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The Structure of Benevolent Childhood Experiences: A Latent Class Analysis and Association with Mental Health Outcomes and Psychological Factors in a Large Adult UK Sample

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Abstract

The aims of this study were firstly to explore the relationship between Benevolent Childhood Experiences (BCEs) and demographic variables, secondly to investigate the taxonic structure of BCEs without considering the confounding effect of Adverse Childhood Experiences (ACEs), thirdly to explore associations between latent classes of BCEs and a range of mental health and psychological factors and fourthly to examine the linear vs. non-linear relationship between BCEs and mental health outcomes. The sample analyzed here consisted of n = 2058 UK general population participants. Our findings revealed weak effects of gender, age, and education across the BCEs. A Latent Class Analysis (LCA) revealed four classes: High BCEs (42%), Intermediate BCEs with opportunity (35%), Intermediate BCEs (17%), and Low BCEs (4%). These classes were associated with psychological factors and mental health outcomes, with higher BCE clusters exhibiting better psychosocial functioning overall. Analysis of quadratic terms yielded no significant results. Implications for further research in this area are discussed.

Keywords Benevolent childhood experiences · Positive childhood experiences · Childhood adversity · Resilience

Key Findings

 The majority of individuals report a substantial number of benevolent childhood experiences (BCEs), which are linked to better psychological functioning in later life.
 Age and education are weakly but significantly associated with

the number of BCEs, with older individuals and those with higher education reporting more positive experiences. 3. Four distinct classes of BCEs were identified. They suggest

that the relationship between BCEs and mental health outcomes is more complex than a simple high-low linear categorization. There is an apparent gap between intermediate and low BCEs.

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While the impact of Adverse Childhood Experiences (ACEs) on later life has long been recognized (Felitti et al., 1998; Lacey & Minnis, 2020), the concept of Benevolent Childhood Experiences (BCEs) is relatively new. The term was introduced by Narayan et al., (2018) as a way to examine and evaluate positive childhood experiences. BCEs are retrospectively assessed experiences such as "having a safe caregiver" or "having at least one good friend" that are supposed to be protective and promotive of adult wellbeing. Narayan et al.'s (2018) scale of positive experiences, alongside other measures (Bethell et al., 2019; Morris et al., 2018; Shevlin et al., 2023), have systematized the concept and enabled a significant increase in research in the field. A recent systematic review (Han et al., 2023) highlighted that higher levels of BCEs are associated with improved mental health, psychosocial functioning, physical health, health behaviors, and reduced psychosocial stress. Additionally, BCEs appear to have a function as a promotive factor rather than a protective one, meaning their effects *directly* contribute to life outcomes rather than mitigating the negative effects of ACEs (Han et al., 2023).

Specifically, as highlighted in the review by Han et al. (2023), a higher number of BCEs tends to be associated

with lower depression before and after controlling for ACEs. This association also extends to anxiety. In general, after accounting for ACEs, a greater number of BCEs is positively linked to fewer personality disorders, lower suicidal ideation and attempts, fewer symptoms of Complex Post-Traumatic Stress Disorder (CPTSD) symptoms, and overall better mental health. However, regarding anxiety and PTSD, there are slightly conflicting results regarding the robustness of this effect after controlling for ACEs (Han et al., 2023). With regard to broader psychological factors, it was reported that a higher number of BCEs was associated with less loneliness, less shame, less emotional instability, greater locus of control, greater wellbeing, and a more secure and less ambivalent attachment (Han et al., 2023).

Even though there is a growing literature on BCEs, less is known about their taxonic nature (i.e., if they occur in a pattern fashion). All research so far has been conducted to discover latent classes among BCEs and ACEs combined (Almeida et al., 2021; Johnson et al., 2022; Narayan et al., 2018, 2023). The results that emerge are generally consistent. Narayan et al. (2018) conducted a two-step cluster analysis on BCEs and ACEs, where ACEs were divided into childhood maltreatment and household dysfunction. The analysis revealed three clusters as the optimal solution, categorized as follows: 1. High BCEs, Low ACEs; 2. High BCEs, Moderate ACEs; and 3. Low BCEs, High ACEs. Notably, cluster 2 exhibited more family dysfunction, while cluster 3 displayed a higher prevalence of maltreatment. This result may be due to the prior subdivision of ACEs into maltreatment and household dysfunction.

In a subsequent study, Narayan et al. (2023) conducted another two-step cluster analysis, utilizing a revised BCE scale and the ACE child maltreatment cluster. This analysis identified five clusters: Cluster 1 = Very High Maltreatment, Low BCEs-Revised; Cluster 2 = High Maltreatment, Low BCEs-Revised; Cluster 3 = High Maltreatment, High BCEs-Revised; Cluster 4 = No Maltreatment, Moderate BCEs-Revised; and Cluster 5 = No Maltreatment, High BCEs-Revised. It is somewhat intriguing that elevated levels of BCEs can coexist with heightened levels of maltreatment (Cluster 3). However, the authors do not explicitly tackle the issue, apart from recognizing a non-linear association between BCEs and ACEs and observing that Cluster 3 had higher levels of BCEs but also PTSD symptoms in comparison with Cluster 4. Similarly, Almeida et al. (2021) combined BCE and the Childhood Trauma Questionnaire (CTQ) and applied hierarchical cluster analysis. The three-cluster solution included: 1. High BCE, Low maltreatment; 2. Moderate BCE, Moderate maltreatment; and 3. Low BCE, High maltreatment. Finally, Johnson et al. (2022) aggregated BCEs and ACEs and employed a latent class analysis (LCA). Their investigation revealed four classes: 1. Low ACE, High BCE; 2. Moderate ACE, High BCE; 3. Moderate ACE, Low BCE; and 4. High ACE, moderate BCE. The unexpected finding of a higher mean BCE score in group 4 than in group 3 raises some concerns (i.e. ACE and BCE are not always linearly inversely related as expected).

We aimed to contribute to this topic addressing the following research aims. First, we explored how BCEs are associated with basic demographic variables as there are very few studies (Bethell et al., 2019; Redican et al., 2023; Xu et al., 2022) on this regard, and virtually none on a large representative sample of adults. For instance, Redican et al. (2023) found women report slightly higher BCE scores, despite prior studies finding no gender difference (Xu et al., 2022; Zhan et al., 2021), so gender had to be examined more in depth. Previous studies appear also to show no significant variation in ethnicity across BCEs (Narayan et al., 2018; Redican et al., 2023). Education also remains a variable that requires further study. Indeed, existing studies (Xu et al., 2022; Zhan et al., 2021) suggest that a higher number of BCEs is associated with higher education. However, the analyses have always been conducted using omnibus tests $(\chi^2, \text{ F-test})$, so a more in-depth analysis is needed. In a nutshell, there is a lack of research conducted on a large representative sample of the adult population across basic demographic variables. The present study aims to fill this gap in the literature.

Second, we assessed the latent categorical structure of BCEs by identifying their classes. BCEs and ACEs have been shown to be separate dimensions rather than forming a continuous spectrum (Karatzias et al., 2020) and BCEs seems to act mainly as a *promotive* factor (having direct effects on outcome) rather than interacting with ACEs (Han et al., 2023). Interestingly, no single study to date has focused exclusively on assessing the latent categorical structure of BCEs alone. Some discrepancies in the studies by Johnson et al. (2022) and Narayan et al. (2023) have indeed left certain questions unanswered, particularly regarding the coexistence of moderate levels of BCEs with higher levels of ACEs. This suggests a non-intuitive relationship between ACEs and BCEs, and maybe with other mental health outcomes.

Third, we explored the associations between classes and psychological outcomes. Two classes of outcomes were explored, namely *mental health outcomes* and *psychological factors*. Mental health outcomes are variables directly related to psychological disorders and of primary interest to clinicians. Anxiety, depression, suicidality and general health are examples of such variables and they have been systematically studied in relation to BCEs (Han et al., 2023). They were included in our study. Other variables having received less attention in previous literature—i.e. proneness to psychosis—were investigated as well. We included also general psychological factors, more closely related to interpersonal life and psychosocial well-being. They have been largely investigated in BCE studies (Han et al., 2023). The factors we chose to investigate were hopefulness, wellbeing, resilience, loneliness, happiness, selfesteem, and attachment.

Eventually, we explored whether the relationship between BCEs and outcomes could be explained either linearly or nonlinearly. Previous research suggested a potential cutoff in ACEs (Briggs et al., 2021; Lacey & Minnis, 2020), and that may apply to BCEs as well. However, the issue has never been investigated. Importatly, we focused on BCEs without simultaneously addressing the confounding presence of ACEs. We saw a gap in the literature when it comes to exploring benevolent experiences independently of their "malevolent" counterparts. Ultimately—and speculatively a greater emphasis on positive experiences could open new therapeutic possibilities in clinical psychology and beyond.

Method

Sample

The sample analyzed here pertains to Wave 6 of the COVID-19 Psychological Research Consortium (C19PRC), denoted as C19PRC-UKW6 (McBride et al., 2023). In March 2020, the C19 PRC was established to conduct highquality research addressing the impact of COVID-19. The longitudinal study has been conducted by multiple universities in the United Kingdom (University of Sheffield, Ulster University, University of Liverpool, University College London, and Royal Holloway, University of London) and collected data regarding mental health and COVID at 6 time points. The primary objective of the C19PRC survey series was to monitor and assess the long-term psychological, social, and economic impact of the pandemic. Although the initial objectives of the C19PRC were primarily related to the study of COVID-19, the quantity and heterogeneity of the data collected later allowed for a focus on psychological phenomena in a broader sense.

Power calculations were performed to determine the optimal baseline sample size required to produce robust prevalence estimates for common mental disorders, with approximately 2,000 respondents set. Inclusion criteria included adults aged 18 or older residing in the UK or Republic of Ireland. Exclusion criteria included non-English speaking citizens and adults without access to the Internet (McBride et al., 2022).

All survey participants (aged 18 or older) provided informed electronic consent (tick box) before starting the survey. They were informed that: (i) their data would be kept confidential, geolocation would be used with their postcode stem, and they could withdraw at any time; (ii) some survey topics might be sensitive (e.g., self-harm/suicide); (iii) how their data would be stored and analyzed; and (iv) they might be contacted for future survey waves.

Recruitment was carried out through reputable online market research companies, with Qualtrics overseeing the process in the UK. Quota sampling methods were employed to ensure that each country's general adult population sample was representative in terms of age, gender, and household income (in the UK).

The C19PRC Study began in the UK on 23 March 2020, 52 days after the first COVID-19 case was detected in the country and following the announcement of strict lockdown measures by the British Prime Minister. To date, multiple waves have been conducted in the UK, with this study focusing on the sixth wave.

The recruitment and follow-up of participants during a period of social and economic upheaval has been challenging. Attrition has been primarily influenced by baseline socio-demographic characteristics rather than initial experiences of mental health problems. Specifically, women, younger adults, lower-income earners, and individuals with dependent children were more likely to drop out (McBride et al., 2023). In wave 6, adults in all age groups except 18-24 years were more likely to participate, and those living in cities were less likely to participate compared to those living in suburban, town, or rural locations. Respondents born in the UK were more likely to participate than those born elsewhere. Lower levels of paranoia were associated with higher participation. Probable diagnoses of major depression, generalized anxiety disorder, or COVID-19-related PTSD at study entry did not predict attrition at C19PRC-UKW6. A retention rate of 51.8% was achieved at wave 6, considering participants contacted from any previous waves.

The data collection for the C19PRC-UKW6 survey was from August to September 2021, approximately four months after C19PRC-UK Wave 5 and one and a half years after the UK's first COVID-19 lockdown and baseline survey. The data collection for wave 6 occurred in two phases. In Phase 1, Qualtrics re-contacted participants from previous waves, and Phase 2 involved recruiting new respondents to fill gaps in sampling quotas. New respondents were informed about the survey through various channels, and incentives were provided for participation. The cross-sectional sample at C19PRC-UKW6 closely mirrored baseline characteristics and was representative of the UK adult population. The final sample (n = 2058) is comprised of phase 1 individuals (n = 1643) and phase 2 individuals (n=415). For detailed information about Wave 6, refer to McBride and colleagues (2023). For context, the data collection occurred after the lifting of all public health guidance and restrictions in July 2021 and the rates of mental health problems had largely returned to pre-pandemic levels (Pierce et al., 2021).

Measures

All demographic and psychological variables collected in Wave 6 are described in McBride et al. (2023). In this study, we focused on *age*, expressed in years, *gender* (male, female, transgender, other, prefer not to say), *ethnicity* (White British/Irish; White non-British/Irish; Indian; Pakistani; Chinese; Afro-Caribbean; African; Arab; Bangladeshi; Other Asian; Other -specify); *highest level of education* (no qualifications; O-level/GCSE or similar; A-level or similar; diploma; undergraduate degree; postgraduate degree; technical qualification; or Other).

For the purposes of this research ethnicity and education were dichotomized. The Ethnicity variable has been dichotomized as follows: White British/Irish and White non-British/Irish have been categorized as "White", while Indian, Pakistani, Chinese, Afro-Caribbean, African, Arab, Bangladeshi; Other Asian, Other-specify have been categorized as Non-White. We recognize that dichotomizing the data results in the loss of some information about the various ethnicities. However, there was no statistical method available to account for all 11 categories simultaneously (see also footnote 1 about the specific distribution of the ethnicities). Educational attainment was dichotomized from the original 8 categories into two categories: Post-secondary education and No post-secondary education. Participants without post-secondary education included those with no qualifications, O-Level/GCSE or similar, and A-Level or similar. Participants with post-secondary education included those with technical qualifications, undergraduate degrees, diplomas, postgraduate degrees, and other qualifications. See also footnote 2 about the specific distribution of educational attainment.

Alternative categorizations or dichotomizations of both ethnicity and education were not considered feasible, and the White vs. Non-White distinction and Post-secondary vs Non Post-secondary one have been employed in other studies in this regard (McBride et al., 2023; Redican et al., 2023).

Please note that the online questionnaire was designed to require responses for participants to proceed, ensuring there is no missing data. However, this does not account for any discrepancies in how the questionnaires were administered between Phase 1 and Phase 2 (see McBride et al., 2023). Measures included:

Mental Health Outcomes

Patient Health Questionnaire-9 (PHQ-9) (Kroenke et al., 2001)

The frequency and severity of depression symptoms over the preceding two weeks was assessed using the PHQ-9, a nineitem measure with scores ranging from 0 to 27. PHQ-9 has well-documented psychometric properties (Kroenke et al., 2010) and is also valid in the general population (Kocalevent et al., 2013; Martin et al., 2006). The instrument showed excellent reliability in the current sample ($\alpha = 0.94$). Generalized Anxiety Disorder Scale (GAD-7) (Spitzer et al., 2006)

Respondents were queried about the frequency of the experiences of anxiety over the preceding two weeks, with scores ranging from 0 to 21. The GAD-7 has exhibited robust reliability and construct validity, showing strong associations with established anxiety measures, diagnoses of generalized anxiety disorder (GAD), and correlations with depression, self-esteem, life satisfaction, and resilience (Löwe et al., 2008). The instrument showed excellent reliability in the current sample ($\alpha = 0.96$).

Suicidality

Adapted from the 2014 English Adult Psychiatric Morbidity Survey (McManus et al., 2016). Participants were first asked if they were willing to address thoughts and actions related to self-harm and suicide. Respondents indicating 'No' were skipped to subsequent measures. Those answering 'Yes' were presented with a statement to evaluate lifetime suicidal ideation ("There may be times in everyone's life when they become very miserable and depressed and may feel like taking drastic action because of these feelings. Have you ever thought of harming yourself or taking your life, even if you would not really do it?"). Further single-items inquired about lifetime attempted suicide ("Have you ever made an attempt to take your own life?") and lifetime deliberate self-harm ("Have you ever deliberately harmed yourself in any way but not with the intention of taking your own life?"). The measure has been validated and used in a large general adult sample (McManus et al., 2016).

Psychosis Screening Questionnaire (PSQ) (Bebbington & Nayani, 1995)

The PSQ, initially designed to assess the presence or absence of self-reported psychotic symptoms within the past year, was modified for this study. The original scale evaluates lifetime endorsement of symptoms before inquiring about their presence in the past year. We considered only lifetime endorsement. Comprising questions on mania, thought insertion, paranoia, strange experiences, and hallucinations, the PSQ demonstrated high sensitivity and specificity in a mixed sample of psychiatric inpatients, outpatients, and GP surgery attendees (Bebbington & Nayani, 1995). In the current sample, sufficient reliability has been demonstrated with $\alpha = 0.71$ and KR = 0.70.

General Health (Contoyannis et al., 2004)

General health was evaluated using a single-item scale ("Compared to someone your own age, would you say your health has on the whole been...") on a 5-point Likert scale ranging from poor (1) to excellent (5). The measure has been validated and used in a large general adult sample (Contoyannis et al., 2004).

Psychological Factors

Benevolent Childhood Experiences scale (BCE: Narayan et al., 2018)

The BCE scale is a 10-item self-report measure designed to quantify positive experiences during the first 18 years of life. The scale assesses various positive experiences, including internal perceived safety (e.g., "Did you have beliefs that gave you comfort"), external perceived safety (e.g., "Did you have at least one caregiver with whom you felt safe"), security and support (e.g., "Was there an adult who could provide you with support or advice?"), and positive and predictable qualities of life (e.g., "Did you have a predictable home routine, like regular meals and a regular bedtime"). Respondents provide binary scores (Yes = 1, No = 0). The instrument has demonstrated robust internal reliability in previous research (Karatzias et al., 2020), and exhibited even greater reliability in the current sample (Cronbach's alpha $\alpha = 0.81$; Kuder-Richardson KR = 0.80). The measure has been successfully administered in a general sample of young adults (Redican et al., 2023).

Short Warwick-Edinburgh Mental Well-being Scale (SWEMWBS) (Stewart-Brown et al., 2009)

A 7-item scale measured mental well-being through items measuring feelings and attitudes over the preceding two weeks (e.g., "I've been dealing with problems well", "I've been feeling relaxed"), scored on a 5-point Likert scale. Raw scores, converted for comparison (Stewart-Brown et al., 2009), indicate overall well-being. The measure has been shown to be valid and reliable in a large sample of adults (Ng Fat et al., 2017). In the current sample, excellent reliability has been demonstrated with $\alpha = 0.92$.

Hopefulness (Brief-H-Pos Scale) (Fraser et al., 2014)

The Brief-H-Pos Scale, a two item measure ("The future seems to me to be hopeful and I believe that things are changing for the better"; "I feel that it is possible to reach the goals I would like to strive for") assessed hopefulness on a 5-point Likert scale. Higher scores denote greater hopefulness. The scale had good internal consistency, test-re-test reliability and concurrent validity (Fraser et al., 2014). In the current sample, the standardized coefficient alpha (Eisinga, et al., 2013) was good (std $\alpha = 0.86$).

Loneliness Scale (Hughes et al., 2004)

A three-item Loneliness Scale, investigated the frequency of feelings of social connectedness (e.g., "How often do you feel isolated from others?") was measured with of scored on a 3-point scale. The scale has been shown to be valid and reliable in a a large sample of adults (Hughes et al., 2004) and it is among the most used measure of loneliness (Maes et al., 2022). In the current sample, very good reliability has been demonstrated with $\alpha = 0.89$.

Happiness (Office for National Statistics, 2016)

A single-item measured subjective happiness on a scale of 0 to 10 ("Overall, how happy did you feel yesterday, where 0 is 'not at all happy' and 10 is 'completely happy'?). This item can be used as a stand-alone measure of happiness, and is also part of the 4-item The Personal Wellbeing Scale and is highly correlated with other indictors of wellbeing (Benson et al., 2019).

Brief Resilience Scale (BRS) (Smith et al., 2008)

The BRS, a 6-item scale, assessed resilience on a 5-point Likert scale (e.g. "I tend to bounce back quickly after hard times"). The BRS has been shown to possess construct, convergent, and discriminant validity in the general population (Kyriazos et al., 2018; Rodríguez-Rey et al., 2016). In the current sample, very good reliability has been demonstrated with $\alpha = 0.86$.

Single-Item Self-esteem Scale (SISES) (Robins et al., 2001)

Respondents rated self-esteem on a 7-point Likert scale, indicating agreement with a *single* statement ("How true or untrue is the following statement?—I have high self-esteem"). SISES has demonstrated strong convergent validity when compared to other assessments of self-esteem (Robins et al., 2001).

Attachment (Emotions in Close Relationships – 12; ECR 12) (Lafontaine et al., 2015)

The ECR is a questionnaire investigating attitudes towards attachment through a Likert scale. In this study,

the "global" version of the items was employed, inquiring about relationships in a broad sense rather than focusing exclusively on romantic relationships. Participants expressed their agreement with each item using a 7-point Likert scale. The items were aggregated to generate two subscale scores (anxiety and avoidance), with higher scores indicating elevated levels of attachment anxiety and/or avoidance. Lafontaine et al. (2015) documented good reliability estimates for the subscales. Comparable reliability estimates have been reported in other studies (Fitzpatrick & Lafontaine, 2017; Labadie et al., 2018). The questionnaire has been used successfully in a large general sample of adults (Brugnera et al., 2019). In the current sample, excellent reliability has been demonstrated for the ambivalence scale ($\alpha = 0.94$) and good reliability for the avoidance scale ($\alpha = 0.83$).

See McBride et al. (2023) to get more information about the subdivision of the variables across Phase 1 and Phase 2.

Statistical Analyses

All analyses were performed through the open-source software R (Version 4.3.2; R Core Team, 2023). Analysis commenced with an exploration of sample demographics across BCE items. This encompassed gender, age, ethnicity (White vs. Non-White), and education (Post-Secondary vs. Non-Post-Secondary).

Subsequently, a LCA analysis was performed, employing all BCEs as indicators and no covariates. The LCA was conducted through the *poLCA* package (Linzer & Lewis, 2011). Solutions ranging from 2 to 7 were modeled, and the fit indexes and statistics [negative log likelihood, Akaike Information Criterion (AIC), the Bayesian Information Criterion (BIC), G^2 , χ^2] were considered. The Lo-Mendell-Rubin adjusted likelihood ratio test (LMR test; Lo et al., 2001) was also scrutinized. The best model was considered to be the one with the lowest AIC and BIC, and the model with one class less than when the LMR becomes non-significant.

Following the identification of the best model, the resultant latent classes were examined in relation to demographic variables. Moreover, the classes were investigated as predictors for the mental health outcomes (e.g., general health, depression, anxiety, suicidal ideation) and psychological factors (e.g. loneliness, resilience, happiness, attachment), after controlling for demographic variables (age, gender, education, ethnicity), in a series of ANCOVA and logistic regression models. Finally, we explored models incorporating BCE sum-centered and BCE sum-centered squares as predictors, aiming to elucidate the linear versus non-linear relationship between BCE and the outcomes.

Results

Demographics

The mean age of participants in the sample (N=2058) was 45.91 years (SD=15.79). In terms of gender, 47.76% identified as man, 51.94% as woman, 0.19% as transgender, 0.05% preferred not to say, and 0.05% identified as other. In terms of ethnicity, 90.86% identified as White, and 9.14% identified as Non-White.¹ For what concerns education, 42% did not attend Post-Secondary Education, and 58% did attend Post-Secondary Education.²

Table 1 presents data on the frequencies of exposure to positive experiences, along with outcomes from bivariate Chi-square tests examining the relationship between BCE and gender.³ The most frequently reported BCE was having at least one good friend, followed by a predictable routine and having a good time. Conversely, less commonly reported BCEs included liking school, having comfort beliefs, and having at least one caregiving teacher. The Chi-square tests demonstrated statistical significance for various positive experiences, with frequencies indicating that women were more inclined to report instances of having a safe caregiver, having at least one good friend, having comfort beliefs, having at least one caregiving teacher, and having a supportive non-caregiver adult. In contrast, men were more likely to experience none of the BCEs.

The relative distribution of individuals based on their total counts of BCEs is depicted in Fig. 1. A total of 1.90% (women: 1.02%, men: 0.88%) reported no BCEs. A total of 1.80% (women: 0.73%, men: 1.07%) reported having experienced one BCE whereas 2.19% (women: 1.07%, men:

¹ For those interested in non-dichotomized data, the ethnic composition of the sample was predominantly White British/Irish (87.71%), followed by White non-British/Irish (3.16%), Indian (2.04%), Pakistani (1.26%), and African (1.02%). Smaller proportions of participants identified as Afro-Caribbean (0.73%), Chinese (0.97%), Other ethnic group (1.70%), Bangladeshi (0.63%), Other Asian (0.63%), and Arab (0.15%). Percentages are reported to 2 decimal places.

 $^{^2}$ For those interested in non-dichotomized data, the most common education level was an undergraduate degree, reported by 27.11% of respondents. This was followed by O-Level/GCSE or similar qualifications (20.02%), A-Level or similar qualifications (19.44%), and postgraduate degrees (15.65%). Technical qualifications accounted for 10.06% of responses, while diplomas made up 3.55%. A smaller proportion of respondents reported having no qualifications (2.96%) or other qualifications (1.21%).

³ Out of the 2058 individuals surveyed, only 6 did not identify as "female" or "male." Specifically, 4 individuals selected "trans," 1 chose "rather not to say," and 1 indicated "other." For the purpose of demographic analyses, these individuals were excluded, because the sample size did not allow for a significant comparison with the female and male categories.

Table 1Endorsementof benevolent childhoodexperiences

| BCE | Total $(n=2052)$ | | Men | | Women | | χ^2 | ф |
|-----------------------------------|------------------|-------|-----|-------|-------|-------|---------------------|------|
| | n | % | n | % | n | % | | |
| 1 Safe Caregiver | 1,614 | 78.65 | 749 | 36.50 | 865 | 42.15 | 409.75** | .356 |
| 2 At least one good friend | 1,796 | 87.52 | 856 | 41.72 | 940 | 45.81 | 451.95 [*] | .355 |
| 3 Comfort beliefs | 1,279 | 62.33 | 596 | 29.04 | 683 | 33.28 | 324.19* | .356 |
| 4 Liked school | 1,210 | 58.97 | 579 | 28.22 | 631 | 30.75 | 304.18 | .355 |
| 5 At least one caregiving teacher | 1,386 | 67.54 | 647 | 31.53 | 739 | 36.01 | 351.08^{*} | .356 |
| 6 Good neighbours | 1,622 | 79.04 | 790 | 38.50 | 832 | 40.55 | 406.32 | .354 |
| 7 Supportive non caregiver adult | 1,402 | 68.32 | 629 | 30.65 | 773 | 37.67 | 361.59*** | .359 |
| 8 Good time | 1,729 | 84.26 | 833 | 40.59 | 896 | 43.66 | 433.97 | .354 |
| 9 Like yourself | 1,430 | 69.69 | 737 | 35.92 | 693 | 33.77 | 358.52 | .354 |
| 10 Predictable routine | 1,754 | 85.48 | 842 | 41.03 | 912 | 44.44 | 440.6 | .354 |

 $p^* = p \le 0.05, p^{**} = p \le 0.01, p^{***} p \le 0.001$



Fig. 1 Percentage of people endorsing different total numbers of BCEs

1.12%) reported two BCEs. Percentages of the summative BCEs continued to rise, reaching a proportion of 6.97% reporting 5 BCEs (women: 3.61%, men: 3.36%) and 9.06% reported 9 BCEs (women: 7.70%, men: 8.53%). Finally, 27.78% (women: 12.67%, men: 15.11%) reported ten BCEs.

In the context of the total number of BCEs, the distribution is highly negatively skewed (M = 7.41, SD = 2.57). Notably, women exhibited a slightly higher mean (M = 7.44, SD = 2.59) than men (M = 7.38, SD = 2.56), although the Mann–Whitney test was not statistically significant (W = 513554, p = 0.369). Regarding age, a simple linear regression with total BCE as the outcome variable and age

in years as the only independent variable revealed a small but significant positive relationship; F(1,2056) = 46.09, p < 0.001, $R^2 = 0.02$; the unstandardized predictor being B = 0.02, p < 0.001 and the standardized one, akin to the correlation coefficient Pearson's rho, was $\beta = 0.15$.

The mean number of BCEs for the individuals categorized as White in ethnicity (M = 7.45, SD = 2.53) was slightly higher than those categorized as non-White in ethnicity(M = 7.03, SD = 2.93). However, the differences were not statistically significant (W = 185017, p = 0.227). Finally, the mean of total BCEs of those who have been to Post-Secondary Education (M = 7.72, SD = 2.42) was higher compared to those who have never been in Post-Secondary Education (M=6.98, SD=2.71) and it was also statistically significant (W=434,073, p<0.001, r=0.14).

Latent Class Analysis

Upon examining the fit indexes of different LCA models (Table 2), the LMR Test did not show significance. Nevertheless, the model showing the lowest Bayesian Information Criterion (BIC) suggests an optimal fit with four classes. Consequently, this specific model has been chosen for further analysis. Entropy value (0.73) was considered good (Wang & Wang, 2019).

In Fig. 2, the profile plot of the 4 classes model is presented.

Upon inspecting the pattern of estimated probabilities for each class, the following patterns emerged. Class 1 was the largest class (42%), characterized by a high probability of endorsement across all BCEs. This was labelled the "High BCE" class. Class 2 was the second largest class

| Table 2 Statistics and fit | Model | LogLikelihood | AIC | BIC | Entropy | LMR test p.value |
|------------------------------------|-----------|---------------|-----------|-----------|---------|------------------|
| indexes for different LCA models | 2 Classes | -9,748.01 | 19,538.01 | 19,656.23 | 0.80 | < 0.001 |
| | 3 Classes | -9,495.50 | 19,055.00 | 19,235.14 | 0.75 | < 0.001 |
| | 4 Classes | -9,437.27 | 18,960.54 | 19,202.61 | 0.73 | < 0.001 |
| | 5 Classes | -9,397.10 | 18,902.19 | 19,206.19 | 0.77 | < 0.001 |
| | 6 Classes | -9,369.63 | 18,869.26 | 19,235.18 | 0.76 | < 0.001 |
| | 7 Classes | -9,344.16 | 18,840.32 | 19,268.16 | 0.71 | < 0.001 |



Note. Class 1 (42%, $n \approx 865$), labeled "High BCE", had high endorsement of all BCEs. Class 2 (35%, $n \approx 720$), labeled "Intermediate BCE with opportunity" showed positive behaviors but some maladjustment in school/environmental functioning. Class 3 (17%, $n \approx 350$), labeled "Intermediate BCE", had sufficient core relationships but struggled socially and academically. Class 4 (4%, $n \approx 82$), labeled "Low BCE", was highly deprived with almost no BCE endorsement. The y-axis represents the probability of individuals in a given class endorsing an item, ranging from 0 to 1.

Fig. 2 Profile plot of the 4 classes model

(35%). Individuals in this class exhibited overall positive behaviors but also displayed maladjustment, particularly in school/environmental functioning and self and comfort beliefs. This was labelled "Intermediate BCE with Opportunity". The third class (17%) indicated that core/close relationships (e.g., friends, parents) were sufficient, but there were significant problems in social and academic functioning. This was labeled "Intermediate BCE". Class 4 (4%) was the smallest one, and also the most highly deprived class, showing virtually no probability of endorsing BCE across all categories. This class represents a small but distinct group apparently facing substantial challenges. This was labelled "Low BCE".

Associations with Psychological Outcomes

The four classes were then used as independent variables to study their associations with demographic variables (Table 3), mental health and general health (Table 4), and psychological factors (Table 5). The analyses included raw means for the predictors as a result of an Analysis of Variance (ANOVA) model or a Chi-Square test (Table 3) and adjusted marginal means for the other outcome variables in an Analysis of Covariance (ANCOVA) model (Tables 4 and 5). For dichotomous outcome variables (Suicide Ideation, Suicide Attempt, Self-harm), conditional marginal probabilities (obtained through logistic regressions) were reported.

| Table 3 | BCE summative score and demographics | s |
|---------|--------------------------------------|---|
|---------|--------------------------------------|---|

| Variable | Class 1 High BCE | Class 2 Interme BCE with Op tunity | ediate opor- | Class 3 Intermediate BCE | Class 4 Low BCE | F or χ^2 | Significant Pairwise Contrasts ^a | η ² or Cra- mér's V |
|-------------------------------------|---------------------|--|-----------------|-----------------------------|--------------------|-----------------|---|--------------------------------------|
| BCE summative score (raw mean) | 9.57 | 6.95 | 4.25 | | 0.79 | 4355*** | All ^{***} | .86 |
| Gender (% Women) | 52.94 | 50.07 | 53.77 | | 53.68 | N.s | NA | .03 |
| Age (Years) | 46.96 | 48.5 | 39.56 | | 37.6 | 35.68*** | All ^{***} except 1 vs 2 and 3 vs 4 | .05 |
| Education (% Non-Post-secondary) | 36.38 | 44.2 | 51.4 | | 56.84 | 33.33*** | 1 vs 2**, 1 vs 3***, 1 vs 4*** | .13 |
| Ethnicity (% Non-White) | 9.37 | 6.08 | 14.02 | | 13.68 | N.s | NA | .10 |

N.s. stands for not significant, NA for not available

^aTukey familywise adjustment for p values has been always used except for the pairwise χ^2 tests (Gender, Education, Ethnicity), adopting a Holm correction

* $p \le 0.05$, ** $p \le 0.01$, *** $p \le 0.001$

| Table 4 | General and me | ental health (| marginal | means and | probabilities | indicated) |
|---------|----------------|----------------|----------|-----------|---------------|------------|
| | | | | | | |

| Variable | Class 1 High BCE | Class 2 Intermediate BCE with Opportunity | Class 3 Intermediate BCE | Class 4 Low BCE | <i>F</i> or χ^2 | Significant Pairwise Contrasts ^a | η^2_{p} |
|---------------------|---------------------|---|--------------------------------|--------------------|----------------------|--|--------------|
| General Health | 3.61 | 3.35 | 3.3 | 3.09 | 9.905*** | 1 vs 2***, 1 vs 3***, 1 vs 4*** | .03 |
| Depression PHQ | 6.05 | 7.8 | 11.26 | 10.58 | 52.5*** | All ^{***} except 3 vs 4 | .08 |
| Anxiety Gad | 4.64 | 6.1 | 8.86 | 8.37 | 53.57*** | All ^{***} except 3 vs 4 | .08 |
| Psychosis Screening | 0.628 | 0.666 | 0.924 | 0.538 | 23.16*** | 1 vs 3**, 2 vs 3* | .008 |
| Suicide Ideation | 0.262 | 0.398 | 0.501 | 0.533 | 142.98*** | All ^{***} (2 vs 3 ^{**}), except 2 vs 4, 3 vs 4 | NA |
| Suicide Attempt | 0.0009 | 0.0014 | 0.0031 | 0.0025 | 117.05*** | 1 vs 3***,1 vs 4*, 2 vs 3*** | NA |
| Self-Harm | 0.0572 | 0.1244 | 0.1896 | 0.2045 | 203.54*** | All ^{***} (2 vs 3 [*]) except 2 vs 4, 3 vs 4 | NA |

Marginal probabilities have been reported only for the dichotomous variables (Suicide ideation, Suicide attempt and Self harm)

^aTukey familywise adjustment for p values has been always used

* $p \le 0.05$, ** $p \le 0.01$, *** $p \le 0.001$

 Table 5
 Psychological factors (marginal means indicated)

| Variable | Class 1 High BCE | Class 2 Intermedi- ate BCE with Oppor- | Class 3 Intermedi- ate BCE | Class 4 Low BCE | F or χ^2 | Significant Pairwise Contrasts ^a | η^2_p |
|-----------------------|---------------------|---|----------------------------------|--------------------|-----------------|---|------------|
| | | tunity | | | | | |
| Well-Being | 22 | 19.6 | 18.7 | 16.7 | 37.24*** | All*** (2 vs 3*,3 vs 4**) | .09 |
| Hopefulness | 7.06 | 6.13 | 5.78 | 5.29 | 27.11*** | All***(2 vs 3*), except 3 vs 4 | .09 |
| Happiness | 6.69 | 5.74 | 5.32 | 4.52 | 27.9^{***} | All***(2 vs 3*,3 vs 4**) | .08 |
| Loneliness | 5.02 | 5.61 | 6.33 | 6.08 | 39.36*** | All ^{***} except 2 vs 4, 3vs 4 | .06 |
| Resilience | 20.5 | 18.8 | 17.7 | 17.9 | 38.85*** | All ^{***} (2 vs 3 ^{**}), except 2 vs 4, 3 vs 4 | .05 |
| Self Esteem | 4.35 | 3.61 | 3.61 | 3.23 | 26.29*** | All ^{***} except 2 vs 3, 2 vs 4, 3 vs 4 | .05 |
| Attachment Avoidance | 22.1 | 24.8 | 25.1 | 24.7 | 11^{***} | 1 vs 2***, 1 vs 3***, 1 vs 4** | .04 |
| Attachment Resistance | 19.6 | 21 | 23.9 | 24.3 | 42.19*** | All ^{***} (1 vs 2 ^{**} ,2 vs 4 ^{**}), except 3 vs 4 | .03 |

^aTukey familywise adjustment for p values has been always used

* $p \le 0.05$, ** $p \le 0.01$, *** $p \le 0.001$

As shown in Table 3, results are congruent with the 4-class model. The average BCE experiences show a sharp decline from the most privileged to the least privileged class. Younger age is significantly associated with less privileged classes. However, there are no statistically significant differences between the first two and last two classes regarding age. Additionally, lower education levels were associated with more deprived classes. However, statistically significant differences in relation to education were only observed between the first class and all others, while differences among the remaining classes were not statistically significant. On the other hand, gender and ethnicity were largely unchanged across different classes.

Upon examining the means and marginal probabilities in Table 4 obtained after "controlling" for demographic variables (age, gender, education, ethnicity), it became apparent that more deprived classes were associated with less favorable health and psychological outcomes. This pattern was observed in general health, but a statistically significant difference was noted only between the first class and all others. Similarly, for depression, all contrasts were statistically significant except for the difference between the third and fourth classes. Anxiety followed the same pattern as depression. Suicidal ideation showed similar patterns, showing all contrasts to be significant, except for those between class 2 and class 3, and class 3 and class 4. Attempted suicide and self-harm also exhibited the same pattern.

An atypical trend was observed in the psychosis screening, which exhibits an unusual peak in class 3 (and is the lowest in class 4). However, the only statistically significant differences were between class 1 and class 3, and class 2 and class 3.

Similar findings were observed in Table 5. Well-being means decreased from class 1 to class 4, with all pairwise differences being statistically significant. Happiness

followed the exact same pattern. Hopefulness exhibited a similar trend, but there was no statistically significant difference between class 3 and class 4. Loneliness also showed all pairwise differences to be statistically significant, except for between class 2 and class 4, and class 3 and class 4. Resilience mirrors the pattern observed in loneliness. Self-esteem followed an identical trend but with another non-statistically significant difference between class 2 and class 3.

Attachment avoidance was significantly lower in the first class compared to the others, with no significant differences among the remaining classes. On the other hand, attachment resistance increased from class 1 to 4, and all pairwise differences were statistically significant, except for the pairwise comparison between class 3 and class 4.

Study of Linearity Vs Non-Linearity

Eventually, we sought to determine whether the relationship between the total number of BCE experienced and various psychological outcomes was linear or nonlinear. We enhanced interpretability by centering the total number of BCEs, focusing on an increase above the mean. Following this, we introduced a quadratic element by squaring the centered total number of BCEs. Subsequently, in a linear regression model, we incorporated both the centered BCE sum and its squared counterpart. By observing the coefficients, we aimed to assess the comparative impact of linearity versus nonlinearity on the psychological variable of interest.

Upon examining the results in Table S1, we find that while all models are statistically significant as a whole, both raw and standardized coefficients of quadratic terms are consistently smaller than their non-quadratic counterparts. Instances where these coefficients are statistically significant are less frequent and they occurred in depression, happiness, loneliness, resilience, self-esteem, and attachment avoidance. These results indicate that overall quadratic terms are not relevant in predicting the total BCE score.

Discussion

The aims of this study were *first* to explore the association between BCE experiences and basic demographic variables, *secondly* to investigate the taxonic structure of BCEs using an LCA approach, *thirdly* to explore associations between latent classes of BCEs and a range of mental health and psychological factors and *fourthly* to examine the linear vs. non-linear relationship between BCEs and outcomes.

We observed that the majority of individuals have a substantial number of positive experiences (at least more than 4/5 BCEs). Additionally, Class 1, characterized by high levels of all BCEs, is notably the largest among the classes. This leads us to consider that most individuals possess a significant array of positive experiences, which are positively associated with later psychological functioning. A similar relationship has been already observed in previous research (Bethel et al., 2019; Hou et al., 2022; Graupensperger et al., 2023; Redican et al., 2023; Xu et al., 2022; Yu et al., 2022; Zhu et al., 2023).

Age was positively correlated with the total number of BCEs, meaning older individuals were more likely to report a higher number of BCEs. This raises questions about whether aging fosters idealized childhood memories (a developmental effect) or reflects generational differences in childhood experiences, such as younger individuals facing worse childhoods (cohort difference). Additionally, potential age-related selection bias may play a role. Older individuals may be more inclined to participate in questionnaires because they feel grateful for their life experiences and are generally more content with their past, leading them to view their childhoods more positively. On the other hand, younger individuals might be more motivated to engage in surveys due to dissatisfaction or discontent with their current lives, and may be seeking an outlet to express their grievances or reflect on negative childhood experiences. Evidence suggests anxiety and depression decrease with age (Shevlin et al., 2020). Other studies (Bethell et al., 2019; Redican et al., 2023; Xu et al., 2022) found significant age differences in BCEs but grouped them into classes (e.g., 0–2, 3–5, 7–9) and did not explore the direct relationship between age and the number of BCEs experienced.

The only other demographic variable significantly associated with the total number of BCEs was education (those with post-secondary education report more BCEs). It is likely that having more BCEs is linked to a favorable socioeconomic context in childhood and the opportunity to pursue higher education later in life. Additionally, it could be that having more positive experiences encourages directly further academic pursuits—in other words, being recognized as "good" at school generates a sense of self-efficacy that might persist into later stages of personal education. Conversely, it might also be that an early predisposition for education, somewhat innate and typical of a particular individual, leads to more positive experiences in childhood and persists later in life. Other studies (Xu et al., 2022; Zhan et al., 2021) reported similar effects of educational status.

On the other hand, there was no overall gender difference in the cumulative BCE score but some subcategories were more commonly endorsed by women, specifically in items related to safe caregiver, at least one good friend, comfort beliefs, and unsupportive non-caregiver adult. The nondifference in BCE cumulative score is in line with previous research (Xu et al., 2022; Zhan et al., 2021), while Redican et al. (2023) found that women were reporting slightly higher BCEs total scores. In this study, ethnicity does not appear to be significantly associated with the total number of BCEs. Redican et al. (2023) also did not find any significant effect associated with ethnicity, as well as the original BCEs study (Narayan et al., 2018).

This study represents the first exploration into the taxonic structure of BCEs, without considering ACEs and their potential confounding effect altogether. We found that the model with the best fit had four classes, which we respectively named High BCE (42%), Intermediate with opportunity (35%), Intermediate BCE (17%), and Low BCE (4%). It is noteworthy that the chosen LCA model is not one that merely categorizes BCEs into high-medium-low, as suggested by studies combining BCEs with ACEs (Almeida et al., 2021; Johnson et al., 2022; Narayan et al., 2018, 2023). Instead, it reveals a slightly more complex pattern, with a high and a low class, but two intermediate classes. Notably, the first intermediate class (Class 2) garners substantial social support, attributing its relatively lower BCE values to issues in the school environment and comfort beliefs. In contrast, Class 3 exhibits a more severe pattern, wherein the only remaining unaffected positive experiences are the "basic" ones of having a good caregiver and at least one close friend. A significant factor to consider regarding the division between Class 2 versus Class 3, is that many items on the BCE scale pertain to school and societal functioning. This could introduce a conceptual confound concerning positive experiences, not necessarily due to a lack of social support or teacher involvement, but rather influenced by individual differences such as temperament, personality, and intelligence. For instance, having an experience at school that is not entirely positive (e.g. "not liking school", or "having a supportive teacher") might simply indicate a less intellectual/abstract inclination rather than a true absence of an

experience reinforcing the individual's psychological wellbeing (Duckworth & Allred, 2012).

In support of this hypothesis, the difference between Class 2 and Class 3 in terms of total average BCEs was relatively small; 6.95 (Class 2) compared to 4.25 (Class 3) (the difference is 2.7). Meanwhile, the difference between Class 3 and Class 4 was much larger; 4.25 compared to 0.79 (the difference is 3.46). However, despite these differences in total BCEs, there was no statistical difference between class 3 and class 4 with regard to many outcomes while there were between class 2 and 3 in terms of various psychological outcomes. Specifically, for the majority of our investigated variables including depression, anxiety, psychosis screening, suicidal ideation, suicidal attempt, self-harm, hopefulness, loneliness, resilience, selfesteem, and attachment resistance, no significant distinction emerged between Class 3 and Class 4. In other words, those 3.46 points of difference seem to have a lesser impact on psychological outcomes compared to the difference of 2.7 points. These results likely indicate that a) the effect of certain BCEs may be more important than others, or b) that specific BCEs just measure "spurious" dynamics that might not be crucial for the mental health and well-being. It may also be c) that there are some interaction/synergistic effects between different BCEs (for a similar account of ACEs, see Briggs et al., 2021), and eventually, d) that there may be a non-linear association between the BCE raw score and the outcomes explored. Of course, some combinations of the four explanations mentioned above might also occur. Given the results of the LCA and the unveiled association between the classes and the psychological outcomes, we mainly support explanations b) and d).

Our results mirror the findings of Johnson and colleagues (2022). In their study, quite inexplicably, Group 3 had Low BCE and Moderate ACE, while Group 4 had moderate BCE and High ACE. In this case, it is unclear why the more maltreated group has more BCEs than a group with less maltreatment. A plausible explanation is that the "positive" experiences measured may not be as significant as they appear. A similar pattern emerges also in Narayan and colleagues (2023).

Regarding the relationship between latent classes and psychological outcomes, the classes that are more advantaged in terms of BCEs consistently exhibit more favorable psychological outcomes across all the variables investigated, both in terms of mental health and psychological factors. These results are in line with those reviewed by Han and colleagues (2023). Moreover, there are reasons to conceptualize BCEs as a promotive factor with direct effects to psychological wellbeing rather than merely a protective factor against ACEs.

In relation to whether BCEs and outcomes have a linear or not-linear relationship our preliminary investigation suggested that there is no substantial quadratic trend in the relationship between BCEs and the outcomes. That means that BCEs do not affect outcomes in a curvilinear U-reversed fashion.

Limitations

This study is not without limitations. Firstly, the LMR test never proved to be significant, and therefore, our choice of the best LCA model was based solely on the analysis of the BIC. However, we separately conducted an analysis of the 5-class model, which turned out to be uninterpretable. Furthermore, our linear / non-linear analysis was preliminary as we introduced exclusively quadratic terms. The decision to include only quadratic terms might have overlooked other non-linear phenomena, such as higher-order polynomial terms or other patterns. Additionally, we primarily explored one causal pathway-from childhood experiences to life outcomes-rather than the reverse, as it is customary in correlation research examining self-reported childhood experiences and their impact on later life outcomes (Lacey & Minnis, 2020). However, in some cases, there may be the opposite effect. For example, depression could potentially lead to a biased negative report of childhood experiences, wherein individuals may perceive their childhood as worse than it actually was.

Implications for Future Research

Regarding the future of the research, the contribution of this study is threefold. First, a non-linear relationship between BCEs and psychological outcomes may exist. Indeed, a similar cut-off has been identified in Adverse Childhood Experiences (ACEs), specifically at 4 ACEs (Briggs et al., 2021; Lacey & Minnis, 2020). This suggests that a comparable cut-off phenomenon might also exist in the case of BCEs. Taxometric analyses (Ruscio et al., 2011) may provide a more comprehensive understanding of such phenomenon.

The second key implication of this study concerns the internal structure of the BCEs. The similar results between classes 3 and 4, despite a noticeable difference in the total number of BCEs, may be present due to some BCE items measuring irrelevant experiences. This suggests the need for a more thorough exploratory factor analysis on the BCEs to understand which items have proper factor loadings and are conceptually validated, and which do not.

The initial study proposed a conceptual division into three domains but did not test this structure (Narayan et al., 2018). The Turkish validation study (Oge et al., 2020) identified a two-factor structure, but we have some concerns about this analysis, including the small sample size (n = 175), the decision to retain two factors (one-factor and three-factor solutions should have been explored as well), and the use

of varimax rotation, which is not suitable for correlated factors. The study by Almeida et al. (2021) found a one-factor structure but lacked clarity on the factor extraction method, and the low Cronbach alpha values raises concerns. A recent Ph.D. thesis (Andrzejewski, 2023) demonstrated a two-factor structure, similar to the Turkish study, while the Chinese BCE validation study (Zhan et al., 2021) relied only on Cronbach alpha, without factor analysis. Future research would benefit from conducting a proper Exploratory Factor Analysis (EFA) of the BCEs. Thirdly, this study highlights the importance of focusing specifically on BCEs rather than consistently examining them in conjunction with ACEs.

Conclusion

This study represents the largest demographic and taxonomic analysis of BCEs conducted so far. The findings indicate minor effects of age and education on certain BCEs, some gender-specific patterns, and no observable effect of ethnicity. Furthermore, an LCA identified four classes, with an unexpected pattern in associations with outcomes observed between the last two classes. What emerged is that the two "intermediate" classes may be biased by the presence of items related to school functioning. Alternatively, or complementary, this "gap" between class 2 and 3 might suggest a kind of "cut-off" point for BCEs, where few or very few BCEs do not significantly alter outcomes. Future research should further investigate this non-linear pattern. It should also conduct a more in-depth analysis of certain benevolent experiences that may not be particularly relevant, focusing more extensively on this construct to provide the most accurate operationalization possible.

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Author Contributions Andrea Zagaria, Mark Shevlin, Philip Hyland and Thanos Karatzias ideated the study. Andrea Zagaria analyzed the data, produced the figures and the tables, and wrote a first draft of the manuscript. Thanos Karatzias, Mark Shevlin and Philip Hyland corrected the draft.

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Declarations

Ethics Approval The University of Sheffield provided ethical approval for the C19PRC Study (Reference number 033759).

Consent of Participants Participants were informed their data would be confidential, geolocating would determine their area, and they could terminate participation at any time. They were also told some topics might be distressing, how their data would be used, and that they would be re-contacted for future surveys. Participants provided informed electronic consent and were directed to the NHS website for COVID-19 concerns and emotional support services if needed.

Conflict of Interest All authors declare they have no conflict of interest.

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References

- Almeida, T. C., Guarda, R., & Cunha, O. (2021). Positive childhood experiences and adverse experiences: Psychometric properties of the benevolent childhood experiences scale (BCEs) among the Portuguese population. *Child Abuse & Neglect*, 120, 105179. https://doi.org/10.1016/j.chiabu.2021.105179
- Andrzejewski, T. (2023). Examining adverse and benevolent childhood experiences and associated psychosocial outcomes among autistic adults (Doctoral dissertation, University of Wyoming). ProQuest Dissertations & Theses Global. https:// www.proquest.com/docview/2818617194?pq-origsite=gscho lar&fromopenview
- Bebbington, P., & Nayani, T. (1995). The psychosis screening questionnaire. International Journal of Methods in Psychiatric Research, 5, 11–19.
- Benson, T., Sladen, J., Liles, A., & Potts, H. W. W. (2019). Personal Wellbeing Score (PWS)-a short version of ONS4: Development and validation in social prescribing. *BMJ Open Quality*, 8(2), e000394. https://doi.org/10.1136/bmjoq-2018-000394
- Bethell, C., Jones, J., Gombojav, N., Linkenbach, J., & Sege, R. (2019). Positive childhood experiences and adult mental and relational health in a statewide sample: Associations across adverse childhood experiences levels. *JAMA Pediatrics*, *173*(11), e193007– e193007. https://doi.org/10.1001/jamapediatrics.2019.3007
- Briggs, E. C., Amaya-Jackson, L., Putnam, K. T., & Putnam, F. W. (2021). All adverse childhood experiences are not equal: The contribution of synergy to adverse childhood experience scores. *American Psychologist*, 76(2), 243. https://doi.org/10.1037/amp0000768

- Brugnera, A., Zarbo, C., Farina, B., Picardi, A., Greco, A., Coco, G. L., ... & Compare, A. (2019). Psychometric properties of the Italian version of the Experience in Close Relationship Scale 12 (ECR-12): An exploratory structural equation modeling study. *Research in Psychotherapy: Psychopathology, Process, and Outcome*, 22(3). https://doi.org/10.4081/ripppo.2019.392
- Contoyannis, P., Jones, A. M., & Rice, N. (2004). The dynamics of health in the British household panel survey. *Journal of Applied Econometrics*, 19(4), 473–503. https://doi.org/10.1002/jae.755
- Duckworth, A., & Allred, K. A. (2012). Temperament in the classroom. In M. Zentner & R. L. Shiner (Eds.), *Handbook of temperament* (pp. 627–644). Guilford.
- Eisinga, R., Grotenhuis, M. T., & Pelzer, B. (2013). The reliability of a two-item scale: Pearson, Cronbach, or Spearman-Brown? *International Journal of Public Health*, 58, 637–642. https://doi.org/ 10.1007/s00038-012-0416-3
- Felitti, V. J., Anda, R. F., Nordenberg, D., Williamson, D. F., Spitz, A. M., Edwards, V., & Marks, J. S. (1998). Relationship of childhood abuse and household dysfunction to many of the leading causes of death in adults: The adverse childhood experiences (ACE) study. *American Journal of Preventive Medicine*, 14(4), 245–258. https://doi.org/10.1016/S0749-3797(98) 00017-8
- Fitzpatrick, J., & Lafontaine, M. F. (2017). Attachment, trust, and satisfaction in relationships: Investigating actor, partner, and mediating effects. *Personal Relationships*, 24(3), 640–662. https://doi.org/ 10.1111/pere.12203
- Fraser, L., Burnell, M., Salter, L. C., Fourkala, E.-O., Kalsi, J., Ryan, A., . . . Menon, U. (2014). Identifying hopelessness in population research: a validation study of two brief measures of hopelessness. *BMJ open*, 4(5), e005093. https://doi.org/10.1136/bmjop en-2014-005093
- Graupensperger, S., Kilmer, J. R., Olson, D. C., & Linkenbach, J. W. (2023). Associations between positive childhood experiences and adult smoking and alcohol use behaviors in a large statewide sample. *Journal of Community Health*, 48(2), 260–268. https://doi. org/10.1007/s10900-022-01155-8
- Han, D., Dieujuste, N., Doom, J. R., & Narayan, A. J. (2023). A systematic review of positive childhood experiences and adult outcomes: Promotive and protective processes for resilience in the context of childhood adversity. *Child Abuse & Neglect*, 144, 106346. https://doi.org/10.1016/j.chiabu.2023.106346
- Hou, H., Zhang, C., Tang, J., Wang, J., Xu, J., Zhou, Q., ... & Wang, W. (2022). Childhood experiences and psychological distress: Can benevolent childhood experiences counteract the negative effects of adverse childhood experiences?. *Frontiers in Psychology*, 13, 800871. https://doi.org/10.3389/fpsyg.2022.800871
- Hughes, M. E., Waite, L. J., Hawkley, L. C., & Cacioppo, J. T. (2004). A short scale for measuring loneliness in large surveys: Results from two population-based studies. *Research on Aging*, 26(6), 655–672. https://doi.org/10.1177/0164027504268574
- Johnson, D., Browne, D. T., Meade, R. D., Prime, H., & Wade, M. (2022). Latent classes of adverse and benevolent childhood experiences in a multinational sample of parents and their relation to parent, child, and family functioning during the COVID-19 pandemic. *International Journal of Environmental Research and Public Health*, 19(20), 13581. https://doi.org/10.3390/ijerph1920 13581
- Karatzias, T., Shevlin, M., Fyvie, C., Grandison, G., Garozi, M., Latham, E., ... & Hyland, P. (2020). Adverse and benevolent childhood experiences in Posttraumatic Stress Disorder (PTSD) and Complex PTSD (CPTSD): implications for trauma-focused therapies. *European journal of psychotraumatology*, *11*(1), 1793599. https://doi.org/10.1080/20008198.2020.1793599
- Kocalevent, R. D., Hinz, A., & Brähler, E. (2013). Standardization of the depression screener patient health questionnaire

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(PHQ-9) in the general population. *General Hospital Psychiatry*, 35(5), 551–555. https://doi.org/10.1016/j.genhosppsych. 2013.04.006

- Kroenke, K., Spitzer, R. L., & Williams, J. B. (2001). The PHQ-9: Validity of a brief depression severity measure. *Journal of General Internal Medicine*, 16(9), 606–613. https://doi.org/10.1046/j. 1525-1497.2001.016009606.x
- Kroenke, K., Spitzer, R. L., Williams, J. B., & Löwe, B. (2010). The patient health questionnaire somatic, anxiety, and depressive symptom scales: A systematic review. *General Hospital Psychiatry*, 32(4), 345–359. https://doi.org/10.1016/j.genhosppsych.2010.03.006
- Kyriazos, T. A., Stalikas, A., Prassa, K., Galanakis, M., Yotsidi, V., & Lakioti, A. (2018). Psychometric Evidence of the Brief Resilience Scale (BRS) and Modeling Distinctiveness of Resilience from Depression and Stress. *Psychology*, 9(7), 1828–1857. https://doi. org/10.4236/psych.2018.97107
- Labadie, C., Godbout, N., Vaillancourt-Morel, M. P., & Sabourin, S. (2018). Adult profiles of child sexual abuse survivors: Attachment insecurity, sexual compulsivity, and sexual avoidance. *Journal of Sex & Marital Therapy*, 44(4), 354–369.
- Lacey, R. E., & Minnis, H. (2020). Practitioner review: Twenty years of research with adverse childhood experience scores–advantages, disadvantages and applications to practice. *Journal of Child Psychology and Psychiatry*, *61*(2), 116–130. https://doi.org/10.1080/ 0092623X.2017.1405302
- Lafontaine, M. F., Brassard, A., Lussier, Y., Valois, P., Shaver, P. R., & Johnson, S. M. (2015). Selecting the best items for a short-form of the experiences in close relationships questionnaire. *European Journal of Psychological Assessment*, 32(2), 140–154. https://doi. org/10.1027/1015-5759/a000243
- Linzer, D. A., Lewis, J. B. (2011). poLCA: An R Package for polytomous variable latent class analysis. *Journal of Statistical Soft*ware, 42(10), 1–29. https://www.jstatsoft.org/v42/i10/
- Lo, Y., Mendell, N. R., & Rubin, D. B. (2001). Testing the number of components in a normal mixture. *Biometrika*, 88(3), 767–778. https://doi.org/10.1093/biomet/88.3.767
- Löwe, B., Decker, O., Müller, S., Brähler, E., Schellberg, D., Herzog, W., & Herzberg, P. Y. (2008). Validation and standardization of the generalized anxiety disorder screener (GAD-7) in the general population. *Medical Care*, 266–274. https://doi.org/10.1097/ MLR.0b013e318160d093
- Maes, M., Qualter, P., Lodder, G. M., & Mund, M. (2022). How (not) to measure loneliness: A review of the eight most commonly used scales. *International Journal of Environmental Research* and Public Health, 19(17), 10816. https://doi.org/10.3390/ijerp h191710816
- Martin, A., Rief, W., Klaiberg, A., & Braehler, E. (2006). Validity of the brief patient health questionnaire mood scale (PHQ-9) in the general population. *General Hospital Psychiatry*, 28(1), 71–77. https://doi.org/10.1016/j.genhosppsych.2005.07.003
- McBride, O., Butter, S., Hartman, T. K., Murphy, J., Hyland, P., Shevlin, M., ... & Bentall, R. P. (2022). Sharing data to better understand one of the world's most significant shared experiences: Data resource profile of the longitudinal COVID-19 psychological research consortium (C19PRC) study. *International Journal of Population Data Science*, 5(4), 1704. https://doi.org/10.23889/ ijpds.v5i4.1704
- McBride, O., Butter, S., Martinez, A. P., Shevlin, M., Murphy, J., Hartman, T. K., ... & Bentall, R. P. (2023). An 18-month follow-up of the Covid-19 psychology research consortium study panel: Survey design and fieldwork procedures for Wave 6. *International Journal of Methods in Psychiatric Research*, 32(2), e1949. https://doi. org/10.1002/mpr.1949
- McManus, S., Bebbington, P., Jenkins, R., & Brugha, T. (2016). Mental health and wellbeing in England: Adult psychiatric morbidity survey 2014. NHS Digital. https://digital.nhs.uk/data-and-infor

mation/publications/statistical/adult-psychiatric-morbidity-survey/adult-psychiatric-morbidity-survey-survey-of-mental-healthand-wellbeing-england-2014

- Morris, A. S., Treat, A., Hays-Grudo, J., Chesher, T., Williamson, A. C., spsampsps Mendez, J. (2018). Integrating research and theory on early relationships to guide intervention and prevention. In A. S. Morris spsampsps A. C. Williamson (Eds.), *Building early social and emotional relationships with infants and toddlers: Integrating research and practice* (pp. 1–25). Springer Nature Switzerland AG. https://doi.org/10.1007/978-3-030-03110-7_1
- Narayan, A. J., Rivera, L. M., Bernstein, R. E., Harris, W. W., & Lieberman, A. F. (2018). Positive childhood experiences predict less psychopathology and stress in pregnant women with childhood adversity: A pilot study of the benevolent childhood experiences (BCEs) scale. *Child Abuse & Neglect*, 78, 19–30. https:// doi.org/10.1016/j.chiabu.2017.09.022
- Narayan, A. J., Merrick, J. S., Lane, A. S., & Larson, M. D. (2023). A multisystem, dimensional interplay of assets versus adversities: Revised benevolent childhood experiences (BCEs) in the context of childhood maltreatment, threat, and deprivation. *Development and psychopathology*, 1–20. https://doi.org/10.1017/S0954579423000536
- Ng Fat, L., Scholes, S., Boniface, S., Mindell, J., & Stewart-Brown, S. (2017). Evaluating and establishing national norms for mental wellbeing using the short warwick-edinburgh mental well-being scale (SWEMWBS): Findings from the health survey for England. *Quality of Life Research*, 26, 1129–1144. https://doi.org/10.1007/ s11136-016-1454-8
- Office for National Statistics. (2016). Personal well-being in the UK: 2015 to 2016. Personal well-being findings from the Annual Population Survey (APS), with analysis by country, region and individual characteristics. Retrieved from https://www.ons.gov.uk/peoplepopulationandcommunity/wellbeing/bulletins/measuringn ationalwellbeing/2015to2016
- Oge, R., Pehlivan, F., & Işikli, S. (2020). Validity and reliability of the benevolent childhood experiences (BCEs) scale in Turkish. *Dusunen Adam-Journal of Psychiatry and Neurological Sciences*, 33(2). https://doi.org/10.14744/dajpns.2020.00074
- Pierce, M., McManus, S., Hope, H., Hotopf, M., Ford, T., Hatch, S. L., ... & Abel, K. M. (2021). Mental health responses to the COVID-19 pandemic: a latent class trajectory analysis using longitudinal UK data. *The Lancet Psychiatry*, 8(7), 610–619.
- R Core Team. (2023). R: A language and environment for statistical computing. R Foundation for Statistical Computing. https:// www.R-project.org/
- Redican, E., McBride, O., Bunting, L., Murphy, J., & Shevlin, M. (2023). Prevalence and predictors of benevolent childhood experiences among a representative sample of young people. *British Journal of Psychology*, 114(1), 229–243. https://doi.org/10.1111/bjop.12607
- Robins, R. W., Hendin, H. M., & Trzesniewski, K. H. (2001). Measuring global self-esteem: Construct validation of a single-item measure and the rosenberg self-esteem scale. *Personality and Social Psychology Bulletin*, 27(2), 151–161. https://doi.org/10. 1177/0146167201272002
- Rodríguez-Rey, R., Alonso-Tapia, J., & Hernansaiz-Garrido, H. (2016). Reliability and validity of the Brief Resilience Scale (BRS) Spanish Version. *Psychological Assessment*, 28(5), e101.

- Ruscio, J., Ruscio, A. M., & Carney, L. M. (2011). Performing taxometric analysis to distinguish categorical and dimensional variables. *Journal of Experimental Psychopathology*, 2(2), 170–196. https://doi.org/10.5127/jep.010910
- Shevlin, M., Redican, E., McElroy, E., Ben-Ezra, M., Karatzias, T., & Hyland, P. (2023). Measuring positive memories of home and family during childhood: The development and initial validation of the 'Memories of home and family scale.' *Current Psychology*, 42(26), 22255–22264. https://doi.org/10.1007/ s12144-022-03220-w
- Shevlin, M., McBride, O., Murphy, J., Miller, J. G., Hartman, T. K., Levita, L., ... & Bentall, R. P. (2020). Anxiety, depression, traumatic stress and COVID-19-related anxiety in the UK general population during the COVID-19 pandemic. *BJPsych open*, 6(6), e125. https://doi.org/10.1192/bjo.2020.109
- Smith, B. W., Dalen, J., Wiggins, K., Tooley, E., Christopher, P., & Bernard, J. (2008). The brief resilience scale: Assessing the ability to bounce back. *International Journal of Behavioral Medicine*, 15(3), 194–200. https://doi.org/10.1080/10705500802222972
- Spitzer, R. L., Kroenke, K., Williams, J. B., & Löwe, B. (2006). A brief measure for assessing generalized anxiety disorder: The GAD-7. *Archives of Internal Medicine*, 166(10), 1092–1097. https://doi. org/10.1001/archinte.166.10.1092
- Stewart-Brown, S., Tennant, A., Tennant, R., Platt, S., Parkinson, J., & Weich, S. (2009). Internal construct validity of the Warwick-Edinburgh mental well-being scale (WEMWBS): A Rasch analysis using data from the Scottish health education population survey. *Health and Quality of Life Outcomes*, 7(1), 1–8. https://doi.org/ 10.1186/1477-7525-7-15
- Wang, J., & Wang, X. (2019). Structural equation modeling: Applications using Mplus. John Wiley & amp; Sons.
- Xu, Z., Zhang, D., Ding, H., Zheng, X., Lee, R. C. M., Yang, Z., ... & Wong, S. Y. S. (2022). Association of positive and adverse childhood experiences with risky behaviours and mental health indicators among Chinese university students in Hong Kong: An exploratory study. *European Journal of Psychotraumatology*, *13*(1), 2065429. https://doi.org/10.1080/20008198.2022. 2065429
- Yu, Z., Wang, L., Chen, W., Zhang, J., & Bettencourt, A. F. (2022). Positive childhood experiences associate with adult flourishing amidst adversity: A cross sectional survey study with a national sample of young adults. *International Journal of Environmental Research and Public Health*, 19(22), 14956. https://doi.org/10. 3390/ijerph192214956
- Zhan, N., Xie, D., Zou, J., Wang, J., & Geng, F. (2021). The validity and reliability of benevolent childhood experiences scale in Chinese community adults. *European Journal of Psychotraumatology*, *12*(1), 1945747. https://doi.org/10.1080/20008198.2021. 1945747
- Zhu, Y., Zhang, G., & Anme, T. (2023). Intergenerational associations of adverse and positive maternal childhood experiences with young children's psychosocial well-being. *European Journal of Psychotraumatology*, 14(1), 2185414. https://doi.org/10.1080/ 20008066.2023.2185414