Patterns of adverse childhood experiences among Chinese preschool parents and the intergenerational transmission of risk to offspring behavioural problems: moderating by coparenting quality

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ABSTRACT

Background: Although intergenerational transmission of ACEs among parents and their offspring have been extensively studied in the West, few studies have been conducted in China on preschool children and their parents, and explore the protective factor for the intergenerational transmission.

Objective: Using latent class analysis and moderation model, this study examined the associations between patterns of adverse childhood experiences of Chinese preschool parents and behavioural problems in their children and whether coparenting quality plays a protective role in this relationship.

Method: A retrospective study was conducted on 3091 parent–child dyads from 11 kindergartens in the northern, central, and southern Anhui provinces in China. Online questionnaires were used to collect the data. Parents reported adverse childhood experiences (ACEs) and provided information on their children’s behavioural problems and perceived coparenting quality. Latent class analysis and a moderating model were used to examine the associations between patterns of adverse childhood experiences of Chinese preschool parents and behavioural problems in their children, and the moderating role of coparenting quality.

Results: Four classes were identified: a high ACEs group, a violent victimisation group, a child abuse and physical neglect group, and a low ACEs group. Increasing levels of co-parenting quality were associated with reduced parent-reported child behaviour problems for all classes, and that potentially buffering effect was significantly stronger for the low ACEs class than for children whose parents in high ACEs class.

Conclusions: Exposure to high ACEs increases the risk of developing behavioural problems in offspring, and coparenting quality may serve as a protective mechanism for intergenerational transmission. Future research should develop and implement interventions to support disadvantaged, at-risk parents and promote coparenting quality.

Keywords: Parental ACEs; offspring behavioural problems; coparenting quality; Chinese preschoolers; latent class analysis

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HIGHLIGHTS

- Four classes of parental ACEs were identified: a high ACEs group, child abuse and physical neglect group, violence victimisation group, and a low ACEs group.
- Children with parents classified in the violence victimisation and low ACEs groups were associated with fewer behavioural problems.
- With higher levels of coparenting quality those in the low ACEs class reported fewer offspring behavioural problems.

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1. Introduction

Adverse childhood experiences (ACEs) occur when an individual is exposed to abuse, mistreatment, or adversity as a child. Maltreatment such as sexual, emotional, and/or physical abuse and neglect, as well as household dysfunction such as when a member of the household struggles with mental illness, substance misuse, or is imprisoned, can all be considered forms of adversity (Abfi, 2020). Research has demonstrated a link between adversative and dysfunctional childhood experiences and later-life psychological, behavioural, interpersonal, and health issues (Felitti et al., 1998; Hughes & Cossar, 2016; Vig et al., 2020). Studies have reported that 69.7% of mothers experienced at least one type of ACE in China (Wang et al., 2021), which is much higher than the rates in developed Western countries (Eismann et al., 2019; Testa & Jackson, 2021). A growing body of research suggests that parental ACEs can increase the risk of and are linked to worse offspring developmental function (Folger et al., 2018), social-emotional function (Folger et al., 2017), behavioural problems (Schickedanz et al., 2018), physical health (Lé-Scherban et al., 2018), vulnerability (Newcomb & Locke, 2001), and interference with a parent’s ability to acquire preventive healthcare for their children (Eismann et al., 2019). Although intergenerational transmission of ACEs among parents and their offspring have been extensively studied in the West, few studies have been conducted in China on preschool children and their parents, despite the fact that early childhood is a critical period in preventing behavioural problems and improving later life well-being (Choi et al., 2019).

The cumulative risk (CR) approach is effective for understanding parental ACEs and offspring behavioural problems. However, it fails to distinguish between distinct types of ACEs and misses out critical facts about the nature and context of ACEs. Furthermore, the cumulative risk method implicitly assumes that distinct ACEs affect outcomes in the same manner and via the same underlying mechanisms (McLaughlin & Sheridan, 2016; Zhang et al., 2020). Latent class analysis (LCA), a person-based method, explains symptomatology heterogeneity and classes the population based on individual differences rather than the variability of a single variable (Lanza & Cooper, 2016). It enables researchers to look for whether the data are categorical and, consequently, find patterns of linked cases. However, few studies have applied this method to examine the relationship between parental ACEs and offspring behavioural problems.

A growing body of research indicates that ACEs have a negative impact on health through the hyperactivation and dysregulation of the stress response (Kalmakis et al., 2015). It is hypothesised that these biological changes brought on by stress in one parent may be passed on to their child, thus increasing the risk to the child’s growth and wellbeing (Bowers & Yehuda, 2016). Coparenting, or how well the marital dyad cooperates with the child, is an important family subsystem (McHale et al., 1996). Studies have shown that high coparenting quality may buffer parenting
stress (Durtschi et al., 2017; Steele et al., 2016), and more supportive coparenting is significantly associated with fewer behavioural problems among children (Choi & Becher, 2019). Research has also established that high coparenting quality may improve parenting strategies, and thus, may break the cycle of intergenerational abuse or trauma (Domoney & Trevillion, 2021; Narayan et al., 2019). Therefore, it is plausible to believe that high coparenting quality may exert a protective role that buffers against the intergenerational transmission of ACEs from parents to preschoolers’ behavioural problems.

This study explored the patterns of parental ACEs among Chinese preschool parents and the intergenerational transmission of risk to offspring behaviour problems, and whether a high level of coparenting quality plays a protective role in this relationship.

2. Methods

Data were collected from 11 kindergartens in the northern, central, and southern Anhui provinces of China, according to the socioeconomic status and population density of children in the region. The participants were 3091 preschool parents with a mean age (M) 34.69 years (SD = 5.02). Among the parents, 83.7% and 16.3% were mothers and fathers, respectively. The mean age of their offspring who participated in the study was 60.71 months (SD = 10.34). The participants’ annual family income ranged from below ¥50 K to above ¥300 K, 90.3% of the families reached 50,000 Yuan per year which is higher than the poor family income level (Ji et al., 2020). Table 1 presents the descriptive statistics for the background characteristics and all study variables.

There are 3,091 children in 11 kindergartens. The children’s teachers and school principals were informed of the objectives of the study. Then, we invited all the parents to participate in our study and received all their agreements. Web-based information and parental consent forms were distributed to the parents. All parents were informed of the objectives, the process to be followed, and their right to withdraw from the study at any time. After receiving consent forms, a web-based questionnaire from the ‘WenJuanXing’ survey platform was used. We received all 3091 online questionnaires; all the parents provided the valid data which was used for later data analysis. Parents were asked to provide their demographic characteristics and answer all the research questions posed in the questionnaire. This study was approved by the ethics committee of the affiliated university.

2.1. Measures

The Chinese version of the Adverse Childhood Experiences International Questionnaire was used to measure parental ACEs (Wang et al., 2021; World Health Organisation, 2019). The main caregivers were asked to retrospectively report adverse experiences during childhood. There were seven categories of questions: emotional neglect (two items), physical neglect (three items), emotional abuse (two items), physical abuse (two items), community violence (two items), peer bullying (three items), and household dysfunction (six items). Items related to sexual abuse were excluded from the questionnaire because of the sensitivity of the topic in China. The participants answered 14 abuse-related questions and had to choose from the following responses: ‘never true,’ ‘rarely true,’ ‘sometimes true,’ ‘often true,’ or ‘very often true.’ They were considered to have been exposed to a category and code ‘1’ if they answered ‘rarely true,’ ‘sometimes true,’ ‘often true,’ or ‘very often true’ to any item in that category, other participants were coded ‘0’. The participants answered six questions related to household dysfunction and had to provide a ‘yes’ or ‘no’ answer. They were considered to have been exposed and coded ‘1’ to household dysfunction if they answered yes to any of the six items, others were coded ‘0’. Seven categories were treated as the binary variable (0 = no, 1 = yes) for the LCA. Cronbach’s alpha for the Chinese version of the Adverse Childhood Experiences International Questionnaire was 0.78.

The Coparenting Relationship Scale (Stright & Bales, 2003) was used to test coparenting quality. This tool can provide information on how parents perceive their current coparenting relationship and is widely used in the Chinese context (Chen, 2019; Fan et al., 2020; Ren & Xu, 2019). It comprised two subscales: supportive coparenting (seven items; e.g. my partner backs me up when I discipline our child) and undermining co-parenting (seven items; e.g. my partner competes with me for our child’s attention). The main caregivers were asked to answer on a five-point Likert scale ranging from 1 (never) to 5 (always). A higher average total score indicates a higher level of coparenting quality. The internal consistency of the sample was good, with a Cronbach’s alpha value of 0.90.

To measure preschool behavioural problems, the Chinese version of the Strength and Difficulties Questionnaire (SDQ) was used (Du et al., 2008; Goodman, 1997). The questionnaire was given to the children’s primary caregivers, who were requested to complete it and respond to each question in light of their child’s behaviour over the previous six months. The questionnaire consisted of five scales: prosocial behaviour (five items), emotional problems (five items), conduct problems (five items), hyperactivity (five items), and peer relationship problems (five items). While a child’s prosocial behaviour subscale score represents their strengths, the other four subscale scores were added to create a total score, which reflects their difficulties.
Each item is rated on a three-point scale ranging from 0 (not true) to 2 (certainly true). In this study, we added scores from the four subscales for difficulties in calculating the child’s total score for behavioural problems, and the total score ranges from 0 to 40. A higher total score indicates a higher level of problematic behaviour. The Cronbach’s α for our sample was 0.64.

2.2. Covariates

Based on previous research that suggested the importance of covariates when analyzing parental ACEs and children’s behavioural problems, the child’s age (months), the child’s gender (1 = boys, 2 = girls), parents’ age (years), marital status (1 = married or cohabitating, 2 = divorced or separated), and the family’s socioeconomic status (SES) were included as covariates. To determine the family’s SES, both mother’s and father’s occupation (1 = Unemployed, nontechnical workers, and farmers; 2 = semi-technical worker and small business owner; 3 = technical worker and semi-professional; 4 = professional, officer, and owner of mid-sized business; and 5 = high-level professional and administrators), education level (1 = primary school degree or below, 2 = middle school or below, 3 = high school or vocational secondary school degree, 4 = vocational college degree, 5 = bachelor’s degree, and 6 = master’s degree or above), and annual family income (1 = <50,000 RMB, 2 = 50,001–100,000 RMB, 3 = 100,001–150,000 RMB, 4 = 150,001–300,000 RMB, 5 = >300,000 RMB) were utilised. The average standardised score of the five variables was used as the family SES in this study (Ren et al., 2022).

### Table 1. Descriptive information for all the variables.

| Variables                  | Category                                                                 | n (%) or Mean ± SD                  |
|----------------------------|-------------------------------------------------------------------------|-------------------------------------|
| Children age (month)       |                                                                         | 60.71 ± 10.34                       |
| Children gender            | Boys                                                                    | 1618 (52.3)                         |
|                            | Girls                                                                   | 1473 (47.7)                         |
| Parent age (year)          |                                                                         | 34.69 ± 5.02                        |
| Responders                 |                                                                         | 2993 (96.8)                         |
| Parental marital status    |                                                                         | 2588 (83.7)                         |
| Father occupational prestige | Unemployment, nontechnical workers, and farmers                        | 183 (5.9)                           |
|                           | Semi-technical worker and small business owner                          | 767 (24.8)                          |
|                           | Technical worker and semi-professional                                   | 704 (22.8)                          |
|                           | Professional, officer, and owners of mid-sized business                 | 904 (29.3)                          |
|                           | High-level professional and administrators                              | 533 (17.2)                          |
| Mother occupational prestige | Unemployment, nontechnical workers, and farmers                        | 183 (5.9)                           |
|                           | Semi-technical worker and small business owner                          | 767 (24.8)                          |
|                           | Technical worker and semi-professional                                   | 704 (22.8)                          |
|                           | Professional, officer, and owners of mid-sized business                 | 904 (29.3)                          |
|                           | High-level professional and administrators                              | 533 (17.2)                          |
| Father education level     | Primary school degree or below                                          | 27 (0.9)                            |
|                           | Middle school or below                                                  | 467 (15.1)                          |
|                           | High school or vocational secondary school degree                       | 489 (15.8)                          |
|                           | Vocational college degree                                               | 704 (22.8)                          |
|                           | Bachelor’s degree                                                       | 1216 (39.3)                         |
|                           | Master’s degree or above                                                | 188 (6.1)                           |
| Mother education level     | Primary school degree or below                                          | 50 (1.6)                            |
|                           | Middle school or below                                                  | 545 (17.6)                          |
|                           | High school or vocational secondary school degree                       | 448 (14.5)                          |
|                           | Vocational college degree                                               | 791 (25.6)                          |
|                           | Bachelor’s degree                                                       | 1126 (36.5)                         |
| Family annual income       | <500000 RMB                                                            | 299 (9.7)                           |
|                           | 50001–10,0000 RMB                                                       | 870 (28.1)                          |
|                           | 100,001–150,000 RMB                                                     | 820 (26.5)                          |
|                           | 150,001–300,000 RMB                                                     | 817 (26.5)                          |
|                           | >300,000 RMB                                                            | 285 (9.2)                           |
| Emotional neglect          | Yes                                                                     | 695 (22.5)                          |
|                           | No                                                                      | 2396 (77.5)                         |
| Physical neglect           | Yes                                                                     | 1371 (44.4)                         |
|                           | No                                                                      | 1720 (55.6)                         |
| Emotional abuse            | Yes                                                                     | 1476 (47.8)                         |
|                           | No                                                                      | 1615 (52.2)                         |
| Physical abuse             | Yes                                                                     | 1836 (59.4)                         |
|                           | No                                                                      | 1255 (40.6)                         |
| Community violence         | Yes                                                                     | 2161 (69.9)                         |
|                           | No                                                                      | 930 (30.1)                          |
| Peer bullying              | Yes                                                                     | 2052 (66.4)                         |
|                           | No                                                                      | 1039 (33.6)                         |
| Household dysfunction      | Yes                                                                     | 1154 (37.3)                         |
|                           | No                                                                      | 1937 (62.7)                         |
| Coparenting quality        |                                                                         | 4.01 ± 0.66                         |
| Problem behaviours         |                                                                         | 9.90 ± 4.52                         |
2.3. Statistical analysis

Two sections were used for the analysis. An LCA was performed to determine the parental ACEs patterns. Model parameterisation, parameter estimates, model identification, goodness of fit assessment, latent classes, and result interpretation are the primary LCA procedures (Collins & Lanza, 2009). The best model was discovered using six model fit indicators. First, Bayesian information criterion (BIC), sample-adjusted Bayesian information criterion (aBIC), and Akaike information criterion (AIC) were used. A better model fit was indicated by smaller values of these indicators (Muthén & Asparouhov, 2002). Second, entropy values between 0 and 1 were used to measure goodness of fit, with values closer to 1 indicating a better fit. Third, it was determined whether the k class was superior to the k-1 class based on the p-value using the Lo-Mendell-Rubin test (LMR) and the bootstrap likelihood ratio test (BLRT). Subsequently, moderation analyses were performed to examine the associations between patterns of parental ACEs, coparenting quality, and offspring behavioural problems. PROCESS macro was used to test the moderation model (Hayes, 2017), in which respondents were assigned to clusters based on their highest predicted cluster membership. The patterns of parental ACEs was considered multicategory variable. Continuous variables were centred around the mean to interpret significant interactions. SPSS (version 26.0; SPSS Inc., Chicago, IL, USA) and Mplus (version 8.0; Muthén and Muthén, Los Angeles, CA, USA) were used to analyze the data.

3. Results

3.1. Descriptive information

3091 parents responded the ACEs. The majority of respondents identified as mothers (n = 2588, 83.7%), married or cohabitating (n = 2993, 96.8%), were of professionals, officers, or owners of mid-sized businesses (father: 904, 29.3%; mother: 1006, 32.5%), had attained a bachelor’s degree (father: 1216, 39.3%; mother: 1126, 36.5%), and family incomes ranged from 50001 to 300000. Full information on the demographics of this sample may be found in Table 1. The prevalence rates of emotional neglect, physical neglect, emotional abuse, physical abuse, community violence, peer bullying, and household dysfunction were 22.5%, 44.4%, 47.8%, 59.4%, 69.9%, 66.4%, and 37.3%, respectively.

3.2. Latent class analysis

Table 2 presents the model fit information for the LCA of adverse parental childhood experiences. Models with 1–6 latent classes were considered. Although the p-value for LMR in model 6 vs model 5 is < 0.001 and BLRT in model 5 vs model 4 is < 0.001, the LMR in model 5 vs model 4 is 0.115 and BLRT in model 6 vs model 5 is 0.118, which means that model 6 is not better that model 5 and model 5 is not better than model 4. Previous study suggest that the BIC is superior to all other information criteria (Nylund et al., 2007).

The lowest BIC (24726.65) of 4-class model indicated that the 4-class model had the best fit. Figure 1 depicts the four identified latent classes. Latent class 1 was labelled as a high ACE class, which contained 40.3% (n = 1246) of the sample and had high probabilities for almost all types of ACEs. In 25.6% (n = 791) of the sample, latent class 2 was categorised as a child abuse and physical neglect group. These individuals are also more likely to be victims of child abuse and physical neglect than those in class 4. Latent class 3 was characterised by parents often experiencing community violence, peer bullying in childhood compared to class 4, which was labelled as a violence victimisation group with 13.2% (n = 408) of the sample. Latent class 4 was labelled as a low ACEs class, which contained 20.9% (n = 646) of the sample and had low probabilities for almost all types of ACEs.

3.3. Moderation model analysis

Table 3 presents the moderation results. Considering high ACEs as a reference group, a statistically significant low ACEs × coparenting quality interaction on offspring behavioural problems was found (B = −0.78, p = .01). However, we did not find significant violent victimisation × coparenting quality interaction (B = 0.02, p = 0.97) and child abuse and physical neglect × coparenting quality interaction (B = 0.54,
on offspring behavioural problems. Simple slope results are shown in Figure 2, and indicate that low ACEs class was associated with lower levels of offspring behavioural problems at low (B = −0.65, \( p = .02 \)), average (B = −1.17, \( p < .001 \)), and high level of coparenting quality (B = −1.68, \( p < .001 \)). The interaction effect was only found in low ACEs class, which suggested that the low ACEs class might experience the increase efficacy of coparenting quality.

4. Discussion

In line with previous research, this study identified four classes of parental ACEs: high ACEs group, child abuse and physical neglect group, violence victimisation group, low ACEs group (Bussemakers et al., 2019). The high ACEs class included the highest proportion (40.3%) of the sample, which means that parents in Anhui, China tended to experience different kinds of adverse experiences in their childhood. Significant associations between parental ACEs and offspring behavioural problems and the moderating effect of coparenting quality were found.

The present finding on the associations between patterns of parental ACEs and offspring behavioural problems was consistent with those of previous studies (Greene et al., 2020; Leve et al., 2005; Stargel & Easterbrooks, 2020). Compared to parents with high ACEs, preschool children whose parents belong to the low ACEs and violence violent victimisation class tend to have a low risk of behavioural problems. Parents who experience high-level ACEs may suffer from dysregulation of the hypothalamic–pituitary–adrenal (HPA) axis (Enlow et al., 2017), which may affect the critical period of fetal brain development, which may last until the child reaches adolescence (O’Donnell et al., 2013) and is thus associated with behavioural problems (Doi et al., 2021). Attachment theory also suggests that parents who encounter adversity as children may struggle to resolve their traumatic experiences and are more likely to use maladaptive strategies (Bowers & Yehuda, 2016), which

### Table 3. Moderation model for patterns of maternal ACEs, coparenting quality, and offspring behavioural problems.

| Predictors                                    | \( B \)  | \( p \)  | 95% CI       |
|-----------------------------------------------|---------|---------|--------------|
| Children age                                  | −0.03   | <.001   | [−0.04, −0.01]|
| Children Gender                               | −0.73   | <.001   | [−1.02, −0.45]|
| Parent age                                    | −0.07   | <.001   | [−0.10, −0.05]|
| Parental marital status                       | −0.98   | .02     | [−1.80, −0.16]|
| Family SES                                    | −0.20   | .04     | [−0.38, −0.01]|
| Class 1: high ACEs                            |         |         |              |
| Class 2: child abuse and physical neglect     | −0.48   | .07     | [−1.01, 0.04]|
| Class 3: violence victimisation               | −0.76   | <.001   | [−1.13, −0.40]|
| Class 4: low ACEs                             | −1.17   | <.001   | [−1.55, −0.79]|
| Coparenting relationship                      | −2.70   | <.001   | [−3.04, −2.36]|
| Class 2 × Coparenting relationship            | 0.02    | .97     | [−0.77, 0.80]|
| Class 3 × Coparenting relationship            | 0.54    | .07     | [−0.03, 1.11]|
| Class 4 × Coparenting relationship            | −0.78   | .01     | [−1.35, −0.22]|
| \( R^2 \)                                     | 0.21    |         |              |
| \( F \)                                       | 74.29***|         |              |
may cause offspring behavioural problems (Cooke et al., 2019). Parents who have witnessed violence during their own childhoods may have mental problems and increase the risk for perpetrating abuse, which can lead to the emergence of behavioural problems (Greene et al., 2020; Leve et al., 2005; Wade et al., 2016). Different with precious studies in western countries (Greene et al., 2020), we did not find the relationship between child abuse and physical neglect group parents and offspring behavioural problems. As the Chinese proverb that states, ‘Beating and scolding is the emblem of love,’ reflects the society’s acceptance of corporal punishment by parents (Liu et al., 2021). Responsible parents in China are viewed as parent with ‘seriousness and lack of affection.’ Therefore, the negative effect of childhood abuse and physical neglect may be mitigated in Chinese society (Chang et al., 2021).

Supporting the moderation hypothesis, results suggest that the low ACEs class might experience increase in the efficacy of coparenting quality. That is, with higher levels of coparenting quality those in the low ACEs class reported lower offspring behavioural problems. Parents who experience childhood adversity are at risk of hyperactivation and dysregulation of the stress response (Kalmakis et al., 2015), which may be caused by stress in parenting (Steele et al., 2016). Supportive coparenting with shared decision-making and less conflict can reduce parental stress (Fagan & Lee, 2014). High quality coparenting was also associated with less negative parenting caused by ACEs (Choi et al., 2019; Rowell & Neal-Barnett, 2022). However, individuals experienced high level of ACEs have been shown to increase neurophysiological sensitivity and erode the stress reactive and adaptive threshold, resulting in maladaptive coping methods (Pearlin et al., 2005). Important psychological resources are injured, leading to reduced levels of perceived social support (Nurius et al., 2016). Therefore, low ACEs class parents might experience increase in the efficacy of coparenting quality and high ACEs class parents might experience decrements in the efficacy of coparenting support.

This study enriches the understanding of how patterns of parental ACEs are associated with offspring behavioural problems and whether coparenting relationships play a buffering role in this relationship in a representative sample taken from Anhui province in China. Nevertheless, it had some limitations. First, despite the fact that retrospective and prospective ACE reports have converged (Reuben et al., 2016), retrospective reports of early encounters may still be less accurate due to the amount of time that has passed between the events and recall. Second, the fact that parents reported all variables in this study raises the possibility of bias. A variety of measurements will be useful for future research. Third, despite the fact that child sexual abuse is strongly linked to behavioural problems in children around the world (Linde-Krieger & Yates, 2018), this study examined participants’ actual adherence to the recommendations of previous studies (Wang et al., 2021). Furthermore, we did not include childhood sexual abuse due to the stigma and sensitivity associated with sexual victimisation in China. This fact may make the study less generalisable. Fourth, this study employed a cross-sectional study design. However, a longitudinal study may be preferable to produce more significant and trustworthy results. Finally, although entropy in this study is 0.66, and the values of 0.6 or higher indicating good class separation (Asparouhov & Muthén, 2014), some studies argued that above 0.8 is better (Weller et al., 2020). This study used the highest predicted cluster membership in the moderation model, the 0.66 entropy in this study may cause boundaries between the classes are fuzzy. Therefore, we suggest a more precise 3-step method can be used in the future study (Asparouhov & Muthén, 2014).

A limited but growing body of research on the generational transmission of adverse childhood experiences from parents to children suggests that protective factors must be investigated to break this risk transfer cycle. This study is the first to examine the associations between patterns of adverse childhood experiences and behavioural problems in Chinese preschool children, and the protective role of
coparenting quality in this intergenerational transmission. The findings highlight the need to devote more resources to supporting disadvantaged, at-risk parents to improve their children’s health, notably by providing an invention to improve coparenting quality.

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Ethics approval

This study was approved by the Ethics Committee of the Anhui Normal University (AHNU-ET2021034). The children’s parents were informed about the study’s objectives and processes, and had the right to withdraw from the study at any time.

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