

Data supplement

Table DS1 The association between paternal depressive symptoms at Millennium Cohort study (MCS)1 and fathers' parenting activity/relationship unadjusted and adjusted for sampling, attrition, family context and socioeconomic factors

Paternal depressive symptoms (MCS1)	Father-child relationship				Parenting activities							
	<i>n</i>	Coefficient (95% CI)	<i>P</i>	<i>n</i>	Warmth (MCS2) Coefficient (95% CI)	<i>P</i>	<i>n</i>	MCS3 Coefficient (95% CI)	<i>P</i>	<i>n</i>	MCS4 Coefficient (95% CI)	<i>P</i>
Unadjusted	7755	0.85 (0.75 to 0.96)	<0.001	7663	-0.12 (-0.16 to -0.07)	<0.001	7542	0.30 (0.21 to 0.40)	<0.001	6621	0.29 (0.19 to 0.39)	<0.001
Adjusted	4430	0.72 (0.59 to 0.84) ^a	<0.001	4372	0.00 (-0.07 to 0.08) ^b	0.960	4306	0.08 (-0.06 to 0.22) ^c	0.266	3871	0.11 (-0.04 to 0.26) ^c	0.162

a. After adjusting for maternal depressive symptoms, child temperament, child gender, marital relationship, fathers' employment, family housing, family income and paternal age.
b. After adjusting for maternal depressive symptoms, child temperament, child gender, marital relationship, paternal education, fathers' employment, family housing, family income and paternal age.
c. After adjusting for maternal depressive symptoms, child temperament, child gender, marital relationship, paternal education, family housing, family income and paternal age.

Table DS2 Descriptive statistics of parenting outcome variables by low and high depressive symptoms for fathers at MCS1

Paternal depressive symptoms MCS1	MCS2	MCS2	MCS3	MCS4
	Parent-child conflict ^a	Parent-child warmth relationship ^b	Parenting activities ^c	Parenting activities ^c
	Mean(SD)	Mean(SD)	Mean(SD)	Mean(SD)
Low depressive symptoms	17.82 (5.40)	32.59 (2.55)	21.63 (5.07)	23.35 (5.29)
High depressive symptoms	20.63 (5.71)	32.18 (2.73)	22.89 (5.88)	24.53 (5.60)

^a Higher score indicate higher levels of father-child conflict

^b Higher scores indicate higher levels of father-child warmth

^c Higher scores indicate lower participation in parenting activities

Table DS3 The association between paternal depressive symptoms at MCS1 and fathers' parenting activity/relationship showing weighted analyses (unadjusted and adjusted), unweight adjusted analysis, and imputed data analyses

Paternal depressive symptoms (MCS1)	Father-child relationship				Parenting activities			
	Conflict (MCS2)		Warmth (MCS2)		MCS3		MCS4	
	Coefficient (95% CI)	p	Coefficient (95% CI)	p	Coefficient (95% CI)	p	Coefficient (95% CI)	p
Unadjusted (weighted) N	0.85(0.75-0.96) 7755	<0.001	-0.12(-0.16- -0.07) 7663	<0.001	0.30(0.21-0.40) 7542	<0.001	0.29(0.19-0.39) 6621	<0.001
Adjusted (weighted) N	0.72 (0.59-0.84) ^a 4430	<0.001	0.00 (-0.07-0.08) ^b 4372	0.960	0.08 (-0.06-0.22) ^c 4306	0.266	0.11 (-0.04-0.26) ^c 3871	0.162
Adjusted (non-weighted) N	0.74(0.62-0.86) ^a	<0.001	-0.01(-0.07-0.04) ^b	0.599	0.07(-0.04-0.19) ^c	0.192	0.12(0.00-0.25) ^c	0.048
Adjusted (imputed) ^d N	0.70(0.61-0.80) ^a 12,396	<0.001	-0.02(-0.06-0.02) ^b 12,396	0.263	0.15(0.06-0.25) ^c 12,396	0.001	0.15(0.06-0.25) ^c 12,396	0.002

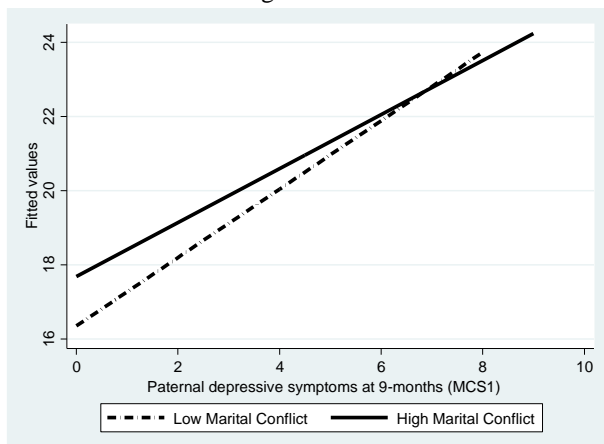
^a After adjusting for maternal depressive symptoms, child temperament, child gender, marital relationship, fathers employment, family housing, family income and paternal age

^b After adjusting for maternal depressive symptoms, child temperament, child gender, marital relationship, paternal education, fathers employment, family housing, family income and paternal age

^c After adjusting for maternal depressive symptoms, child temperament, child gender, marital relationship, paternal education, family housing, family income and paternal age

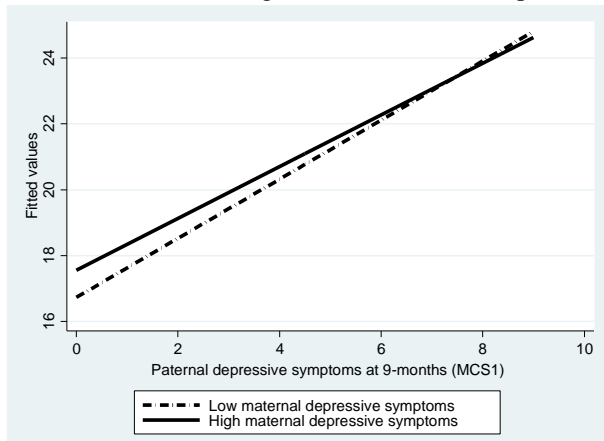
^d All predictor and outcome variables were used as predictors in the imputation model (set for 25 imputations)

Fig DS1 Interaction graph showing the effect of paternal depressive symptoms on father-child conflict in families with low and high levels of marital conflict ^a



^a The graph uses dichotomised scales to illustrate the interaction but the analysis uses the continuous measure

Fig DS2 Interaction graph showing the effect of paternal depressive symptoms on father-child conflict in families with low and high levels of maternal depressive symptoms ^a



^a The graph uses dichotomised scales to illustrate the interaction but the analysis uses the continuous measure