Growing Up in Scotland: Parenting and children's health

TECHNICAL APPENDIX

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Contents

1 TECHNICAL TERMS AND PROCEDURES

1.1 Multivariate analysis

Many of the parenting measures are inter-related - parents who had a warm relationship with their child were also likely to be parents who undertook many joint activities with their child, had more rules about behaviour, low levels of conflict and home chaos. Individual measures of family adversity factors are also inter-related - for example, younger mothers are more likely to have lower qualifications, to be lone parents, and to live in areas of high deprivation. In addition, the analysis indicates that family adversity is associated with parenting so that parents with particular characteristics are more or less likely to report certain parenting behaviours. Simple analysis may identify a relationship between parental warmth and child health. However, this relationship may be occuring because of the underlying associations between family adversity and child health, and family adversity and parenting. Thus, it is actually the lower family adversity experienced amongst mothers with higher warmth which is associated with a greater likelihood of better health in their children rather than the level of warmth itself.   To avoid this difficulty, multivariate regression analysis was used. This analysis allows the examination of the relationships between an outcome variable and multiple explanatory variables whilst controlling for the inter-relationships between each of the explanatory variables. This means it is possible to identify an *independent* relationship between any single explanatory variable and the outcome variable; to show, for example, that there is a relationship between parental warmth and child health that does not simply occur because both family adversity and parental warmth are related.

1.2 Understanding odds ratios

To understand an odds ratio we first need to describe the meaning of odds. The definition of odds is similar but significantly different to that of probability. This is best explained in the form of an example. If 200 individuals out of a population of 1000 experienced persistent poverty, the probability (p) of experiencing persistent poverty is 200/1000, thus p=0.2. The probability of not experiencing persistent poverty is therefore 1-p = 0.8. The odds of experiencing persistent poverty are calculated as the quotient of these two mutually exclusive events. So, the odds in favour of experiencing persistent poverty to not experiencing persistent poverty, is therefore 0.2/0.8=0.25. Suppose that 150 out of 300 people living in social rented housing experience persistent poverty compared to 50 out of 150 who live in owner occupied housing. The odds of a person living in social rented housing of experiencing persistent poverty are 0.5/0.5=1.0. The odds of a person living in owner occupied housing of experiencing persistent poverty is 0.3333/0.6666=0.5. The odds ratio of experiencing persistent poverty is the ratio of these odds, 1.0/0.5=2.0. Thus the odds of experiencing persistent poverty are twice as high among people who live in social rented housing (compared to people who live in owner occupied housing – the 'reference category').

1.3 The analytical sample

The sample was restricted to cases where the natural mother was the main carer interviewed in all five sweeps (N=3486). For multivariate modelling, further filtering was used to exclude cases with missing information on the complete set of measures used (i.e. all health outcomes, parenting measures and covariates). This resulted in a data set with 3343 cases. Analysis used SPSS version 15 (complex samples procedures). This took account of the complex survey design and weighting to compensate for survey attrition.

2 FURTHER DETAILS OF ANALYSIS AND RESULTS

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2.1 Associations between health behaviours and health

Table 2.1 **Univariate associations between health behaviours and selected health measures**

	Physical activity				Screen time on termtime weekday				Fruit and vegetable consumption previous day				Frequency of sweets, crisps, sugary soft drinks			
					Up to 2 hours	More than 2 hours			5 or more different fruits and/or vegetables	Fewer than 5 different fruits/ vegetables			Less frequent	More than once a day		
	High	Low	Total	p			Total	p			Total	p			Total	p
Poor general health	4	6	5	**	4	6	5	†	4	6	5	*	4	7	5	***
Poor dental health	16	18	17	NS	14	21	17	***	12	19	17	***	13	23	17	***
Poor mental health	11	15	13	**	9	17	12	***	8	15	13	***	11	16	13	***
Bases																
Weighted	*2145*	*1276*	*3422*		*2060*	*1340*	*3400*		*1073*	*2352*	*3424*		*2242*	*1189*	*3432*	
Unweighted	*2177*	*1258*	*3435*		*2167*	*1246*	*3413*		*1151*	*2287*	*3438*		*2333*	*1113*	*3446*	

Note: † denotes p<0.1, *p<0.05, **p<0.01 and *** p<0.001, NS = not significant

2.2 Correlations between parenting measures

Table 2.2 Correlations between parenting measures

	Mother-infant attachment	Warmth of mother-child relationship	Mother and child joint activities	Conflict in mother-child relationship	Smacking	Parental supervision	Number of rules	Home chaos
Mother-infant attachment	1.00	0.11***	0.06	-0.25	-0.12	0.13***	0.08	-0.20***
Warmth of mother-child relationship		1.00	0.19***	-0.26***	0.01	-0.01	0.13***	-0.19***
Mother and child joint activities			1.00	-0.09***	-0.10***	0.00	0.18***	-0.20***
Conflict in mother-child relationship				1.00	0.16***	-0.01	-0.16	0.34***
Smacking					1.00	-0.09***	-0.05	0.15***
Parental supervision						1.00	-0.05**	-0.02
Number of rules							1.00	-0.27***
Home chaos								1.00

N=3,486 (unweighted)

Note: This table shows correlation coefficients for continuous parenting measures, where available (ie before banding). ** denotes statistical signficant at p<0.01, *** denotes p<0.001.

2.3 Associations between individual dimensions of parenting and child health outcomes

Table 2.3 shows associations between individual dimensions of parenting and health, modelled in two stages. Stage 1 adjusts for basic demographic factors (see note for Table) together with all other parenting measures. At stage 1, some of the associations that were found between individual aspects of parenting and child health in Chapter 4 of the main report, Table 4.1 disappear with the simultaneous adjustment for all parenting measures.

Moving from stage 1 to stage 2 (adjusting for other important family factors), many associations between parenting and health are reduced in magnitude. Some contrasts between groups lose their statistical significance. However, even in the fully adjusted stage 2 models, the connection, control and negativity domains of parenting behaviours all contained measures that remained significantly associated with children's health.

Figure 2-A is a graphical presentation showing associations between the highest-risk group in each parenting measure and child health outcomes. The bars indicate the odds and 95% confidence intervals associated with illhealth for each high-risk group, when compared with the lowest risk group in each parenting measure[1]. Odds ratios greater than one indicate that the high risk parenting group is associated with greater likelihood of illhealth. Where the 95% confidence bar crosses the x axis (set at a value where the odds of illhealth is equal to one), this indicates that the likelihood of illhealth for the high risk parenting group is unlikely to differ from the lowest-risk reference group.

Models are adjusted for child gender, age at sweep 5, birth order, number of children in household, mother's ethnic group, mother's age at birth of survey child, mother's educational qualifications and mental health, family composition, household equivalised income, housing tenure, area deprivation and all other parenting measures

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[1] For some parenting measures (mother-infant attachment, mother-child warmth and smacking) there are only two groups to compare ("high" versus "low" attachment, "high/medium" versus "low" warmth and "no" versus "some" smacking). Other parenting measures were divided into three groups (see Chapter 3). For simplicity, Figure 4.1 omits the 'middle' group and compares the risk of illhealth associated with the highest-risk group (eg low mother-child activities, high home chaos, etc) with the lowest risk group (respectively high mother-child activities, low home chaos, etc).

Table 2.3   Associations between individual parenting measures and child health outcomes

		General health fair, bad or very bad				Limiting longstanding illness				Total difficulties score borderline or abnormal			
		stage 1 OR (95% CI)	p	stage 2 OR (95% CI)		stage 1 OR (95% CI)	p	stage 2 OR (95% CI)		stage 1 OR (95% CI)		stage 2 OR (95% CI)	p
Mother-infant attachment (high)	medium	1.08 (0.70 - 1.68)		1.13 (0.71 - 1.80)		**1.74 (1.04 - 2.91)**	*	**1.82 (1.05 - 3.13)**	*	1.03 (0.74 - 1.44)		1.11 (0.80 - 1.55)	
	low	1.34 (0.88 - 2.04)		1.30 (0.83 - 2.04)		**1.81 (1.09 - 3.02)**	*	**1.78 (1.08 - 2.94)**	*	1.16 (0.85 - 1.58)		1.14 (0.82 - 1.59)	
Warmth of mother-child relationship (medium/high)	low	**1.71 (1.10 - 2.65)**	*	1.50 (0.97 - 2.32)		**2.38 (1.54 - 3.65)**	***	**2.07 (1.34 - 3.20)**	***	**1.97 (1.49 - 2.59)**	***	**1.79 (1.35 - 2.39)**	***
Mother and child activities (high)	medium	1.47 (0.77 - 2.80)		1.35 (0.69 - 2.66)		1.36 (0.79 - 2.35)		1.34 (0.79 - 2.30)		1.17 (0.78 - 1.76)		0.95 (0.62 - 1.47)	
	low	**1.99 (1.09 - 3.62)**	*	1.46 (0.80 - 2.69)		1.00 (0.60 - 1.69)		0.94 (0.55 - 1.61)		**1.91 (1.31 - 2.78)**		1.28 (0.86 - 1.90)	
Conflict in mother-child relationship (low)	medium	0.91 (0.57 - 1.45)		0.86 (0.54 - 1.35)		1.18 (0.66 - 2.11)		1.19 (0.66 - 2.11)		**1.81 (1.19 - 2.76)**	**	**1.80 (1.19 - 2.72)**	**
	high	1.06 (0.66 - 1.70)		0.92 (0.55 - 1.53)		**2.10 (1.14 - 3.86)**	*	**2.20 (1.14 - 4.23)**	*	**7.20 (4.58 - 11.31)**	***	**7.49 (4.80 - 11.71)**	***
Smacking (none)	some	0.97 (0.67 - 1.41)		1.02 (0.71 - 1.47)		0.72 (0.47 - 1.10)		0.76 (0.49 - 1.18)		1.27 (0.97 - 1.66)		**1.50 (1.12 - 2.01)**	*
Parental supervision (high)	medium	**1.88 (1.05 - 3.38)**	*	1.71 (0.91 - 3.22)		0.82 (0.42 - 1.59)		0.70 (0.34 - 1.45)		**1.99 (1.41 - 2.82)**	***	**1.74 (1.20 - 2.53)**	**
	low	**2.62 (1.53 - 4.50)**	***	**1.98 (1.09 - 3.58)**	*	**2.41 (1.39 - 4.17)**	**	**2.04 (1.17 - 3.55)**	*	**2.49 (1.72 - 3.63)**	***	**1.79 (1.21 - 2.65)**	**
Number of rules (high)	medium	1.28 (0.57 - 2.85)		1.24 (0.54 - 2.86)		1.01 (0.47 - 2.18)		1.11 (0.48 - 2.61)		1.58 (0.86 - 2.89)		1.61 (0.84 - 3.09)	
	low	1.46 (0.66 - 3.24)		1.29 (0.57 - 2.94)		1.05 (0.47 - 2.32)		1.14 (0.48 - 2.71)		**2.21 (1.23 - 3.97)**	**	**2.00 (1.10 - 3.64)**	*
Home chaos (low)	medium	1.65 (1.00 - 2.72)		1.57 (0.93 - 2.66)		**2.50 (1.32 - 4.74)**	**	**2.37 (1.26 - 4.45)**	*	1.23 (0.80 - 1.89)		1.17 (0.75 - 1.83)	
	high	**1.63 (1.03 - 2.57)**	*	1.38 (0.83 - 2.28)		**2.22 (1.32 - 3.72)**	**	**2.02 (1.17 - 3.48)**	**	**2.29 (1.64 - 3.21)**	***	**1.94 (1.33 - 2.83)**	***

Table 2.3   Continued

		3 or more health problems last 12 months		3 or more accidents/injuries sweeps 1-5		Dental decay	
		stage 1 OR (95% CI) p	stage 2 OR (95% CI)	stage 1 OR (95% CI) p	stage 2 OR (95% CI)	stage 1 OR (95% CI)	stage 2 OR (95% CI) p
Mother-infant attachment (high)	medium	1.09 (0.85 - 1.41)	1.14 (0.88 - 1.49)	0.89 (0.64 - 1.23)	0.87 (0.63 - 1.20)	0.94 (0.73 - 1.22)	0.99 (0.76 - 1.29)
	low	0.93 (0.73 - 1.18)	0.92 (0.71 - 1.19)	0.96 (0.71 - 1.30)	0.89 (0.63 - 1.25)	0.74 (0.54 - 1.01)	0.82 (0.58 - 1.14)
Warmth of mother-child relationship (medium/high)	low	1.08 (0.88 - 1.32)	1.06 (0.86 - 1.31)	1.05 (0.79 - 1.41)	1.02 (0.75 - 1.40)	**1.35 (1.06 - 1.70)** *	1.28 (0.99 - 1.64)
Mother and child activities (high)	medium	0.83 (0.65 - 1.05)	0.78 (0.61 - 1.00)	0.99 (0.72 - 1.35)	0.89 (0.64 - 1.24)	**1.43 (1.03 - 1.98)** *	1.22 (0.89 - 1.68)
	low	0.96 (0.76 - 1.22)	0.85 (0.67 - 1.08)	1.11 (0.78 - 1.59)	0.95 (0.67 - 1.34)	**2.32 (1.77 - 3.03)** ***	**1.80 (1.38 - 2.36)** ***
Conflict in mother-child relationship (low)	medium	1.16 (0.94 - 1.43)	1.14 (0.91 - 1.43)	1.31 (0.96 - 1.81)	1.26 (0.91 - 1.76)	0.98 (0.71 - 1.34)	0.95 (0.70 - 1.30)
	high	1.10 (0.86 - 1.40)	1.04 (0.80 - 1.35)	1.19 (0.85 - 1.66)	1.11 (0.78 - 1.59)	1.04 (0.77 - 1.41)	0.99 (0.72 - 1.37)
Smacking (none)	some	1.15 (0.94 - 1.42)	1.16 (0.94 - 1.44)	**1.34 (1.03 - 1.74)** *	**1.34 (1.02 - 1.77)** *	1.10 (0.91 - 1.33)	1.15 (0.94 - 1.42)
Parental supervision (high)	medium	1.05 (0.82 - 1.33)	0.97 (0.76 - 1.23)	**1.35 (1.01 - 1.81)** *	1.25 (0.91 - 1.71)	1.24 (0.94 - 1.63)	1.11 (0.84 - 1.47)
	low	**1.51 (1.19 - 1.93)** ***	**1.27 (1.00 - 1.62)** †	1.13 (0.86 - 1.49)	0.96 (0.71 - 1.30)	**1.54 (1.18 - 2.03)** **	1.24 (0.95 - 1.62)
Number of rules (high)	medium	0.95 (0.65 - 1.39)	0.96 (0.66 - 1.39)	0.77 (0.47 - 1.26)	0.83 (0.51 - 1.35)	1.33 (0.88 - 2.01)	1.36 (0.90 - 2.05)
	low	1.03 (0.69 - 1.54)	1.00 (0.67 - 1.49)	0.85 (0.51 - 1.42)	0.87 (0.53 - 1.41)	**2.25 (1.44 - 3.53)** ***	**2.22 (1.41 - 3.49)** ***
Home chaos (low)	medium	0.98 (0.74 - 1.30)	0.94 (0.70 - 1.27)	1.12 (0.84 - 1.50)	1.02 (0.74 - 1.42)	1.06 (0.78 - 1.44)	0.98 (0.70 - 1.37)
	high	**1.31 (1.04 - 1.66)** *	1.17 (0.92 - 1.50)	**1.45 (1.04 - 2.01)** *	1.26 (0.91 - 1.73)	**1.32 (1.05 - 1.67)** *	1.15 (0.90 - 1.46)

Note: Stage 1 adjusts for child gender, age at sweep 5, birth order, number of children in household and other parenting measures. Stage 2 further adjusts for mother's ethnic group, age at birth of the survey child, educational qualifications and mental health; and family composition from sweeps 1 to 5, housing, household equivalised income and area deprivation. OR=odds ratio, CI= confidence interval. p denotes statistical probability for parameter effect, where † denotes p=0.52, *p<0.05, ** p<0.01, *** p<0.001.

Figure 2-A   Associations between individual dimensions of parenting and child health outcomes

N=3,343 (unweighted)
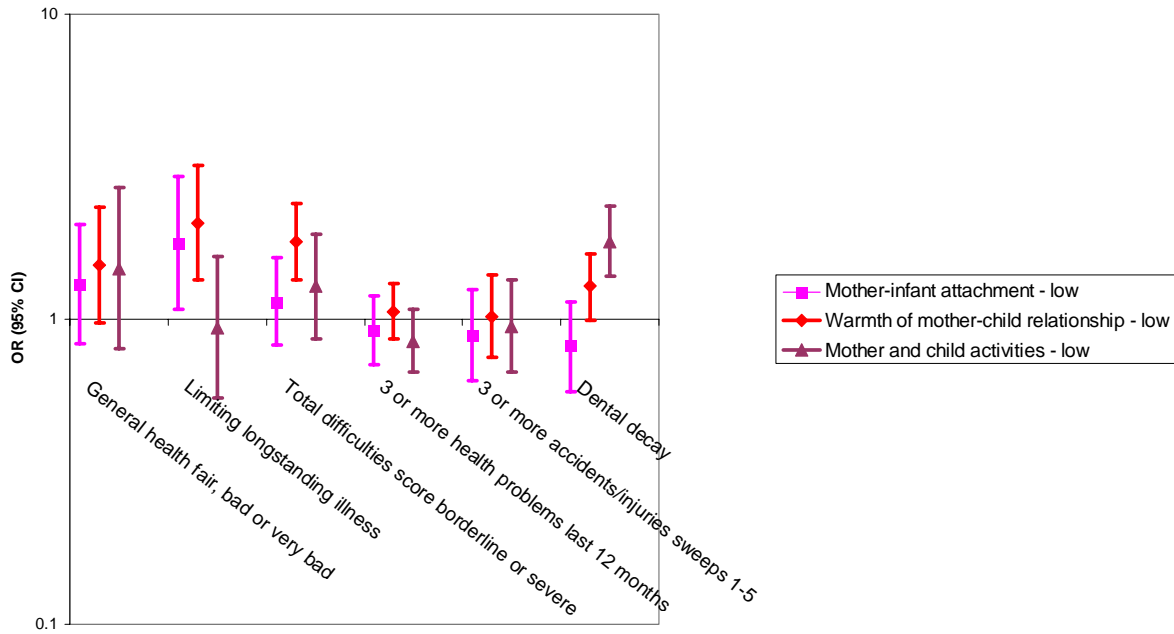
Associations between connection and child health

Associations between negativity and child health
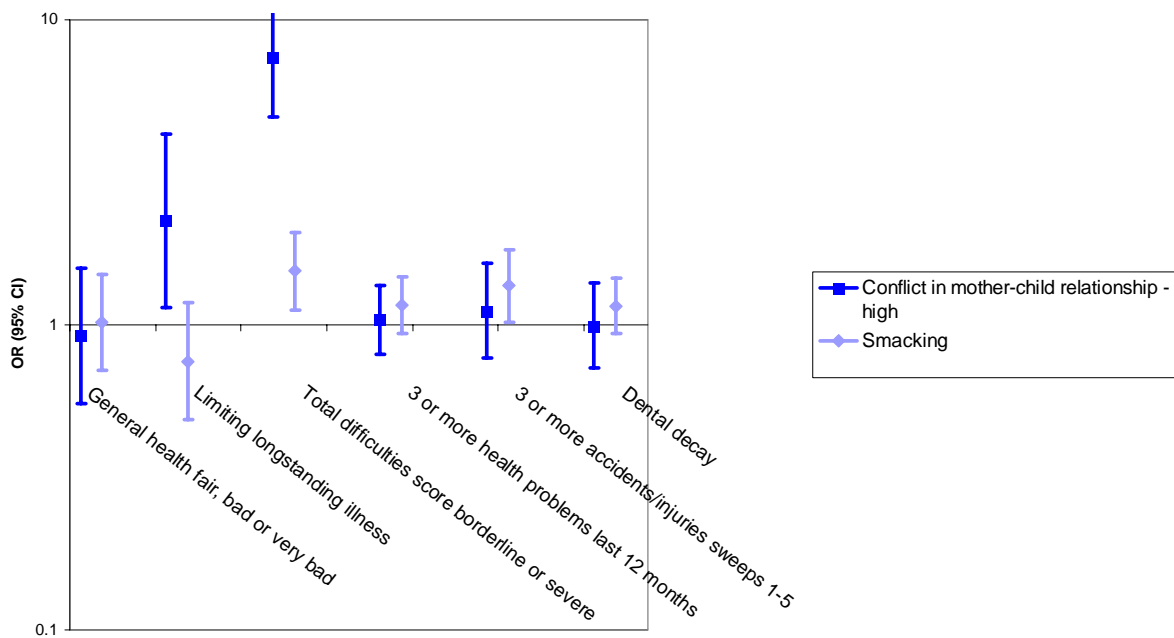
Associations between control and child health

Legend:
- Number of rules (low)
- Home chaos (high)
- Supervision - low

Categories:
- General health fair, bad or very bad
- Limiting longstanding illness
- Total difficulties score borderline or severe
- 3 or more health problems last 12 months
- 3 or more accidents/injuries sweeps 1-5
- Dental decay

Y-axis: OR (95% CI)
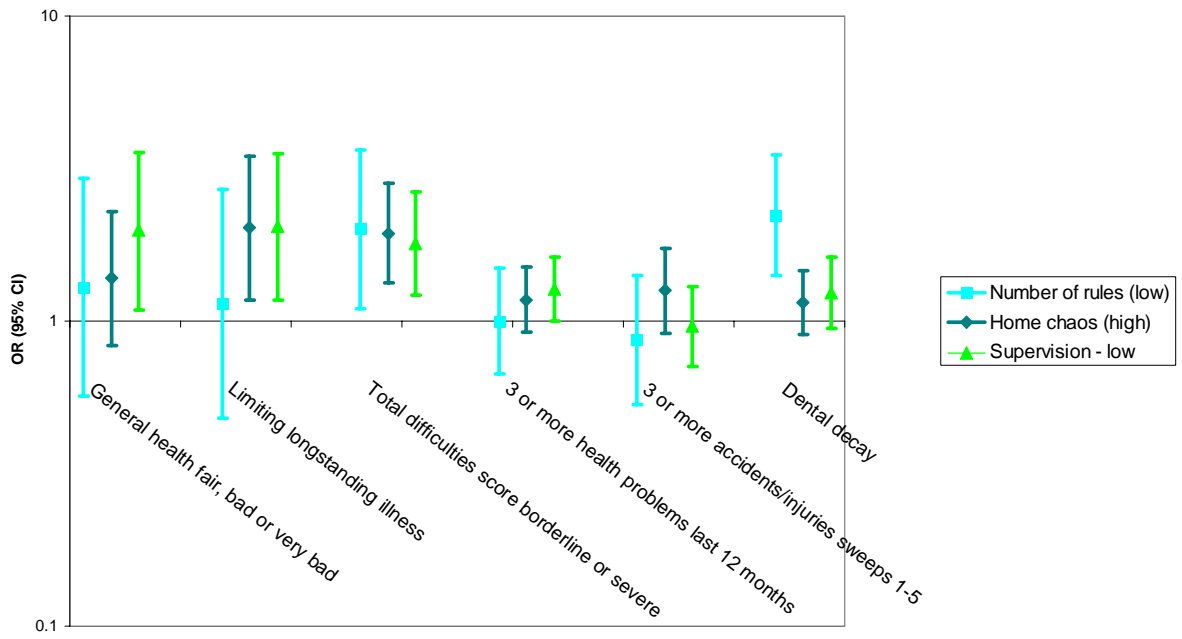
2.4 Associations between individual dimensions of parenting and health behaviours

Table 2.4 shows odds ratios and 95% confidence intervals for associations between each parenting measures and health behaviours for stage 1 and stage 2 adjustments carried out as for Table A.1 above.

At stage 1, some of the associations that were found between individual aspects of parenting and child health behaviours in Chapter 4, Table 4.3 disappear with the simultaneous adjustment for all parenting measures.

Moving from stage 1 to stage 2 (adjusting for other important family factors), as in the previous section, some associations between parenting and health are reduced in magnitude and others lose their statistical significance. For instance, associations between low levels of parental supervision and screen time disappear, once the full set of family factors is in the models. In the fully adjusted stage 2 models, the connection, control and negativity domains of parenting behaviours all contained measures that were significantly associated with children's health behaviours.

Figure 2-B provides a graphical summary of the main findings for the fully adjusted (stage 2) models. As for Figure 2-A, the focus is on a comparison between the highest-risk and lowest-risk groups in any parenting measure.

The bars show odds and associated 95% confidence intervals of poor health associated with highest-risk group for each parenting measure, when compared to lowest risk group. Models are adjusted for child gender, age at sweep 5, birth order, number of children in household, mother's ethnic group, mother's age at birth of survey child, mother's educational qualifications and mental health, family composition, household equivalised income, housing tenure, area deprivation and all other parenting measures.

Table 2.4   Associations between individual parenting measures and child health behaviours

		Physical activity - not meeting guidelines				Screen time 2 hours plus on termtime weekday			
		stage 1 OR (95% CI)	p	stage 2 OR (95% CI)	p	stage 1 OR (95% CI)	p	stage 2 OR (95% CI)	p
Mother-infant attachment (high)	medium	1.21 (0.98 - 1.48)		1.23 (1.00 - 1.51)		**0.78 (0.65 - 0.93)**	*	**0.83 (0.68 - 1.00)**	*
	low	1.18 (0.96 - 1.44)		1.21 (0.99 - 1.48)		**0.82 (0.69 - 0.97)**	**	0.88 (0.74 - 1.06)	
Warmth of mother-child relationship (medium/high)	low	**1.24 (1.05 - 1.46)**	*	**1.22 (1.03 - 1.43)**	*	0.99 (0.85 - 1.15)		0.91 (0.79 - 1.06)	
Mother and child activities (high)	medium	**1.25 (1.03 - 1.53)**	*	**1.26 (1.02 - 1.55)**	*	1.17 (0.95 - 1.43)		1.03 (0.84 - 1.26)	
	low	**1.83 (1.45 - 2.31)**	***	**1.78 (1.41 - 2.24)**	***	**1.50 (1.18 - 1.91)**	***	1.19 (0.93 - 1.51)	
Conflict in mother-child relationship (low)	medium	1.09 (0.92 - 1.29)		1.09 (0.91 - 1.30)		1.15 (0.98 - 1.36)		**1.20 (1.02 - 1.42)**	*
	high	1.02 (0.83 - 1.25)		1.04 (0.83 - 1.29)		**1.37 (1.12 - 1.68)**	**	**1.33 (1.09 - 1.62)**	**
Smacking (none)	some	0.89 (0.75 - 1.05)		0.88 (0.74 - 1.05)		1.12 (0.98 - 1.28)		**1.16 (1.01 - 1.33)**	*
Parental supervision (high)	medium	1.06 (0.89 - 1.27)		1.06 (0.89 - 1.26)		1.10 (0.92 - 1.32)		1.01 (0.84 - 1.22)	
	low	1.11 (0.89 - 1.38)		1.10 (0.90 - 1.35)		**1.43 (1.17 - 1.74)**	**	1.19 (0.96 - 1.49)	
Number of rules (high)	medium	1.19 (0.92 - 1.54)		1.12 (0.86 - 1.45)		**1.34 (1.08 - 1.67)**	**	**1.41 (1.12 - 1.79)**	**
	low	**1.39 (1.05 - 1.84)**	*	1.29 (0.97 - 1.72)		**2.07 (1.60 - 2.67)**	***	**2.02 (1.54 - 2.64)**	***
Home chaos (low)	medium	0.95 (0.77 - 1.18)		0.97 (0.77 - 1.23)		1.13 (0.89 - 1.43)		1.05 (0.82 - 1.34)	
	high	0.99 (0.85 - 1.17)		1.01 (0.84 - 1.21)		**1.41 (1.17 - 1.70)**	***	1.19 (0.98 - 1.45)	

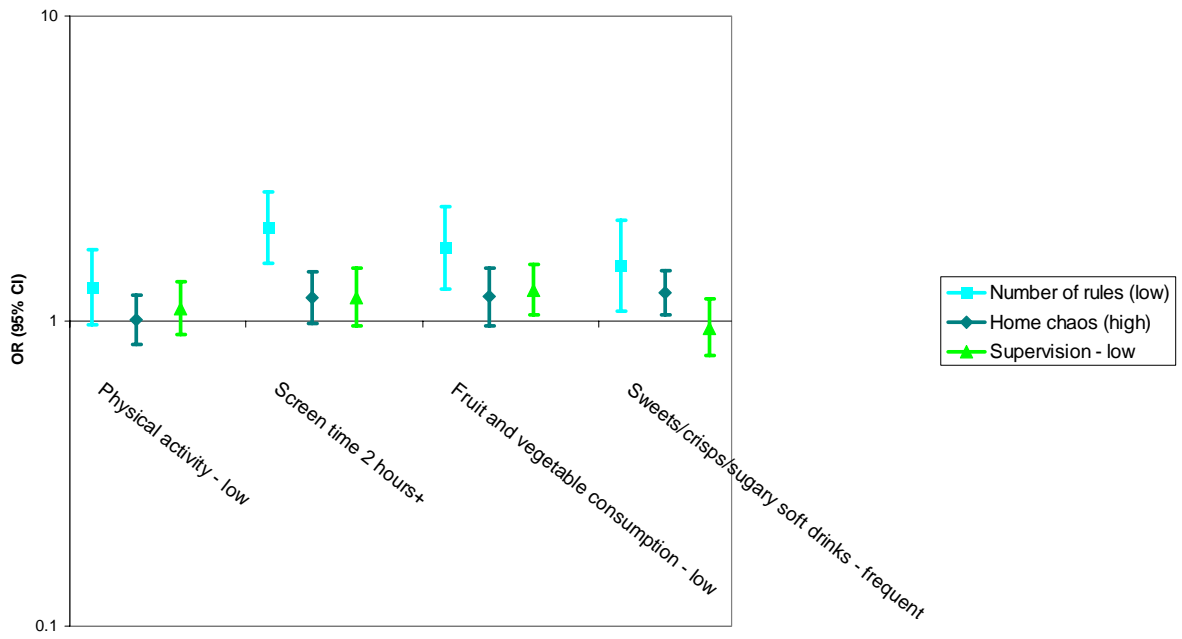|		Fruit and vegetable consumption - low				Sweets/crisps/sugary soft drinks more than once daily			
		stage 1 OR (95% CI)	p	stage 2 OR (95% CI)	p	stage 1 OR (95% CI)	p	stage 2 OR (95% CI)	p
Mother-infant attachment (high)	medium	1.05 (0.86 - 1.28)		1.08 (0.89 - 1.30)		0.85 (0.69 - 1.05)		0.89 (0.72 - 1.09)	
	low	1.07 (0.87 - 1.32)		1.14 (0.92 - 1.41)		0.87 (0.70 - 1.07)		0.92 (0.74 - 1.13)	
Warmth of mother-child relationship (medium/high)	low	0.94 (0.79 - 1.12)		0.90 (0.74 - 1.08)		1.14 (0.98 - 1.34)		1.10 (0.93 - 1.30)	
Mother and child activities (high)	medium	**1.61 (1.36 - 1.89)**	***	**1.55 (1.32 - 1.82)**	***	**1.41 (1.16 - 1.72)**	*	**1.30 (1.07 - 1.59)**	**
	low	**2.81 (2.26 - 3.50)**	***	**2.62 (2.08 - 3.30)**	***	**1.88 (1.53 - 2.30)**	***	**1.60 (1.30 - 1.96)**	***
Conflict in mother-child relationship (low)	medium	1.07 (0.90 - 1.27)		1.08 (0.91 - 1.29)		0.96 (0.76 - 1.20)		0.96 (0.76 - 1.21)	
	high	1.25 (0.99 - 1.59)		1.28 (1.01 - 1.62)		0.99 (0.79 - 1.25)		0.97 (0.77 - 1.21)	
Smacking (none)	some	**1.24 (1.05 - 1.45)**	**	**1.24 (1.06 - 1.46)**	**	1.02 (0.87 - 1.19)		1.03 (0.88 - 1.21)	
Parental supervision (high)	medium	1.18 (0.95 - 1.46)		1.14 (0.93 - 1.41)		1.10 (0.87 - 1.39)		1.02 (0.80 - 1.30)	
	low	**1.37 (1.13 - 1.65)**	***	**1.26 (1.05 - 1.53)**	*	1.12 (0.91 - 1.38)		0.95 (0.77 - 1.18)	
Number of rules (high)	medium	1.12 (0.83 - 1.51)		1.13 (0.83 - 1.54)		1.14 (0.84 - 1.54)		1.17 (0.87 - 1.58)	
	low	**1.73 (1.27 - 2.37)**	***	**1.74 (1.27 - 2.38)**	***	**1.54 (1.10 - 2.17)**	*	**1.52 (1.08 - 2.14)**	*
Home chaos (low)	medium	1.09 (0.91 - 1.31)		1.00 (0.83 - 1.21)		1.07 (0.84 - 1.37)		1.03 (0.81 - 1.31)	
	high	1.21 (0.98 - 1.50)		1.20 (0.96 - 1.49)		**1.42 (1.22 - 1.65)**	***	**1.24 (1.05 - 1.47)**	*

Note: Stage 1 adjusts for child gender, age at sweep 5, birth order, number of children in household and other parenting measures. Stage 2 further adjusts for mother's ethnic group, age at birth of the survey child, educational qualifications and mental health; and family composition from sweeps 1 to 5, housing, household equivalised income and area deprivation. OR=odds ratio, CI= confidence interval.p denotes statistical probability for parameter effect, *p<0.05, ** p<0.01, *** p<0.001.

Figure 2-B   Associations between individual dimensions of parenting and child health behaviours

N=3,343 (unweighted)
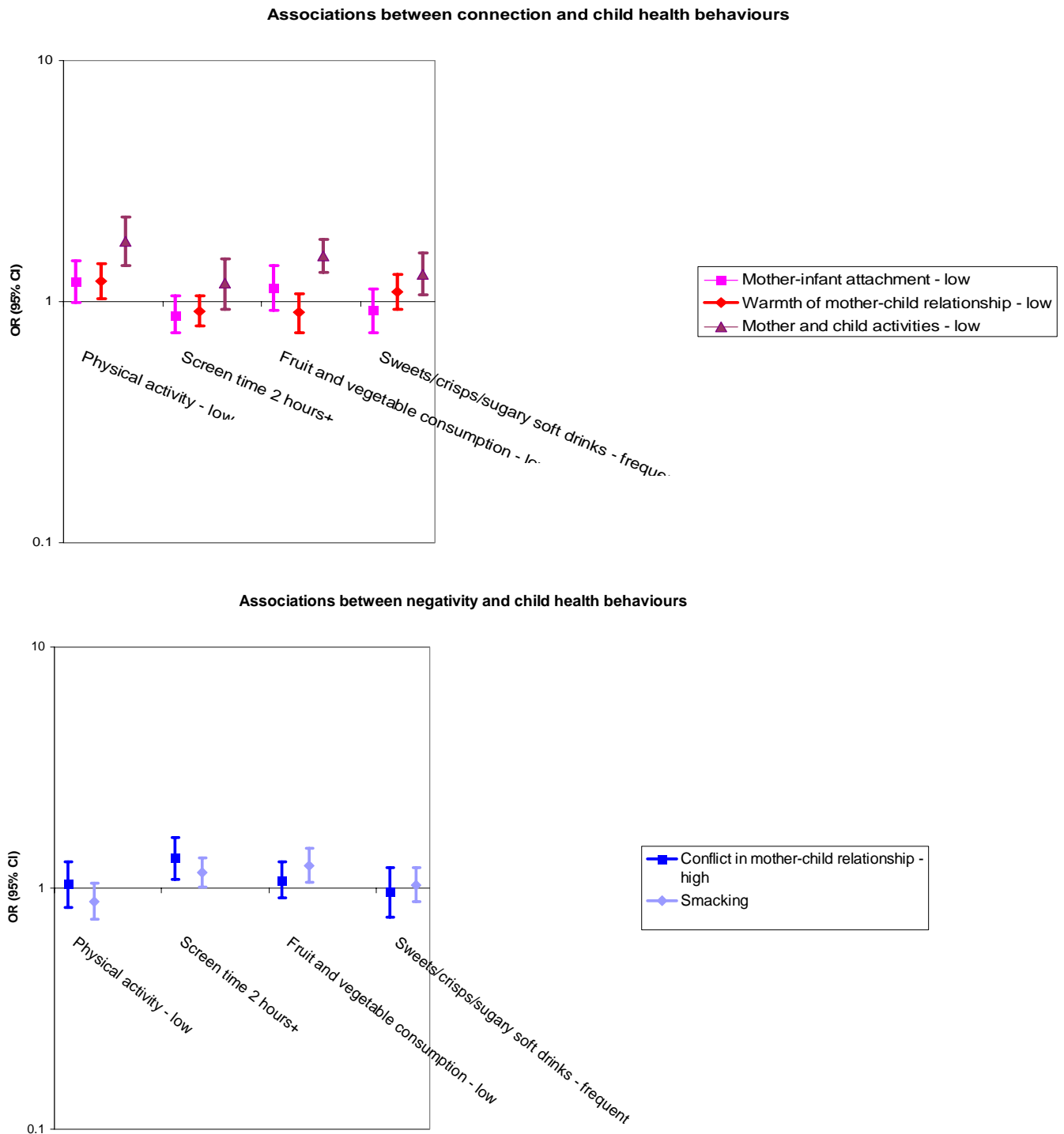
Associations between connection and child health behaviours

Associations between negativity and child health behaviours

Associations between control and child health behaviours

Legend:
- Number of rules (low)
- Home chaos (high)
- Supervision - low

Y-axis: OR (95% CI)

X-axis categories:
- Physical activity - low
- Screen time 2 hours+
- Fruit and vegetable consumption - low
- Sweets/crisps/sugary soft drinks - frequent

2.5   Associations between parenting index and health/health behaviours

Tables 2.5 and 2.6 shows odds ratios and 95% confidence intervals for associations between the parenting index and both health and health behaviours for stage 1 and stage 2 adjustments carried out as for sections 2.3 and 2.4 above.

At the first stage (adjusting for child's gender, age in months at sweep 5, birth order and number of children in the household) low parenting skills were significantly associated with greater likelihood of all the health and health behaviour outcomes. Average parenting skills were also significantly more disadvantageous than high parenting skills in terms of all except two outcomes (health problems, and accidents and injuries).

At the second stage other important family influences on health were added to the model. These reduced the independent effects of parenting on outcomes. In the case of health problems and accidents/injuries the effects of the parenting index were reduced to non-significance. The effects of average parenting skills on general health, dental health, physical activity and poor snacking behaviour were also reduced to non-significance. Elsewhere, associations remained significant.

Figures 2-C and 2-D indicate the magnitude of associations between (respectively) the parenting index and health, and the parenting index and health behaviours. For each health or health behaviour outcome, there are two bars showing the odds of poorer outcome for children with average or low skills when contrasted with children with highly skilled parents. Note that the scale of the y axis is different in the two figures.

Table 2.5   Associations between parenting index and child health outcomes

		General health fair, bad or very bad		Limiting longstanding illness	
		Stage 1	Stage 2	Stage 1	Stage 2
		OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Parenting index (high skills)	average skills	1.78 (1.11 - 2.86)*	1.47 (0.91 - 2.38)	2.56 (1.23 - 5.34)*	2.43 (1.12 - 5.27)*
	low skills	4.51 (2.90 - 7.03)***	2.66 (1.65 - 4.29)	6.08 (2.94 - 12.56)***	4.81 (2.10 - 10.99)***

		3 or more health problems last 12 months		3 or more accidents/injuries sweeps 1-5	
		Stage 1	Stage 2	Stage 1	Stage 2
		OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Parenting index (high skills)	average skills	1.18 (0.92 - 1.51)	1.07 (0.83 - 1.38)	1.02 (0.75 - 1.40)	0.95 (0.69 - 1.30)
	low skills	1.58 (1.26 - 1.97)***	1.23 (0.97 - 1.55)	1.40 (1.04 - 1.88)*	1.09 (0.78 - 1.51)

		Total difficulties score borderline or abnormal		Dental decay	
		Stage 1	Stage 2	Stage 1	Stage 2
		OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Parenting index (high skills)	average skills	3.46 (2.11 - 5.67)***	2.86 (1.75 - 4.66)***	1.46 (1.06 - 2.00)*	1.23 (0.89 - 1.68)
	low skills	19.15 (11.82 - 31.03)***	11.60 (7.19 - 18.72)***	3.20 (2.32 - 4.40)***	2.13 (1.53 - 2.97)***

Note: Low levels of parenting indexindicate least optimal parenting * denotes p<0.05, **p<0.01, *** p<0.001. Stage 1 analyses adjust for child's gender, the child's age in months at sweep 5, whether the child was first born or had older siblings and the number of children in the household at sweep 5. Stage 2 further adjusts for mother's ethnic group, age at birth of the survey child, educational qualifications and mental health; and family composition from sweeps 1 to 5, housing, household equivalised income and area deprivation.

Table 2.6   Associations between parenting index and child health behaviours

		Physical activity - low		Screen time 2 hours plus on term time weekday	
		Stage 1	Stage 2	Stage 1	Stage 2
		OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Parenting index (high skills)	average skills	1.19 (1.00 - 1.42)*	1.15 (0.97 - 1.36)	1.58 (1.31 - 1.90)***	1.38 (1.15 - 1.66)***
	low skills	1.76 (1.43 - 2.16)***	1.64 (1.33 - 2.03)***	2.67 (2.19 - 3.26)***	1.84 (1.50 - 2.25)***

		Fruit and vegetable consumption - under 5 portions		Sweets/crisps/sugary soft drinks more than once daily	
		Stage 1	Stage 2	Stage 1	Stage 2
		OR (95% CI)	OR (95% CI)	OR (95% CI)	OR (95% CI)
Parenting index (high skills)	average skills	1.42 (1.19 - 1.69)***	1.32 (1.10 - 1.57)***	1.27 (1.04 - 1.54)*	1.12 (0.92 - 1.37)
	low skills	2.86 (2.22 - 3.68)***	2.41 (1.83 - 3.18)***	2.08 (1.70 - 2.54)***	1.50 (1.22 - 1.84)***

Note: Low levels of parenting indexindicate least optimal parenting * denotes p<0.05, **p<0.01, *** p<0.001. Stage 1 analyses adjust for child's gender, the child's age in months at sweep 5, whether the child was first born or had older siblings and the number of children in the household at sweep 5. Stage 2 further adjusts for mother's ethnic group, age at birth of the survey child, educational qualifications and mental health; and family composition from sweeps 1 to 5, housing, household equivalised income and area deprivation.

Figure 2-C   Associations between parenting skills and child health
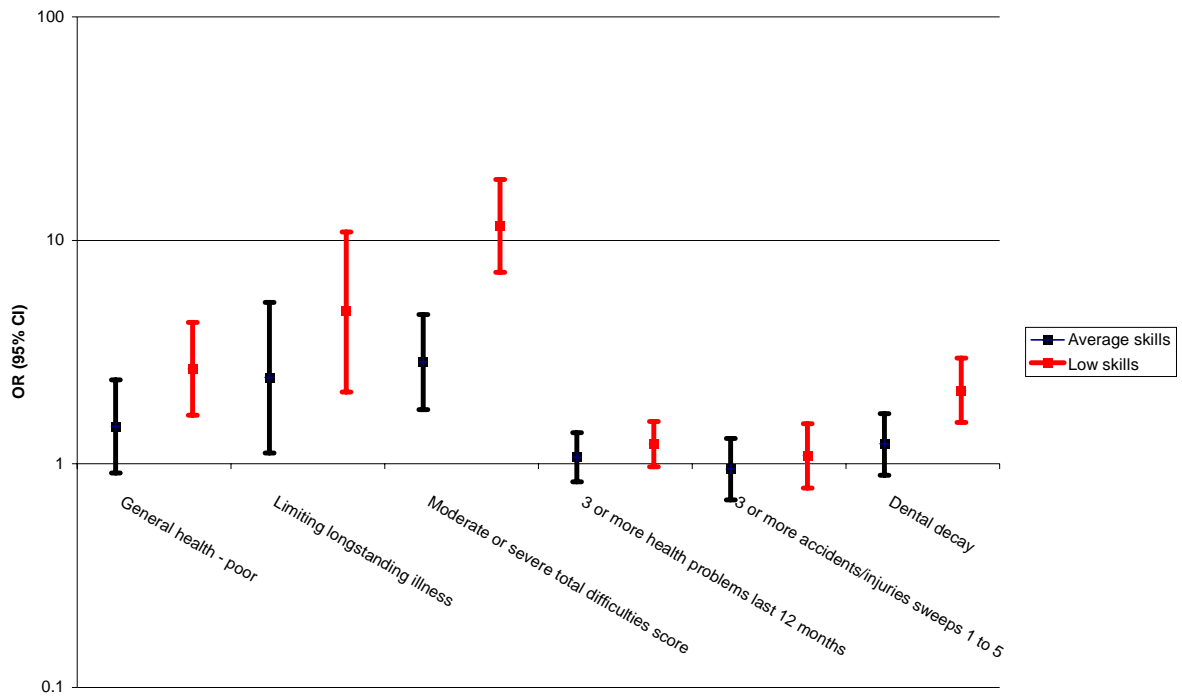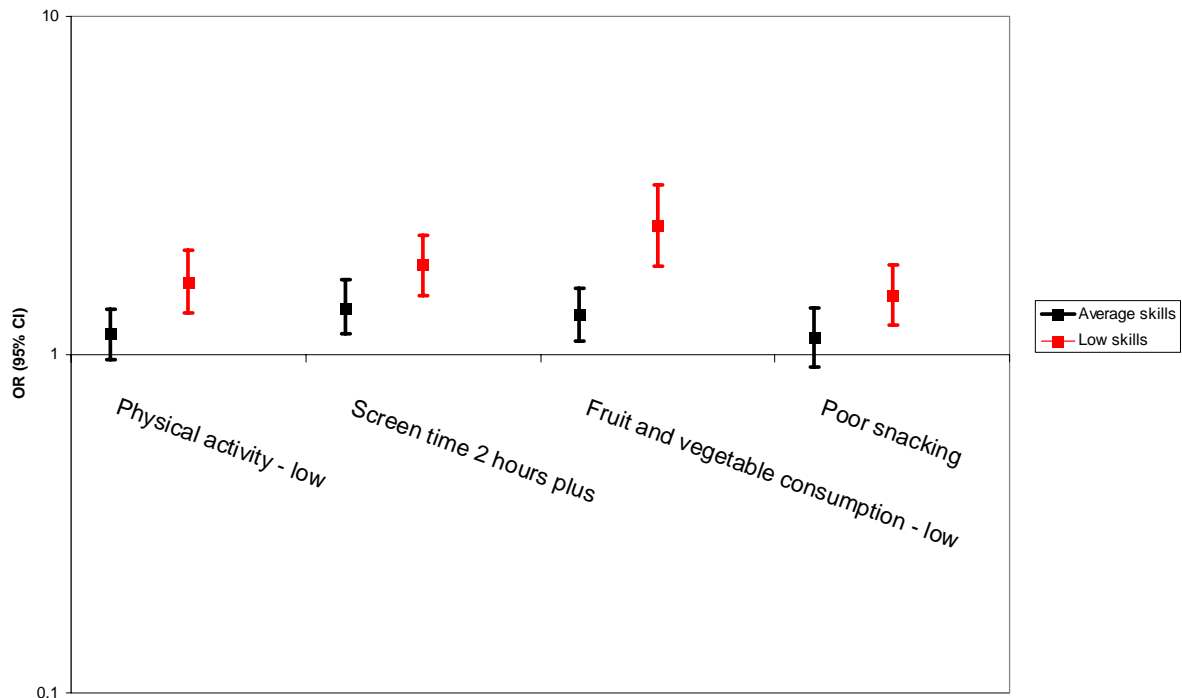

Figure 2-D   Associations between parenting skills and child health behaviours

Note: Analysis adjusts for child's gender, age in months at sweep 5, whether child was mother's first born, number of children in household at sweep 5, mother's ethnic group, mother's age at birth of survey child, mother's educaitonal qualifications, mother's maternal health, family composition from sweeps 1 to 5, housing, household equivalised income and area deprivation.

2.6 Effect of parenting on health inequalities linked to family adversity

Associations between family adversity and all health and health behaviour outcomes were modelled using a binary variable for family adversity (0=no family adversity, 1=some family adversity). There were 2 stages to the models. Stage 1 contained standard controls (child's gender, age in months at sweep 5, whether the child was first born or had older siblings and the number of children in the household at sweep5). Stage 2 added all the eight individual parenting measures.

The "effect" of parenting was measured by the change in the odds ratio for family adversity from stage 1 to 2 (ie after parenting was added to the models). Since an odds ratio of 1.00 indicates "no effect" of family adversity, the percentage effect of parenting was calculated as follows: (stage 1 odds – stage 2 odds)/ (stage 1 odds – 1)*100. Table 2.6 below presents further details.

Table 2.7 Calculation of the effect of parenting on health inequalities linked to some family adversity

Health and Health Behaviour outcomes	Odds of poor health relating to some family adversity				% effect of parenting adjustment
	Stage 1 - unadjusted for parenting	p	Stage 2 - adjusted for parenting	p	
Poor general health	4.03	***	3.02	***	33
Limiting longterm illness	2.62	***	1.90	***	44
Borderline or abnormal behavioual and emotional difficulties	4.56	***	3.13	***	40
3 or more health problems last year	1.49	***	1.38	**	22
3 or more accidents or injuries since birth	1.96	***	1.88	***	8
Poor dental health	2.70	***	2.06	***	38
Screen time - 2 hours or more	2.08	***	1.72	***	33
Low fruit and vegetable consumption	1.69	***	1.32	**	54
Frequent snacking on crisps, sweets or sugary drinks	1.98	***	1.67	***	32

** denotes $p < 0.01$, *** denotes $p < 0.001$