bernstein, Harris, and Lieberman (2018) have developed the Benevolent Childhood Experiences (BCEs) scale, a new, full, concise assessment of PCEs designed for adults. The BCEs scale examines the presence or absence of 10 PCEs from birth to age 18, similar to the ACEs scale (Centers for Disease Control and Prevention [CDC], 2017; Felitti et al., 2019). The BCEs items were developed based on developmental psychopathology perspective, ecological systems and ecological-transactional perspectives to describe positive experiences and resources within the diverse and interacting systems (Narayan et al., 2018). Items include those related to oneself (e.g. comfortable belief, positive self-evaluation), one's family (e.g. caregivers, family support), and one's social community (e.g. available friendship support, caring teachers). The BCEs scale has been validated in various samples in western countries, such as low-income pregnant women sample, homeless sample, adolescents and adults sample (Crandall et al., 2020, 2019; Karatzias et al., 2020; Merrick, Narayan, DePasquale, & Masten, 2019; Narayan et al., 2018), see Table 1. However, little is known about the reliability and validity of BCEs within a Chinese context. Whether there exist cross-cultural differences between Western and non-Western countries is unknown. Furthermore, the frequencies, validity and reliability of the BCEs scale in community-dwelling adults have yet been reported. Additionally, several studies found the contributing

and promotive role of PCEs in prosocial orientation from childhood to early adulthood (Catalano & Hawkins, 1996; Catalano et al., 2005; Eisenberg et al., 1999). Prosocial behaviours generally are defined as voluntary behaviours intended to benefit others (Eisenberg, 2014). One study indicated that PCEs significantly promoted prosocial behaviours in early adulthood in the context of adolescent substance use (Kosterman et al. (2011)). Nonetheless, little is known about how PCEs affect prosocial behaviours across different levels of trauma exposure.

To sum up, the first aim of this study was to examine the psychometric properties of the Chinese version BCEs in a community sample. We hypothesized that BCEs would have a good discriminant validity from childhood trauma and lifetime trauma, and predictive validity for the severity of PTSD and depression. The second aim of this study was to investigate the independent and interaction effects of PCEs and childhood trauma and lifetime trauma in predicting PTSD and depression symptoms. We hypothesized that PCEs would show protective effects on PTSD and depression across different childhood trauma and lifetime trauma exposure levels. The third aim was to examine the interactions of PCEs, childhood trauma and lifetime trauma on prosocial behaviours. We hypothesized that PCEs would promote adulthood prosocial behaviours in the presence of trauma.

2. Methods

2.1. Participants and procedure

The data were from an ongoing project to study the intergenerational transmission of psychopathology. Students and one of their family members (mostly parents) from two schools in east China's Jiangxi Province and three schools in central China's Hunan Province were invited to participate in the programme. Of the five schools, four schools were public schools and one was a private school. The gross domestic product (GDP) of Jiangxi and Hunan provinces in 2019 were CNY 2,476 trillion and CNY 3,975 trillion, representing moderated development in China (National Bureau of Statistics of China, 2019). The adults were asked to complete self-administrated questionnaires when they attended parent-teacher conferences. A total of 8,746 questionnaires were distributed, and 7,451 were received with a recovery of 85.2%. Of the 7,451 questionnaires, 6,929 completed scales used in this study. The final sample consisted of 2,286 males and 4,643 females. The average age was 38.04 years (SD = 7.81), ranging from 18 to 81. Of these participants, 62.2% lived in urban, 37.8% lived in rural; 9.4% completed primary school education, 43.9% junior high school education, 28.9% high school education and 17.9% colleges and above education.

Table 1. Prior research using the BCEs scale.

Author	Country	Participants	Reliability	Main outcomes variables
Narayan et al. (2018)	United States	101 pregnant women	0.80 ^a	Prenatal depression, prenatal PTSD, prenatal perceived stress, prenatal stressful life events
Crandall et al. (2020)	United States	489 adolescents from a large northwestern city	Null	Risky sex behaviours, substance abuse, depression, anxiety, body image
Crandall et al. (2019)	United States	246 adults from Amazon Mechanical Turk	Null	Physical health, cognitive, mental and social health
Daines, Hansen, Novilla, and Crandall (2021)	United States	1030 adults	Null	Family health
Gunay-Oge, Pehlivan, and Isikli (2020)	Turkey	259 adults	0.62	Personality psychopathology (antisocial, avoidant, borderline, dependent, depressive, obsessive-compulsive, paranoid, passive-aggressive, schizoid, schizotypal and self-defeating personality disorder symptoms)
Karatzias et al. (2020)	UK	275 trauma-exposed adults	0.79	PTSD and Complex PTSD symptoms
Merrick et al. (2019)	United States	50 homeless primary caregivers	Null	Psychological distress, sociodemographic risk, parenting stress
Merrick, Narayan, Atzl, Harris, and Lieberman (2020)	United States	101 low-income pregnant women	Null	Prenatal depression symptoms, prenatal PTSD symptoms, risky reproductive planning, prenatal stressful life events
Miller, Cheung, Novilla, and Crandall (2020)	United States	246 adults recruited through Amazon Mechanical Turk	Null	Extroverted personality characteristic, depression, stress, executive function, past smoking habits
Oge (2020)	Turkey	175 Turkish adults	0.61	Psychopathological symptom severity, life satisfaction
Starbird and Story (2020)	United States	334 adults (71 adoptees, 59 former foster children, 207 neither adopted nor former foster children)	Null	Narcissism, early maladaptive schemas
Vogeler et al. (2020)	United States	192 women	Null	PTSD, co-dependency,

Reliability is internal consistency reliability. ^a Test-retest stability of the BCEs scale. PTSD = posttraumatic stress disorder.

The data were collected from 5 November 2019, to 24 December 2019, before the outburst of the COVID-2019. It took participants about 40 minutes to finish the survey. This study was approved by the Moral & Ethics Committee of School of Psychology, Jiangxi Normal University (Nanchang, China). Written informed consent was obtained from all participants.

3. Measures

3.1. Positive childhood experiences

The Benevolent Childhood Experiences (BCEs) scale is a new instrument to measure PCEs before the age of 18 (Merrick et al., 2019; Narayan et al., 2018). It consists of 10 yes/no items measuring perceived safety and security (e.g. presence of beliefs that gave comfort, at least one good friends), positive and predictive quality of life (e.g. enjoyment of school, regular meals and bedtime), and external support (e.g. a teacher who cared, good neighbours). The total score ranges between 0 and 10, with higher score indicating more PCEs. The scale was translated into Chinese using the standard procedure of translation-back-translation revision with permission from Dr. Angela J. Narayan. One psychologist and two postgraduate psychology students independently translated the BCEs scale from English to Chinese.

Then, they discussed the accuracy and meaning of the content, and confirmed the preliminary Chinese version. One psychiatrist and one postgraduate student majoring in English who had never seen the original BCEs scale back-translated the preliminary Chinese version separately. They discussed any discrepancies between their translations and completed back-translation. All these translators who were fluent in Chinese and English compared the original version and back-translated version, discussed any inconsistencies and reached a consensus. Subsequently, the Chinese version was piloted with ten adults who had only primary school education and five undergraduate psychology students. The final Chinese version of BCEs can be found in the Appendix A.

3.2. Childhood trauma

The Childhood Trauma Questionnaire (CTQ) is one of the tools to measure childhood abuse, and neglect experiences with 25 clinical items and 3 validity items (Bernstein et al., 2003). It constitutes five dimensions of emotional abuse, physical abuse, sexual abuse, emotional neglect and physical neglect. Each item is rated on a 5-point scale, from 1 (never) to 5 (always). The total score is in the range from 25 to 125. The Chinese

version of CTQ has been proven good psychometric properties (Zhao, Zhang, & Li, 2005). Cronbach's α was 0.83 with the current sample.

3.3. Life trauma

The Life Events Checklist for DSM-5 (LEC-5) was used to assess potentially traumatic events fulfilling with DSM-5 criteria A for PTSD during the whole lifetime (Weathers et al., 2013). The LEC consists of 17 items, assessing severity of traumatic exposure in natural disasters, traffic accidents, toxic substances, life-threatening illnesses, and so on. Each item includes six possible choices: happened to me, witnessed it, learned about it, part of my job, not sure, and does not apply. The first four choices were regarded as exposure to the event. The total number of events was calculated, ranging from 0 to 17. Cronbach's α was 0.85 with the current sample.

3.4. PTSD symptoms

The Posttraumatic Stress Disorder Checklist for DSM-5 (PCL-5) combined with LEC-5 were used to measure PTSD symptoms within the past month (Blevins, Weathers, Davis, Witte, & Domino, 2015). The PCL-5 consists of 20 items divided into the four dimensions of re-experiencing, avoidance, negative alterations in cognition and mood, and hyperarousal symptoms. Participants rated each item by five points, ranging from 0 (not at all) to 4 (extremely). The total score was calculated, ranging from 0 to 80. A cut-off of 33 was used for screening probable PTSD. The PCL-5 has demonstrated good psychometric properties in China (Liu et al., 2014). Cronbach's α was 0.92 with the current sample.

3.5. Depressive symptoms

The Patient Health Questionnaire-9 (PHQ-9) is a self-report assessment to measure depressive symptoms over the past two weeks (Kroenke, Spitzer, & Williams, 2001). The PHQ-9 consists of 9 items that were based on DSM-IV criteria for the diagnosis of depression. Each item is rated on a 4-point scale, ranging from 0 (not at all) to 3 (nearly every day). A total score of 7 was suggested to screen clinical depression in Chinese (Wang et al., 2014). Cronbach's α was 0.82 with the current sample.

3.6. Prosocial behaviours

The prosocial subscale of the Strengths and Difficulties Questionnaire (SDQ) was used to assess adults' prosocial behaviours to keep consistent with children's measures. (Goodman, 1997). The subscale consists of 5 items, with each item scoring from 0 (not true) to 2

(certainly true). The total score ranges from 0 to 10. We reworded items to measure the prosocial behaviours tendency of adults. For example, 'Shares readily with other children (treats, toys, pencils, etc.)' was reworded to 'Shares readily with other adults (treats, etc.)', 'Kind to younger children' was reworded to 'Kind to less social status', 'Often volunteers to help others (parents, teachers, other children)' was reworded to 'Often volunteers to help others (parents, colleagues and friends)'. Cronbach's α was 0.85 with the current sample.

3.7. Analyses

Descriptive statistics were used to analyse sample characteristics and BCEs frequency. T-test and analysis of variance (ANOVA) were utilized to examine whether levels of PCEs differed across participants' gender, ages, residence, and education. Bivariate correlations between PCEs and other variables were examined. Multiple hierarchical regressions were conducted to examine the interdependent and interaction effects of PCEs, lifetime trauma, childhood trauma on symptoms of PTSD and depression and prosocial behaviours. First, variables except demographics were standardized. Then, covariates (age, gender, residence, and education), PCEs, childhood trauma and lifetime trauma were added in the first step of the regression. To examine the interaction effects of PCEs, childhood trauma and lifetime trauma, the interaction terms between PCEs and lifetime trauma, PCEs and childhood trauma, childhood trauma and lifetime trauma, as well as the interaction term of PCEs, childhood trauma, and lifetime trauma exposure were entered into the second step. A simple slope analysis was used to probe interactions (Aiken & West, 1991). The analysis was conducted with SPSS 23.0 and the significant level was set at $p < .05$, two tails.

4. Results

4.1. Descriptive Statistics

In the sample, 40.0% participants had experienced one to three potential traumatic events, and 27.2% had experienced four or more traumatic events. The prevalence of probable PTSD and depression was 1.8% and 9.1%, respectively. Frequencies of the ten PCEs are presented in Table 2. Independent sample t-tests showed that participants who resided in urban ($M = 8.79$, $SD = 1.59$) reported higher levels of PCEs than those lived in rural ($M = 8.38$, $SD = 1.92$), [$t(6929) = 9.10$, $p < .001$], while males ($M = 8.68$, $SD = 1.78$) and females ($M = 8.61$, $SD = 1.71$) reported similar levels of PCEs, [$t(6929) = 1.49$, $p > .05$]. ANOVA indicated that individuals with higher levels of education reported more

Table 2. Frequencies, means and standard deviation of PCEs.

Items	Community people (<i>n</i> = 6929)	Homeless parents (<i>n</i> = 50) (Merrick et al., 2019)	Pregnant women (<i>n</i> = 101) (Narayan et al., 2018)
1. Caregivers with whom felt safe	88.5%	94%	90%
2. Good friends	94.6%	86%	87%
3. Comfortable beliefs	77.9%	76%	69%
4. Like schools	94.1%	68%	67%
5. Caring teachers	87.6%	86%	82%
6. Good neighbours	92.7%	66%	59%
7. Supportive adults (not a parent or the person from #1)	68.0%	68%	78%
8. Opportunities to have a good time	82.4%	80%	86%
9. Love yourself	91.4%	64%	67%
10. A predictable home routine	86.3%	68%	81%
	M = 8.63 SD = 1.73	M = 7.56 SD = 2.23	M = 7.84 SD = 2.14

The full, original Benevolent Experiences scale is available in Narayan et al. (2018).

PCEs [$F(3, 6925) = 71.74, p < .001$] (primary school: $M = 7.74, SD = 2.20$; junior middle school: $M = 8.54, SD = 1.76$; high school: $M = 8.87, SD = 1.51$; college or above: $M = 8.97, SD = 1.52$).

4.2. Reliability, discriminant and predictive validity of BCEs scale

The Cronbach's α of the BCEs scale was 0.70 in this sample, suggesting good reliability. Means, SD, and bivariate correlations of PCEs, childhood trauma, lifetime trauma, PTSD, depression, and prosocial behaviours are shown in Table 3. As expected, PCEs were negatively correlated with severity of PTSD and depression, while positively correlated with prosocial behaviours, indicating good predictive validity. Interestingly, PCEs were not related to lifetime trauma exposure ($r = -0.07, p > .05$), suggesting excellent discriminant validity. It is not surprising that PCEs were negatively related to childhood trauma ($r = -0.37, p < .001$), but the correlation coefficient was modest. With regard to specific childhood trauma subscales, the correlation between PCEs and emotional neglect was higher ($r = -0.35, p < .001$), the

correlation of PCEs with emotional abuse ($r = -0.21, p < .001$), physical abuse ($r = -0.18, p < .001$), sexual abuse ($r = -0.17, p < .001$), and physical neglect ($r = -0.28, p < .001$) were lower.

4.3. The interdependent and interactive effects of PCEs on severity of PTSD and depression

PCEs ($\beta = -0.06$ for PTSD; $\beta = -0.10$ for depression), lifetime trauma ($\beta = 0.28$ for PTSD; $\beta = 0.19$ for depression) and childhood trauma ($\beta = 0.24$ for PTSD; $\beta = 0.23$ for depression) were independently associated with severity of PTSD and depression after controlling for demographics, see Table 4 step 1. The interaction term of PCEs and lifetime trauma negatively predicted severity of PTSD ($\beta = -0.04$) and depression ($\beta = -0.03$), the interaction of lifetime trauma and childhood trauma positively predicted severity of PTSD ($\beta = 0.05$) and depression ($\beta = 0.05$), while the interaction of PCEs and childhood trauma, as well as the interaction of PCEs, childhood trauma, and lifetime trauma was not related to both PTSD and depression, see Table 4 step 2. Simple slope analyses showed that the relationships of lifetime trauma with severity of PTSD ($\beta_{M+0.5SD} = 0.27, p < .001$; $\beta_{M-0.5SD} = 0.30, p < .001$) and depression ($\beta_{M+0.5SD} = 0.18, p < .001$; $\beta_{M-0.5SD} = 0.21, p < .001$) were weaker in presence of high PCEs, see Table 4 and Figure 1

4.4. The interdependent and interactive effects of PCEs on prosocial behaviours

PCEs ($\beta = 0.15$), lifetime trauma ($\beta = 0.03$) and childhood trauma ($\beta = -0.21$) were independently associated with prosocial behaviours after controlling for demographics. A significant interaction effect of PCEs and childhood trauma on prosocial behaviours was also found ($\beta = -0.05$). Simple slope analyses showed that the relationship between childhood trauma and prosocial behaviours was stronger in the presence of high PCEs ($b_{M+0.5SD} = -0.22, p < .001$; $b_{M-0.5SD} = -0.19, p < .001$), see Table 4 and Figure 1c.

Table 3. Bivariate correlations of studied variables (*n* = 6929).

	1	2	3	4	5	6	7	8	9	10
1 age	1									
2 sex	-.20***	1								
3 residence	.13***	-.08***	1							
4 education	-.19***	-.06***	-.42***	1						
5 PCEs	-.02	-.02	-.11***	.18***	1					
6 childhood trauma	.05***	-.05***	.10***	-.17***	-.37***	1				
7 lifetime trauma	-.01	-.14***	-.03*	.09***	-.01	.07***	1			
8 PTSD symptoms	-.01	-.04***	.09***	-.11***	-.17***	.29***	.30***	1		
9 depressive symptoms	-.05***	.01	.03*	-.03***	-.19***	.28***	.21***	.55***	1	
10 prosocial behaviours	-.04***	.08***	-.12***	.16***	.22***	-.26***	.01	-.06***	-.04***	1
Mean	38.04	-	-	-	8.63	36.98	2.48	6.26	2.51	7.39
SD	7.81	-	-	-	1.73	9.86	3.01	8.18	3.01	2.38

PCEs = positive childhood experiences; PTSD = posttraumatic stress disorder.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

Table 4. Hierarchical regressions for symptoms of PTSD and depression and prosocial behaviours.

Variables	PTSD symptoms				Depressive symptoms				Prosocial behaviours			
	Step1		Step2		Step1		Step2		Step1		Step2	
	β	t	β	t	β	t	β	t	β	t	β	t
Age	-.04	-3.42***	-.04	-3.23***	-.05	-4.30***	-.05	-4.13***	.01	0.72	.01	0.74
Sex, ref = female	-.00	-0.34	-.00	-0.32	-.04	-3.35***	-.04	-3.34***	-.08	-6.43***	-.08	-6.48***
Residence, ref = rural	-.03	-2.67**	-.03	-2.63***	-.01	-0.54	-.01	-0.51	.04	3.43***	.04	3.48***
Education, ref = primary school												
Junior middle school	-.08	-3.71***	-.08	-3.85***	-.03	-1.61	-.04	-1.73	.04	1.88	.04	1.94
High school	-.13	-6.12***	-.13	-6.22***	-.02	-0.84	-.02	-0.91	.09	4.12***	.09	4.11***
College degree or above	-.12	-6.03***	-.12	-6.10***	-.02	-0.82	-.02	-0.85	.10	5.25***	.10	5.14***
Lifetime trauma	.29	26.44***	.28	25.25***	.20	17.65***	.19	16.61***	.03	2.67**	.03	2.59**
Childhood trauma	.24	19.87***	.23	19.33***	.23	19.11***	.23	18.60***	-.20	-15.76***	-.21	-16.23***
PCEs	-.06	-4.68***	-.06	-4.74***	-.10	-7.90***	-.10	-7.93***	.13	10.53***	.15	11.20***
PCEs \times lifetime trauma			-.04	-3.15**			-.03	-2.64**	-	-	-	-
Childhood trauma \times lifetime trauma			.05	4.06***			.05	3.85***	-	-	-	-
PCEs \times childhood trauma											-.05	-3.87***

PCEs = positive childhood experiences; PTSD = posttraumatic stress disorder.

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

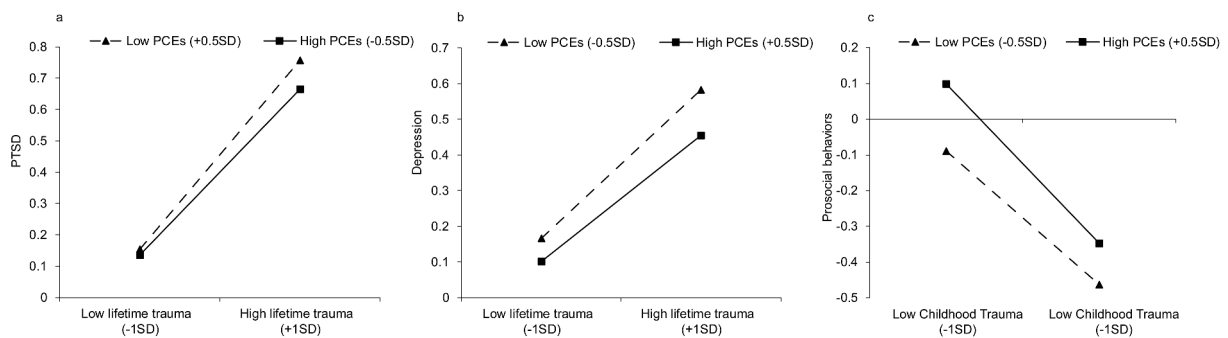


Figure 1. The interactions of PCE, childhood trauma, and lifetime trauma on symptoms of PTSD, depression and prosocial behaviours. (a) Interaction effect of PCEs and lifetime trauma on PTSD symptoms. (b) Interaction effect of PCEs and lifetime trauma on depressive symptoms (c) Interaction effect of PCEs and childhood trauma on prosocial behaviours. PCEs = positive childhood experiences; PTSD = posttraumatic stress disorder.

5. Discussion

To the best of our knowledge, this is the first study to examine the reliability and validity of the Benevolent Childhood Experiences (BCEs) scale in a large Chinese community sample. Our findings demonstrated good reliability, discriminant and predictive validity of BCEs. PCEs were negatively correlated with symptoms of PTSD and depression, while positively correlated with prosocial behaviours, indicating good predictive validity. Besides, PCEs were only modestly associated with childhood trauma and not related to lifetime trauma, suggesting excellent discriminant validity. Compared to previous samples using the same questionnaire, the mean number of BCEs in the current sample significantly higher than the homeless sample ($t = 3.39$, $p < .01$) and pregnant women sample ($t = 3.70$, $p < .001$) (Merrick et al., 2019; Narayan et al., 2018). Interestingly, although frequencies of total PCEs in community people were quite high: 94.6% of community people reported having at least one caregiver and 68.0% people reported having at least an adult who could support them, there were still

2.7% people reporting few PCEs, less than or equal 5 items. These findings highlight the importance of fostering PCEs to prevent and intervene in mental health problems.

In the present sample, the prevalence of probable PTSD was a little higher than that reported in one national survey of Chinese adults (Huang et al., 2019), while lower than that reported in a cross-national survey of general population (Koenen et al., 2017). Consistent with our hypothesis, PCEs were associated with less symptoms of PTSD and depression and more prosocial behaviours in adulthood after adjustment of demographics, childhood trauma and lifetime trauma. The direct effect of PCEs was independent and in the opposite direction of risk factors, supporting the compensatory model of resilience theory (Zimmerman, 2013). The findings of enduring positive influence of PCEs on prosocial behaviours in adulthood are also consistent with the research of Eisenberg et al. (1999) and Kosterman et al. (2011). Further studies should continue to explore the psychological and biological mechanisms of the independent effects of PCEs on mental problems.

Previous research has documented that different types of trauma exposure may have differential effects on psychopathology (Benfer et al., 2018; Kilic, Magruder, & Koryurek, 2016; Ogle, Rubin, Berntsen, & Siegler, 2013). Maltreatment is associated with multiple mental health problems, while the impact of community violence is more constrained (Cecil, Viding, Barker, Guiney, & McCrory, 2014). Interpersonal events usually lead to more severe clinical symptoms than non-interpersonal events (Ogle et al., 2013). In this study, we for the first time found that the protective effects of PCEs on PTSD, depression and behavioural problems were different for lifetime trauma and childhood trauma. Specifically, PCEs had a protective effect on PTSD and depression in the presence of lifetime trauma, and showed a reduced positive effect on prosocial behaviours in high levels of childhood trauma.

The lifetime trauma reported by our participants was quite different from childhood trauma. Lifetime trauma, measured by LEC-5 fulfilling the DSM-5 criterion A for PTSD, is considered as experiencing or witnessing potentially life-threatening events (e.g. direct experiences of natural disaster, transportation accident, toxic substance, weapon assault and life-threatening illness). However, childhood trauma is related to chronic physical, sexual, or emotional abuse and neglect usually by family members or acquaintances (Bernstein et al., 2003). In addition, lifetime trauma endorsed by adults may be mostly about recent events due to retrospective reports. Given that emotion condition is relatively unstable and vulnerable to current environment, it is not surprising that the protective effects of PCEs were higher on PTSD and depression for individuals confronted with recent and sudden trauma. Concerning prosocial behaviours, too many chronic childhood adversities might have deeply shaped an individual's improper behavioural habits and cognitive schema. Possibly, these people firmly believed that the world was dangerous and people around were not trustworthy. In face of these conditions, PCEs were still beneficial to stable prosocial behaviours, but the effect was attenuated (Zimmerman, 2013).

These findings have potentially implications for lifespan health and prevention of psychiatric disorders. Whether exposed to trauma or not, it appears that PCEs play important protective roles against multiple mental health problems in life. However, there are a small of community-dwelling adults reported low PCEs. Increasing PCEs, particularly in vulnerable children with lower PCEs and higher trauma, may promote wellness. This probably depends on the joint efforts made by family, school and society. The findings may also have important implications for clinical practice. Integrating intervening skills that could activate PCEs into trauma-focused psychotherapy might

relieve PTSD and depression severity better and more efficiently. As for trauma-related abnormalities in prosocial behaviours, more efforts are needed to change adverse cognitive and behavioural patterns as well as improve their experience of positive events. In addition, the interaction effect of childhood trauma and lifetime trauma was significant, suggesting a cumulative effect of multiple trauma exposure (Suliman et al., 2009). A comprehensive assessment of traumatic exposure during the whole lifespan is needed in the clinical diagnosis process and treatment programmes.

5.1. Limitation

The current study has several strengths such as a large sample size, well-validated instruments, and various measures of trauma exposures and indicators of psychopathology, however, several limitations should be noted. First, this is a cross-sectional study and causal effects cannot be confirmed. Although lifetime trauma and childhood experiences may implicate causal relationships, longitudinal research is required to replicate our findings. Second, the BCEs scale relies on retrospective self-report, which may introduce potential reporting biases, in spite that retrospective reports of objective life events have good reliability (Hardt & Rutter, 2004). Third, given that participants' ages ranged from 18 to 81 years, recall bias is a concern and accurate recall may be particularly problematic for older participants. Besides, the findings were based mostly on women and exclusively on parents. Fourth, this is the first study to use reworded SDQ subscale measuring prosocial behaviours. More studies are needed to validate the scale and replicate our findings. Fifth, lifetime trauma focused on the whole lifetime without separating childhood and adulthood. Although the correlation of childhood trauma with lifetime trauma was small. An accurate measure of trauma in childhood and adulthood is required for future research. Finally, longitudinal studies are needed to examine the developmental sensitive period of positive and negative experiences for mental health and determine the effects of duration on developmental outcomes.

6. Conclusions

In conclusion, although research has predominantly focused on childhood trauma and its effects on lifespan health, researchers have called for a better understanding of positive early experiences that can counteract the effects of adversity. This study addresses a gap by exploring the psychometric property of BCEs in a Chinese community sample and the role of PCEs on PTSD and depression and prosocial behaviours. The data illuminate the importance of fostering PCEs to prevent and intervene in mental

health problems. Moreover, findings highlight the need for comprehensive assessments of both PCEs and various types of traumatic experiences.

Disclosure statement

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

Data availability statement

The data that support the findings of this study are available on request from the corresponding author, Fulei Geng. The data are not publicly available due to their containment of information that could compromise the privacy of research participants.

Funding

The present study was funded by National Natural Science Foundation of China (grant numbers: 31700987). The funder had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

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Appendix A

Supply Table 1 the Chinese version of BCEs

根据您的18岁以前的成长经历作答	是	否
1. 您是否至少有一个您觉得安全的看护人?	1	0
2. 您至少有一个好朋友吗?	1	0
3. 您有让您感到安慰的信念/信仰吗?	1	0
4. 您喜欢您的学校吗?	1	0
5. 您有至少一个关心您的老师吗?	1	0
6. 您有好邻居吗?	1	0
7. 除了父母, 亲人及其他监护人, 您有一个能给您提供建议或支持的成年人?	1	0
8. 您有过能玩得尽兴的机会吗?	1	0
9. 您是否喜欢自己并乐于接纳自己?	1	0
10. 您是否有规律的家庭生活方式, 如有规律的饮食和固定的睡觉时间?	1	0