

Childhood adversity and adulthood happiness: Evidence from Japan

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Abstract

In this study, we examined the impact of childhood interpersonal adversity on adulthood subjective well-being, with a focus on the mediating and moderating effects of social support and socioeconomic status (SES). We concentrated on parental maltreatment (abuse and neglect) and bullying in school as childhood adversity variables and on perceived happiness, life satisfaction, and self-rated health as adulthood subjective well-being measures. Our empirical analysis was based on micro data from a survey in municipalities in and around the Tokyo metropolitan area ($N = 3,292$). We obtained four key findings. First, the experience of childhood adversity had a substantial negative impact on adulthood subjective well-being. Second, social support and SES significantly mediated the impact of childhood adversity. Third, a large proportion of the impact of childhood interpersonal adversity was unexplained by social support and SES mediation effects. Fourth, no social support or SES variable moderated the impact of childhood interpersonal adversity. Hence, we can conclude that childhood interpersonal adversity affects adulthood subjective well-being in a relatively independent manner rather than being substantially mediated or moderated by social support or SES. Accordingly, social policies should aim at reducing incidents of childhood maltreatment and bullying in addition to helping people enhance levels of social support and SES in later life.

Keywords: Childhood adversity, adulthood subjective well-being, mediation analysis, Japan

1. Introduction

In this study, we examined the impact of childhood adversity on adulthood subjective well-being. Studies in the field of psychiatric epidemiology have demonstrated that childhood adversity is associated with higher risk of mental disorders in adulthood (Benjet et al. 2010; Kessler et al. 1997). We investigated how a general status of adulthood subjective well-being—such as perceived happiness, life satisfaction, and self-rated health—is affected by childhood adversity. It is reasonable to hypothesize that traumatic experiences in childhood negatively affect not only mental health but also more general subjective well-being in later life.

The current analysis is also expected to contribute new evidence to sociological research that addresses the related issues. Many studies have evidenced the impact of family income and other family background in childhood on adulthood outcomes (Duncan et al. 1998; Bowles et al. 2005). It is widely recognized that childhood poverty has a long-lasting impact in later life. In the current study, by contrast, we concentrated on the impact of childhood interpersonal adversity, such as parental maltreatment—physical abuse and neglect—and bullying in school, which has been largely understudied in sociological research.

This study also addresses the issue of the pathway or mechanism that links childhood adversity and adulthood subjective well-being. Favorable social support and higher levels of socioeconomic status (SES) may buffer or moderate the adverse impact of traumatic experiences in childhood (Schwarzer et al. 2004). Childhood interpersonal adversity is, however, also likely to reduce the chances of obtaining favorable social support or higher levels of SES (Hill et al. 2010). If that is the case, social support and SES may not only moderate but also mediate the impact of childhood adversity.

Psychiatric epidemiology and psychology studies have investigated the role of social support as a moderator and/or mediator of adulthood mental health, but results have generally been mixed (Seeds et al. 2010; Ford et al. 2011). Moreover, they have often treated SES as a control variable, leaving its moderating/mediating role largely unexplored. Meanwhile, sociological studies have shown evidence that

lower economic conditions in childhood lead to lower levels of adulthood SES and that lower SES has a negative impact on subjective well-being (Duncan and Brooks-Gunn 1997). In this study, we tentatively hypothesized that childhood interpersonal adversity affects adulthood subjective well-being in a relatively direct manner, even if the moderating or mediating effects of social support and SES are statistically significant. If this hypothesis is accepted, policies that aim at reducing incidents of childhood maltreatment and bullying should be given more focus.

We examined two hypotheses based on the micro data derived from a social survey conducted in municipalities in and around the Tokyo metropolitan area ($N = 3,305$): (1) parental maltreatment and peer bullying have a negative impact on adulthood subjective well-being and (2) their impact is relatively independent of social support and SES, rather than being substantially mediated or moderated by them. We applied an approach similar to that of previous psychiatric studies that demonstrated that childhood adversity is a key determinant of adulthood mental health. However, we focused on a more general status of subjective well-being to obtain findings that are of greater interest for happiness studies. Moreover, in order to identify the mediating/moderating effects of social support or SES, we employed a mediation analysis and estimated the regression models that reflected the interaction between childhood adversity and social support or SES.

2. Literature Review

It has been found that childhood interpersonal adversity contributes to the development of behavioral and psychological pathology and deteriorate health status in later life (Afifi et al. 2008; Afifi et al. 2009; Corso et al. 2009; Gilbert et al. 2009; Gladstone et al. 2006; Horwitz et al. 2001; Jansen et al. 2011; Weich et al. 2009). However, the mechanism or pathway that links childhood interpersonal adversity to mental health in later life is still under debate. Some researchers have provided evidence that social support moderates or buffers the negative impact of child adversity, albeit depending on gender, types of social support, and other factors (Collishaw et al. 2007; Pitzer and Fingerman 2010; Powers et al. 2009;

Shwartz et al. 2004).

In addition, social support, which is an interaction between individuals and the social environment, is likely affected by childhood interpersonal adversity. For example, an individual's perception of family support in adulthood may be influenced by his/her experience of abuse or neglect in childhood (Brown et al. 2008; Vranceanu et al. 2007). In addition, the sense of belonging in a social network may be negatively associated with experiences of peer bullying (Seeds et al. 2010). It is likely that perceived social support mediates rather than moderates the impact of childhood stressful events on mental health in adulthood. A deteriorated perception of social support is likely to lead to a higher risk of depression and other mental disorders in adulthood. Indeed, previous studies have stressed the mediating role of perceived social support (Hill et al. 2010; Seeds et al. 2010). Hence, it is not easy to characterize the role of social support. As a recent example, Ford et al. (2011) found no mediating or moderating effect of social relationships, although they observed that network size and negative aspects of close relationships mediate the impact of childhood interpersonal adversity.

It should also be noted that perceived social support is not the only potential moderator or mediator of childhood adversity. It is widely recognized that higher levels of SES in terms of one's own or household income, educational attainment, and occupational status tend to raise perceived happiness and life satisfaction (Frey and Stutzer 2002; Clark and Oswald 1994; Di Tella et al. 2001; Korpi 1997; Winkelmann and Winkelmann 1998). Therefore, it is likely that higher levels of SES moderate the impact of childhood adversity in addition to their direct effect on subjective well-being.

Similar to social support, however, SES is endogenous in nature and likely to be affected by stressful events in childhood. If that is the case, SES can be a mediator of childhood adversity as well. Previous studies have examined the effects of family income and family background in childhood on developmental outcomes in adolescence and on adult poverty outcomes. Corcoran (1995) and Haveman and Wolfe (1995) provided comprehensive surveys on this issue, and Duncan and Brooks-Gunn (1997) thoroughly examined the ways in which economic deprivation damages children during their

development. It is widely recognized that there are many possible ways for poverty to be transmitted from parents to children (Seccombe 2000; Seccombe and Ferguson 2006). In particular, it has been observed that family income is a key determinant of later-life outcomes for children (Duncan et al. 1998; Bowles et al. 2005). The same may be true, at least partly, for childhood interpersonal adversity; SES mediates the impact of childhood interpersonal adversity on adulthood subjective well-being.

An open question is to what extent social support and SES mediate and/or moderate the impact of childhood adversity on adulthood subjective well-being, even if their roles are statistically significant. Indeed, Carneiro and Heckman (2003) stressed a limited rate of return from education in children from poor families. Their analysis underscores the importance of family in creating a difference in both cognitive and non-cognitive abilities that shape success in life and points to the risk that school education cannot fully fill the ability gap between children from rich and poor families. Oshio et al. (2010) emphasized that the impact of child poverty on later-life outcomes is more or less direct and argued that its impact on poverty risks in adulthood cannot be entirely explained by its negative impact on educational attainment. Similarly, they showed that child poverty substantially reduces happiness and self-rated health on its own, not through current poverty or lower educational attainment.

Our empirical analysis provided evidence from Japan regarding these issues. In recent years, a growing number of empirical studies have been examining the impact of childhood adversity on mental health in Japan, including Fujiwara et al. (2011) as one of the most recent examples. To our best knowledge, however, little research discusses the association between childhood adversity and adulthood subjective well-being or the pathway that links them. The impact of childhood adversity in later life will potentially become a serious issue in the near future in Japan, judging by the remarkably high growth rate in the number of counseling cases related to child abuse and neglect in public child-counseling offices, which increased from 17,725 cases in 2000 to 55,152 in 2010 according to the Ministry of Health, Labour and Welfare.

3. Data

3.1 Survey and Sample

Our empirical analysis is based on the data derived from the survey of the Japanese Study of Stratification, Health, Income, and Neighborhood (J-SHINE). The J-SHINE survey was conducted during October 2010 and February 2011 in four municipalities in and around the Tokyo metropolitan area. The selection of survey sites was based on the cooperation of local governments. Survey participants were community residents aged 25 to 50 years and were randomly selected from voter registration lists. The questionnaire was self-administered using a computer-assisted personal interview unless the participants requested a face-to-face interview. The total sample size was 4,117 (response rate = 31.6%). We analyzed the data of 3,292 respondents and excluded 825 that had missing data, such as household income and key variables of childhood adversity and adulthood mental health. Table 1 summarizes the basic features of the sample and provides the prevalence or basic statistics of key variables used in this empirical analysis.

3.2 Childhood Interpersonal Adversity

We focused on three types of childhood adverse experience: physical abuse and neglect by parents and bullying in school. The survey asked the respondents about the experience of parental maltreatment before graduating from junior high school at age 15. More specifically, we utilized the reported answers (yes or no) to the questions “Were you often pushed, or had an object thrown at you, or hit by either of your parents?” (physical abuse) and “Did your parents often fail to provide necessary care, such as three meals a day, medical treatment, and other daily necessities?” (neglect). According to the survey, 6.5% and 2.2% of respondents experienced abuse and neglect, respectively, and 8.0% experienced at least one of them (see Table 1). Bullying during childhood was measured by a single item that asked whether respondents were bullied in any form, including psychological bullying (being ignored and isolated by peers), physical bullying (physical aggression and violence), and others (blackmail and loss of personal property), during their elementary and junior high school years (ages 7–14). If their responses were positive, they were asked how long they were bullied for in total. Having been bullied for twelve months

or longer was coded as having been bullied during childhood. Results indicated that 12.1% of respondents had experienced bullying in school (see Table 1).

3.3 Adulthood Subjective Well-being

We considered three measures of adulthood subjective well-being: perceived happiness, life satisfaction, and self-rated health. The survey asked the respondents “In general, how happy are you?” (perceived happiness) on a four-point scale, “In general, how satisfied are you with your life?” (life satisfaction) on a five-point scale, and “How do you assess your current health status?” (self-rated health) on a five-point scale. We coded the responses of the lowest two scores in each answer as perceived unhappiness, life dissatisfaction, and poor self-rated health. The results were 12.1%, 14.3%, and 10.7% respectively (see Table 1).

3.4 Social Support

We considered three types of perceived social support: emotional, instrumental, and negative support. The survey asked the respondents “How much helpful guidance do the following people give you when you have a problem or are in a trouble?” (emotional support), “how much practical support do the following persons give you when you need some help in your daily life?” (instrumental support), and “how often do the following persons irritate you?” (negative support). All items were based on a five-point scale (1 = *a lot*, 2 = *some*, 3 = *a little*, 4 = *never*, and 5 = *not applicable*). The questions were asked for each of the following sources of support: (i) the spouse/partner, (ii) other coresiding family members, (iii) non-coresiding family members or relatives, (iv) neighbors, and (v) friends. We reversed the order of responses, summed the reversed scores for each source of support, and divided the sum (ranging 5–25) into tertiles, to measure the level of perceived support for each type. The standardized internal consistency estimate was 0.95 for emotional support, 0.98 for instrumental support, and 0.95 for negative support.

3.5 Socioeconomic Status

We considered household income, educational attainment, and occupational status as SES variables. For

household income, respondents selected their household income from 15 income bands. We calculated a median for each band and equivalized the income by dividing by the root of the number of household members. We then divided the equivalized household income into quintiles. If a respondent did not report household income, we imputed their household income to individual income only if he/she was working, unmarried, and residing with a parent. Educational attainment consisted of three categories: graduated from (i) junior high school, (ii) high school, and (iii) college or higher educational institute. Occupational status had three categories: (i) regularly employed (including managers), (ii) non-regularly employed (such as part-time workers), and (iii) unemployed and others (including housewives and students).

3.6 Background Variables

As background variables, we first considered the respondent's retrospective assessment of their living standards at age 5, which were likely to confound the impact of childhood adversity, especially parental maltreatment, on adulthood subjective well-being. To the question "How was the living standard of your family when you were five years old?" participants responded on a five-point scale. We included the answers to these answers (using the lowest category as a reference) as control variables, although we recognized that they were not free from recall bias. In addition, we included age (25–29, 30–34, 35–39, 40–44, and 45–49), current family status (whether having a spouse or partner and whether having a child/children), and residential areas (binary indicator variables for each study site).

4. Method

We first overviewed the association between childhood interpersonal adversity and adulthood subjective well-being, based on a matrix that shows their distributions without controlling any other variables. For example, we examined how the prevalence of perceived unhappiness differed between those who had experienced parental abuse in childhood and those who had not.

Second, we examined the mediating roles of social support and SES by conducting three-step hierarchical probit regressions. The estimation results were expressed in terms of the "marginal effect"

(dy/dx) —that is, how an increase in each binary regressor (x) from 0 to 1 raises the probability of perceived unhappiness (y)—along with its standard error. In Model 1, we estimated the association between childhood interpersonal adversity and adulthood subjective well-being, controlling for background variables only. In Model 2, we added SES variables in the first model to determine any mediating effect of SES. If SES has a mediating effect, we would observe a substantial drop in the marginal effect and its statistical significance. In Model 3, we further added three types of social support variables to the second model, using their lowest tertiles as reference categories. If perceived social support were a key mediator after adjusting for background and SES variables, we would observe a substantial drop in the marginal effect and its statistical significance.

Third, we conducted the mediation analysis (Baron and Kenny 1986; Jasti et al. 2008; MacKinnon et al. 2007) to compute the proportion of the association mediated by social support and SES for each combination of childhood adverse experience and adulthood subjective well-being. We calculated the proportion of mediated association by comparing the rescaled coefficients on childhood adverse experience obtained with and without adding mediators to the probit regression model that predicts the adulthood subjective well-being.

Finally, we examined the moderating effect of perceived social support by adding the interaction term of childhood adversity with each of the social support and SES variables to Model 3, following Hill et al. (2010) and others. We denoted this model as Model 4. For example, suppose that we added the interaction term of abuse and the highest quartile of emotional support in the regression model to predict perceived unhappiness. If the interaction term had a negative and significant coefficient, then we can argue that emotional support moderated the negative impact of abuse on perceived happiness in adulthood. An alternative method would be to estimate the models that include all interaction terms. We estimated these models but did not provide their results because we found that their general patterns were almost the same as those in Model 4.

5. Results

We begin with an overview of the basic features of the sample, which are summarized in Table 2. As seen in this table, the respondents who had experienced parental maltreatment and bullying in school tended to report unhappiness and dissatisfaction with their life as well as poor self-rated health. The differences were all highly significant ($p < 0.001$), although it should be noted that the effects of other factors were not controlled in these analyses. For example, 24.3% of those who had been abused by parents in childhood felt unhappy, in contrast to 11.2% of those who had not. The difference was most prominent between those who had been neglected by parents and those who had not.

Table 3 summarizes the results of the three-step hierarchical probit regressions for the association between the experience of being abused by parents and perceived unhappiness. In Model 1, which controlled for background variables only, we observed a highly significant association between childhood abuse and adulthood unhappiness; if one had the experience of being abused by parents, the probability that he/she would feel unhappy in adulthood was estimated to rise by 8.4%.

When we added SES in Model 2, the marginal effect of abuse declined modestly to 7.7%, maintaining its statistical significance. Higher household income significantly reduced the probability of perceived unhappiness, while educational attainment did not matter. For occupational status, being unemployed or non-regularly employed raised the probability of perceived unhappiness. These findings suggest that SES, as represented by income and occupational status, mediates the impact of parental abuse to some extent. However, the fact that perceived unhappiness in adulthood remained highly associated with the experience of being abused by parents even after adjusting for SES suggests that the mediating effect of SES is not dominant.

When further adding six indicator variables for perceived social support in Model 3, we found that emotional and instrumental supports were negatively associated with perceived unhappiness, while negative support was positively associated with it. The marginal effect of abuse on perceived unhappiness dropped further to 6.0% but remained highly significant, suggesting that the impact cannot be explained

fully by mediation by social support.

We repeated the three-step hierarchical probit regressions for other measures of childhood adversities and adulthood subjective well-being and summarized the estimation results in Table 4. Model 1 confirmed strong associations between each type of childhood adversity and adulthood subjective well-being. Comparing the estimated marginal effects, we observed that the experience of being neglected by parents had the largest impact, while that of being bullied in school had the smallest. The impact of the experience of being abused by parents lay in between. When we controlled for SES in Model 2, the marginal effect on each well-being outcome declined modestly but maintained statistical significance in the association with each childhood interpersonal adversity except for the impact of bullying in school on life dissatisfaction. When we added social support in Model 3, we found a further decrease in the impact, and again, statistical significance was maintained across all combinations of childhood adversity and adulthood subjective well-being except for bullying and life dissatisfaction.

Table 5 presents the proportions of the impact of childhood interpersonal adversity mediated by social support and SES. For example, we found that social support and SES, when combined, mediated 40.4%, 33.2%, and 38.3% of the impact of abuse, neglect, and bullying, respectively on perceived unhappiness in adulthood. In other words, a substantial portion of the impact of abuse on perceived unhappiness in adulthood was unexplained by either social support or SES. The same was true for the impact on life satisfaction and self-rated health, although the mediating effect of social support and SES were most limited for the impact on self-rated health.

Comparing social support and SES, we observed that social support had a larger mediating effect than SES for perceived unhappiness and life dissatisfaction, except for the impact of neglect on poor self-rated health. By contrast, the mediating effect of SES was somewhat larger than that of social support for the impact of bullying. Finally, within the three types of social support, we found that negative social support tended to have a larger mediating effect than emotional and instrumental support, especially for abuse and neglect.

Finally, Tables 6 and 7 summarize the estimation results of Model 4, in which the interaction term of childhood adversity and each type of social support (Table 6) or SES variables (Table 7) was added to Model 3. The two tables provide only the estimated marginal effects of childhood adversity and its interaction terms to save space. For example, we observe from Table 6 that the experience of being abused by parents raised the probability of perceived unhappiness by 6.7%—which is slightly higher than 6.0% in Model 3 without the interaction term (see Table 4)—and that its interaction with receiving the highest tertile of emotional support reduces the probability by 4.4%. The negative sign of the interaction terms indicated a moderating effect. It was not statistically significant; however, it indicates that emotional support did not moderate the impact of abuse on perceived happiness. More generally, we illustrate in Tables 6 and 7 that the effects of interaction terms were not statistically significant in most cases with only one exception of neglect and negative support on perceived unhappiness. Although favorable social supports and higher SES levels per se were positively associated with subjective well-being as suggested in Table 3, their mediating and moderating effects were limited.

6. Discussions and Conclusion

In this study, we examined the impact of childhood interpersonal adversity on adulthood subjective well-being with a particular focus on mediating and moderating effects of social support and SES, using large-scale population data from Japan. Our analyses revealed four key findings.

First, the experience of childhood adversity had a substantial negative impact on adulthood subjective well-being. We observed that the experiences of being abused or neglected by parents and of being bullied in school significantly raised the possibility of feeling unhappy, being dissatisfied with life, and perceiving oneself to be unhealthy in adulthood. The experience of being neglected had a more adverse impact on subjective well-being than being physically abused or bullied. These results confirm that a negative association of childhood interpersonal adversity can be observed not only with adulthood mental health—as already evidenced from many psychiatric studies—but also with a general status of adulthood

subjective well-being. In addition, we found that interpersonal childhood adversity has a long-lasting impact in later life, similar to the impact of child poverty observed in the results of previous sociological research.

Second, our regression analysis confirmed that social support and SES significantly mediated the impact of childhood adversity. The estimated impact of each type of childhood adversity declined in response to the consecutive inclusion of social support and SES variables. These results are reasonable in general. The experience of interpersonal adversity in childhood is likely to make it difficult to sustain favorable relationships with others, which may reduce the chance of receiving positive social support, and it may in turn lower the levels of adulthood subjective well-being (Brown et al. 2008; Vranceanu et al. 2007). The same may be true for SES as well. Childhood interpersonal adversity may reduce the chances of achieving higher educational attainments, higher income, and more stable occupational status, which could further lead to lower levels of subjective well-being.

Third, our mediation analysis revealed that a large proportion of the impact of childhood adversity was unexplained by the mediation effects of either social support or SES. Their mediation effects, combined together, accounted for 15.9%–56.4% of the impact of childhood adversity depending on a combination of childhood adversity and adulthood subjective well-being. In particular, the proportion of the impact mediated was more limited for self-rated health than for perceived happiness and life satisfaction, suggesting that the latter two measures are generally more sensitive to socioeconomic factors and personal relationships with others than is self-rated health.

Fourth, our additional regression analysis, which added the interaction term of childhood adversity and social support and SES variables, confirmed that most types of social support and SES variables did not moderate the impact of childhood adversity. Although we found that higher levels of positive social support and SES were associated with subjective well-being, they did not significantly reduce the sensitivity of subjective well-being to childhood adversity.

The third and fourth findings, combined together, indicate that childhood interpersonal adversity

affects adulthood subjective well-being in a relatively independent manner rather than being substantially mediated or moderated by social support or SES. This has clear policy implications. If social support is a major mediator of childhood adversity, policies that aim to help individuals to obtain higher levels of positive social support can mitigate the negative impact of childhood adverse experience. Similarly, financial aid in school education and job training may break the chain between childhood adversity and subjective well-being if SES variables substantially mediate the impact of childhood adversity. However, on the contrary, the current study suggests that policy measures to enhance social support and SES levels cannot fully offset or moderate adverse consequences of interpersonal victimization in childhood. Rather, great emphasis should be placed on the policies that aim at reducing incidents of childhood maltreatment and bullying per se, in addition to helping people to enhance levels of social support or SES in later life.

We recognize that this study has several limitations in addition to the limited sample size. First, the experiences of childhood interpersonal adversity are based on the respondents' retrospective reports and may not be free from biases (Durrett et al. 2004; Hardt et al. 2006). Second, there may be another pathway connecting childhood adversity and adulthood subjective well-being. We focused on perceived social support and SES as social and psychological resources; however, factors such as social capital or its individual perception, social network, self-esteem, sense of control, and sense of coherence are also potential mediators (Shaw and Krause, 2002). Covering a wider range of potential mediators should increase the proportion of the mediated impact. Third, our analysis was based on a cross-sectional dataset, which made it difficult to identify any causality. It may be that lower levels of subjective well-being discourage individuals from receiving social support and obtaining higher SES levels (Maher et al. 2006). These limitations should be addressed in future research.

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Table 1. Basic features of the sample

Variables		All	Men	Women
Childhood adversity (%)				
Abused by parents		6.5	6.2	6.8
Neglected by parents		2.2	1.8	2.6
Bullied in school		12.1	11.4	12.8
Adulthood subjective well-being (%)				
Perceived unhappiness		12.1	16.0	8.4
Life dissatisfaction		14.3	17.4	11.4
Poor self-rated health		10.7	9.7	11.6
Social support				
Emotional support (range: 5–25)	Mean	14.2	15.1	13.4
	S. D.	(3.6)	(3.5)	(3.4)
Instrumental support (range: 5–25)	Mean	14.3	14.8	13.7
	S. D.	(3.6)	(3.7)	(3.4)
Negative support (range: 5–25)	Mean	19.6	20.1	19.1
	S. D.	(3.0)	(2.8)	(3.0)
Socioeconomic status (SES)				
Household income ('000 yen)	Mean	4,128	4,261	4,003
	S. D.	(2,501)	(2,520)	(2,478)
Educational attainment				
Junior high school		2.9	3.5	2.4
High school		39.6	38.3	40.9
College or above		57.4	58.2	56.6
Occupational status				
Regularly employed (incl. management)		54.4	80.4	29.9
Non-regularly employed		23.0	9.9	35.4
Self-employed		5.3	5.9	4.6
Unemployed		1.5	1.6	1.4
Others		15.9	2.2	28.8
Background variables				
Age (range: 25–50)	Mean	37.4	37.6	37.3
	S. D.	(7.1)	(7.1)	(7.2)
Family status (%)				
Having a partner		69.9	67.7	72.0
Having child(ren)		57.5	53.6	61.2
Retrospective assessment of living standard at age 5				

Very low	4.2	4.4	4.0
Low	15.9	16.1	15.7
Average	60.9	62.3	59.6
High	15.4	14.4	16.2
Very high	3.7	2.8	4.5
Residential area			
Area1	19.5	19.8	19.3
Area 2	23.3	23.5	23.1
Area 3	29.3	29.4	29.2
Area 4	27.9	27.3	28.5
Number of observations	3,292	1,599	1,693

Table 2. An overview of distributions of childhood interpersonal adversity and adulthood subjective well-being

	All	Abused by parents		Neglected by parents		Bullied in school	
		Yes	No	Yes	No	Yes	No
Adulthood subjective well-being (%)							
Perceived unhappiness	12.1	24.3	11.2	29.2	11.7	20.3	11.0
Life dissatisfaction	14.3	27.6	13.4	37.5	13.8	20.1	13.5
Poor self-rated health	10.7	25.2	9.7	34.7	10.7	17.3	9.8
Number of observations	3,292	214	3,078	72	3,220	399	2,893
(% proportion of total sample)	(100.0)	(6.5)	(93.5)	(2.2)	(97.8)	(12.1)	(87.9)

Note. Proportions of each adulthood subjective well-being outcome differ significantly between “Yes” and “No” for all types of childhood adversity ($p < 0.001$).

Table 3. Estimated impact of abuse by parents on perceived unhappiness in adulthood: three-step hierarchical probit regressions

Controlling for:	Model 1		Model 2		Model 3	
	Background variables ^a		Background variables + SES		Background variables + SES + social support	
	<i>dy/dx</i>	S. E.	<i>dy/dx</i>	S. E.	<i>dy/dx</i>	S. E.
Abused by parents	0.084 ^{***}	(0.018)	0.077 ^{***}	(0.017)	0.060 ^{***}	(0.017)
Social support						
Emotional support ^b						
Middle tertile					-0.057 ^{***}	(0.014)
Highest tertile					-0.077 ^{***}	(0.020)
Instrumental support ^b						
Middle tertile					-0.038 ^{**}	(0.014)
Highest tertile					-0.061 ^{***}	(0.020)
Negative support ^b						
Middle tertile					0.003	(0.014)
Highest tertile					0.086 ^{***}	(0.014)
Socioeconomic status (SES)						
Household income ^b						
2nd quintile			-0.033 ^{**}	(0.016)	-0.032 ^{**}	(0.016)
3rd quintile			-0.037 ^{**}	(0.015)	-0.034 ^{**}	(0.015)
4th quintile			-0.081 ^{***}	(0.019)	-0.078 ^{***}	(0.018)
5th quintile (highest)			-0.072 ^{***}	(0.018)	-0.068 ^{***}	(0.018)
Educational attainment ^b						
Junior high school			0.000	(0.027)	-0.006	(0.026)
High school			0.006	(0.011)	0.005	(0.011)
Occupational status ^b						
Non-regularly employed			0.037 ^{**}	(0.014)	0.032 [*]	(0.014)
Self-employed			0.022	(0.023)	0.014	(0.021)
Unemployed			0.157 ^{***}	(0.034)	0.138 ^{***}	(0.030)
Others			0.037	(0.019)	0.033	(0.018)
Pseudo R^2	0.1449		0.1747		0.2219	
Log pseudo likelihood	-1037.960		-1001.782		-944.437	
Number of observations	3,292		3,392		3,392	

Note: ^aBackground variables include demographics (gender and age), current family status (having a spouse/partner and child(ren)), retrospective assessments of living standards at age 5, and residential areas. Their estimation results are not reported to save space.

^bReference categories for each perceived social support, household income, educational attainment, and occupational status are lowest tertile, 1st quintile, college or above, and regularly employed, respectively.

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

Table 4. Estimated impact of parental maltreatment and bullying in school on subjective well-being

Controlling for:	Model 1		Model 2		Model 3	
	Background variables ^a		Background variables + SES		Background variables + SES + Social support	
	<i>dy/dx</i> ^b	S. E.	<i>dy/dx</i>	S. E.	<i>dy/dx</i>	S. E.
Abused by parents						
Perceived unhappiness	0.084 ^{***}	(0.018)	0.070 ^{***}	(0.017)	0.060 ^{***}	(0.017)
Life dissatisfaction	0.097 ^{***}	(0.020)	0.086 ^{***}	(0.019)	0.069 ^{***}	(0.019)
Poor self-rated health	0.099 ^{***}	(0.018)	0.092 ^{***}	(0.017)	0.085 ^{***}	(0.017)
Neglected by parents						
Perceived unhappiness	0.106 ^{***}	(0.030)	0.101 ^{***}	(0.029)	0.077 ^{**}	(0.030)
Life dissatisfaction	0.152 ^{***}	(0.032)	0.148 ^{***}	(0.031)	0.130 ^{***}	(0.031)
Poor self-rated health	0.135 ^{***}	(0.028)	0.128 ^{***}	(0.027)	0.118 ^{***}	(0.027)
Bullied in school						
Perceived unhappiness	0.052 ^{***}	(0.014)	0.042 ^{**}	(0.014)	0.036 ^{**}	(0.014)
Life dissatisfaction	0.037 [*]	(0.016)	0.026	(0.016)	0.019	(0.016)
Poor self-rated health	0.053 ^{***}	(0.014)	0.049 ^{***}	(0.014)	0.047 ^{***}	(0.014)

Note: ^aBackground variables include demographics (gender and age), current family status (having a spouse/partner and child(ren)), retrospective assessments of living standards at age 5, and residential areas.

^bThe change of the probability of each well-being outcome in response to an increase in each binary variable from 0 to 1.

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

Table 5. Estimated proportions of the impact of parental maltreatment and bullying in school on adulthood subjective well-being mediated by social support and socioeconomic status, adjusted for background variables^a

	Social support				SES	Total
	Emotional	Instrumental	Negative	Total		
Abused by parents	(%)					
Perceived unhappiness	6.2	2.0	19.2	27.4	13.0	40.4
Life dissatisfaction	5.3	0.6	16.3	22.2	16.2	38.4
Poor self-rated health	2.2	0.4	7.5	10.1	9.9	20.0
Neglected by parents						
Perceived unhappiness	4.8	4.5	18.1	27.4	5.8	33.2
Life dissatisfaction	3.3	1.6	11.9	16.8	2.1	18.9
Poor self-rated health	1.5	0.5	6.0	8.1	8.8	16.8
Bullied in school						
Perceived unhappiness	8.3	2.4	8.1	18.8	19.5	38.3
Life dissatisfaction	10.4	1.4	9.4	21.3	35.2	56.4
Poor self-rated health	2.5	0.5	3.5	6.5	9.4	15.9

Note: ^aBackground variables include demographics (gender and age), current family status (having a spouse/partner and child(ren)), retrospective assessments of living standards at age 5, and residential areas.

Table 6. Estimated impact of childhood interpersonal adversity and its interaction with social support on adulthood subjective well-being, adjusted for background variables, social support, and socioeconomic status (Model 4)

	Childhood adversity × Emotional support ^a		Childhood adversity × Instrumental support		Childhood adversity × Negative support	
	Main effect	Interaction	Main effect	Interaction	Main effect	Interaction
	dy/dx^b	dy/dx	dy/dx	dy/dx	dy/dx	dy/dx
Childhood adversity = Abused by parents						
Perceived unhappiness	0.067*** (0.019)	-0.044 (0.046)	0.058** (0.020)	0.009 (0.040)	0.079*** (0.024)	0.040 (0.034)
Life dissatisfaction	0.075*** (0.022)	-0.028 (0.048)	0.076*** (0.022)	-0.028 (0.046)	0.065** (0.027)	0.008 (0.038)
Poor self-rated health	0.093*** (0.020)	-0.035 (0.041)	0.093*** (0.020)	-0.030 (0.040)	0.092** (0.024)	-0.015 (0.034)
Childhood adversity = Neglected by parents						
Perceived unhappiness	0.094** (0.035)	-0.106 (0.083)	0.079* (0.034)	-0.009 (0.067)	0.140*** (0.040)	-0.127* (0.057)
Life dissatisfaction	0.156*** (0.037)	-0.112 (0.074)	0.137*** (0.036)	-0.027 (0.071)	0.105* (0.050)	0.050 (0.063)
Poor self-rated health	0.124*** (0.032)	-0.022 (0.063)	0.120*** (0.031)	-0.004 (0.063)	0.079 (0.040)	0.070 (0.055)
Childhood adversity = Bullied in school						
Perceived unhappiness	0.024 (0.015)	0.064 (0.032)	0.028 (0.015)	0.042 (0.032)	0.024 (0.017)	0.030 (0.029)
Life dissatisfaction	0.014 (0.018)	0.025 (0.038)	0.015 (0.018)	0.018 (0.037)	0.001 (0.021)	0.049 (0.033)
Poor self-rated health	0.052*** (0.016)	-0.022 (0.034)	0.036* (0.017)	0.041 (0.032)	0.048** (0.018)	-0.003 (0.030)

Note: ^aThe interaction term of childhood adversity and the highest tertile of each social support variable.

^bThe change of the probability of each well-being outcome in response to an increase in each binary variable from 0 to 1. The figures in the parentheses are robust standard errors.

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

Table 7. Estimated impact of childhood interpersonal adversity and its interaction with socioeconomic status on adulthood subjective well-being, adjusted for background variables, social support, and socioeconomic status (Model 4)

	Childhood × Household		Childhood × Educational		Childhood × Occupational	
	adversity	income ^a	adversity	attainment ^b	adversity	status ^c
	Main effect	Interaction	Main effect	Interaction	Main effect	Interaction
	dy/dx^d	dy/dx	dy/dx	dy/dx	dy/dx	dy/dx
Childhood adversity = Abused by parents						
Perceived unhappiness	0.044 ^{***}	0.047	0.058 [*]	0.004	0.075 ^{***}	-0.035
	(0.021)	(0.036)	(0.025)	(0.034)	(0.023)	(0.034)
Life dissatisfaction	0.077 ^{***}	-0.024	0.073 ^{**}	-0.008	0.085 ^{***}	-0.035
	(0.023)	(0.042)	(0.027)	(0.038)	(0.025)	(0.039)
Poor self-rated health	0.086 ^{**}	-0.005	0.096 ^{***}	-0.026	0.083 ^{**}	0.004
	(0.021)	(0.037)	(0.023)	(0.035)	(0.022)	(0.035)
Childhood adversity = Neglected by parents						
Perceived unhappiness	0.054	0.074	0.086 [*]	-0.020	0.086 [*]	-0.019
	(0.037)	(0.060)	(0.040)	(0.059)	(0.040)	(0.060)
Life dissatisfaction	0.115 ^{**}	0.048	0.144 ^{***}	-0.030	0.131 ^{**}	0.000
	(0.038)	(0.065)	(0.040)	(0.064)	(0.041)	(0.062)
Poor self-rated health	0.123 ^{***}	-0.014	0.152 ^{***}	-0.086	0.137 ^{***}	-0.041
	(0.033)	(0.058)	(0.034)	(0.059)	(0.036)	(0.056)
Childhood adversity = Bullied in school						
Perceived unhappiness	0.024	0.040	0.047 [*]	-0.021	0.023	0.027
	(0.017)	(0.029)	(0.020)	(0.028)	(0.020)	(0.028)
Life dissatisfaction	0.004	0.054	0.028	-0.017	0.032	0.018
	(0.019)	(0.034)	(0.023)	(0.032)	(0.022)	(0.032)
Poor self-rated health	0.030	0.054	0.035	0.022	0.051 ^{**}	-0.010
	(0.017)	(0.030)	(0.021)	(0.029)	(0.019)	(0.029)

Note: ^aThe interaction term of childhood adversity and the top two quintiles of household income.

^bThe interaction term of childhood adversity and having graduated from college or above.

^cThe interaction term of childhood adversity and being regularly employed.

^dThe change of the probability of each well-being outcome in response to an increase in each binary variable from 0 to 1. The figures in the parentheses are robust standard errors.

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