

# Child Maltreatment and Adult Living Standards at 50 Years

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abstract

**BACKGROUND AND OBJECTIVE:** Child maltreatment (abuse and neglect) has established effects on mental health. Less is known about its influence on adult economic circumstances. We aimed to establish associations of child maltreatment with such outcomes and explore potential pathways.

**METHODS:** We used 1958 British birth cohort data ( $N = 8076$ ) to examine associations of child neglect and abuse with adult (50 years) long-term sickness absence, not in employment, education or training (NEET), lacking assets, income-related support, poor qualifications, financial insecurity, manual social class, and social mobility. We assessed mediation of associations by 16-year cognition and mental health.

**RESULTS:** Abuse prevalence varied from 1% (sexual) to 10% (psychological); 16% were neglected. A total of 21% experienced 1 maltreatment type, 10% experienced  $\geq 2$  types. Sexual and nonsexual abuse were associated with several outcomes; eg, for sexual abuse, adjusted odds ratio (aOR) of income-related support was 1.75 (95% confidence interval [CI], 1.12–2.72). Associations were little affected by potential mediating factors. Neglect was associated with several adult outcomes (eg, aOR of NEET was 1.43 [95% CI, 1.10–1.85]) and associations were mediated by cognition and mental health (primarily by cognition): percent explained varied between 4% (NEET) to 70% (poor qualifications). In general, the risk of poor outcome increased by number of maltreatment types (eg, aOR for long-term sickness absence increased from 1.0 [reference] to 1.76 [95% CI, 1.32–2.35] to 2.69 [95% CI, 1.96–3.68], respectively, for 0, 1, and  $\geq 2$  types of maltreatment).

**CONCLUSIONS:** Childhood maltreatment is associated with poor midadulthood socioeconomic outcomes, with accumulating risk for those experiencing multiple types of maltreatment. Cognitive ability and mental health are implicated in the pathway to outcome for neglect but not abuse.



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**WHAT'S KNOWN ON THIS SUBJECT:** Child maltreatment (abuse and neglect) has established effects on long-term mental health. The extent to which broader adult life circumstances (eg, economic productivity) are affected and underlying child-to-adult pathways are less well understood due to scarcity of long-term follow-up.

**WHAT THIS STUDY ADDS:** Child maltreatment was associated with poor adult socioeconomic outcomes, with evidence of accumulating burden for those experiencing multiple maltreatments. Associations for neglect operated via cognition; associations for sexual and nonsexual abuse were little affected by adolescent cognition and mental health.

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Child maltreatment, encompassing abuse and neglect, is a major social welfare problem. Several consequences have been identified, including poor mental health, obesity, and poor cardiovascular profiles, with effects perpetuating into adulthood.<sup>1-4</sup> Although early-life socioeconomic disadvantage is known to affect adult circumstances in terms of economic productivity, including employment, and social mobility,<sup>5</sup> less is known about the influence of maltreatment on such outcomes.<sup>3</sup> Identifying influences on these outcomes is important, given their economic implications: for example, costs of long-term absences from work are substantial and shared between individuals, employers, and the government. Individuals suffer financial and social losses, becoming increasingly distanced from the labor market; UK employers pay £9 billion per year in sick-pay associated costs, and the government spends £13 billion per year on health-related benefits.<sup>6</sup> Therefore, reducing unfavorable outcomes is high on the policy agenda.<sup>6,7</sup>

The limited evidence available on associations between child maltreatment and adult socioeconomic outcomes comes from cross-sectional studies<sup>8,9</sup> or includes maltreatment cases that have been reported to authorities, which may be atypical of maltreatment in the general population.<sup>10</sup> Moreover, because child maltreatment is associated with poorer educational achievement and cognition,<sup>3,11</sup> we might expect less favorable social mobility patterns from class of origin, as well as less advancement over the individuals' working life. The deficits in cognitive abilities and behavioral adjustment observed in maltreated children<sup>11</sup> could represent important pathways to reduced economic circumstances in adulthood, given that such deficits have detrimental economic consequences.<sup>12-14</sup> It is important to improve understanding

of the full consequences of child maltreatment and likely explanations, partly because detrimental socioeconomic outcomes have implications for health<sup>15-18</sup> yet, to our knowledge, such associations have not been demonstrated.

Using a general population birth cohort, we aimed to establish the extent to which child maltreatment is associated with adult circumstances with respect to labor market participation, living standards, and social mobility, taking into account other early-life factors, such as parental education. We also examined potential mediating pathways via adolescent cognition and mental health. Specific outcomes included: long-term sickness absence; not in employment, education, or training; lacking assets; income-related support; poor educational qualifications; financial insecurity; manual social class and inter- and intragenerational social mobility to midadulthood. We examined neglect and (different types of) abuse separately to assess whether there were differential effects on outcomes and also examined associations for multiple types of maltreatment to assess the cumulative burden.

## METHODS

The 1958 British birth cohort is a longitudinal study of all individuals born in 1 week in March 1958, across England, Scotland, and Wales ( $n = 17\ 638$ ) and 920 immigrants with the same birth week.<sup>19</sup> Information was collected throughout childhood (at birth and at 7, 11, and 16 years) and adulthood (23, 33, 42, 45, and 50 years) from individuals, as well as parents, teachers and school doctors (childhood surveys) and nurses (at 45 years). Of the 11 971 invited, 9377 participated in the 45-year survey, with 9315 completing childhood maltreatment questions; of these, 8150 participated at 50 years (Supplemental Fig 1). Respondents

in midadulthood were broadly representative of the surviving cohort.<sup>20</sup> Ethical approval was given for various surveys, including at 50 years, by the London Multicentre Research Ethics Committee; informed consent was obtained from participants at various ages.

## Childhood Maltreatment

Neglect (prospective) was identified from information collected in childhood from parental interviews (usually the mother) and the child's teacher by using structured questionnaires (Table 1). Experience of emotional neglect and abuse (sexual, physical, psychological, or witnessing) during childhood (to 16 years) was reported at 45 years by using a confidential direct computer data entry questionnaire (Table 1).

## Adult Outcomes

Details of adult outcomes are given in Table 2. In brief, we identified 3 labor market groups from participant reports of their current economic activity: the (1) long-term sickness absence (LTS), (2) not in employment, education, or training (NEET), and (3) employed (full- or part-time as an employee or self-employed) or in education or training. Home ownership and receipt of income-related support were used as markers of assets/wealth. Education level was measured prospectively to 50 years. At 45 years, information on financial insecurity was ascertained. For social class and mobility, we used information on occupation collected at birth, 23 years, and 50 years to group nonmanual and manual classes. Social mobility was examined from (1) parent's class to own class at 50 years (intergenerational) and (2) own class at 23 to 50 years (intragenerational). For intergenerational mobility, we created 2 binary variables: (1) upward mobility from manual class at birth (versus stable manual);

**TABLE 1** Definition of Child Maltreatment and Representative Variables From the 1958 British Birth Cohort

	Definition <sup>3</sup>	1958 British Birth Cohort Variables <sup>a</sup>	Reference Age (y)	Age (y) Collected (Ascertainment Method)
Neglect (prospective) <sup>b</sup>	Failure to meet a child's basic physical, emotional, medical/dental, or education need; failure to provide adequate nutrition, hygiene, or shelter; or failure to ensure a child's safety.	Constructed from:		
		Child looks undernourished, scruffy or dirty.	7 and 11	7 and 11 (T)
		Hardly ever takes outings with mother.	7 and 11	7 and 11 (P)
		Hardly ever takes outings with father.	7 and 11	7 and 11 (P)
		Mother has little interest in education.	7 and 11	7 and 11 (T)
Emotional neglect <sup>c</sup>		Constructed from:		
		How affectionate was your mother toward you?	0–16	45 (S)
		How affectionate was your father toward you?	0–16	45 (S)
Sexual abuse	Any completed or attempted sexual act, sexual contact, or noncontact sexual interaction with a child by a caregiver.	I was sexually abused by a parent.	0–16	45 (S)
Physical abuse	Intentional use of physical force or implements against a child that results in, or has the potential to result in, physical injury.	I was physically abused by a parent: punched, kicked or hit or beaten with an object, or needed medical treatment.	0–16	45 (S)
Psychological abuse	Intentional behavior that conveys to a child that s/he is worthless, flawed, unloved, unwanted, endangered, or valued only in meeting another's needs.	I was verbally abused by a parent.	0–16	45 (S)
	UK definition includes harmful (unintentional) parent-child interactions: "the persistent emotional maltreatment of a child such as to cause severe and persistent adverse effects on the child's emotional development" <sup>21</sup>	I suffered humiliation, ridicule, bullying, or mental cruelty from a parent.		
Witnessing intimate partner violence	Any incident of threatening behavior, violence, or abuse (psychological, physical, sexual, financial, or emotional) between intimate partners or adult family members, irrespective of sex or sexuality	I witnessed physical or sexual abuse of others in my family.	0–16	45 (S)

P, parent report; S, self-report; T, teacher report.

<sup>a</sup> For retrospective reports at 45 years, information was obtained via direct computer data entry derived from the Personality and Total Health Through Life Project,<sup>22</sup> originating from the Parental Bonding Instrument,<sup>23</sup> British National Survey of Health and Development,<sup>24</sup> and the US National Comorbidity Survey.<sup>25</sup> Participants were instructed: "The following are statements about your childhood. For each, please say whether the statement applies to you." Response options were: "Yes," "No," or "Can't say."

<sup>b</sup> Neglect (prospective) defined as  $\geq 2$  items at either 7 or 11 years (note: at each age, if 1 or 2 items were missing, we used the sum of the remaining 4 or 3 items, respectively; if >2 items were missing, the variable neglect was treated as missing).

<sup>c</sup> Defined as either parent "not at all affectionate toward me."

and (2) downward mobility from nonmanual class at birth (versus stable nonmanual). Similar variables were created for intragenerational mobility (23–50 years).

Covariates were identified as early-life factors that influence socioeconomic destinations and included those related to socioeconomic background (ie, social class in 1958, parental education, household amenities, crowding, and tenure), birth (maternal age, birth weight, and birth order) and poor child health. Potential mediating factors included cognitive ability and mental health assessed at

16 years (indicated by reading/math tests and internalizing/externalizing behaviors, respectively, as in previous work<sup>11</sup>).

### Analysis

We used logistic regression to assess associations of each type of maltreatment with adult outcomes (labor market participation, living standards, and social class) separately. We tested the interaction between each type of maltreatment and sex; there was little evidence of effect modification, hence results are presented for sexes combined. We examined univariable associations

before adjusting for covariates (listed above). Next, because different types of maltreatment cooccur,<sup>27</sup> we assessed (1) associations for all types of maltreatment simultaneously and (2) 2-way correlations between maltreatment types. Mutual adjustment for 6 types of maltreatment may be overadjustment. Thus, we derived a score to represent the number of moderately correlated types of maltreatment (ie, pairwise correlation coefficients  $\geq 0.4$ ) and examined the score and other types of maltreatment simultaneously with outcomes. To assess possible

**TABLE 2** Details of Outcomes (Adult Socioeconomic Conditions), Covariates, and Potential Mediating Factors

	Age (y) (Ascertainment Method <sup>a</sup> )	Details
<b>Adult Socioeconomic Outcomes</b>		
LTS	23, 50 (S)	Current economic activity: sickness absence (23 y); permanently sick/disabled (50 y)
NEET	23, 50 (S)	Current economic activity: unemployed and seeking work or looking after the home or family
Lack of assets	50 (S)	Current status: non-home owner
Income-related support	50 (S)	Currently in receipt of $\geq 1$ targeted benefit or tax credit, including: housing benefit, council tax benefit, jobseeker's allowance, income support, working tax credit, and child tax credit (universal credits, such as child benefit, were excluded)
Financial insecurity	45 (S)	Affirmative answer to "During the last 6 months have you had a major financial crisis?"
Poor qualifications	Up to 50 (S)	Less than 0 level (broadly comparable to less than grade 10 in the United States)
Manual social class	23, 50 (S) <sup>a</sup>	current occupation coded according to the registrar general's social classification (a standard method of categorizing occupations in the United Kingdom) and categorized as nonmanual (professional/managerial, skilled nonmanual) or manual (skilled manual, partly skilled/unskilled)
<b>Covariates</b>		
Maternal age	Birth (P)	Age (y) at birth of cohort member in 1958
Birth weight	Birth (M)	kg
Birth order	7 (P)	1, 2, 3, $\geq 4$
Poor childhood health	7 (P)	Child has any physical handicap or disabling condition
Social class in 1958	Birth (P)	Father's occupation categorized as: professional/managerial, skilled nonmanual, skilled manual, partly skilled/unskilled/no male head
Parental education	Birth and 7 (P)	Both mother and father left school at the minimum leaving age
Household amenities	7 (P)	Lack of or sharing a bathroom, lavatory, or hot water
Household crowding	7 (P)	>1 person per room
Housing tenure	7 (P)	Owner occupier, renter, or other
<b>Potential mediating factors</b>		
Cognitive ability	16 (M)	Reading (selection of appropriate words to complete 35 sentences, parallel to the Watts-Vernon comprehension test) and mathematics (numerical and geometric questions with 27 multiple choice questions and 4 true-or-false questions) tests, administered at school. Tests were conducted over several months and were age standardized to 16 years. The two scores were converted to a scale of 0 to 100 and averaged. Examined as a single internally standardized z score (mean = 0, SD = 1). <sup>11</sup>
Mental health	16 (T)	Internalizing and externalizing behaviors on the Rutter Scale. <sup>26</sup> Examined as 2 internally standardized z scores (mean = 0, SD = 1).

M, measured or tests; P, parent report; S, self-report; T, teacher report.

<sup>a</sup> Social mobility was an additional outcome, using parent report at birth and self-report at 23 and 50 years.

mediation of associations by cognition and mental health, we used 2 methods in which these factors were modeled separately and combined: (1) in a series of adjusted models; and (2) in mediation analyses using inverse odds ratio (OR) weighting,<sup>28</sup> from which we obtained the "total effects" of maltreatment on outcomes and the "direct effects" that were not via potential mediator(s) (the percent of "total effect" explained was calculated). To investigate the cumulative burden of multiple types of maltreatment, we examined associations between the number of types (0, 1, and  $\geq 2$ ) and outcomes using a trend test.

In sensitivity analyses, we checked first whether child maltreatment

associations with adult (50 years) outcomes were replicated with similar outcomes, where available, at 23 years (ie, LTS, NEET, and social class). Second, we examined associations for NEET as 2 categories: unemployed seeking work and looking after home/family. Associations with outcomes were broadly similar for the 2 categories (data not shown), possibly because individuals may identify as home/family rather than unemployed, thus, associations for combined NEET groups are presented.

To investigate whether those maltreated in childhood were as likely as the nonmaltreated to be socially mobile, we estimated ORs for upward and downward mobility from class at birth (intergenerational

mobility). Specifically, we examined upward mobility among those who were from a manual background and downward mobility among those who were from a nonmanual class. Similar analyses were undertaken for intragenerational mobility.

Of the 8150 participants who completed the child maltreatment questions at 45 years and participated at 50 years, the number available for analysis was 8076 due to exclusions ( $n = 98$ ) with intellectual impairment assessed at 7 years and missing data ( $n = 5$ ) (Supplemental Fig 1). Social class and mobility analyses were restricted to those employed at 50 years ( $n = 7002$ ). Missing data ranged from 0.01% (education level) to 16% (23-year social class). To minimize

data loss, missing data were imputed by using multiple imputation chained equations. Following guidelines (to justify the plausibility of the missing-at-random assumption), imputation models included all model variables (including 23-year outcomes), plus main predictors of missingness (7-year behavior and cognitive ability).<sup>20</sup> Regression analyses were run across 20 imputed data sets and overall estimates were obtained. Imputed results were broadly similar to those obtained by using observed values; the former are presented.

## RESULTS

Prevalence of child maltreatment varied from 1% for sexual abuse to 6% for physical and witnessing abuse and 10% for psychological abuse; 11% experienced emotional neglect and 16% were identified as neglected (prospective) (Table 3). In midadulthood, outcomes, such as LTS, NEET, and financial insecurity, affected <1 in 10 of the population, whereas outcomes, such as income-related support, were more prevalent. Upward mobility from class of origin was common (44%), partly occurring as intragenerational mobility (23 to 50 years).

All types of child maltreatment, when examined separately, were associated with increased risk of adult LTS, NEET, lack of assets, and financial insecurity (Supplemental Table 6, Model 1). Associations attenuated after adjustment for covariates (Supplemental Table 6, Model 2); for example, the OR of LTS ranged from 2.50 (95% confidence interval [CI], 1.94–3.22) to 1.77 (95% CI, 1.34–2.33) for neglect (prospective). For LTS, NEET, and social class at 23 years, patterns of association were similar to those observed for the 50-year outcomes (Supplemental Table 7). A total of 21% of the population experienced 1 type of maltreatment and 10% experienced  $\geq 2$  types (Supplemental

Table 8). Except for qualifications and social class, the risk of unfavorable outcomes increased with the number of types of maltreatment (eg, adjusted OR for LTS increased from 1.0 to 1.76 [95% CI, 1.32–2.35] to 2.69 [95% CI, 1.96–3.68] [ $P_{\text{trend}} < 0.01$ ] for 0, 1, and  $\geq 2$  types, respectively).

When all maltreatment types were considered simultaneously (Supplemental Table 6, Model 3), associations with 50-year outcomes were reduced, particularly for emotional neglect and physical, psychological, and witnessing abuse. These 3 types of abuse were moderately correlated ( $r \geq 0.4$ ), whereas other types of maltreatment were less correlated ( $r < 0.3$ ); hence, we created a nonsexual abuse score (0, 1, and 2–3 types). In simultaneous analysis of neglect (prospective), emotional neglect, sexual abuse, and nonsexual abuse, both abuse measures were associated with lacking assets, income-related support, and financial insecurity (Table 4). Sexual abuse was also associated with poor qualifications and manual class, whereas nonsexual abuse was associated with LTS: the OR increased from 1.0 (reference) to 1.75 (95% CI, 1.22–2.51) to 2.10 (1.40–3.17) ( $P_{\text{trend}} < 0.01$ ), respectively, for 0, 1, and 2 to 3 types. For both abuse measures, associations with outcomes were generally little affected by cognition and mental health at 16 years (Table 4, Supplemental Table 9). Emotional neglect was associated with only 1 outcome (financial insecurity) and again, 16-year cognitive ability and mental health did not explain the association. Lastly, neglect (prospective) was associated with several outcomes (LTS, NEET, lacking assets, poor qualifications, and manual class); eg, the LTS OR was 1.69 (95% CI, 1.28–2.23) and the NEET OR was 1.43 (95% CI, 1.10–1.85). Associations were attenuated or abolished when cognition and

mental health were included in the models (Table 4) or considered as mediators (Supplemental Table 9). Hence, associations were mediated by these factors, with percent explained varying from 4% (NEET) to 70% (poor qualifications); in separate models for each mediator, the effect was mostly via cognition (percent explained range, 8%–67%; data not shown).

Neglect (prospective) and sexual abuse were associated with social mobility (Table 5). These groups were less likely to be upwardly mobile (move from manual to nonmanual class) both between and within generations (eg, neglect [prospective] OR, 0.45 [95% CI, 0.39–0.53] and 0.61 [95% CI, 0.50–0.74], respectively). The neglected (prospective) were also more likely to be downwardly mobile (move from nonmanual to manual class) between and within generations (OR, 2.31 [95% CI, 1.56–3.41] and 2.11 [95% CI, 1.63–2.74]). No clear social mobility patterns were found for nonsexual abuse.

## DISCUSSION

In this population-based study of child maltreatment and adult socioeconomic outcomes, we showed two important findings. First, there were long-term associations of childhood abuse and neglect with unfavorable outcomes in midadulthood across a range of important socioeconomic indicators, such as LTS and lacking assets. Associations were mostly robust after adjustment for other early-life factors, including social class and parental education, and risk of unfavorable outcomes increased with multiple types of maltreatment. Second, our study elucidates some important mechanisms underlying child maltreatment–adult outcome associations by showing that adolescent cognitive ability had a predominant mediating role in

**TABLE 3** Prevalence of Childhood Maltreatment, Adult Labor Market Participation, Living Standards, Social Class, and Mobility in the 1958 Birth Cohort (*N* = 3947 Males; 4129 Females)

	Males	Females	Total	<i>P</i> <sub>sex-difference</sub> <sup>a</sup>
	<i>N</i> (%)	<i>N</i> (%)	<i>N</i> (%)	
Child maltreatment (0–16 y)				
Neglect (prospective) <sup>b</sup>	634 (17.2)	574 (14.8)	1208 (16.0)	<.01
Emotional neglect	429 (10.9)	449 (10.9)	878 (10.9)	.99
Sexual abuse	18 (0.5)	97 (2.4)	115 (1.4)	<.01
Physical abuse	225 (5.7)	224 (5.4)	449 (5.6)	.59
Psychological abuse	314 (8.0)	462 (11.2)	776 (9.6)	<.01
Witness abuse	166 (4.2)	297 (7.2)	463 (5.7)	<.01
Labor market participation, living standards, and social class (at 50 y) <sup>c</sup>				
LTS	145 (3.9)	168 (4.7)	313 (4.3)	.10
NEET	144 (3.9)	420 (10.9)	564 (7.4)	<.01
Lack of assets <sup>d</sup>	532 (13.5)	566 (13.8)	1098 (13.7)	.79
Income-related support <sup>e</sup>	420 (13.2)	710 (18.0)	1130 (15.9)	<.01
Financial insecurity <sup>f</sup>	208 (5.4)	239 (6.0)	447 (5.7)	.32
Poor qualifications <sup>g</sup>	1308 (33.2)	1150 (27.9)	2458 (30.4)	<.01
Manual social class	1390 (39.0)	794 (23.2)	2184 (31.3)	<.01
Social mobility to age 50 y				
From class at birth (intergenerational)				<.01
Stable manual	1105 (32.0)	603 (18.1)	1708 (25.2)	
Upward from manual class	1251 (36.2)	1715 (51.6)	2966 (43.8)	
Stable nonmanual	858 (24.9)	835 (25.1)	1693 (25.0)	
Downward from nonmanual class	239 (6.9)	171 (5.1)	410 (6.1)	
From class at age 23 y (intragenerational)				<.01
Stable manual	993 (34.1)	313 (10.6)	1306 (22.2)	
Upward from manual class	632 (21.7)	382 (12.9)	1014 (17.3)	
Stable nonmanual	1108 (38.1)	1908 (64.4)	3016 (51.3)	
Downward from nonmanual class	177 (6.1)	361 (12.2)	538 (9.2)	

*N* varies due to missing data.

<sup>a</sup> *P* value from  $\chi^2$  test.

<sup>b</sup> At either 7 years and/or 11 years.

<sup>c</sup> Details in Table 2.

<sup>d</sup> Non-home owner.

<sup>e</sup> Receiving  $\geq 1$  targeted benefit or tax credit.

<sup>f</sup> Reported at 45 years.

<sup>g</sup> Less than 0 level (broadly comparable to less than grade 10 in the United States).

neglect (prospective) associations with several adult outcomes, whereas cognition and mental health had negligible mediating effects for sexual and nonsexual abuse associations.

Our study has several strengths, including prospectively measured mediating factors and a range of socioeconomic outcomes. Potential confounding factors were also recorded prospectively (eg,

family socioeconomic background [parental education, household tenure]). We cannot exclude the possibility of residual or uncontrolled confounding (eg, through inadequate measurement of relevant factors, such as parental cognitive capacities). Ascertainment of childhood maltreatment is not straightforward, with limitations noted for all methods,<sup>3</sup> including those used here. Our neglect measure

has the advantage of prospective ascertainment of some (failure to meet a child's basic physical, emotional, or educational needs) but not all aspects (eg, inadequate nutrition) of the conventional definition.<sup>3</sup> Multiple sources for neglect reporting (parent and teacher) may reduce misclassification,<sup>29</sup> and rather than relying on individual items, we used a composite score. Abuse by a parent up to 16 years was reported in adulthood; exclusion of abuse by others may lead to an underestimate of prevalence, and information is lacking on timing, frequency, and duration of abuse. Despite differences in study design, prevalence was generally within the ranges reported in a review<sup>3</sup> and were similar to another UK study.<sup>30</sup> The study's power to detect associations with sexual abuse was limited because there were few reported cases. Retrospective reports are common due to the lack of reliable alternative methods,<sup>3</sup> but concerns remain about validity<sup>31</sup> (eg, biases from rationalizing economic underachievement).<sup>32</sup> In this regard, our sensitivity analyses replicating associations for outcomes 2 decades before retrospective reports suggests that such biases are unlikely to be a major explanation for associations. Construct validity of retrospective reports is suggested by previous work showing expected associations with prospectively assessed family dysfunction<sup>33</sup> and poor mental health.<sup>11</sup> Abuse was reported blind to knowledge of our research questions, and most midadult outcomes (6 of 7) were assessed 5 years later (at age 50 years). Participants in midadulthood are generally representative of the surviving cohort<sup>20</sup>; we followed current guidelines for multiple imputation<sup>34</sup> to avoid loss from missing data.

Our study demonstrates associations for a breadth of maltreatments and adult outcomes measured decades later in midadulthood. The range

**TABLE 4** ORs (95% CIs) for Associations Between Types of Child Maltreatment and Adult Outcomes (Labor Market Participation, Living Standards, and Social Class) in the 1958 Birth Cohort

Adult Outcome		Neglect (Prospective)	Emotional Neglect	Sexual Abuse	Nonsexual Abuse <sup>a</sup>		
					0	1	2–3
LTS <sup>b</sup>	Unadjusted <sup>c</sup>	2.50 (1.94–3.22)	1.76 (1.30–2.39)	3.51 (1.93–6.36)	1	2.06 (1.47–2.89)	2.77 (1.93–3.98)
	Adjusted <sup>d</sup>	1.69 (1.28–2.23)	1.18 (0.84–1.65)	1.80 (0.95–3.42)	1	1.75 (1.22–2.51)	2.10 (1.40–3.17)
	+ 16-y cognition	1.23 (0.92–1.63)			1	1.87 (1.30–2.68)	2.31 (1.53–3.51)
	+ 16-y mental health	1.52 (1.15–2.02)			1	1.67 (1.17–2.40)	1.93 (1.28–2.92)
	+ 16-y cognition and mental health	1.19 (0.89–1.58)			1	1.80 (1.25–2.60)	2.18 (1.43–3.31)
NEET <sup>e</sup>	Unadjusted <sup>c</sup>	1.67 (1.32–2.13)	1.41 (1.09–1.82)	1.87 (1.07–3.25)	1	1.33 (0.99–1.79)	1.62 (1.17–2.24)
	Adjusted <sup>d</sup>	1.43 (1.10–1.85)	1.20 (0.92–1.58)	1.35 (0.75–2.43)	1	1.20 (0.89–1.63)	1.33 (0.93–1.90)
	+ 16-y cognition	1.29 (0.99–1.69)					
	+ 16-y mental health	1.37 (1.06–1.78)					
	+ 16-y cognition and mental health	1.27 (0.97–1.67)					
Lack of assets	Unadjusted <sup>c</sup>	2.27 (1.93–2.66)	1.44 (1.19–1.73)	2.60 (1.72–3.92)	1	1.51 (1.22–1.87)	1.78 (1.40–2.27)
	Adjusted <sup>d</sup>	1.68 (1.42–1.99)	1.13 (0.92–1.38)	1.62 (1.04–2.53)	1	1.31 (1.04–1.64)	1.36 (1.04–1.78)
	+ 16-y cognition	1.35 (1.13–1.61)		1.49 (0.95–2.33)	1	1.36 (1.08–1.70)	1.44 (1.10–1.89)
	+ 16-y mental health	1.55 (1.30–1.85)		1.56 (1.00–2.43)	1	1.27 (1.01–1.59)	1.28 (0.97–1.67)
	+ 16-y cognition and mental health	1.31 (1.10–1.57)		1.48 (0.94–2.31)	1	1.32 (1.05–1.66)	1.37 (1.04–1.80)
Income-related support	Unadjusted <sup>c</sup>	1.17 (0.97–1.40)	1.19 (0.98–1.44)	2.15 (1.41–3.27)	1	1.34 (1.08–1.67)	1.49 (1.16–1.91)
	Adjusted <sup>d</sup>	1.03 (0.85–1.24)	1.03 (0.84–1.27)	1.75 (1.12–2.72)	1	1.29 (1.03–1.61)	1.32 (1.00–1.74)
	+ 16-y cognition			1.68 (1.07–2.62)	1	1.31 (1.04–1.64)	1.35 (1.03–1.78)
	+ 16-y mental health			1.70 (1.09–2.66)	1	1.26 (1.01–1.58)	1.28 (0.97–1.69)
	+ 16-y cognition and mental health			1.66 (1.06–2.59)	1	1.29 (1.03–1.61)	1.32 (1.00–1.74)
Financial insecurity	Unadjusted <sup>c</sup>	1.31 (1.02–1.68)	2.37 (1.87–3.00)	2.95 (1.70–5.13)	1	2.42 (1.84–3.19)	2.24 (1.60–3.14)
	Adjusted <sup>d</sup>	1.16 (0.88–1.54)	1.86 (1.43–2.41)	1.86 (1.04–3.34)	1	2.02 (1.51–2.69)	1.56 (1.08–2.27)
	+ 16-y cognition		1.85 (1.43–2.40)	1.85 (1.03–3.32)	1	2.02 (1.52–2.70)	1.57 (1.08–2.27)
	+ 16-y mental health		1.84 (1.42–2.39)	1.84 (1.02–3.30)	1	2.00 (1.49–2.67)	1.53 (1.06–2.22)
	+ 16-y cognition and mental health		1.84 (1.42–2.39)	1.84 (1.02–3.30)	1	2.00 (1.50–2.67)	1.53 (1.06–2.23)
Poor qualifications	Unadjusted <sup>c</sup>	3.67 (3.22–4.18)	1.32 (1.14–1.53)	2.33 (1.61–3.38)	1	1.14 (0.95–1.35)	1.32 (1.07–1.61)
	Adjusted <sup>d</sup>	2.30 (1.99–2.66)	1.11 (0.94–1.32)	1.53 (1.00–2.34)	1	0.90 (0.73–1.09)	0.88 (0.69–1.12)
	+ 16-y cognition	1.37 (1.15–1.63)		1.27 (0.78–2.04)			
	+ 16-y mental health	2.07 (1.78–2.39)		1.44 (0.93–2.22)			
	+ 16-y cognition and mental health	1.32 (1.11–1.58)		1.25 (0.77–2.03)			
Manual social class	Unadjusted <sup>c</sup>	2.54 (2.22–2.91)	1.26 (1.07–1.48)	2.15 (1.37–3.36)	1	0.97 (0.79–1.18)	1.15 (0.90–1.45)
	Adjusted <sup>d</sup>	1.77 (1.53–2.06)	1.17 (0.97–1.40)	1.80 (1.11–2.93)	1	0.79 (0.64–0.98)	0.82 (0.63–1.07)
	+ 16-y cognition	1.26 (1.08–1.48)		1.68 (1.01–2.79)			
	+ 16-y mental health	1.64 (1.41–1.91)		1.78 (1.09–2.89)			
	+ 16-y cognition and mental health	1.23 (1.05–1.45)		1.68 (1.01–2.79)			

<sup>a</sup> Score for cumulative experience of physical, psychological, or witnessing abuse (0 = 86.8; 1 = 7.9%; 2–3 = 5.5%).

<sup>b</sup> LTS baseline = employed, in education or training.

<sup>c</sup> Results are presented for sexes combined because there was no evidence of differences in effect (ie, *P* value for maltreatment\*sex interaction  $\geq$  0.06); all associations are sex-adjusted.

<sup>d</sup> Additionally adjusted for covariates (maternal age, birth weight, birth order, poor childhood health, social class in 1958, parental education, household amenities, crowding, and tenure) and simultaneously for other types of child maltreatment.

<sup>e</sup> NEET baseline = employed, in education or training.

of outcomes is important because there is no single measure of socioeconomic position; indicators reflect different, although often related, characteristics<sup>35</sup> that may have specific limitations (eg, housing varies over time and geographically). The outcomes are important because of their costs to individuals and

society; for example, in Britain, ~140 million working days per year are lost from sickness absence<sup>6</sup> and 1.68 million are unemployed.<sup>36</sup> LTS is associated with premature mortality<sup>15–17</sup>, and worklessness is associated with poor physical and mental health<sup>18</sup> and with educational and economic outcomes

in subsequent generations.<sup>37</sup> Therefore, reduction of LTS and unemployment are policy priorities.<sup>6,7</sup> The timing of outcomes is also noteworthy; previous studies have examined socioeconomic outcomes in early adulthood<sup>38</sup> or used mixed age samples,<sup>8,9</sup> however, our findings for both early and later adulthood

**TABLE 5** ORs (95% CIs) for Associations Between Types of Child Maltreatment and (Inter- and Intragenerational) Social Mobility in the 1958 Birth Cohort

	Neglect (Prospective)	Emotional Neglect	Sexual Abuse	Nonsexual Abuse <sup>a</sup>		
				0	1	2–3
Intergenerational 0–50 y						
Upward versus stable manual	0.45 (0.39–0.53)	0.87 (0.71–1.06)	0.50 (0.30–0.85)	1	1.24 (0.98–1.57)	1.14 (0.86–1.53)
Downward versus stable nonmanual	2.31 (1.56–3.41)	1.15 (0.77–1.72)	1.85 (0.57–6.04)	1	0.93 (0.59–1.48)	0.95 (0.53–1.70)
Intragenerational 23–50 y						
Upward versus stable manual	0.61 (0.50–0.74)	0.96 (0.75–1.24)	0.47 (0.22–1.01)	1	1.46 (1.08–1.98)	1.30 (0.87–1.94)
Downward versus stable nonmanual	2.11 (1.63–2.74)	1.16 (0.85–1.58)	1.49 (0.71–3.13)	1	1.11 (0.81–1.53)	1.15 (0.76–1.74)

Results are presented for sexes combined as there was no evidence of differences in effect (ie, *P* value for maltreatment\*sex interaction  $\geq 0.10$ ); all associations are adjusted for sex and for other types of child maltreatment.

<sup>a</sup> Score for cumulative experience of physical, psychological, or witnessing abuse.

outcomes suggests that the impact of childhood maltreatment persists over decades: to our knowledge, this has not been demonstrated previously. An individual is close to peak earning capacity at age 50 years in the United Kingdom<sup>39</sup>; poor outcomes at this age (eg, lacking assets) may presage hardship and associated poor health during old age. Patterns of association were generally consistent across maltreatment types, and when multiple types were examined cumulatively, the greatest maltreatment burden was associated with the greatest risk of unfavorable outcomes. Findings for LTS and NEET are consistent with other studies showing that greater exposure to adverse childhood experiences is linked to inability to work<sup>8</sup> and unemployment<sup>8,9</sup> in US mixed-age samples. The observed magnitude of maltreatment–outcome associations is not negligible when compared with other influences: ORs for LTS varied between 1.4 to 2.3 for different maltreatments versus 2.2 for depression.<sup>40</sup> With few exceptions,<sup>9</sup> previous studies examine single (eg, sexual abuse<sup>38,41</sup>) or combined maltreatments without examining potential differential effects.<sup>8</sup> Nevertheless, our findings generally agree with the literature,<sup>10,38,41,42</sup> thereby adding credence to the growing evidence (especially given differences in maltreatment ascertainment methods). For example, the detrimental maltreatment associations with education, employment, and assets

in our general population agree with those for documented (ie, more extreme) maltreatment.<sup>10</sup> Our witnessing abuse findings are novel; to our knowledge, this has not been examined, although witnessing parental violence has been associated with lower adult income.<sup>42</sup> However, not all findings are consistent; for example, sexual abuse and education associations shown here agree with some<sup>43</sup> but not all<sup>38</sup> studies and sex differences<sup>10,41</sup> in associations were not replicated. Child neglect and sexual abuse, but no other maltreatments, were associated with social class at 50 years and, interestingly, these groups were less likely to be upwardly mobile across and within generations. These findings are consistent with more general observations on disadvantaged groups having less favorable mobility patterns, and they are important given policy commitments to lowering poverty and increasing social mobility.<sup>44</sup>

With regard to potential mechanisms underlying child maltreatment–adult outcome associations, we found support for the mediating effects of adolescent cognitive abilities and mental health in associations for neglect (prospective), where a predominant effect was observed for cognition. Such findings are as expected from the evidence of deficits in cognitive abilities and behavioral adjustment among maltreated children,<sup>11</sup> and the detrimental economic consequences related to

these deficits.<sup>12–14</sup> Our finding argues for support for remedial inputs for cognitive skills and the development of children who have been neglected, which may involve clinicians, child welfare, and other practitioners. Intriguingly, our results provide little support for the mediating effects of adolescent cognitive abilities or behavioral adjustment in the associations for sexual and nonsexual abuse. Explanations for this unexpected finding are not clear. Our cognitive and behavioral measures were prospectively assessed and of demonstrable relevance to neglect associations, but may not capture the most salient dimensions of abuse. Given these findings and the scarcity of other studies on potential mechanisms of child maltreatment–adult outcome associations, our study highlights the need for future research to confirm our results and to investigate additional mechanisms. This research is warranted to inform the direction of effective remedial strategies.

In conclusion, childhood abuse and neglect have long-term associations with detrimental outcomes in midadulthood, indicated by a range of socioeconomic measures. The risk of unfavorable outcome(s) was increased for those experiencing multiple types of maltreatment. Our findings suggest maltreated individuals grow up to experience socioeconomic disadvantage, which in turn may affect their health and that of the next generation. Our study therefore contributes to the evidence



base on the full long-term costs of child maltreatment, the elucidation of which is important to determine policy priorities. Prevention of maltreatment is a primary goal but represents an enormous challenge for which continued efforts are essential. In addition, investment in programs to alleviate the negative effects of maltreatment is needed. Our study suggests that one important target for action is the

maximization of cognitive skills and development of neglected children.

Studies nor the UK Data Service bear any responsibility for the analysis or interpretation of these data.

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#### ABBREVIATIONS

CI: confidence interval  
LTS: long-term sickness absence  
NEET: not in employment, education or training  
OR: odds ratio

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**Child Maltreatment and Adult Living Standards at 50 Years**  
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