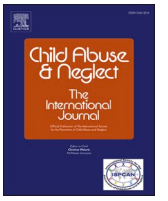
Child Abuse & Neglect 144 (2023) 106346



Contents lists available at ScienceDirect

Child Abuse & Neglect

journal homepage: www.elsevier.com/locate/chiabuneg





A systematic review of positive childhood experiences and adult outcomes: Promotive and protective processes for resilience in the context of childhood adversity

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ARTICLE INFO

Keywords:
Positive childhood experiences
Benevolent childhood experiences
Resilience
Childhood adversity
Adverse childhood experiences
Intergenerational transmission

ABSTRACT

Background: Research on positive childhood experiences (PCEs) as counterparts to childhood adversity has surged in the last five years. A systematic review of the additive and interactive effects of childhood adversity and PCEs across adult outcomes is needed that contextualizes the long-term correlates of childhood experiences within a developmental perspective.
Objective: The current review synthesizes the empirical evidence for PCEs as resilience factors for a range of adult outcomes.
Methods: Articles published until May 2023 were systematically identified according to PRISMA Guidelines through PubMed and PsycINFO databases and references of included articles. Then, 131 records were screened, and 58 studies were included.
Results: Higher levels of PCEs were significantly but modestly associated with lower levels of childhood adversity. Higher levels of PCEs were associated with outcomes reflecting mental health, psychosocial functioning, physical health and health behaviors, and psychosocial stress. Most studies found direct, promotive effects of PCEs for more favorable outcomes. Few studies found significant interaction effects between childhood adversity and PCEs on outcomes, suggesting that PCEs may more frequently directly promote positive outcomes rather than moderate the effects of adversity on outcomes.
Conclusions: Individuals' childhood adversity and PCEs are somewhat independent sets of experiences; many individuals experience both, and the presence of one does not preclude the other. PCEs predict more favorable outcomes independent of childhood adversity more often than they interact with and moderate the effects of adversity on outcomes. Although the literature base is steadily growing, more research on PCEs in diverse and international samples is needed.

1. Introduction

Childhood experiences, both positive and negative, provide the foundation for development across the lifespan (Cicchetti & Toth, 2009; Masten, 2006). Since Felitti and colleagues' (1998) seminal study on adverse childhood experiences (ACEs), more than two decades of research have documented the negative effects of childhood adversity on health and psychosocial outcomes in adulthood and across generations (Folger et al., 2018; Hughes et al., 2017; Kalmakis & Chandler, 2015; Sun et al., 2017). As a result, public health

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https://doi.org/10.1016/j.chiabu.2023.106346
Received 13 March 2023; Received in revised form 6 June 2023; Accepted 7 July 2023
Available online 18 July 2023
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and policy endeavors have largely focused on preventing and mitigating the detrimental effects of childhood adversity [e.g., Centers for Disease Control and Prevention, 2019; Center for the Study of Social Policy, 2020]. In recent years, a growing body of research has also begun to examine the associations of positive childhood experiences (PCEs) with adaptive and maladaptive outcomes in adults (Bethell, Jones, Gombojav, Linkenbach, & Sege, 2019; Morris, Hays-Grudo, Zapata, Treat, & Kerr, 2021; Narayan, Rivera, Bernstein, Harris, & Lieberman, 2018). Over the past five years alone, dozens of studies have now examined the dual effects of childhood adversity and PCEs in predicting adulthood health outcomes. Thus, a systematic review that synthesizes these findings is needed.

1.1. Individual and cumulative PCEs

Children's assets and resources promote competent development and buffer children against the negative consequences of adversity. These assets exist across multiple levels of analysis and are often referred to as the "short list" of resilience factors (Masten, 2001; Wright, Masten, & Narayan, 2012). For example, extensive research has emphasized the role of stable and supportive home environments, including positive family relationships (e.g., healthy parent-child attachment, positive parenting practices) and predictable routines; positive relationships at school, including favorable relationships with peers, teachers, and other mentors; and positive experiences in the community (e.g., good relationships with neighbors), in addition to positive internal assets (positive core beliefs and self-esteem). These positive relationships and experiences rarely occur in isolation and instead, tend to accumulate across multiple levels of ecology with cumulative benefits on positive adjustment and adaptation (Evans, Li, & Whipple, 2013; Masten, Lucke, Nelson, & Stallworthy, 2021; Narayan, Lieberman, & Masten, 2021). Accordingly, many investigators have drawn on concepts from the "short list" of resilience factors to develop instruments that measure cumulative PCEs (Morris et al., 2018; Narayan et al., 2018; Ungar & Liebenberg, 2011). This review aligns with the resilience literature and synthesizes how dimensions and measurement of PCEs associate with more favorable adult outcomes.

1.2. The growth and current state of PCEs research

While early studies on PCEs and adult outcomes began over a decade ago (Chung, Mathew, Elo, Coyne, & Culhane, 2008; Skodol et al., 2007), research on this topic has rapidly grown over the last five years. This movement was largely propelled by the development and validation of the Benevolent Childhood Experiences (BCEs) scale (Narayan et al., 2018), which is used globally, and an influential paper showing the association of PCEs with current psychosocial functioning above and beyond the effects of ACEs in a large state-wide adult sample (Bethell et al., 2019). Higher PCEs, a set of seven items adapted from the 28-item Child and Youth Resilience Measure (CYRM-28; Ungar & Liebenberg, 2011), predicted better adult mental and relational health, even in individuals with four or more ACEs and after controlling for adults' current social support (Bethell et al., 2019).

Like the ACEs scale (Felitti et al., 1998), the BCEs scale assesses the extent to which adults had specific experiences from birth to age 18 (Narayan et al., 2018). Importantly, the BCEs scale is intended to assess adults' retrospective reports of favorable childhood experiences (including resources and relationships), which is an important distinction from other well-validated measures that assess positive experiences for current children via parent-report or child self-reports (e.g., CYRM; Ungar & Liebenberg, 2011). The initial psychometric study of the BCEs scale found that higher levels of BCEs predicted lower levels of PTSD symptoms and fewer stressful life events in pregnant women after accounting for women's ACEs, and began to offset the effects of ACEs on negative outcomes even when ACEs were high (Narayan et al., 2018). Research conducted in the United States and internationally has shown that BCEs predict a variety of adult outcomes (e.g., Almeida, Guarda, & Cunha, 2021; Crandall et al., 2019; Doom, Seok, Narayan, & Fox, 2021; Gunay-Oge et al., 2020b). The Protective and Compensatory Experiences (PACEs) scale (Morris et al., 2018) and the PCEs index with seven items adapted from the CYRM (Bethell et al., 2019) are also retrospective instruments about childhood resources that have advanced PCEs research in adults (e.g., Crandall, Magnusson, Hanson, & Leavitt, 2021; Morris et al., 2021; Yu, Wang, Chen, Zhang, & Bettencourt, 2022).

Examples of adult outcomes linked to earlier PCEs include indicators of mental and physical health (Bethell et al., 2019; Narayan et al., 2018; Slopen, Chen, Guida, Albert, & Williams, 2017), health behaviors such as sleep health and quality (Geng, Zou, Liang, Zhang, Li, & Wang, 2021; Nevarez-Brewster et al., 2022), psychosocial functioning (Crandall et al., 2019; Crandall et al., 2020; Crandall et al., 2021), and perceived stress (Doom et al., 2021; Merrick, Narayan, DePasquale, & Masten, 2019). Accumulating evidence on PCEs indicates that it may be an equally important childhood construct to childhood adversity in predicting long-term health and wellbeing, echoing long-standing findings that both favorable and adverse experiences during childhood have enduring and formative effects (Masten, 2006; Narayan et al., 2021; Wright et al., 2012). This dual emphasis on capturing how negative and positive childhood experiences coexist and operate in the context of one another has encouraged many researchers to consider accounting for both PCEs and ACEs in studies of lifespan health (Narayan et al., 2021).

As evidence for PCEs grows, there is a need to understand the breadth and implications of this research. There has yet to be a systematic examination of the most common correlates of PCEs, both before and after accounting for childhood adversity. Furthermore, greater clarity is needed in regard to resilience processes, including the promotive versus protective functions by which PCEs relate to more adaptive outcomes, particularly within the context of childhood adversity. While some researchers have conceptualized PCEs as a promotive factor that directly predicts better outcomes independent of the effects of adversity (Bethell et al., 2019; Narayan et al., 2018), others have provided preliminary evidence for protective effects of PCEs such that the influence of childhood adversity on outcomes is weakened in the context of higher PCEs (Morris et al., 2021). Therefore, this review provides a synthesis of extant research on PCEs and adult outcomes and identifies how PCEs may operate in the context of childhood adversity.

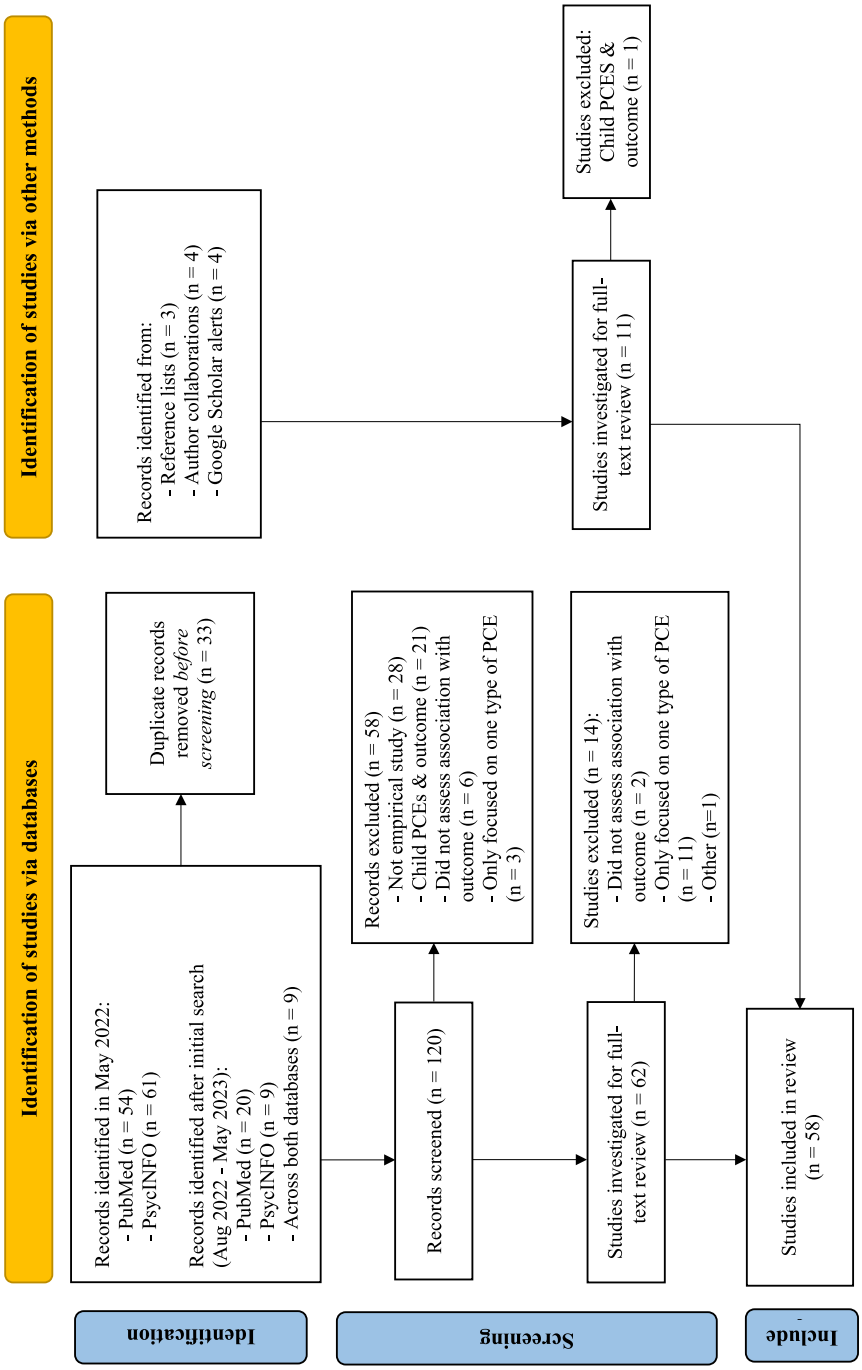


Fig. 1. PRISMA flow diagram.

1.3. Theoretical frameworks

This review draws upon the developmental psychopathology (DP) perspective, a multidisciplinary framework for understanding normative and non-normative development across the lifespan that has informed current understanding of risk and resilience pathways (Cicchetti & Toth, 2009; Masten, 2006; Masten et al., 2021). Central to this review, the developmental and lifespan principles of DP emphasize the enduring impact of both early life and cumulative experiences on subsequent development (Cicchetti & Toth, 2009). While the DP literature often focuses on the detrimental effects of cumulative risk, cumulative resource models often also lead to positive outcomes (Evans et al., 2013; Masten et al., 2021; Narayan, 2015).

The systems principle of DP posits that development is shaped by dynamic interactions among individuals and the many systems in which they are embedded (Masten, 2006; Masten et al., 2021). In line with this multisystem perspective, resilience is often defined as the capacity of a dynamic system, rather than an individual state or trait, to successfully adapt to significant risks or threats to healthy adaptation (Masten et al., 2021). Measurement efforts to identify PCEs, such as the BCEs and PACEs instruments, have aligned with DP to include multisystem positive childhood experiences (e.g., those within the family, as well as with peers, teachers, neighbors, and the broader community; Morris et al., 2018; Narayan et al., 2018, Narayan, Merrick, Lane, & Larson, 2023). Items on the BCEs and PACEs scales reflect the collective influence of factors that often work in concert with one another within a developing child's ecology to promote competence and resilience (Wright et al., 2012). This review similarly examined composite, multisystem measures of PCEs.

Finally, the DP perspective also emphasizes that resilience processes, such as promotive versus protective factors, underlie children's positive adaptation in contexts of heightened threat (Masten, 2006; Narayan et al., 2021). Promotive factors are directly associated with more favorable outcomes (e.g., lower depressive symptoms, higher life satisfaction) regardless of risk levels and are believed to be assets or strengths that would universally help most children thrive (Masten et al., 2021; Narayan, 2015; Wright et al., 2012). In contrast, protective factors operate by directly reducing or buffering against the negative effects of adversity and are therefore particularly beneficial within high-risk contexts. Statistically, promotive factors are most clearly evident by direct, main effects while protective factors are commonly measured via interaction effects whereby a positive factor moderates the effects of a risk factor for better outcomes (Masten et al., 2021; Narayan, 2015). Some factors, such as warm and supportive parenting, may be promotive factors for most children regardless of risk, but may become protective factors and buffer children against negative outcomes in adverse contexts (Masten, 2001; Narayan, 2015; Narayan et al., 2021). This review distinguished between promotive and protective effects of PCEs to inform how PCEs operate in various ways for better adult outcomes.

1.4. The current review

The purpose of this review was to systematically review and synthesize associations between PCEs and adult outcomes. The first aim was to identify the different types of adult outcomes (e.g., mental health, physical health, other psychosocial outcomes) that have been studied with PCEs. The second aim was to examine the extent to which PCEs and childhood adversity are independent experiences by examining their associations with one another. Based on previous research showing only modest associations between BCEs and ACEs (e.g., Merrick et al., 2019; Narayan et al., 2018), we hypothesized that PCEs would only be modestly associated with childhood adversity across studies, reflecting partial independence. The third aim was to understand the processes by which PCEs were associated with adult outcomes in the context of childhood adversity, by examining whether PCEs showed main (promotive) effects on outcomes versus interactive (protective) effects with adversity for outcomes. We hypothesized that there would be evidence for both promotive and protective effects of PCEs.

2. Method

2.1. Search strategy

The protocol for this review was pre-registered with PROSPERO and is available at: https://www.crd.york.ac.uk/prospero/display_record.php?ID=CRD42022332591. This review was conducted in accordance with the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines (Page et al., 2021; See Fig. 1). The first search was conducted in May 2022 on PubMed and PsycINFO databases using the following keywords: "positive childhood experiences" OR "benevolent childhood experiences" OR "counter-ACEs" OR "advantageous childhood experiences" OR "protective and compensatory experiences." These search terms were based on terminology in papers known to the authors and terms identified through citations from those papers. In August 2022, reference lists of included papers were scanned, resulting in three additional studies, and a second search using the same keywords was conducted to identify any recently published studies. In December 2022, four studies were identified from Google Scholar alerts and three studies were identified via author collaborations. During the revision stage of this paper (May 2023), one final database search was conducted and one paper was identified via author collaborations, resulting in 12 additional included studies.

2.2. Eligibility criteria

Included studies were: 1) peer-reviewed articles and dissertations that reported findings from 2) empirical studies with humans, 3) written in English, and 4) those that measured and examined the influence of PCEs (two or more experiences) during childhood (0–18 years) on at least one outcome in adulthood (18+ years). Studies were excluded if they: 1) did not analyze data (e.g., chapters, review papers), 2) only focused on one type of positive childhood experience (e.g. secure attachment, solely measuring dyadic relationships

with caregivers), 3) assessed concurrent positive experiences in children or offspring, rather than in adults, with no assessment of adult outcomes, or 4) examined the concurrent influence of PCEs on outcomes in childhood.

2.3. Review strategy

All studies were imported into Covidence systematic review software (2022) for screening and data extraction. After removing duplicates, two independent reviewers screened the abstracts of 131 records and reviewed the full text of the 73 studies that remained after the screening phase. Inter-rater reliability was 94.7 % and 94.5 % for abstracts and full-text review, respectively, and disagreements were resolved through reviewer discussion. One of the senior authors also reviewed 23.3 % ($n = 17$) of the articles included after the full-text review for quality check. During the abstract screening stage ($n = 131$), the main reason for exclusion was that the record was not an empirical study ($n = 28$). Additionally, 21 studies were excluded because they examined associations between concurrent PCEs and child outcomes, six studies did not assess associations between PCEs and any outcomes (e.g., they only measured prevalence of PCEs), and three studies focused only on one type of PCE. During the full-text stage ($n = 73$), one study was excluded because they examined associations between concurrent PCEs and child outcomes, two studies did not assess associations between PCEs and any outcomes, 11 studies focused only on one type of PCE, and one study included PCEs in a composite score so PCEs could not be isolated from other variables. The remaining 58 studies (53 peer-reviewed publications and 5 dissertations) were included in the final review. One dissertation (Abbott, 2021) included three separate studies, but we count this as one study and report findings from these studies together. The reviewers who screened studies extracted all relevant information from included studies, and disagreements were resolved through discussion with input from senior authors as needed.

3. Results

Results from the 58 studies include study and sample characteristics, measures of PCEs and childhood adversity, type of outcome, correlations between PCEs and childhood adversity measures, and associations between PCEs and outcomes, including information on main and/or interaction effects of PCEs with childhood adversity for outcomes.

3.1. Descriptive information

3.1.1. Study characteristics

While the earliest study dated back to 2004, the majority of studies ($n = 54$) were published or became available between 2017 and 2023, highlighting recent growth in research on PCEs and adult outcomes. More than half of the studies were conducted in the United States only ($n = 34$), 22 studies were conducted in other countries, most commonly in China ($n = 10$) and Turkey ($n = 3$), and two studies used samples from a large, multi-national study (i.e., United States, United Kingdom, Canada, and Australia). Almost all studies were classified as cross-sectional (i.e., assessed retrospective PCEs and contemporaneous outcomes at the same timepoint). Only three longitudinal studies measured PCEs prospectively during childhood and outcomes during adulthood.

3.1.2. Sample characteristics

Sample sizes of included studies ranged from $n = 43$ to 9468 participants ($M = 1467$; $SD = 2390$). Participant characteristics across studies included college or university students ($n = 11$), community samples of parents or other primary caregivers ($n = 9$), and community samples of pregnant people ($n = 4$). There were also studies specific to low-income pregnant people ($n = 4$), homeless parents ($n = 2$), low-income adults ($n = 2$), and psychiatric patients ($n = 2$). Almost all study samples were restricted to individuals 18 years and older except two studies that included pregnant individuals as young as 14 to 16 years (Anderson, 2021; Chung et al., 2008) and another study that included college or university students as young as 17 years (Hou et al., 2022). Three studies also examined parent-reported outcomes of children in the next generation (Johnson, Browne, Meade, Prime, & Wade, 2022; Reese et al., 2022; Zhu, Zhang, & Anme, 2023).

3.1.3. PCEs measures

Most studies ($n = 39$; 67.2 %) measured PCEs via the BCEs scale (Original and Revised versions, Narayan et al., 2018, Narayan, Merrick, et al., 2023), whereas 19 studies used other measures of PCEs. Nine of these studies used other established questionnaires, including the PACEs scale (Morris et al., 2018; $n = 3$), the safety and competence domains from the Traumatic Antecedents Questionnaire (TAQ; Van der Kolk, Spinazzola, & Hopper, 1995; $n = 2$), Resilience Questionnaire (Rains & McClinn, 2013; $n = 1$), Positive Childhood Experiences scale (Dogan & Aydin, 2020; $n = 1$), Childhood Experiences Questionnaire-Revised (CEQ-R; Zanarini, Gunderson, Marino, Schwartz, & Frankenburg, 1989; $n = 1$), and the Childhood Caregiving Environment Scale (Abbott & Slack, 2021; $n = 1$). After Bethell et al. (2019) published a set of seven items adapted from the CYRM (Ungar & Liebenberg, 2011), seven additional studies used either the entirety or parts of this set of seven items, including five studies that combined items from this index with BCEs or self-constructed items. Five studies constructed their own measures of PCEs based on their survey items.

3.1.4. Childhood adversity measures

Most studies ($n = 50$; 86.2 %) measured childhood adversity in addition to PCEs. Thirty-five studies used a version of the ACEs scale (Felitti et al., 1998; Schmidt, Narayan, Atzl, Rivera, & Lieberman, 2020). Nine studies used other questionnaires, including the Childhood Trauma Questionnaire (Bernstein et al., 2003; $n = 6$), the TAQ ($n = 2$), and the CEQ-R ($n = 1$). Six studies constructed their

Table 1
Main effects of positive childhood experiences (PCEs) for MENTAL HEALTH PROBLEMS, with and without childhood adversity (CA).

Study	Sample	PCEs measure	CA measure	Outcome(s)	Findings	Direction
				Mental health problems		
Abbott (2021)	618 parents	CCES	Self-constructed	Depressive symptoms	Higher PCEs predicted lower depressive symptoms, even after accounting for CA.	+
Bethell et al. (2019)	6188 adults	Self-constructed, adapted from CYRM	ACEs	Depressive disorder/poor mental health	After controlling for CA, the adjusted odds of depression/poor mental health were 72 % lower for adults with highest (6–7) vs. lowest (0–2) PCEs scores and 50 % lower for those reporting intermediate (3–5) PCEs scores.	+
Cárdenas et al. (2022)	208 pregnant people	BCEs	CTQ-Short Form*	Prenatal and postpartum depressive symptoms	Higher PCEs were associated with lower depressive symptoms across pregnancy and lower postpartum depression.	+
Chung et al. (2008)	1476 low-income pregnant people	Self-constructed	Self-constructed	Prenatal depressive symptoms	Higher PCEs were associated with lower rates of depressive symptoms before, but not after, accounting for CA.	+/Null
Clark et al. (2023)	292 pregnant people	BCEs	ACEs	General and specific forms of psychopathology	Higher PCEs were linked to latent factors of general psychopathology, thought problems, detachment, and disinhibited externalizing behaviors during pregnancy, even after accounting for CA. Higher PCEs were linked to latent factors of internalizing symptoms and antagonistic externalizing behaviors before, but not after, accounting for CA.	Mixed
Crandall et al. (2019)	246 adults	BCEs	ACEs	Depressive symptoms	Higher PCEs predicted lower depressive symptoms, even after accounting for CA.	+
Crandall et al. (2020)	489 adults	Self-constructed, adapted from BCEs	Self-constructed, adapted from ACEs	Depressive and anxiety symptoms	Higher PCEs predicted lower depressive symptoms, even after accounting for CA, but not anxiety symptoms.	Mixed
Crandall et al. (2021)	206 low-income adults	BCEs + Bethell et al. (2019) index	ACEs	Emotional/cognitive health problems (e.g., depression), suicidal ideation and attempt	Higher PCEs were associated with less suicidal ideation and/or attempts, and less emotional/cognitive health problems (including mild to severe depression ratings), accounting for CA.	+
Doom et al. (2021)	502 university students	BCEs	ACEs	Depressive and anxiety symptoms	Higher PCEs were associated with lower depressive symptoms, but not anxiety symptoms, accounting for CA.	Mixed
Geng, Zou, et al. (2021)	7245 adults	Chinese BCEs	Chinese CTQ	Depressive and PTSD symptoms	Higher PCEs predicted lower PTSD and depressive symptoms, accounting for CA.	+
Geng, Li, et al. (2021)	7218 adults	Chinese BCEs	Chinese CTQ	PTSD symptoms	Higher PCEs predicted lower risk of PTSD among trauma exposed individuals, accounting for CA.	+
Gunay Oge et al. (2020a)	175 adults	Turkish BCEs	None	Psychiatric symptoms	PCEs were negatively correlated with severity of psychiatric symptoms.	+
Gunay-Oge et al. (2020b)	259 adults	BCEs	Turkish ACEs	Personality disorder symptoms	Higher PCEs were associated with lower symptoms for 11 out of 14 personality disorders, accounting for CA.	+
Hanson et al. (2022)	555 college students	BCEs	ACEs	Depressive and anxiety symptoms	Higher PCEs indirectly predicted lower depressive and anxiety symptoms through greater executive functioning, emotion regulation, and thriving, accounting for CA.	+
Karatzias et al. (2020)	275 trauma-exposed adults	BCEs	ACEs	PTSD and complex PTSD symptoms	Higher PCEs predicted lower complex PTSD symptoms, even after accounting for CA, but did not predict general PTSD symptoms.	Mixed
Kuhar & Kocjan (2021)	4847 adults	Resilience Questionnaire	Self-constructed	Depression and anxiety disorders, suicide attempts, self-rated general mental health	Higher PCEs predicted greater self-rated mental health, lower risk of depression and anxiety disorders, and less suicide attempts, even after accounting for CA.	+
Merrick et al. (2020)	101 low-income pregnant people	BCEs	ACEs	Prenatal depressive and PTSD symptoms	PCEs at any time period of childhood (early childhood, middle childhood, adolescence) did not predict prenatal depressive or PTSD symptoms.	Null
Miller et al. (2020)	246 adults	BCEs	ACEs	Depressive symptoms	Higher PCEs were associated with lower depressive symptoms, accounting for CA.	+
Narayan et al. (2018)	101 low-income pregnant people	BCEs	ACEs	Prenatal depressive and PTSD symptoms	Higher PCEs predicted lower depressive symptoms before, but not after, accounting for CA. Higher PCEs predicted less PTSD symptoms, even after accounting for CA.	Mixed

(*continued on next page*)

Table 1 (*continued*)

Study	Sample	PCEs measure	CA measure	Outcome(s)	Findings	Direction
Narayan, Frederick, et al. (2023)	Sample 1: 548 adults; Sample 2: 1198 adults	BCEs	ACEs	Depressive and anxiety symptoms, suicidal thoughts and behaviors	Higher PCEs predicted lower depressive and anxiety symptoms and suicidal thoughts and behaviors across both samples, accounting for CA.	+
Narayan, Merrick, et al., 2023	1746 adults	BCEs (Original & Revised)	ACEs	Depressive, anxiety, and PTSD symptoms	Higher PCEs (using both measures) predicted lower levels of depressive, anxiety, and PTSD symptoms, accounting for CA.	+
Novilla et al. (2022)	206 low-income adults	BCEs + Bethell et al. (2019) index	ACEs	Depression (symptoms above cut-off)	Higher PCEs were indirectly associated with lower risk of depression through less shame.	+
Rodriguez et al. (2021)	214 university students	BCEs	Self-constructed, adapted from ACEs	Global mental health symptoms, including depressive and anxiety subscales	Higher PCEs were associated with lower global mental health symptoms, including depressive and anxiety symptoms, accounting for CA.	+
Rollins & Crandall (2021)	489 adults	Self-constructed	Self-constructed	Depressive and anxiety symptoms	Higher PCEs indirectly predicted lower depressive and anxiety symptoms through less shame and greater self-regulation, respectively, accounting for CA.	+
Saleptsi et al. (2004)	192 psychiatric patients and 63 non-psychiatric controls	TAQ	TAQ*	Psychiatric disorders	Psychiatric patients reported lower PCEs scores compared to controls.	+
Skodol et al. (2007)	520 patients with personality disorders	CEQ-R	CEQ-R	Remission of personality disorder	Higher PCEs predicted greater remission from avoidant and schizotypal personality disorders.	+
Slopen et al. (2017)	1255 adults	Self-constructed	None	Major depressive disorder (symptoms above cut-off)	Higher PCEs were associated with less risk of major depressive disorder.	+
Tang et al. (2023)	1816 university students	Chinese BCEs	ACEs*	Depression (symptoms above cut-off), suicidal ideation	Four classes were identified based on BCEs items: 1) Relationship support, 2) low BCEs, 3) high BCEs, and 4) high quality of life. The high BCEs, relationship support, and quality of life groups reported lower odds of depression than the low BCEs class, accounting for CA. The high BCEs and quality of life group reported also less suicidal ideation than the low BCEs class, accounting for CA.	+
Vogeler et al. (2020)	192 partners of sex addicts	BCEs	ACEs	PTSD symptoms and posttraumatic stress related to partner's sexually addictive behaviors	PCEs did not significantly predict PTSD symptoms or posttraumatic stress related to partner's sexually addictive behaviors.	Null
Xu et al. (2022)	332 university students	Chinese BCEs	ACEs	Depressive and anxiety symptoms	Higher PCEs were associated with lower depressive and anxiety symptoms, accounting for CA.	+
Zhan et al. (2021)	6929 adults	Chinese BCEs	Chinese CTQ	Depressive and PTSD symptoms	Higher PCEs predicted lower PTSD and depressive symptoms, accounting for CA.	+
Zhang et al. (2021)	1821 university students	BCEs	None	Depressive symptoms	Higher PCEs indirectly predicted lower depressive symptoms through less uncertainty stress.	+

Notes. ACEs = Adverse Childhood Experiences scale. BCEs = Benevolent Childhood Experiences scale. CCES = Childhood Caregiving Environment Scale. CEQ-R = Childhood Experiences Questionnaire-Revised. CTQ = Child Trauma Questionnaire. CYRM = Child & Youth Resilience Measure. PTSD = Posttraumatic stress disorder. TAQ = Traumatic Antecedents Questionnaire. *Indicates childhood adversity was measured but not accounted for in the same model as PCEs. (+) = More favorable outcomes. (+/Null) = Significant favorable outcome before, but not after, accounting for childhood adversity. Null = No significant associations. Mixed = A mix of favorable and null outcomes.

own measures of childhood adversity based on their survey items.

3.1.5. Outcomes

Mental health problems were the most common outcome ($n = 34$; Table 1), followed by psychosocial functioning ($n = 28$; Supplemental Table A) and psychosocial stress ($n = 12$; Supplemental Table A), and physical health outcomes and behaviors ($n = 16$; >Supplemental Table B). Studies measured an array of mental health outcomes, including depression or depressive symptoms ($n = 26$), anxiety or anxiety symptoms ($n = 10$), posttraumatic stress disorder (PTSD) symptoms ($n = 9$), suicidal ideation or attempts ($n = 5$), and other psychiatric symptoms or disorders ($n = 6$). Physical health and health behaviors included substance use ($n = 11$), physical activity ($n = 4$), sleep ($n = 3$), risky sexual behaviors ($n = 3$), consumption of fruits and vegetables ($n = 2$), and the presence of chronic health conditions ($n = 2$). Other physical health indicators included body mass index (BMI), obesity, and cardiovascular health.

For this review, "psychosocial functioning" refers to non-clinical psychological factors (e.g., self-esteem, gratitude) and external resources (e.g., social support, family health) that influence individuals' well-being and ability to function within their social environments. The psychosocial functioning domain included family-related outcomes ($n = 5$), social support ($n = 3$), life satisfaction or meaning ($n = 3$), and shame ($n = 3$), as well as other well-being indicators that only occurred once, such as self-esteem, loneliness, and gratitude, among others. "Psychosocial stress" refers to experiences of mental or emotional distress that may stem from either internal perceptions (e.g., perceived stress) or environmental factors (e.g., job loss). Psychosocial stress was most commonly measured via general perceived or psychological distress ($n = 9$). In addition, three studies measured "uncertainty stress," which is stress caused by being unsure about someone or something (future or current). One study measured stress specific to parenting.

Three additional outcome domains were identified during the review process because they appeared in multiple studies: parenting-related outcomes ($n = 8$), stressful life events ($n = 6$), and executive functioning skills ($n = 4$; Supplemental Table C). The life events domain included traumatic events, prenatal stressful events, intimate partner violence, and adverse family experiences. Parenting-related outcomes included self-reported parental reflective functioning, beliefs and attitudes about parenting, aggression and neglect toward the child, confidence and self-efficacy, role satisfaction, disintegrative responses (emotional arousal), and parenting quality. One dissertation study also examined parenting behaviors through observational measures of parent-child interactions (Huffer, 2018). Finally, Hawk (2022) examined grade point average as an outcome, which did not fit into any other categories.

3.2. Correlations between PCEs and childhood adversity

Of the 50 studies that measured childhood adversity in addition to PCEs, 26 studies examined correlations between total PCEs and cumulative childhood adversity measures. All correlation coefficients were statistically significant in the negative direction and small to moderate in strength, ranging from $r = -0.26$ to $r = -0.62$.

3.3. Main effects of PCEs only (promotive effects)

Fifteen studies investigated main effects of PCEs with adult outcomes, without including measures of childhood adversity in the same model. Findings from these studies are reported below by outcome domain and reflect statistically significant results after accounting for all covariates. Results regarding mental health outcomes are reported in Table 1 and results regarding all other outcomes are reported in Supplemental Tables A-C. In these studies, higher PCEs predicted better mental health, reflected primarily by lower depressive symptoms (Zhang et al., 2021), including during pregnancy and the postpartum period (Cárdenas, Kujawa, & Humphreys, 2022), as well as lower odds of major depressive disorder (Slopen et al., 2017). Higher PCEs were also associated with lower odds of being diagnosed with personality disorders (Saleptsi et al., 2004) and lower severity of psychiatric symptoms (Gunay Oge et al., 2020a). In terms of physical health and health behaviors, higher levels of PCEs predicted better cardiovascular health (Slopen et al., 2017) and more physical exercise (Kosterman et al., 2011). Graupensperger, Kilmer, Olson, and Linkenbach (2022) found that higher levels of PCEs predicted less cigarette use and higher likelihood of any drinking in the past month. However, among those who consumed alcohol, higher levels of PCEs predicted lower quantities of alcohol use and less risky drinking patterns. Higher levels of PCEs predicted more positive psychosocial functioning, including higher self-esteem and psychological resilience (Kocatürk & Çiçek, 2021), prosocial behaviors (Kosterman et al., 2011), social support and education (Slopen et al., 2017), and flourishing (Woodward et al., 2023). However, higher PCEs predicted higher narcissism (Starbird & Story, 2020) and PCEs were not associated with family-level adaptation to the COVID-19 pandemic (Prime, Wade, & Browne, 2022). While higher levels of PCEs were associated with lower general perceived stress (Marshall, 2020; Merrick et al., 2019) and lower uncertainty stress (Pei et al., 2022; Zhang et al., 2021), PCEs did not predict parenting stress (Merrick et al., 2019). For parenting outcomes, Abbott (2021) found that higher PCEs predicted more positive self-reported parenting behaviors (i.e., lower psychological and physical aggression, lower neglect toward child), but not parenting attitudes (i.e., spanking and affection beliefs, parenting confidence).

3.4. Main effects of PCEs after controlling for childhood adversity (promotive effects)

A total of 42 studies examined whether PCEs predicted adult outcomes after controlling for childhood adversity. Findings from these studies are reported below by outcome domain and reflect statistically significant results after accounting for all covariates, including childhood adversity. Results regarding mental health outcomes are reported in Table 1 and results regarding all other outcomes are reported in Supplemental Tables A-C.

3.4.1. Mental health outcomes

Most studies ($n = 24$) reported that higher PCEs predicted better mental health outcomes even after controlling for childhood adversity. Higher PCEs most commonly predicted lower depressive ($n = 15$), anxiety ($n = 6$), and PTSD ($n = 5$) symptoms, and lower odds of depressive or anxiety disorders (Kuhar & Kocjan, 2021). Bethell et al. (2019) also found that higher PCEs predicted lower odds of depression/poor mental health. Other mental health outcomes included lower suicidal ideation and attempts (Crandall et al., 2021; Kuhar & Kocjan, 2021; Tang et al., 2023; Narayan, Frederick, Merrick, Sayyah, & Larson, 2023), lower symptoms of and higher remission from personality disorders (Gunay-Oge et al., 2020b; Skodol et al., 2007), lower disturbances from complex PTSD symptoms (Karatzias et al., 2020), lower severity of global mental health symptoms (Rodriguez, McDonald, & Brown, 2021), and higher self-ratings of mental health (Kuhar & Kocjan, 2021). Higher PCEs were also linked to lower prenatal psychopathology, including lower thought problems, detachment, and disinhibited externalizing behaviors (Clark, Hankin, Narayan, & Davis, 2023).

Not all studies on mental health outcomes reported that higher PCEs predicted mental health outcomes after controlling for childhood adversity. Merrick, Narayan, Atzl, Harris, and Lieberman (2020) found that higher levels of PCEs did not predict prenatal depressive symptoms before or after accounting for childhood adversity. Furthermore, two studies found that higher PCEs significantly predicted lower prenatal depressive symptoms, but this relation became null after controlling for childhood adversity (Chung et al., 2008; Narayan et al., 2018). Multiple studies found that higher PCEs did not predict anxiety symptoms (Crandall et al., 2020; Doom et al., 2021) or PTSD symptoms (Karatzias et al., 2020; Merrick et al., 2020; Vogeler et al., 2020) when accounting for childhood adversity. Clark et al. (2023) found that higher PCEs were linked to internalizing symptoms and antagonistic externalizing behaviors before, but not after, accounting for childhood adversity.

3.4.2. Physical health outcomes and behaviors

Findings were mixed regarding whether higher PCEs predicted physical health indicators and health-related behaviors when accounting for childhood adversity. Higher PCEs predicted fewer sleep problems (Crandall et al., 2019; Geng, Zou, et al., 2021) and better sleep quality during pregnancy (Nevarez-Brewster et al., 2022). Higher PCEs also predicted less risky sexual behaviors (e.g., having sex with someone you do not know or trust; Crandall et al., 2020) and reproductive planning (i.e., teenage, unwanted, or currently unplanned pregnancy; Merrick et al., 2020), but did not predict timing of sexual initiation (Xu et al., 2022). Higher PCEs predicted lower substance use in some studies (Crandall et al., 2020; Novilla, Broadbent, Leavitt, & Crandall, 2022), but not in others (Anderson, 2021; Crandall et al., 2019; Crandall et al., 2021; Kuhar & Kocjan, 2021; Miller, Cheung, Novilla, & Crandall, 2020; Rollins & Crandall, 2021; Xu et al., 2022). Findings were also mixed on whether PCEs predicted fruit and vegetable consumption (Crandall et al., 2019; Crandall et al., 2021) or physical activity (Crandall et al., 2019; Crandall et al., 2021; Kuhar & Kocjan, 2021). PCEs did not predict BMI or multimorbidity (Crandall et al., 2019; Xu et al., 2022).

3.4.3. Psychosocial functioning and stress

Higher PCEs consistently predicted more positive psychosocial functioning and lower psychosocial stress, even after accounting for childhood adversity. Specifically, higher PCEs significantly predicted less loneliness (Doom et al., 2021; Xu et al., 2022); less shame (Novilla et al., 2022; Rollins & Crandall, 2021); lower affective lability (Almeida, Fernandes, & Cunha, 2023); less aggressive behavior (Narayan, Frederick, et al., 2023); more positive body image (Crandall et al., 2020); higher locus of control, forgiveness, gratitude, and familial closeness (Crandall et al., 2019); greater family health (Daines, Hansen, Novilla, & Crandall, 2021; Reese et al., 2022); higher social support (Bethell et al., 2019; Daines et al., 2021); higher thriving (Hanson et al., 2022) and flourishing (Yu et al., 2022); better self-regulation (Hanson et al., 2022; Rollins & Crandall, 2021); greater wellbeing and mental toughness (Shaw, Hansen, & St Clair-Thompson, 2022); greater life satisfaction and meaning (Xu et al., 2022); more prosocial behaviors (Zhan, Xie, Zou, Wang, & Geng, 2021); more elaborate positive memories with childhood caregivers (Narayan, Atzl, Merrick, Harris, & Lieberman, 2020); more secure and less ambivalent attachment styles (Anderson, 2021); and higher self-compassion (Chasson, & Taubman–Ben-Ari, O., 2022). Zhu et al. (2023) also found that higher parental PCEs predicted lower difficulties and prosocial problems in their children. Higher PCEs predicted less perceived stress, even after accounting for childhood adversity (Crandall et al., 2019; Doom et al., 2021; Miller et al., 2020; Novilla et al., 2022). While Narayan et al. (2018) found that higher PCEs predicted less perceived stress during pregnancy, this relation became null after controlling for adversity.

3.4.4. Other outcomes

Although higher PCEs predicted higher executive functioning in adults after controlling for childhood adversity (Crandall et al., 2019; Hanson et al., 2022; Miller et al., 2020), findings were mixed for the life events and parenting-related domains. Higher PCEs predicted lower stressful life events during pregnancy (Merrick et al., 2020; Narayan et al., 2018) and higher parental PCEs predicted lower adverse family experiences for their children (Reese et al., 2022). However, Almeida et al. (2021) found that while higher PCEs predicted less adulthood adversity and victimization, this relationship became null after controlling for childhood adversity. Further, PCEs did not predict total number of lifetime traumatic life events (Karatzias et al., 2020) or incidents of intimate partner violence (Anderson, 2021). For parenting, higher PCEs significantly predicted higher positive parental reflective functioning (Anderson, 2021; Håkansson, Watten, Söderström, Skårderud, & Øie, 2018), greater self-efficacy and role satisfaction (Chasson, & Taubman–Ben-Ari, O., 2022), more nurturing parenting attitudes (Morris et al., 2021), and increased mind-minded commenting during parent-child interactions, which reflects parents' attunement to their infant (Huffer, 2018). However, PCEs did not predict less harsh parenting attitudes (Morris et al., 2021) or observed synchrony and intrusiveness during parent-child interactions (Huffer, 2018).

3.5. Interactive effects of PCEs (protective effects)

Ten studies directly tested statistical interactions between childhood adversity and PCEs (See Supplemental Table D). None of these studies reported evidence for a classic protective effect whereby higher PCEs attenuated the association between childhood adversity and negative outcomes. Four studies reported a significant interaction whereby in individuals with high PCEs, the association between adversity and negative outcomes was stronger than for individuals with moderate or low PCEs (Narayan, Merrick, et al., 2023; Rodriguez et al., 2021; Yu et al., 2022; Zhan et al., 2021). The remaining studies reported non-significant interactions between PCEs and childhood adversity for depressive and anxiety symptoms, loneliness, perceived stress (Doom et al., 2021); prenatal sleep quality (Nevarez-Brewster et al., 2022); nurturing or harsh parenting attitudes toward the child (Morris et al., 2021); affective lability (Almeida et al., 2023); and grade point average (Hawk, 2022). Finally, one study examined whether childhood adversity moderated the positive effects of PCEs on insomnia severity and reported that higher levels of childhood adversity weakened the benefits of PCEs (Geng, Zou, et al., 2021).

Thirteen studies used other analytic methods to examine potential protective effects rather than testing a statistical interaction between childhood adversity and PCEs in regression models (see Supplemental Table E). Using subgroup analyses, five studies examined the association between childhood adversity and outcomes in the context of high and low PCEs. Two studies provided evidence for a protective effect such that the association between childhood adversity and negative outcomes was weaker in the context of higher PCEs (Morris et al., 2021; Novilla et al., 2022). The other three studies found the opposite result such that childhood adversity more strongly predicted worse outcomes in the context of higher PCEs (Crandall et al., 2019; Xu et al., 2022; Zhu et al., 2023). Five studies examined the association between PCEs and adult outcomes in the context of high and low levels of childhood adversity (Bethell et al., 2019; Crandall et al., 2019; Kuhar & Kocjan, 2021; Xu et al., 2022; Zhu et al., 2023). Findings were mixed such that PCEs more strongly predicted some favorable outcomes in the context of low adversity (e.g., 0 to 1 ACE) and others in the context of high adversity (e.g., 4 or more ACEs). Finally, six studies compared outcomes across groups or clusters characterized by different levels of PCEs and childhood adversity. Across most studies, groups with high levels of PCEs reported better outcomes than groups with low levels of PCEs, even when they also experienced high levels of childhood adversity (Narayan, Merrick, et al., 2023; Abbott, 2021; Almeida et al., 2021; Hou et al., 2022; Narayan et al., 2018). In contrast, Johnson et al. (2022) found that groups with moderate-to-high levels of childhood adversity reported increased risk of parent, child, and family dysfunction during the COVID-19 pandemic, regardless of their PCEs levels.

4. Discussion

This review found that overall, higher PCEs were associated with better mental health and psychosocial outcomes. However, findings regarding physical health, life events, and parenting were more mixed. While most studies reported promotive effects of PCEs, there was little evidence for classic linear protective effects of PCEs against childhood adversity.

4.1. PCEs and common adult outcomes

The first aim identified the most common adult outcomes associated with PCEs. Higher PCEs consistently predicted more favorable mental health outcomes, reflected primarily by lower depression or depressive symptoms, followed by lower anxiety and PTSD symptoms. While PCEs predicted a range of other mental health and psychosocial outcomes, additional research needs to replicate and clarify these associations given the small number of studies for certain outcomes. Findings were mixed for almost all indicators of physical health and health behaviors, as well as for parenting and life events. However, these outcomes were less frequently studied and further evidence is needed to make more reliable conclusions.

4.2. Independent effects of PCEs and childhood adversity

The second aim was to examine the extent to which PCEs and childhood adversity are independent versus overlapping constructs. Correlational findings indicated that PCEs were significantly inversely associated with childhood adversity, and correlation coefficients were low to moderate in magnitude. These patterns indicate that PCEs and childhood adversity are at least partially distinct sets of experiences rather than opposite ends of a single spectrum of childhood experiences. That is, the presence of childhood adversity does not prevent PCEs from occurring, although they are often somewhat related. Higher levels of adversity may relate to the lower likelihood of PCEs, particularly if the source of adversity and PCEs stem from the same people or sources. Indeed, multiple studies identified groups characterized by both high PCEs and childhood adversity (e.g., Narayan, Merrick, et al., 2023; Hou et al., 2022; Narayan et al., 2018). This distinction is further supported by research that BCEs and ACEs items were better modeled by a two-factor versus one-factor latent model (Zhang et al., 2021). PCEs and childhood adversity are semi-independent constructs that should be considered in tandem in research on lifespan development.

4.3. Promotive versus protective effects of PCEs

The final aim clarified the nature of associations between PCEs and adult outcomes, particularly within the context of childhood adversity. Most studies found promotive effects of PCEs whereby higher PCEs were associated with more favorable outcomes even after accounting for childhood adversity. In contrast, only two studies found evidence for classic protective effects of PCEs (Morris et al.,

2021; Novilla et al., 2022). Unexpectedly, multiple studies showed that the association between adversity and negative outcomes was stronger for individuals with high PCEs compared to low or moderate PCEs (e.g., Narayan, Merrick, et al., 2023; Rodriguez et al., 2021; Yu et al., 2022), even though individuals with high PCEs usually showed better adult outcomes when PCEs were modeled as direct effects.

Findings from person-oriented analyses that examined how distinct subgroups of individuals clustered based on similar levels of PCEs and childhood adversity further clarified these unexpected interaction findings. For instance, while the linear regression in Narayan, Merrick, et al.'s (2023) study showed unexpected interaction results (i.e., the association between childhood adversity and PTSD symptoms was strongest for individuals with the highest levels of PCEs), cluster analyses revealed more nuanced results in the expected direction. For instance, individuals with high BCEs and high childhood maltreatment reported: 1) higher PTSD symptoms than individuals with only moderate BCEs but no maltreatment, but 2) lower PTSD symptoms than individuals with low BCEs and high maltreatment. These findings illustrate that PCEs and childhood adversity do not exist in linear association with one another, and many individuals have distinct combinations of both that uniquely relate to adult outcomes. In sum, PCEs may remain beneficial for those who have experienced childhood adversity and may even begin to offset the negative effects of adversity on development, but there may also be risks that are not completely offset by PCEs (e.g., Johnson et al., 2022). More research should use person-oriented methods to examine the unique interplay between PCEs and childhood adversity.

4.4. Limitations of the current review

There was substantial geographic and demographic diversity across samples. Because of the relatively small number of included studies, however, this review did not analyze subgroups at the level of racial, ethnic, sexual, gender minority, or socioeconomic status differences, which is a much-needed future direction. Give the small number of studies and heterogeneity of outcomes across studies, a meta-analysis was not possible but should be considered in the future.

4.5. Future directions

This review highlights several gaps in the existing PCEs literature and directions for future research. The evidence base for PCEs can be strengthened with the inclusion of more diverse samples. Slightly more than half of all studies were conducted within the U.S. (n = 34, 58.6 %), and only six studies focused on low-income adults, limiting the generalizability of this research. About a quarter of all studies (n = 16; 27.6 %) had majority female samples. Future studies should strive for more balanced samples by including a higher proportion of men and gender-nonconforming individuals. Given that there has been some focus on pregnant samples (n = 8), it would also be helpful to focus on PCEs and adjustment of non-gestational caregivers during the perinatal period, a particularly important developmental transition during which childhood experiences may influence expectant adults' mental health, relationships, prenatal attributions, caregiving expectations (Narayan et al., 2020). Future studies should also examine PCEs as resilience factors across generations, especially in the context of childhood adversity.

Most included studies were cross-sectional and focused on adults' retrospective reports of childhood experiences. Research on retrospective reports suggests these methods are valid but often benefit from corrections to control for potential inflated associations between childhood and adulthood variables if reported by the same informant (Reuben et al., 2016). Accordingly, future PCEs studies might benefit from implementing corrections when examining associations between childhood experiences and adult outcomes (Narayan, Merrick, et al., 2023). When possible, studies should also use prospective, longitudinal study designs that examine how positive experiences documented during childhood associate with outcomes measured in adulthood. Adult outcomes in this review were mostly assessed via self-reports, so future research should incorporate multi-method outcomes (e.g., observed couple or parent-child interactions, laboratory assessment of health or executive functioning). Finally, researchers should use PCEs instruments, such as the PACEs (Morris et al., 2018) and BCEs scales (Original and Revised versions; Narayan, Merrick, et al., 2023) that have strong psychometric properties and were developed and validated as full stand-alone instruments.

Future research should clarify the mechanisms by which PCEs contribute to more positive adjustment, including mediators and moderators of associations. For example, higher PCEs have been shown to predict better mental health in adults via lower shame (Novilla et al., 2022; Rollins & Crandall, 2021). Further, future research should identify which PCEs are particularly salient for certain outcomes, similar to how the childhood adversity literature has documented that maltreatment-specific adversity is particularly harmful for long-term adaptation (Narayan, Merrick, et al., 2023). In addition, the developmental timing and personal salience of specific PCEs would be important to investigate. For example, a child might place higher importance on family relationships but lower importance on friend or teacher relationships across various developmental stages. Finally, currently no experimental evidence exists that increasing cumulative PCEs as defined by these measurement tools improves adult outcomes. Although correlational findings are strong, we cannot make causal claims with this evidence.

4.6. Implications and conclusions

PCEs are an important target for promoting resilience in adults, including those with high levels of childhood adversity. For instance, encouraging adults and parents to reflect on their PCEs may in turn elicit positive childhood memories that could facilitate intergenerational transmission of PCEs to children (Narayan et al., 2020). Studies suggest that parental PCEs may also have intergenerational benefits (Narayan et al., 2020; Reese et al., 2022; Zhu et al., 2023). Thus, in translational and clinical settings, it is important to screen adults for PCEs alongside childhood adversity (Merrick & Narayan, 2020). Screening adults for ACEs illuminates

the extent of their adversity but does not provide insight into the extent of assets or resources that they had (or lacked). Screening adults and parents for PCEs illuminates what favorable experiences or assets were present, and also sheds light on the absence of resources. This practice informs understanding of whether childhood environments were characterized by resources and deprivation. Evidence-based interventions that target one domain of functioning (e.g., parenting) may further benefit from creative ways to help parents recreate their PCEs for children. Furthermore, policymakers could increase policies that promote cumulative resources for children, such as supportive parents, teachers, and communities, and multisystem connectedness.

This review underscores the importance of PCEs in promoting lifespan health and well-being and offsetting the negative effects of childhood adversity on long-term outcomes. Because PCEs and childhood adversity tend to be partially independent experiences, empirical, clinical, public health, and policy efforts that only assess and prevent childhood adversity will be missing half the story if they do not also assess and promote PCEs. Researchers need to extend effects of PCEs on multi-domain outcomes, conduct international PCEs research, clarify mechanisms involving PCEs and risk factors, and examine intergenerational effects of PCEs.

Funding

This work is supported by the National Science Foundation Graduate Research Fellowship awards for Han and Dieujuste, the National Institute of Health (K01HL143159; PI: Doom), and a Professional Research Opportunities for Faculty (PROF) award and Public Good Grant from the University of Denver (Narayan).

Declaration of competing interest

None.

Data availability

No data was used for the research described in the article.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.chiabu.2023.106346.

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