



OPEN ACCESS

Adolescent mental health and subsequent parenting: a longitudinal birth cohort study

M Byford,¹ R A Abbott,² B Maughan,³ M Richards,¹ D Kuh¹

► Additional material is published online only. To view please visit the journal online (<http://dx.doi.org/10.1136/jech-2013-202997>).

¹MRC Unit for Lifelong Health and Ageing at UCL, London, UK

²Department of Psychiatry, University of Cambridge, Cambridge, UK

³Social Genetic and Developmental Psychiatry, Kings College London, London, UK

Correspondence to

M Byford, MRC Unit for Lifelong Health and Ageing at UCL, 33 Bedford Place, London WC1B 5JU, UK; m.byford@ucl.ac.uk

Received 17 June 2013

Revised 7 November 2013

Accepted 25 November 2013

Published Online First

19 December 2013

ABSTRACT

Background Adolescent mental health problems are associated with a range of adverse outcomes in adulthood but little is known about the effects on adult parenting practices. This study aimed to examine prospective associations between adolescent conduct and emotional problems and subsequent parenting behaviours in adulthood.

Methods The study sample comprised 1110 members from the MRC National Survey of Health and Development. Prospective data were collected from teacher reports of conduct and emotional problems at age 13 and 15 years and adult outcome measures of parenting included intellectual environment, cognitive stimulation, coercive discipline, parental interest and parental aspiration.

Results In regression models adjusted for the confounding effects of social background, cognition and education, adolescent conduct problems predicted coercive parenting behaviours in adulthood. The effects of adolescent emotional problems on the development of coercive discipline practices were explained by covariates. Likewise, the inability of parents who displayed conduct problems in adolescence to provide an intellectually stimulating home environment was fully explained by the adjustment for education.

Conclusions Adolescents who exhibit conduct problems are more likely to develop coercive styles of parenting.

childhood conduct problems and increased risk of physical punishment and lower levels of parental warmth and sensitivity.¹⁰ The Medical Research Council National Survey of Health and Development (NSHD) offers a valuable opportunity to extend these findings to a larger population-based cohort, where adult life chances in relation to childhood conduct and emotional problems have been investigated.^{4 5 11} We examined links between these childhood mental health problems and subsequent parenting of the next generation of this cohort, hypothesising that adolescent conduct problems would be associated with fewer cognitively stimulating activities, less affection and greater use of coercive discipline, and that adolescent emotional problems would be associated with lower levels of parental interest and affection towards their first-born offspring.

METHODS

Data source

The NSHD initially consisted of 5362 children, all births to non-manual and agricultural workers plus a random sample of manual workers selected from all single births within marriage that occurred in England, Wales and Scotland during 1 week in March 1946. This cohort has been followed up 22 times since birth. In 1969, a second-generation survey was undertaken which included 1690 first-born offspring (874 boys; 816 girls) who were born to male and female members of the NSHD cohort between 1965 and 1975.¹² For this survey, study members were interviewed by trained health visitors during home visits in the year their first-born child turned 4 and 8 years. Information was collected on a range of social, demographic and parenting variables. Response rates for the second-generation survey were high, ranging from 94% when cohort members were aged 22 years to 100% when they were aged 27 years. This study predated the local ethic committees and therefore ethical consent was assumed by participation.

Measures

Adolescent mental health (age 13–15 years)

Identification of conduct and emotional problems was based on questionnaires completed by form teachers when study members were aged 13 and 15 years, using a forerunner of the Rutter A scale.^{13 14} Items for conduct problems referred to unpunctuality, restlessness, truancy, daydreaming, indiscipline, disobedience and lying. Items for emotional problems referred to anxiety, timidity, fearfulness, diffidence and avoidance of attention.¹⁵ Previous studies using this cohort have created^{4 5 11} summary measures of these problems by deriving global measures for each

INTRODUCTION

Just over 10% of adolescents have clinically diagnosable mental health problems, of which conduct and emotional disorders are the most prevalent.¹ Prospective cohort studies have consistently shown that adolescent conduct problems are associated with a number of disadvantageous outcomes, including leaving school early, substance abuse, later crime and unemployment.^{2–4} Likewise, emotional problems in adolescence predict poor long-term outcomes such as impaired personal relationships, educational underachievement and adult mental disorders.⁵ Yet little is known about the parenting outcomes of individuals with a history of conduct and emotional problems. A large literature suggests that adult mental health problems are associated with a range of suboptimal parenting practices, such as hostility, higher rates of negative interactions,⁶ fewer positive parent–infant interactions,⁷ as well as the use of coercive discipline.⁸ Childhood conduct problems appear to be stable over time and persist into adulthood,⁹ but few studies have examined how these behaviours influence parenting practices in later life. One study found associations between increasing levels of



Open Access
Scan to access more
free content



CrossMark

To cite: Byford M, Abbott RA, Maughan B, et al. *J Epidemiol Community Health* 2014;**68**:396–402.

from factor analysis, then dividing scores for these into absent, mild and severe based on established centile cuts. For conduct problems, these were 0–75%, 75–93% and 94% or higher, respectively; and for emotional problems these were 0–50%, 50–87% and 88% or higher, respectively. For both sets of problems, the centile cut for ‘severe’ was guided by epidemiological evidence to capture potentially clinically diagnosable disorders.^{4 15}

Parenting (age 19–29 years)

Parenting variables were collected when study members were aged 19–29 years and were based on questions asked of mothers (study members or wives of study members) during home visits when their first-born offspring were aged 4 and 8 years (table 1). Summary measures were identified using confirmatory factor analysis (table 2). Individual items were retained if they had a loading near or over 0.35 and the number of factors was based on those with eigenvalues greater than one.¹⁶ At age 4, these factors were cognitive stimulation (data available for 94% of parent–offspring pairs) representing measures by parents to stimulate or teach their children, prior to starting formal education; and coercive discipline (94% available) representing parental use of threats and coercion to achieve desired behaviour. At age 8, the factors were intellectual environment (80% available) representing the reading culture in homes; and coercive discipline (79% available) representing parental use of threats and coercion to achieve desirable behaviour, as well as the frequency of inconsistent discipline. The questionnaire items identified by factor analysis were summed to create scores of 0–4 with higher scores representing higher levels for each behaviour. Three other questions asked of mothers that did not load strongly onto any of the factors were included: parental interest in school activities at age 8, based on teacher–parent meetings and discussions, ranging from 0 (no interest) to 4 (frequent parent–teacher contacts) (81% available); aspiration at age 8, based on wishes that the child should progress to some form of further education (82% available), ranging from 0 (no aspiration) to 4 (aspiration for university education) and affection (100% available), based on mothers’ reports of affection shown towards offspring by either the mother or the father at age 4 (yes=88%, no=12%) and age 8 (yes=69%, no=31%). The interviewer was less likely to ask certain question if the child was present in the room; this may account for some of the missing data.

Covariates

Social circumstances of origin can simultaneously influence risk of developing childhood mental health problems as well as parenting practices. Parental household social class was measured by the occupational social class of the fathers of study members, classified according to the British Registrar General system, and coded into professional, managerial and intermediate, skilled manual, semiskilled manual and unskilled.¹⁷ Since fathers were mostly in continuous, paid employment while many of the mothers had given up work or were working part time, the fathers’ social class was used as an indicator of the social circumstances of the spouse and offspring. Parental household social class was taken from mid-childhood (11 years) wherever possible or at age 4 or 15 years if this was unknown. If the social class of the fathers was unknown, that of the mothers was substituted if available. Adult social class was represented by the current or last Registrar General class of the husband when offspring were aged 4 years, or, if this was missing, age 8 years.

Childhood cognition correlates highly with childhood mental health problems¹⁸ and may also influence parenting style. Cognition was measured by four tests at age 11 years: (i) a

Table 1 Questions relating to parenting practices

Question	Age 4	Age 8
Have you (or your husband) taught X the alphabet?	■	
Have you (or your husband) taught X to count?	■	
Have you (or your husband) taught X to write?	■	
Have you (or your husband) taught X his/her colours?	■	
Have you tried to prepare X in any way for going to school?		■
Does your husband read or tell stories to X?	■	
Do you read or tell stories to X?	■	
Do you regularly take out books from the library?		■
Does your husband regularly take out books from the library?		■
Do you or your husband read for pleasure?		■
Does X use a lending library of any sort at all?	■	
Does X regularly take out books from the public library?		■
Does X regularly take out books from the school library?		■
Does X read for pleasure?		■
When X has been naughty do you ever send X out of the room or up to bed?	■	■
When X has been naughty do you ever keep X indoors or make X sit still?	■	■
When X has been naughty do you ever smack X?	■	■
When X has been naughty do you ever stop X sweets or not allow X to do something he/she enjoys?	■	■
When X has been naughty do you ever tell X you won’t love them if he/she behaves like that?	■	■
When X has been naughty do you ever say that you will send him/her away or that you’ll have to go away?	■	■
When X has been naughty do you ever try to frighten X with something like a policeman?	■	■
When X has been naughty do you ever threaten to use a stick or something like that?	■	■
Do you and your husband generally agree about dealing with X when he/she is naughty?*	■	■
On the whole, do you feel that where discipline is concerned that you are consistent?†		
If X has been especially good during the day, do you generally like to let X know?	■	
If you want X to be good on a particular occasion do you ever promise him/her anything in advance?	■	
Do you or your husband show affection towards X or are you fairly reserved?	■	■
Have you met X’s class teacher or head teacher during the past year?‡		■
Do you ever discuss X’s progress with the class teacher or head teacher?‡		■
At what age would you like X to leave school?§		

Responses were binary (Yes/No) unless otherwise stated.

*Item dichotomised to ‘Usually agree’ versus ‘Rarely agree’ and ‘Never agree’.

†Item dichotomised to ‘absolutely consistent’ and ‘fairly consistent’ versus ‘not very consistent’.

‡Responses: Yes, with class teacher; with head teacher; with both.

§Responses: 15 years, 16 years, 17 years, 18 years or later.

verbal and non-verbal test, where participants were asked to select an appropriate word or shape to complete 80 different series, yielding scores for Verbal Intelligence and Non-Verbal Intelligence; (ii) an arithmetic test comprising 50 addition, multiplication, subtraction and division sums; (iii) Word Reading and (iv) Vocabulary.¹⁹ All scores for participants with a valid score for each test were standardised to give a mean of 0 and a SD of 1, summed to create a total score representing overall cognitive ability at 8 years, then restandardised.²⁰

Educational attainment may mediate any association between childhood mental health problems and subsequent parenting practices. The highest educational or training qualifications

Table 2 Factor loadings, eigenvalues and cumulative variance for factor pattern of parenting practices at ages 4 and 8

G1 parenting practices	Factor 1	Factor 2
<i>Age 4</i>		
Cognitive stimulation ^a		
Parents taught child to count	0.95	0.095
Parents taught child to write	0.51	0.02
Parents taught child the alphabet	0.66	0.05
Parents taught child his/her colours	0.76	0.15
Coercive discipline ^b		
Parents told child they wouldn't love him/her	0.09	0.68
Parents disagreed about discipline practices	0.01	0.37
Parents threatened to call a policeman	0.12	0.67
Parents threatened to use a stick	0.10	0.52
Eigenvalues	2.25	1.32
Cumulative variance	0.62	0.98
<i>Age 8</i>		
Intellectual environment ^c		
Mother regularly took books out of the library	0.96	0.02
Father regularly took books out of the library	0.91	0.03
Parents read for pleasure	0.88	0.06
Child regularly took books out of the library	0.64	0.07
Coercive discipline ^d		
Parents told child they wouldn't love him/her	0.04	0.58
Parents disagreed about discipline practices	0.07	0.56
Parents used discipline inconsistently	0.13	0.68
Parents threatened to call a policeman	0.03	0.69
Parents threatened to use a stick	0.07	0.43
Eigenvalues	2.58	1.28
Cumulative variance	0.69	0.96

Data available for ^a 94%, ^b 94%, ^c 80%, ^d 79% of parent-offspring pairs.

achieved by age 26 were classified by the Burnham scale and recoded into none; vocational only; ordinary level ('O' levels or equivalent); advanced ('A' levels or equivalent) or higher qualifications (degree or equivalent).²¹

Statistical methods

Linear regression examined the association between adolescent mental health and parenting practices (intellectual environment, cognitive stimulation, coercive discipline and parental involvement). Adolescent mental health variables were entered as categorical variables (none, mild and severe problems), with the first of these categories serving as the reference. These analyses were performed in two stages. First, conduct and emotional problems were adjusted for each other only, given the high degree of co-occurrence between these two sets of problems.¹¹ Second (Model 2), coefficients were adjusted for parent and offspring sex, adolescent cognition, social class and educational attainment to estimate the effects of alternative explanatory variables. ORs were calculated to measure associations between adolescent mental health and parental affection at ages 4 and 8 (yes/no) using the same two-step approach.

The present analysis is based on a sample of 1110 study members for whom there was complete information on both adolescent conduct and emotional problems and adult parenting outcomes. This sample represents 66% of the parent-offspring pairs. To examine the effects of missing data on the representativeness of the sample, the obtained sample of 1110 was compared with the remaining 580 study members on a range of

sociodemographic measures. This analysis suggested that there were statistically significant ($p < 0.05$) tendencies for the obtained sample to under-represent children with lower cognitive capability scores at 11 years, as well as those with lower educational attainment and manual occupations in adulthood.

RESULTS

In the sample, 70 (6.3%) study members had severe conduct problems in adolescence, 183 (16.5%) had mild problems and 857 (77.2%) had no conduct problems. Just over 10% (121) of study members had severe emotional problems in adolescence, 414 (37.3%) had mild problems and 575 (51.8%) had no emotional problems. Table 3 summarises the descriptive characteristics of these three groups. Those with adolescent conduct problems were more likely to be boys, have a father from a manual social class, have lower cognitive scores, achieve lower educational and occupational outcomes and to report higher levels of coercive discipline. Those who displayed emotional problems in adolescence were more likely to be women, have lower cognitive scores and report higher levels of coercive discipline. In all cases, characteristics of those with mild conduct and emotional problems fell between those with severe or no problems.

Table 4 shows the associations between adolescent mental health and a range of parenting measures. Parents who displayed mild conduct problems in adolescence were less likely to provide an intellectually stimulating home environment, but these effects became non-significant after controlling for the covariates. The association was largely explained by education and social class which remained associated with the provision of an intellectual environment in Model 2. Adolescent conduct problems were associated with increased use of coercive discipline at ages 4 and 8 years and this effect remained for mild conduct problems after controlling for covariates in Model 2. Parents who displayed severe emotional problems in adolescence were more likely to use coercive discipline as parents, but this effect was explained in part by the addition of adult social class to Model 2 and also by adolescent conduct problems which continued to exert an effect in the adjusted models.

Table 5 shows that study members with severe emotional problems in adolescence were less likely to show affection towards their first-born child. This association was reduced to non-significance by the addition of adult social class and education.

DISCUSSION

In this prospective, population-based follow-up of 1110 adolescents through the transition to parenthood, individuals who displayed mild conduct problems according to their school teachers had a higher likelihood of developing coercive parenting behaviours in adulthood. These findings, although reduced, remained after adjustment for other important predictors of parenting, such as childhood cognition, social background and education. The deleterious effects of early conduct problems on the ability of parents to provide a stimulating home environment for their offspring were attenuated after adjustment for covariates. Likewise, severe emotional problems, indicative of adolescent depression and anxiety, were associated with harsh discipline practices, but these effects were explained by social class. Thus, this study suggests that a large component of the association between adolescent mental health and subsequent parenting is likely to reflect the negative trajectory that these early behaviours place individuals on in terms of limited educational qualifications and poor socioeconomic outcomes.

Table 3 Comparison of baseline characteristics of those with (mild or severe) or without conduct and emotional problems in adolescence

	Conduct problems			p Value*
	None (n=857)	Mild (n=183)	Severe (n=70)	
% Men	42	51	54	0.02
Cognitive ability (mean, SD)	0.18 (0.9)	-0.16 (0.9)	-0.28 (0.6)	<0.001
Parental social class (% manual)	66	70	75	0.08
Adult social class (% manual)	56	60	63	0.003
Education (% O levels/equivalent)	64	78	84	<0.001
Parenting				
Intellectual environment (mean, SD)	2.37 (1.3)	2.25 (1.3)	2.00(1.4)	0.1
Cognitive stimulation (mean, SD)	3.18 (0.8)	3.18 (0.8)	3.14 (0.8)	0.2
Coercive discipline (age 4) (mean, SD)	0.50 (0.7)	0.77 (0.8)	0.80 (0.9)	<0.05
Coercive discipline (age 8) (mean, SD)	0.49 (0.7)	0.75 (0.9)	0.77 (0.9)	<0.05
Parental interest (mean, SD)†	2.80 (0.9)	2.77 (1.1)	2.84 (0.9)	0.3
Parental aspiration (mean, SD)†	2.71 (1.7)	2.57 (1.7)	2.47 (1.7)	0.1
Parental affection age 4 (% yes) †	86	88	84	0.6
Parental affection age 8 (% yes) †	80	78	86	0.3
	Emotional problems			p Value*
	None (n=575)	Mild (n=414)	Severe (n=121)	
% Men	50	41	32	<0.001
Cognitive ability (mean, SD)	0.21 (0.8)	-0.16 (0.8)	-0.61 (0.7)	<0.001
Parental social class (% non-manual)	76	72	70	0.2
Adult social class (% non-manual)	53	51	60	0.01
Education (% O levels/equivalent)	65	70	74	0.3
Parenting				
Intellectual environment (mean, SD)	2.3 (1.3)	2.32 (1.3)	2.10 (0.9)	0.3
Cognitive stimulation (mean, SD)	3.2 (1.3)	3.19 (0.8)	2.22 (1.3)	0.1
Coercive discipline (age 4) (mean, SD)	0.56 (0.8)	0.52 (0.8)	0.75 (0.9)	<0.06
Coercive discipline (age 8) (mean, SD)	0.53 (0.7)	0.53 (0.8)	0.71 (1.0)	<0.05
Parental interest (mean, SD) †	2.86 (0.9)	2.79 (1.0)	2.71 (1.0)	0.4
Parental aspiration (mean, SD)†	2.67 (1.7)	2.73 (1.7)	2.52 (1.7)	0.2
Parental affection age 4 (% yes) †	87	88	86	0.8
Parental affection age 8 (% yes) †	80	82	71	0.02

*For difference between three groups.

†Not included in factor analysis.

These findings corroborate those of Jaffee *et al.*²² who found that negative associations between childhood conduct disorder and positive parenting were explained by social class, and that adolescent depressive and anxiety disorder did not predict later parenting practices. In another birth cohort analysis,¹⁰ early conduct problems remained associated with parental over-reactivity and physical punishment after adjustment for a range of potential confounders, including maternal education, poorer living standards and early motherhood. One possible explanation for this discrepancy may be the way in which conduct problems were defined. Raudino *et al.*¹⁰ included parent-reported and teacher-reported behaviours relating to defiance of authority, aggression, cruelty towards others and destruction of property. These measures vary from those used in this study and may be more similar to studies of adolescent aggression,²³ delinquency²⁴ and anti-social behaviour²⁵ which have shown associations with later negative parenting.

Several study limitations should be noted. Adolescent mental health data contain only teachers' assessments of the survey members' behaviour, with no information from the parents or the children themselves. However, teachers' assessments have

been shown to be better predictors of adolescents' functional impairment,²⁶ as well as future delinquent behaviour,²⁷ than assessments based on parent ratings. Given that certain negative parenting practices, such as harsh discipline, are more prevalent among teenage mothers,²⁸⁻²⁹ the prevalence of coercive discipline may be underestimated in this sample. Just 3% (50/1690) of parents were teenagers at the birth of their first-born offspring, and by the time parenting practices were first assessed 4 years later, all parents, including the wives of study members, were over 20 years of age. The parenting measures relied solely on reports from mothers on how they and their husbands interacted with their children, rather than using independent observations. Self-report measures could result in attenuated associations, since respondents may be unwilling to report socially undesirable information, thereby reducing confidence in the validity and reliability of the measures.³⁰ Nevertheless, research has shown that there is a correspondence between the self-reported child-rearing attitudes of mothers and their actual child-rearing behaviours.³¹⁻³² A further limitation of the study is the missing scores for adolescent mental health, particularly among those with poorer educational and occupational

Table 4 Regression coefficients with 95% CIs and *p* for trend, representing associations between adolescent conduct and emotional problems and subsequent parenting practices

	Model 1		p Value	Model 2+covariates	
		β (95% CI)		β (95% CI)	p Value
Conduct problems					
Intellectual environment (age 8)	Mild	-0.39 (-0.60 to -0.19)	<0.001	-0.14 (-0.33 to 0.05)	0.2
	Severe	-0.13 (-0.45 to 0.18)	0.4	0.20 (-0.11 to 0.51)	0.2
Cognitive stimulation (age 4)	Mild	0.05 (-0.09 to 0.18)	0.5	0.06 (-0.08 to 0.20)	0.4
	Severe	-0.01 (-0.21 to 0.19)	0.9	0.09 (-0.12 to 0.30)	0.4
Coercive discipline (age 4)	Mild	0.30 (0.17 to 0.43)	<0.001	0.17 (0.03 to 0.30)	0.01
	Severe	0.32 (0.13 to 0.52)	0.001	0.17 (-0.02 to 0.37)	0.08
Coercive discipline (age 8)	Mild	0.28 (0.16 to 0.41)	<0.001	0.17 (0.04 to 0.30)	0.009
	Severe	0.24 (0.05 to 0.44)	0.01	0.13 (-0.06 to 0.32)	0.2
Parental interest (age 8)	Mild	-0.10 (-0.26 to 0.06)	0.2	0.01 (-0.16 to 0.18)	0.9
	Severe	-0.04 (-0.30 to 0.19)	0.6	0.11 (-0.15 to 0.37)	0.4
Parental aspiration (age 8)	Mild	-0.11 (-0.39 to 0.16)	0.4	0.05 (-0.23 to 0.33)	0.7
	Severe	0.05 (-0.34 to 0.23)		0.01 (-0.42 to 0.43)	0.9
Emotional problems					
Intellectual environment (age 8)	Mild	-0.04 (-0.21 to 0.12)	0.6	0.07 (-0.09 to 0.21)	0.5
	Severe	-0.11 (-0.36 to 0.15)	0.4	0.08 (-0.16 to 0.33)	0.7
Cognitive stimulation (age 4)	Mild	-0.01 (-0.11 to 0.10)	0.9	0.02 (-0.09 to 0.13)	0.8
	Severe	-0.10 (-0.27 to 0.06)	0.2	-0.06 (-0.22 to 0.12)	0.5
Coercive discipline (age 4)	Mild	0.01 (-0.08 to 0.12)	0.7	-0.04 (-0.15 to 0.05)	0.4
	Severe	0.22 (0.07 to 0.38)	0.005	0.13 (-0.03 to 0.29)	0.1
Coercive discipline (age 8)	Mild	0.03 (-0.08 to 0.13)	0.5	-0.01 (-0.11 to 0.09)	0.8
	Severe	0.20 (0.04 to 0.35)	0.01	0.10 (-0.05 to 0.26)	0.2
Parental interest (age 8)	Mild	-0.07 (-0.20 to 0.05)	0.3	-0.06 (-0.19 to 0.08)	0.4
	Severe	-0.15 (-0.35 to 0.05)	0.1	-0.13 (-0.33 to 0.07)	0.2
Parental aspiration (age 8)	Mild	0.04 (-0.18 to 0.26)	0.7	0.09 (-0.13 to 0.31)	0.4
	Severe	-0.11 (-0.44 to 0.22)	0.5	-0.07 (-0.42 to 0.27)	0.7

Coefficients represent the mean difference in parents with mild and severe conduct and emotional problems versus those with none.

Model 1: adolescent conduct and emotional problems mutually adjusted only; Model 2: additionally adjusted for covariates: Parent and offspring sex, adolescent cognition, social class and educational attainment. Coefficients in bold are significant at the 5% level. The results of full models available online (tables S1 and S2).

outcomes. Given the association between adolescent conduct problems and leaving school early and unemployment,³ it is likely that the levels of mental health problems are underestimated in this cohort of adolescents and therefore findings may be conservative estimates of the effect of conduct problems on later parenting practices. In addition, this study was unable to

distinguish between those individuals whose conduct problems emerge in early life and persist into adulthood with major adverse social, physical and health consequences from those whose conduct problems are limited to adolescence and represent relatively temporary, near normative behaviour.³³ Likewise, it has been shown that the risk of poor adult outcomes

Table 5 ORs with 95% CIs and *p* for trend, representing associations between adolescent conduct and emotional problems and subsequent parental affection

	Model 1		p Value	Model 2+covariates	
		OR (95% CI)		OR (95% CI)	p Value
Conduct problems					
Parental affection age 4	Mild	1.01 (0.61 to 1.68)	0.9	1.17 (0.68 to 2.02)	0.6
	Severe	0.69 (0.35 to 1.38)	0.3	0.84 (0.40 to 1.76)	0.6
Parental affection age 8	Mild	0.85 (0.58 to 1.28)	0.5	0.88 (0.58 to 1.36)	0.6
	Severe	1.52 (0.74 to 3.15)	0.3	1.53 (0.70 to 3.35)	0.3
Emotional problems					
Parental affection age 4	Mild	1.08 (0.72 to 1.61)	0.4	1.28 (0.83 to 1.96)	0.3
	Severe	0.88 (0.49;1.59)	0.7	10.5 (0.56;1.98)	0.9
Parental affection age 8	Mild	1.15 (0.82 to 1.60)	0.4	1.28 (0.89 to 1.83)	0.2
	Severe	0.61 (0.39 to 0.96)	0.03	0.69 (0.42 to 1.12)	0.1

ORs represent the likelihood of affection in study members who displayed mild and severe mental health problems in adolescence compared versus those with none.

Model 1: adolescent conduct and emotional problems mutually adjusted only; Model 2: additionally adjusted for covariates: parent and offspring sex, adolescent cognition, social class and educational attainment. Coefficients in bold are significant at the 5% level. The results of full models available online (table S3).

following depression may differ according to the age of onset⁵ for which insufficient information was available in this study. Thus, the measures of conduct and emotional problems may lack power to identify those presenting with the most severe problems. This may explain why no long-term effects of adolescent emotional problems on parenting practices were observed and why mild but not severe conduct problems predicted the use of coercive discipline.

The study has a number of strengths. These findings are derived from a large cohort study which includes mothers and fathers and provides prospective ratings of adolescent mental health and a wide range of important covariates assessed across the life course. In addition, a range of parenting practices, which were measured at least 4 years after those for adolescent mental health, were well characterised across early offspring childhood. Since only first-born offspring were included, any sibling-order effects were eliminated.

These results extend the body of evidence linking adolescent conduct problems with a wide range of adverse outcomes to include the development of negative parenting behaviours, most notably coercive discipline. Coercive styles of parenting are associated with poorer cognitive outcomes in offspring³⁴ and may teach children negative styles of interpersonal behaviour that interfere with academic performance and peer relationships.⁸ A large proportion of young people who display conduct problems will go on to be antisocial adults.³ There is also evidence that parental conduct problems are associated with impaired parenting behaviours that in turn influence risks of conduct problems in offspring,³⁵ thus perpetuating an intergenerational cycle of disadvantage.

Since these data were collected in the 1960s, parenting, and what defines good parenting, has changed. For example, there has been a widespread decline in the reported acceptance of harsh punishment while parental involvement in education has increased. Furthermore, the context of parenting has changed with the rise in family break-up and increase in maternal employment, factors which may impact socioeconomic background as well as the time available for positive parent-child interactions.³⁶ The intervening decades have also seen a rise in the prevalence of adolescent conduct and emotional disorders.³⁷ It is impossible to relate the results of this study to current definitions of parenting, but it is clear from this and other^{2-5, 10} research that conduct and emotional problems in adolescence place individuals on a negative trajectory characterised by poorer educational outcomes and employment opportunities, as well as the increased risk that mental health problems will persist into adulthood. Combined, these factors diminish parental ability to provide a developmentally appropriate learning context and predispose parents to rely on methods of harsh and coercive discipline.

A range of strategies have shown potential to reduce levels of childhood conduct problems. These include parent training programmes and school-based programmes aimed at improving the classroom and home management of children with conduct difficulties.³⁸ The findings from this study suggest that part of the association between adolescent mental health and parenting is likely to be mediated by social background and educational attainment. Evidence suggests that adolescent conduct problems select individuals into environments likely to be marked by high rates of stress³⁹ which in turn may promote irritability and anxiety and increase the likelihood of harsh parenting. For example, early conduct problems may lead to affiliations with deviant peer groups which in turn lead to increased risks of crime, substance abuse and mental health problems³ and these

factors hinder academic progress and limit employment opportunities. Thus, it is likely that pathways linking adolescent misconduct with the long-term capacity of individuals to provide optimal caregiving environments involve multiple mechanisms across the life course. Efforts aimed at improving the long-term parenting outcomes of adolescents who display mental health problems should therefore encompass a broad set of factors aimed at improving socioeconomic inequalities, improving persistence in education and addressing individual developmental difficulties.

What is already known on this subject?

- ▶ Previous research has shown a relation between adolescent conduct and emotional problems and multiple adverse outcomes in adulthood.
- ▶ However, much remains unclear about the prospective association between mental health problems that begin in adolescence and the subsequent development of parenting skills.

What this study adds

- ▶ Within a large population-based cohort, adolescent conduct problems predicted the use of coercive styles of discipline in adulthood.
- ▶ The associations remained after the addition of other important predictors of parenting to the regression analyses, including cognition, social class and education.
- ▶ Early interventions aimed at preventing and treating adolescent mental health problems could have lasting effects on the quality of parenting provided to subsequent generations.

Contributors All the authors contributed to the conception and design of the study. MB drafted the article and performed the statistical analysis with guidance from RAA and MR who, along with BM and DK contributed to the interpretation of the data. All authors approved the manuscript, and MB is the guarantor of the paper.

Competing interests None.

Provenance and peer review Not commissioned; externally peer reviewed.

Open Access This is an Open Access article distributed in accordance with the Creative Commons Attribution Non Commercial (CC BY-NC 3.0) license, which permits others to distribute, remix, adapt, build upon this work non-commercially, and license their derivative works on different terms, provided the original work is properly cited and the use is non-commercial. See: <http://creativecommons.org/licenses/by-nc/3.0/>

REFERENCES

- 1 Green H, McGinnity A, Meltzer H, *et al.* *Mental health of children and young people in Great Britain, 2004*. London: Palgrave, 2004.
- 2 Fergusson DM, Horwood LJ. Early conduct problems and later life opportunities. *J Child Psychol Psychiatry* 1998;39:1097-108.
- 3 Fergusson DM, Horwood LJ, Ridder EM. Show me the child at seven: the consequences of conduct problems in childhood for psychosocial functioning in adulthood. *J Child Psychol Psychiatry* 2005;46:837-49.
- 4 Colman I, Murray J, Abbott RA, *et al.* Outcomes of conduct problems in adolescence: 40 year follow-up of national cohort. *BMJ* 2009;338:a2981.

- 5 Colman I, Wadsworth ME, Croudace TJ, *et al.* Forty-year psychiatric outcomes following assessment for internalizing disorder in adolescence. *Am J Psychiatry* 2007;164:126–33.
- 6 Lovejoy MC, Graczyk PA, O'Hare E, *et al.* Maternal depression and parenting behavior: a meta-analytic review. *Clin Psychol Rev* 2000;20:561–92.
- 7 Paulson JF, Dauber S, Leiferman JA. Individual and combined effects of postpartum depression in mothers and fathers on parenting behavior. *Pediatrics* 2006;118:659–68.
- 8 Bor W, Sanders MR. Correlates of self-reported coercive parenting of preschool-aged children at high risk for the development of conduct problems. *Aust N Z J Psychiatry* 2004;38:738–45.
- 9 Kim-Cohen J, Caspi A, Moffitt TE, *et al.* Prior juvenile diagnoses in adults with mental disorder: developmental follow-back of a prospective-longitudinal cohort. *Arch Gen Psychiatry* 2003;60:709–17.
- 10 Raudino A, Woodward LJ, Fergusson DM, *et al.* Childhood conduct problems are associated with increased partnership and parenting difficulties in adulthood. *J Abnorm Child Psychol* 2012;40:251–63.
- 11 Richards M, Abbott RA, Collis G, *et al.* *Childhood mental health and life chances in post-war Britain: insights from three national birth cohort studies.* Centre for Mental Health London, 2009.
- 12 Wadsworth ME. Effects of parenting style and preschool experience on children's verbal attainment: results of a British longitudinal study. *Early Child Res* 1986;1:237–48.
- 13 Rutter M, Tizard J, Whitmore K. *Education, health and behaviour.* London: Longman, 1970.
- 14 Elander J, Rutter M. Use and development of the Rutter parents' and teachers' scales. *Int J Methods Psychiatr Res* 1996;6:63–78.
- 15 Rodgers B. Behaviour and personality in childhood as predictors of adult psychiatric disorder. *J Child Psychol Psychiatry* 1990;31:393–414.
- 16 Jolliffe I. *Principal component analysis.* 2nd edn. New York: Springer, 2002.
- 17 Office of Population Censuses and Surveys. *Classification of Occupations.* London: HMSO, 1970.
- 18 Maughan B, Carroll J. Literacy and mental disorders. *Curr Opin Psychiatry* 2006;19:350–4.
- 19 Pigeon DA. Tests used in the 1954 and 1957 surveys. In: Douglas JWB. *The home and the school.* (Appendix 1) London: Granada, 1964.
- 20 Richards M, Hardy R, Kuh D, *et al.* Birth weight and cognitive function in the British 1946 birth cohort: longitudinal population based study. *BMJ* 2001;322:199–203.
- 21 Department of Education and Science. *Burnham Further Education Committee grading courses.* London: HMSO, 1972.
- 22 Jaffee SR, Belsky J, Harrington H, *et al.* When parents have a history of conduct disorder: how is the caregiving environment affected? *J Abnorm Psychol* 2006;115:309–19.
- 23 Conger RD, Neppl T, Kim KJ, *et al.* Angry and aggressive behavior across three generations: a prospective, longitudinal study of parents and children. *J Abnorm Child Psychol* 2003;31:143–60.
- 24 Thornberry TP, Freeman-Gallant A, Lizotte AJ, *et al.* Linked lives: the intergenerational transmission of antisocial behavior. *J Abnorm Child Psychol* 2003;31:171–84.
- 25 Serbin L, Karp J. Intergenerational studies of parenting and the transfer of risk from parent to child. *Curr Dir Psychol Sci* 2003;12:138–42.
- 26 Hart EL, Lahey BB, Loeber R, *et al.* Criterion validity of informants in the diagnosis of disruptive behavior disorders in children: a preliminary study. *J Consult Clin Psychol* 1994;62:410–4.
- 27 Bank L, Duncan T, Patterson GR, *et al.* Parent and teacher ratings in the assessment and prediction of antisocial and delinquent behaviors. *J Pers* 1993;61:693–709.
- 28 Regalado M, Sareen H, Inkelas M, *et al.* Parents' discipline of young children: results from the National Survey of Early Childhood Health. *Pediatrics* 2004;113(6 Suppl):1952–8.
- 29 Wissow L S. Child discipline in the first three years of life. In: Halfon N, McLearn KT, Schuster MA. eds *Child rearing in America: challenges facing parents with young children.* New York: Cambridge University Press, 2002.146–177.
- 30 Bailey JA, Hill KG, Oesterle S, *et al.* Parenting practices and problem behavior across three generations: monitoring, harsh discipline, and drug use in the intergenerational transmission of externalizing behavior. *Dev Psychol* 2009;45:1214–26.
- 31 Kochanska G, Kuczynski L, Radke-Yarrow M. Correspondence between mothers' self-reported and observed child-rearing practices. *Child Dev* 1989;60:56–63.
- 32 Dekovic M, Janssens J, Gerris J. Factor structure and construct validity of the block Child Rearing Practices Report (CRPR). *Psychol Assess* 1991;3:182–7.
- 33 Moffitt T. E. Life-course persistent versus adolescence-limited antisocial behaviour: a 10-year research review and a research agenda. In: Cicchetti D, Cohen DJ, eds. *Developmental psychopathology.* Wiley, 2013:570–98.
- 34 Byford M, Kuh D, Richards M. Parenting practices and intergenerational associations in cognitive ability. *Int J Epidemiol* 2012;41:263–72.
- 35 Raudino A, Fergusson DM, Woodward LJ, *et al.* The intergenerational transmission of conduct problems. *Soc Psychiatry Psychiatr Epidemiol* 2013;48:465–76.
- 36 Gardner F, Maughan B, Collishaw S, *et al.* *Has parenting changed over recent decades? Can changes in parenting explain the rise in adolescent problem behaviour?* Nuffield Foundation, 2009.
- 37 Collishaw S, Maughan B, Goodman R, *et al.* Time trends in adolescent mental health. *J Child Psychol Psychiatry* 2004;45:1350–62.
- 38 National Institute for Health and Clinical Excellence (Clinical guideline 158). *Antisocial behaviour and conduct disorders in children and young people: recognition, intervention and management.* 2013.
- 39 Champion LA, Goodall G, Rutter M. Behaviour problems in childhood and stressors in early adult life. A 20 year follow-up of London school children. *Psychol Med* 1995;25:231–46.