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Barnes, Jacqueline and Gardiner, J. and Sutcliffe, A. and Melhuish, Edward C. (2014) The parenting of preschool children by older mothers in the United Kingdom. *European Journal of Developmental Psychology* 11 (4), pp. 397-419. ISSN 1740-5629.

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The parenting of preschool children by older mothers in the United Kingdom

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Running head: Parenting and older mothers in the UK

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European Journal of Developmental Psychology

Online: 16 December 2013

DOI: [10.1080/17405629.2013.863728](https://doi.org/10.1080/17405629.2013.863728)

Abstract

The parenting literature has focussed on teenage motherhood but less is known about older mothers. In industrialised societies more women are giving birth later in life. The study examined whether there are any age trends in the use of discipline, home organisation, provision of learning opportunities, maternal responsiveness and mother-child relationships treating maternal age at birth as a continuous construct. The sample was from two national UK cohorts with common assessments at 3 years (N = 24,610). Withholding treats or attention as discipline and parent-child conflict decreased as maternal age increased. Harsh discipline such as smacking was low for teenage mothers, highest in the mid-twenties after which it declined. Household chaos decreased with maternal age increasing up to age 30 after which it was likely to be higher. Positive and responsive parenting generally increased with maternal age up to about the age of 40 after which it plateaued. Thus overall, while older motherhood is associated with medical risks for mother and child it should not present problems in relation to parenting during the preschool years.

Keywords: Discipline, parent-child relationship, learning opportunities, preschool, family functioning

In recent years there has been a strong trend towards later childbearing. In 2010, nearly half (48%) of all babies in England and Wales were born to mothers aged 30 and over, (ONS, 2011). Births to women aged 40 and over almost tripled from 1990 to 2010. Similarly, in the USA between 1990 and 2004 births to women 35-39 years increased by 43%, to women 40-44 increased by 62%, and to women 45+ increased by 150% (Martin et al., 2006). Older motherhood is not a new phenomenon (Berryman, 1991) but has received increased attention in relation to assisted reproductive technology (Boivin et al., 2009; Campbell, 2011). The trend for delaying motherhood has been attributed to factors such as increased participation in higher education, delayed marriage and the desire to develop a career and ensure both relationship and financial stability before starting a family (Cooke, Mills & Lavender, 2012; Jefferies, 2008). Nevertheless concerns regarding later motherhood have been highlighted (Shaw & Giles, 2009).

Biological risks are greater with older motherhood, for mothers and their infants (Vohr et al., 2009). Less is known about risks for parenting but, for a variety of reasons such as the mother's capacity to cope with the on-going demands of parenting, it could be that older mothers might not cope as well once infants are born. Alternatively older mothers have more 'life experience', more qualifications and potentially more ways to gain support if needed so they could cope more effectively. Finally, younger mothers may have more energy but on average fewer financial resources (Hall & Hall, 2007).

Home experiences are important for preschool children's development (Melhuish et al., 2008a). The possibility that parenting is more effective with increasing maternal age is suggested by a finding that child health and developmental outcomes were more advantageous for children born to older mothers (Sutcliffe, Barnes, Belsky, Gardiner & Melhuish, 2012). In addition, there is substantial evidence of the deleterious consequences for children of young motherhood (Botting, Rosata & Wood, 1998; Moffitt & the E-Risk Study

Team, 2002). Children of teenage mothers are likely to have lower achievement, lower cognitive development and more behavioural and emotional problems (Kiernan & Mensah, 2009; Moore & Brooks-Gunn, 2002). There is evidence that adolescent mothers use more harsh parenting (Lee & Guterman, 2010) and their knowledge of infant development is lower (Bornstein, Cote, Haynes, Hahn & Park, 2010) suggesting that they may be less able to stimulate their children. However, the topic of teen parenthood is inextricably linked with reduced socio-economic and educational circumstances, likely to adversely influence parenting behaviours (Hall & Hall, 2007; Lopez Turley, 2003). Moffitt and colleagues (2002) concluded that young mothers also had significantly less human and social capital, experienced more mental health problems than older mothers, that their partners were less reliable and supportive and were more likely to be more abusive.

The social advantages of older parents might outweigh biological risks (Stein & Susser, 2000). Evidence about families using assisted reproduction, who tend on average to be older than mothers who have conceived naturally, conclude that they are generally well-adjusted and have good relationships with their children (Golombok, 2002), use less harsh parenting than other families, have less family stress and discord, and report feeling more competent (Barnes, 2006). Mothers who conceived using egg donation aged 50+ had no more stress than women who conceived in their 30s or 40s (Steiner & Paulson, 2007). These positive findings may be unique to assisted reproduction mothers and needs to be evaluated in a population sample.

Socio-demographic characteristics, social support and conception method are not the only factors that need to be included when thinking about the potential impact of older maternal age on parenting. Maternal age interacts with number of previous children. Parental awareness was found to be higher with more years of experience as a parent, but was not

related to demographic characteristics (Newberger, 1987). Thus any examination of the relevance of maternal age on parenting outcomes needs to take parity into account.

To investigate the relevance of ‘older motherhood’ it needs defining but there is little consensus about the terms ‘younger’ or ‘older mother’. The medical literature generally defines older motherhood as age 35+ years based on the increase in poor outcomes including preterm labour, foetal death or abnormalities after that age (Bianco et al., 1996; Vohr et al., 2009). In the developmental psychology literature the focus has been at the other end of the age spectrum, investigating the risks of being a young mother (e.g. Moore & Brooks-Gunn, 2002). Choices of cut-point for ‘young mother’ usually range from 18 to 21 years (Lee & Guterman, 2010). Some studies characterise all non-teen mothers as ‘older’ which does not allow for study age trends in parenting . Fergusson and Woodward (1999) used four age groups starting with teenage, but the top age was defined as 30 or older. Currently in the UK half of mothers are at least 30 years old (ONS, 2011) meaning that the majority are ‘older’. To identify non-linear trends in the impact of maternal age on parenting maternal age should be treated as a continuous indicator rather than dividing mothers into younger and older groups.

Studies have demonstrated that older mothers may have more parenting knowledge and feel more positive about their role as a parent, but it is not clear if there is a ceiling effect, or even a curvilinear relationship between maternal age and parenting outcomes. There is a lack of evidence about parenting behaviour such as the use of harsh discipline or management of the home differentiating mothers in their 20s and 30s from those who are older. The current study aimed to explore in more detail aspects of parenting and the home environment that are known to be relevant to children’s socio-emotional and cognitive development in relation to maternal age, without preconceptions about what constitute ‘older’. The outcomes thus include potentially negative parenting such as harsh discipline; and potentially positive

behaviours such as responsiveness and having a close parent-child relationship. The study is not limited to first time parents so the number of children in the family can be incorporated into analyses, born both before and after the target 3-year old, reflecting real-life family circumstances by examining effects in a representative community sample.

The hypothesis being tested is that maternal age is relevant to parenting behaviour. Based on studies focussing on very young mothers, it was expected that parenting would be less optimal for the youngest mothers and improving with increasing maternal age but the study is exploratory in relation to whether this trend would be linear, or would decline at some point with 'older mother' status.

Method

Participants

The study makes use of data from two longitudinal studies. The sample consisted of the mothers of children in the Millennium Cohort Study (MCS) (Dex & Joshi, 2004) and the National Evaluation of Sure Start (NESS) Impact Study (Melhuish, Belsky, Leyland, Barnes & the NESS Team, 2008) seen when their children were 3 years old (see Table 1). Multi-region ethical approval was obtained for both MCS and NESS studies from the National Health Service (NHS) South West Multicentre Research Ethics Committee. Parents provided written informed consent. Participants for this study are the mothers, both samples were selected on the basis of the children's characteristics. For both studies children were sampled from the government's Child Benefit records.

Eligible children for the MCS were all those born over 16 months starting in September 2000 living in 398 electoral wards in the UK, clustered geographically by ward and stratified to ensure an adequate representation of wards with high minority ethnic populations (30+% Black or Asian in the 1991 Census), and the poorest 25% of wards based on the Child Poverty Index (CPI, Noble et al., 2000). The MCS sample was first contacted

when children were 9 months (18,552, response rate 70%). Of these, 14,898 were seen when the child was 3 years (80.3% retention). Additional children were recruited for the 3 year sweep to give a sample of 15,590 (Plewis, 2007). The NESS sample was selected from children living in areas receiving a Sure Start Local Programme (Melhuish et al., 2008b), all in the 20% most disadvantaged areas in England based on the CPI (Noble et al., 2000). A random sample was selected from Child Benefit records of those born during 29 months starting in January 2002. A sample of 12,705 (response rate 84%) was seen at 9 months. Of these, 11,118 were randomly selected to be approached when the child was 3 years old and 9,191 (82.7%) of the families participated. The total sample consisted of: 24,610 mothers of 3-year-olds (15,590 MCS and 9,191 NESS) whose children had a mean age of 3.2 years (s.d. 0.2). The mean maternal age at the child's birth was 28.3 years (s.d. 6.1) and the mean paternal age at birth was 32.6 years (s.d. 5.7). Families seen at both time points differed from those seen only at 9 months (see Table 2). A greater proportion were lone mothers, more were step families, fewer were workless, white ethnic backgrounds were more frequent, Pakistani/Bangladeshi and Black less so, fewer of the children were firstborn, more had one sibling, fewer mothers had no educational qualifications, more mothers were in professional occupations and fewer unemployed and fewer women were unemployed.

Procedure

Data collection procedures were coordinated across studies, with common researcher training to ensure comparable information so data could be combined. Data were gathered during home visits by parental interview and researcher observations.

Outcomes

For most of the outcomes sub-sets of items from longer scales are used due to the time constraints of the longitudinal birth cohort study, the Millennium Cohort Study, which had to cover a wide range of topics in a relatively short interview (Johnson 2012). In a number of

cases the putative outcome variables were the sums of component scores from three or more questions. Cronbach's alpha was calculated and the effect of dropping individual components was considered. Where there were more than three components to an outcome, exploratory factor analysis was applied, using two or three factors, to see if there was evidence of clusters among the components which could be analysed as independent outcomes.

Use of discipline was assessed by asking how often (never, rarely, once a month, once a week, daily or more) each of five strategies was used when their child was naughty, using items from the Parent-Child Conflict Tactics Scale (CTSPC; Straus, Hamby, Finkelhor, Moore & Runyan, 1998). Factor analysis suggested a breakdown into two discipline outcomes: "withdrawal of attention / treats", consisting of "send to bedroom or naughty chair" and "take away treats" (Cronbach's alpha 0.60), and "overt punishment" consisting of "smack", "shout" and "tell off" (Cronbach's alpha 0.67).

Lack of organisation of the home environment was studied with three questions from the Confusion, Hubbub and Order Scale (CHAOS; Matheny, Wachs, Ludwig and Phillips, 1995) (you can't hear yourself think in our home, the atmosphere in our home is calm, it's really organised in our home; Cronbach's alpha 0.65). Responses are coded on a five point agree to disagree scale so that a higher score indicates more disorganisation.

The Home Learning Environment was assessed with the EPPE Home Learning Environment measure (HLE; Melhuish, et al., 2008a). Mothers were asked about the frequency of five activities (painting/drawing, learning the alphabet, teaching songs/poems, counting, taking child to the library) each with a possible score from 0 to 7, a higher score indicating a more stimulating and educational environment.

Mothers were asked seven of the nine items in the parent/child closeness scale from the Child-Parent Relationship Scale (CPRS; Pianta, 1992) (e.g. s/he will seek comfort from

me, s/he spontaneously shares information with me; Cronbach's alpha 0.66) and the six item parent/child conflict scale (e.g. dealing with her/him drains my energy, if the s/he is in bad mood, I know we are in for a long day; Cronbach's alpha 0.78). Responses on a five point scale ranged from 'definitely does not apply' to 'definitely applies'.

Observations were made by interviewers using the Home Observation of the Environment measure (HOME; Caldwell & Bradley, 1988) using three items from the Responsiveness scale (answers child's questions verbally, praises child spontaneously, caresses or kisses child) and three items from the Acceptance of Child scale (does not scold more than once, does not use physical restraint, does not slap or spank), scored yes/no and combined to form 'supportive parenting' score (Cronbach's alpha 0.57). The observations were based on a home visit lasting 45-60 minutes. Observers documented any instances of the relevant behaviour as they occurred during the interview.

Covariates

Covariates were selected based on their significant relationship with parenting outcomes. Participant characteristics were mother's ethnic group (six categories from UK census – Black Caribbean or African, Indian, Pakistani or Bangladeshi, white, mixed, and other), parity at birth of the child (as a surrogate for birth order), number of siblings at the assessment time point, being a lone mother, being a mother and step-father family, living in workless household, mother's educational attainment, mother's social class (defined by habitual occupation) and mother's employment status (not in paid employment / part-time work / full-time work). Paternal age, family income and child sex were also added as covariates.

Data analysis

Families without a natural mother present were excluded from the analysis (N=171). The percentage of missing data was low (less than 10%) for all indicators with the exception

of “mother’s ethnic group”, where 18.5% of the data were missing. Missing data were imputed using the Amelia II package (Honaker, Joseph, King, Scheve & Singh, 2012). Five imputations were generated, and models fitted, consolidated using Rubin’s Rules (Rubin, 1987), with degrees of freedom found using Hesterberg’s equation (1998).

Since participants were geographically clustered, linear mixed-effects models were used with a random effect fitted for clustering. The principal independent variable was maternal age *at the target child’s birth*, treated as a continuous variable. An initial model was fitted with a linear term in maternal age. A quadratic term was added and retained if significant. If the quadratic term was significant, cubic and higher order terms were added successively and retained if significant. Models were fitted in R 2.11.1, using the lme package (Pinheiro & Bates, 2012) in R 3.0 (R Development Core Team, 2010). Analyses were undertaken for MCS and NESS samples separately and also for the combined total sample. Results were broadly similar in all cases; therefore results are given for the combined sample.

In addition to fitting models for each parenting outcome two composite outcomes were created to represent predominantly ‘negative and disciplinary’ (referred to as negative for brevity) aspects of parenting (withdrawal of attention or treats, harsh discipline, home chaos, parent/child conflict) and ‘positive’ aspects (parent/child closeness, HLE, supportive parenting) with scores ranging from 0 to 100 and models were fitted for these composites. The four outcomes in ‘discipline/negative’ parenting were re-scaled to have a range of 0-25 and all given equal weighting. The three outcomes included in ‘positive’ parenting were re-scaled to 0 – 33.3 and all given equal weighting.

Results

Mean values of parenting outcomes are given in Table 3 and associations between parenting outcomes with each other, with the ‘positive’ and ‘negative’ composites, and with

maternal age are shown in Table 4. Results of the regression models for the composite parenting outcomes are given in Table 5, results of the final controlled models for each separate parenting outcome are in Tables 6 and 7. Regression lines of significant maternal age at birth effects are shown in Figures 1 and 2.

The composite 'disciplinary/negative' parenting outcome had a linear relationship with maternal age, less negative parenting with increasing maternal age (see Table 5 and Figure 1). However examination of its component parts showed more complexity. Management of difficult child behaviour by withdrawal of attention or withholding treats, potentially a less harsh strategy, declined with increasing maternal age as did reported mother/child conflict (See Table 6 and Figure 1). However management of difficult child behaviour by overt punishment (smack, shout, tell off) was curvilinear in relation to maternal age. Use of these strategies was lower for younger mothers, rising to a peak for mothers giving birth in their mid-twenties, then declining with increasing maternal age (see Table 6 and Figure 1). Household chaos was highest for the youngest mothers with a downwards slope for increasing maternal age up to about 30 years, after which it increased so that older mothers were likely to report more home disorganisation though not as much as teenage mothers (see Table 6 and Figure 1). Household chaos was associated most highly with parent/child conflict (see Table 4).

Total 'positive' parenting had a non-linear relationship with maternal age, lowest for teenage mothers, reaching a peak for those who gave birth in their mid-thirties, after which it dropped, though not to the level of the youngest mothers (see Table 5 and Figure 2). Maternal supportiveness and mother/child closeness followed a similar pattern to the total positive parenting score but with plateaus from maternal age of about 40 years (see Table 7 and Figure 2). The Home Learning Environment (HLE) was only marginally related to maternal

age, slightly lower for the youngest mothers, highest for mothers giving birth in their twenties then decreasing with increasing maternal age (see Table 7 and Figure 2).

Clearly many other family characteristics were significant predictors of the parenting outcomes (see Table 5). Girls experienced less 'negative' disciplinary parenting and more 'positive' parenting as did 3-year olds with a larger number of siblings. Not being a first born was related to more 'negative' parenting. Lone mothers and those in living step-parent families were likely to have higher 'negative' and lower 'positive' parenting. Other socioeconomic factors such as family income, maternal education and maternal social class had minimal or no relationship with 'negative' parenting but were predictors of 'positive' parenting with more educated mothers and those in higher status occupations more positive and supportive overall, providing more stimulating home environments.

Discussion

From these results, , unlike perinatal medical risks attached to later motherhood, parenting of preschool aged children involved less parent-child conflict and less use of discipline for mothers who had given birth at an older age t. Since all the relevant socio-demographic characteristics of the families that might be relevant to difficult child behaviour were taken into account in the analyses, one could conjecture that older mothers may have more strategies for coping with annoyance or misbehaviour and were able to use their maturity to provide more creative ways to deal with their young children.

While mothers giving birth in their mid-twenties used more harsh discipline, its use decreasing with maternal age, home chaos decreased only up to mothers giving birth at around age thirty. At this age the home learning environment score was likely to be highest. After that it was likely that, although overall more positive and less negative, mothers giving birth in their later thirties and forties were likely to have homes with more disorganisation with a slightly lower focus on providing many educational opportunities. Possibly women

giving birth in their late twenties to early thirties are the most highly committed to the role of being a parent having been able to address some life challenges before giving birth, but without the attendant anxiety that biologically they would be considered 'elderly'. This high commitment has been found for parents who conceive using assisted reproductive technologies, generally older than the average (Barnes 2006; Golombok, 2002). Mothers giving birth in their late thirties and forties may be less committed, or more relaxed about how perfect their homes should be as child care environments. Alternatively they may place greater faith in the role of the preschool and school to provide stimulating activities. They may also be more involved in employment or other activities.

In conclusion, this study has found in a large and nationally representative sample that, while there are many medical reasons why close attention should be given to the physical well-being of older mothers and their infants both in utero and immediately postpartum, an increase in older motherhood (ONS, 2013) should not necessarily be a cause for concern in relation to subsequent parenting. Indeed it is likely that they will be preparing their children well for preschool and then school experiences in a warm and responsive home environment. Other work has shown that 3-year old children of older mothers are likely to have better language development and to experience fewer unintentional injuries (Sutcliffe et al., 2012). Women with more life experiences may be able to draw upon a wider range of support from that can help to reduce some of the stress of parenting. Older mothers appeared to be less concerned about keeping their home highly organised. While home chaos was included in the 'negative' parenting dimension and was associated significantly with the two disciplinary constructs. However, it was more strongly related to parent-child conflict so may reflect a different kind of dynamic in the family, with greater or lesser concern for an orderly home, which children might disrupt.

While high levels of ‘chaos’ are found to have an adverse influence on child development (Dumas et al., 2005) there may be a ‘happy medium’ that places mothers under less pressure. Older mothers were likely to use less discipline and it has been shown for this same group of mothers that their 3-year-old children are likely to have fewer behaviour problems than children of younger mothers (Sutcliffe et al., 2012). Child behaviour problems have been linked in many studies with young parenthood (Kiernan & Mensah, 2009; Moore & Brooks-Gunn, 2002). The younger parents in this study were more likely to describe conflict with their child feeling less close to them, which might relate to the development of child behaviour or emotional problems. It could be useful for community practitioners such as health visitors to access the expertise of older parents’ child management to support young parents, using interventions such as peer to peer mentoring (Day, Michelson, Thomson, Penney & Draper, 2012).

The study had some advantages, notably that it is based on a large national sample of families, and that it has examined maternal age as a continuous construct to enable the identification of non-linear trends. However the coverage of parenting is limited. In addition, given the lower reliability of some scales, the results based on the composite ‘positive’ and ‘negative’ parenting may be more robust. It would have been useful to have reports of parenting stress, on commitment to the parental role, and on the roles played by mothers and fathers in the family. A further limitation is that parity is not a perfect indicator of birth order. In addition, the NESS sample over-represented families from disadvantages backgrounds, who may have more risk factors that could influence parenting. In summary, this broad brush examination of parenting should provide pointers for future, more detailed research to explore the processes taking place in families in relation to maternal age.

Acknowledgements

This research was funded in part by the Wellcome Trust through a grant entitled ‘Health of children born to older mothers’; the funding body had no involvement in the design and conduct of the study; collection, management, analysis and interpretation of the data; and preparation, review or approval of the manuscript.

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Table 1. Maternal and family characteristics of the sample when children aged 3 unless otherwise specified (N= 24,610)

Characteristic		N	%
Lone parent		5378	21.9
Living with step-paternal figure		588	2.4
Living in workless household		5881	23.9
Mother's ethnic group	White	16787	83.7
	Mixed	220	1.1
	Indian	467	2.3
	Pakistani / Bangladeshi	1459	7.3
	Black	726	3.6
	Other	399	2.0
Mother's parity at birth of child	1	11508	46.8
	2	8029	32.6
	3 or more	5073	20.6
Number of siblings in the home	0	6151	25.0
	1	10651	43.3
	2	4807	19.5
	3 or more	2995	12.2
Family annual income	< £11,000	5887	24.6
	£11,000 to £22,000	8591	35.8
	> £22,000	9497	39.6
Mother's educational	No formal qualifications	3386	13.8

qualifications	GCSE or equivalent	10076	41.0
	A level or equivalent	5999	24.4
	Degree or higher degree	4260	17.3
	Other qualification	877	3.6
Mother's social class	Managerial/professional	5594	23.5
	Intermediate	5111	21.4
	Small employer/self-employed	1715	7.2
	Lower supervisory/ technical	1855	7.8
	Semi-routine/routine	8368	35.1
	Unemployed	1196	5.0
Mother's employment status	Not working	13074	53.5
	Part-time work	7340	30.1
	Full-time work	4009	16.4
Child's sex	Female	12069	49.0

Note: Workless household = all income from State benefits; GCSE = General Certificate of Education, gained generally at age 16; A level = Advanced level, gained generally at age 18

Table 2 Comparison of families seen at both 9 months and 3 years with those seen only at 9 months

Family characteristic		Seen 9 months and 3 years (N = 24782)*		Seen only at 9 months (N = 7589)		<i>p</i> -value for test of difference
		N	%	N	%	
Lone mother at 9 months		5064	21.3	928	12.4	< 10 ⁻³
Living with step-paternal figure at 9 months		102	0.4	10	0.1	< 10 ⁻³
Living in workless household at 9 months		5902	24.9	2807	37.4	< 10 ⁻³
Mother's ethnic group	White	16367	84.4	1183	76.7	< 10 ⁻³
	Mixed	208	1.1	28	1.8	0.011
	Indian	435	2.2	42	2.7	0.26
	Pakistani / Bangladeshi	1338	6.9	144	9.3	< 10 ⁻³
	Black	668	3.4	114	7.4	< 10 ⁻³
	Other	366	1.9	32	2.1	0.68

Mother's parity at birth of child	1	11154	47.0	759	52.3	$< 10^{-3}$
	2	7749	32.6	424	29.2	0.008
	3 or more	4840	20.4	267	18.4	0.075
Number of sibs at age 9 months	0	9789	41.2	3255	43.3	0.001
	1	8077	34.0	2310	30.7	$< 10^{-3}$
	2	3738	15.7	1156	15.4	0.47
	3 or more	2139	9.0	793	10.6	$< 10^{-3}$
Family annual income at 9 months	< £11,000	8040	35.7	3589	50.5	$< 10^{-3}$
	£11,000 to £22,000	8730	38.7	2693	37.9	0.19
	> £22,000	5764	25.6	830	11.7	$< 10^{-3}$
Mother's educational qualifications at 9 months	No formal qualifications	3188	13.4	1862	24.9	$< 10^{-3}$
	GCSE or equivalent	9763	41.2	2920	39.0	0.001
	A level or equivalent	5809	24.5	1464	19.5	$< 10^{-3}$
	Degree or higher degree	4135	17.4	957	12.8	$< 10^{-3}$
	Other qualification	825	3.5	287	3.8	0.16
Mother's social class at	Managerial / professional	5610	24.5	1110	15.6	$< 10^{-3}$

9 months	Intermediate	3936	17.2	1050	14.7	< 10 ⁻³
	Small employer / self-employed	864	3.8	243	3.4	0.17
	Low supervisory / technical	1387	6.0	421	5.9	0.67
	Semi-routine / routine	9758	42.6	3475	48.7	< 10 ⁻³
	Unemployed	1376	6.0	836	11.7	< 10 ⁻³
Mother's employment status at 9 months	Not working	13643	57.5	5092	67.9	< 10 ⁻³
	Part-time work	6071	25.6	1214	16.2	< 10 ⁻³
	Full-time work	3998	16.9	1195	15.9	0.062
Child's sex (= female)		11648	49.1	3597	47.9	0.075

* Total differs from Table 1, representing the total sample and including those with no mother in the home at age 3

Table 3. Mean values and standard deviations of parenting outcomes (N=24,610)

Outcome	Mean	S.D.
'Negative parenting' ¹	35.4	8.09
'Positive parenting' ²	79.8	9.62
Withdrawal of attention or treats for discipline ³	5.51	2.02
Overt discipline (smack, shout and tell off) ³	8.74	2.37
Household chaos ⁴	7.15	2.15
Parent / child conflict ⁵	13.9	5.12
Home Learning Environment ⁶	19.4	6.91
Parent/ child closeness ⁵	32.9	3.13
Supportive parenting ⁷	17.1	1.66

1 Withdrawal of attention + overt discipline + household chaos + parent/child conflict

2 Home Learning environment + Parent/child closeness + Supportive parenting

3 Parent-Child Conflict Tactics Scale (CTSPC); Straus et al., 1998

4 CHAOS; Matheny, Wachs, Ludwig and Phillips, 1995

5 Child-Parent Relationship Scale (CPRS); Pianta (1992)

6 Home Learning Environment (HLE); Melhuish, et al., 2008b

7 Home Observation of the Environment measure (HOME); Caldwell & Bradley, 1988

Table 4. Associations between parenting outcomes and maternal age (N=24,610).

	Withdrawal of Attention	Overt Discipline	Household Chaos	Parent / Child Conflict	Home Learning Environment	Parent / Child Closeness	Observed Supportive Parenting	'Positive' Parenting	'Negative' Parenting
Maternal Age	-0.15 ***	0.02 *	-0.04 ***	-0.09 ***	-0.01	0.18 ***	0.12 ***	0.12 ***	-0.10 ***
Withdrawal of Attention		0.37 ***	0.11 ***	0.25 ***	0.04 ***	-0.02 ***	-0.03 ***	0.01	0.54 ***
Overt Discipline			0.15 ***	0.34 ***	-0.09 ***	0.03 ***	-0.01 *	-0.06 ***	0.64 ***
Household Chaos				0.26 ***	-0.09 ***	-0.19 ***	-0.13 ***	-0.19 ***	0.50 ***
Parent / Child Conflict					-0.10 ***	-0.32 ***	-0.12 ***	-0.24 ***	0.86 ***
Home Learning Environment						0.13 ***	0.13 ***	0.76 ***	-0.10 ***
Parent / Child Closeness							0.20 ***	0.56 ***	-0.25 ***

Closeness									
Observed Supportive Parenting								0.61 ***	-0.12 ***
'Positive' Parenting									-0.22 ***

* p <.05, *** p<.001

Table 5. Regression results for composite parenting outcomes. All parameters refer to characteristics at child age 3 years except maternal and paternal age and maternal parity, which are at birth. Coefficients for maternal and paternal age are per 5 year change in age. Maternal age was centred on age 30; therefore the linear effect of maternal age is the slope of the regression line at this point (see Figures 1 and 2)

Model Parameter		Negative Parenting		Positive Parenting	
		Beta	<i>p</i>	Beta	<i>p</i>
Maternal age	Maternal age	-1.2	< 10 ⁻³	0.25	< 10 ⁻³
	Maternal age ²			-0.17	< 10 ⁻³
Paternal age		-0.37	< 10 ⁻³	0.058	0.38
Child's age		-0.30	0.54	0.64	0.051
Child's sex = female		-2.4	< 10 ⁻³	2.6	< 10 ⁻³
Mother is lone parent		0.82	0.006	-0.045	0.82
Presence of step-father figure		3.8	< 10 ⁻³	-1.4	< 10 ⁻³
Child raised in workless household		0.80	0.009	-1.9	< 10 ⁻³
Number of siblings (baseline = 0)	1	3.7	< 10 ⁻³	-1.1	< 10 ⁻³
	2	5.0	< 10 ⁻³	-1.7	< 10 ⁻³
	≥ 3	6.2	< 10 ⁻³	-2.7	< 10 ⁻³
Mother's parity at birth of child (baseline = 1)	2	-0.87	< 10 ⁻³	-0.11	0.51
	≥ 3	-3.5	< 10 ⁻³	0.28	0.30
Mother's ethnic group (baseline = "white")	Mixed	-0.55	0.49	-0.12	0.82
	Indian	-4.9	< 10 ⁻³	-1.2	0.027
	Pakistani / Bangladeshi	-5.3	< 10 ⁻³	-3.7	< 10 ⁻³
	Black (African / Caribbean)	-2.9	< 10 ⁻³	-2.8	< 10 ⁻³
	Other	-3.5	< 10 ⁻³	-2.7	< 10 ⁻³
Family income (baseline = < £11,000 p.a.)	£11,000 to £22,000 p.a.	0.16	0.56	0.83	< 10 ⁻³

	> £22,000 p.a.	0.098	0.75	1.4	< 10 ⁻³
Mother's educational attainment (baseline = no formal qualifications)	GCSE	0.18	0.55	1.8	< 10 ⁻³
	A Level	0.19	0.55	2.8	< 10 ⁻³
	Degree	0.49	0.17	3.6	< 10 ⁻³
	Other	0.37	0.49	1.2	< 10 ⁻³
Mother's social class, defined by habitual employment (baseline = managerial or professional)	Intermediate	0.65	0.032	-0.88	< 10 ⁻³
	Small employer / Self-employed	0.090	0.83	-0.74	0.007
	Technical	0.99	0.009	-0.83	0.002
	Routine	0.41	0.17	-2.0	< 10 ⁻³
	Unemployed	-1.3	0.043	-3.9	< 10 ⁻³
Mother's work status (baseline = not working)	Working part time	-0.16	0.51	0.088	0.60
	Working full time	-1.1	< 10 ⁻³	-0.65	0.001

Table 6. Results of linear regression models for components of ‘negative parenting’ outcomes. All parameters refer to characteristics at child age 3 years except maternal and paternal age and maternal parity, which are at birth. Coefficients for maternal and paternal age are per 5 year change in age. Maternal age was centred on age 30; therefore the linear effect of maternal age is the slope of the regression line at this point (see Figure 1).

Model Parameter		Withdrawal of Attention / Treats		Overt Punishment		Household Chaos		Parent / Child Conflict	
		Beta	<i>p</i>	Beta	<i>p</i>	Beta	<i>p</i>	Beta	<i>p</i>
Maternal age	Maternal age	-0.24	< 10 ⁻³	-0.16	< 10 ⁻³	-0.031	0.041	-0.20	< 10 ⁻³
	Maternal age ²	-0.019	0.020	-0.048	< 10 ⁻³	0.040	< 10 ⁻³		
	Maternal age ³			0.013	0.048				
Paternal age		-0.083	< 10 ⁻³	-0.025	0.21	-0.021	0.12	0.0066	0.86
Child’s age		0.37	< 10 ⁻³	-0.36	< 10 ⁻³	-0.17	0.016	-0.31	0.087
Child’s sex = female		-0.27	< 10 ⁻³	-0.34	< 10 ⁻³	-0.16	< 10 ⁻³	-0.47	< 10 ⁻³
Mother is lone parent		0.16	< 10 ⁻³	0.069	0.22	0.0084	0.85	0.17	0.12
Presence of step-father figure		0.63	< 10 ⁻³	0.16	0.12	0.29	< 10 ⁻³	0.89	< 10 ⁻³
Child raised in workless household		0.052	0.27	-0.14	0.010	0.22	< 10 ⁻³	0.44	< 10 ⁻³
Number of siblings (baseline = 0)	1	0.29	< 10 ⁻³	0.35	< 10 ⁻³	0.83	< 10 ⁻³	0.36	< 10 ⁻³
	2	0.29	< 10 ⁻³	0.37	< 10 ⁻³	1.4	< 10 ⁻³	0.35	0.015
	≥ 3	0.35	< 10 ⁻³	0.30	< 10 ⁻³	2.0	< 10 ⁻³	0.32	0.079
Mother’s parity at birth of child (baseline = 1)	2	-0.081	0.042	-0.092	0.045	-0.015	0.67	-0.43	< 10 ⁻³
	≥ 3	-0.38	< 10 ⁻³	-0.40	< 10 ⁻³	-0.16	0.004	-1.1	< 10 ⁻³
Mother’s ethnic group (baseline = “white”)	Mixed	-0.14	0.32	0.088	0.59	-0.21	0.074	0.24	0.42
	Indian	-0.67	< 10 ⁻³	-0.40	0.019	-0.76	< 10 ⁻³	-0.21	0.35
	Pakistani / Bangladeshi	-0.83	< 10 ⁻³	-0.42	< 10 ⁻³	-1.0	< 10 ⁻³	0.26	0.19
	Black (African / Caribbean)	-0.15	0.026	-0.26	0.014	-0.57	< 10 ⁻³	-0.53	0.007
	Other	-0.38	< 10 ⁻³	-0.46	0.003	-0.58	< 10 ⁻³	-0.024	0.94

Family income (baseline = < £11,000 p.a.)	£11,000 to £22,000 p.a.	0.12	0.001	0.071	0.11	-0.079	0.040	-0.25	0.014
	> £22,000 p.a.	0.22	< 10 ⁻³	0.13	0.018	-0.26	< 10 ⁻³	-0.35	0.002
Mother's educational attainment (baseline = no formal qualifications)	GCSE	0.14	0.004	0.087	0.082	-0.029	0.49	-0.36	0.001
	A Level	0.25	< 10 ⁻³	0.071	0.18	-0.11	0.019	-0.53	< 10 ⁻³
	Degree	0.34	< 10 ⁻³	0.064	0.29	-0.22	< 10 ⁻³	-0.24	0.091
	Other	0.054	0.48	0.13	0.14	-0.039	0.62	0.011	0.96
Mother's social class, defined by habitual employment (baseline = managerial or professional)	Intermediate	-0.083	0.076	0.21	< 10 ⁻³	0.18	< 10 ⁻³	0.078	0.48
	Small employer / Self-employed	-0.094	0.16	0.062	0.40	0.096	0.096	0.027	0.86
	Technical	0.0078	0.89	0.059	0.40	0.30	< 10 ⁻³	0.21	0.14
	Routine	-0.19	< 10 ⁻³	0.0086	0.86	0.30	< 10 ⁻³	0.34	0.003
	Unemployed	-0.41	< 10 ⁻³	-0.24	0.022	-0.12	0.12	0.80	< 10 ⁻³
Mother's work status (baseline = not working)	Working part time	0.047	0.19	-0.0079	0.84	-0.0085	0.81	-0.28	0.002
	Working full time	-0.071	0.095	-0.16	0.001	0.070	0.11	-0.65	< 10 ⁻³

Table 7. Results of linear regression models of components of ‘positive parenting’ outcomes. All parameters refer to characteristics at child age 3 years except maternal and paternal age and maternal parity, which are at birth. Coefficients for maternal and paternal age are per 5 year change in age. Maternal age was centred on age 30; therefore the linear effect of maternal age is the slope of the regression line at this point (see Figure 2)

Model Parameter		Home Learning Environment		Parent/ Child Closeness		Observed Supportive Parenting	
		Beta	<i>p</i>	Beta	<i>p</i>	Beta	<i>p</i>
Maternal age at birth	Maternal age	-0.070	0.15	0.18	< 10 ⁻³	0.058	< 10 ⁻³
	Maternal age ²	-0.053	0.042	-0.051	< 10 ⁻³	-0.023	< 10 ⁻³
Paternal age at birth		0.061	0.17	-0.0052	0.84	0.0036	0.76
Child’s age		0.11	0.62	0.35	0.007	0.097	0.11
Child’s sex = female		1.7	< 10 ⁻³	0.46	< 10 ⁻³	0.20	< 10 ⁻³
Mother is lone parent		-0.29	0.034	0.27	< 10 ⁻³	-0.014	0.71
Presence of step-father figure		-0.50	0.083	-0.44	0.006	-0.16	0.028
Child raised in workless household		-0.51	< 10 ⁻³	-0.59	< 10 ⁻³	-0.32	< 10 ⁻³
Number of siblings (baseline = 0)	1	-0.41	0.001	-0.18	0.009	-0.19	< 10 ⁻³
	2	-0.71	< 10 ⁻³	-0.37	< 10 ⁻³	-0.26	< 10 ⁻³
	≥ 3	-0.88	< 10 ⁻³	-0.60	< 10 ⁻³	-0.47	< 10 ⁻³
Mother’s parity at birth of child (baseline = 1)	2	-0.50	< 10 ⁻³	0.097	0.14	0.10	< 10 ⁻³
	≥ 3	-0.50	0.007	0.27	0.015	0.19	< 10 ⁻³
Mother’s ethnic group (baseline = “white”)	Mixed	-0.16	0.65	0.010	0.96	-0.037	0.67
	Indian	0.045	0.83	-0.77	0.0035	-0.19	0.062
	Pakistani / Bangladeshi	-1.9	< 10 ⁻³	-1.4	< 10 ⁻³	-0.27	< 10 ⁻³
	Black (African / Caribbean)	-1.6	< 10 ⁻³	-0.46	< 10 ⁻³	-0.32	< 10 ⁻³
Family income (baseline = < £11,000 p.a.)	Other	-1.3	< 10 ⁻³	-1.1	< 10 ⁻³	-0.15	0.049
	£11,000 to £22,000 p.a.	0.17	0.22	0.33	< 10 ⁻³	0.13	< 10 ⁻³
Mother’s educational attainment	> £22,000 p.a.	0.26	0.10	0.66	< 10 ⁻³	0.19	< 10 ⁻³
	GCSE	0.69	< 10 ⁻³	0.59	< 10 ⁻³	0.23	< 10 ⁻³

(baseline = no formal qualifications)	A Level	1.3	$< 10^{-3}$	0.87	$< 10^{-3}$	0.29	$< 10^{-3}$
	Degree	1.9	$< 10^{-3}$	0.99	$< 10^{-3}$	0.33	$< 10^{-3}$
	Other	0.88	$< 10^{-3}$	0.21	0.14	0.093	0.14
Mother's social class, defined by habitual employment (baseline = managerial or professional)	Intermediate	-0.67	$< 10^{-3}$	-0.17	0.039	-0.044	0.19
	Small employer / Self-employed	-0.53	0.004	-0.23	0.034	-0.019	0.71
	Technical	-0.18	0.31	-0.31	0.002	-0.14	0.002
	Routine	-0.94	$< 10^{-3}$	-0.65	$< 10^{-3}$	-0.18	$< 10^{-3}$
	Unemployed	-1.8	$< 10^{-3}$	-1.1	$< 10^{-3}$	-0.44	$< 10^{-3}$
Mother's work status (baseline = not working)	Working part time	-0.10	0.41	0.21	0.001	-0.0073	0.82
	Working full time	-0.60	$< 10^{-3}$	0.12	0.13	-0.075	0.043

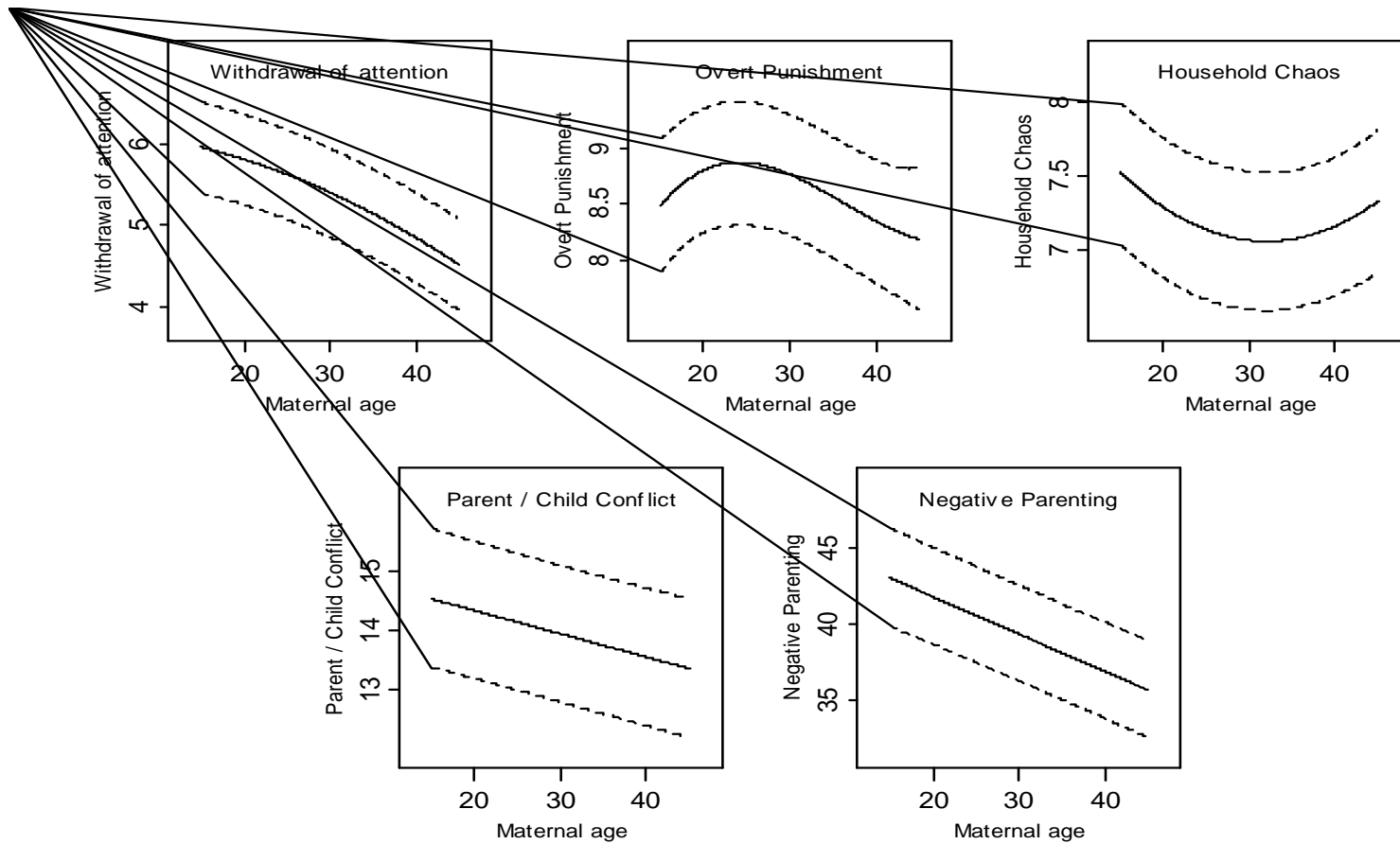


Figure 1. Regression lines for components of ‘negative parenting’ and the composite scale. Dashed lines represent 95% confidence intervals.

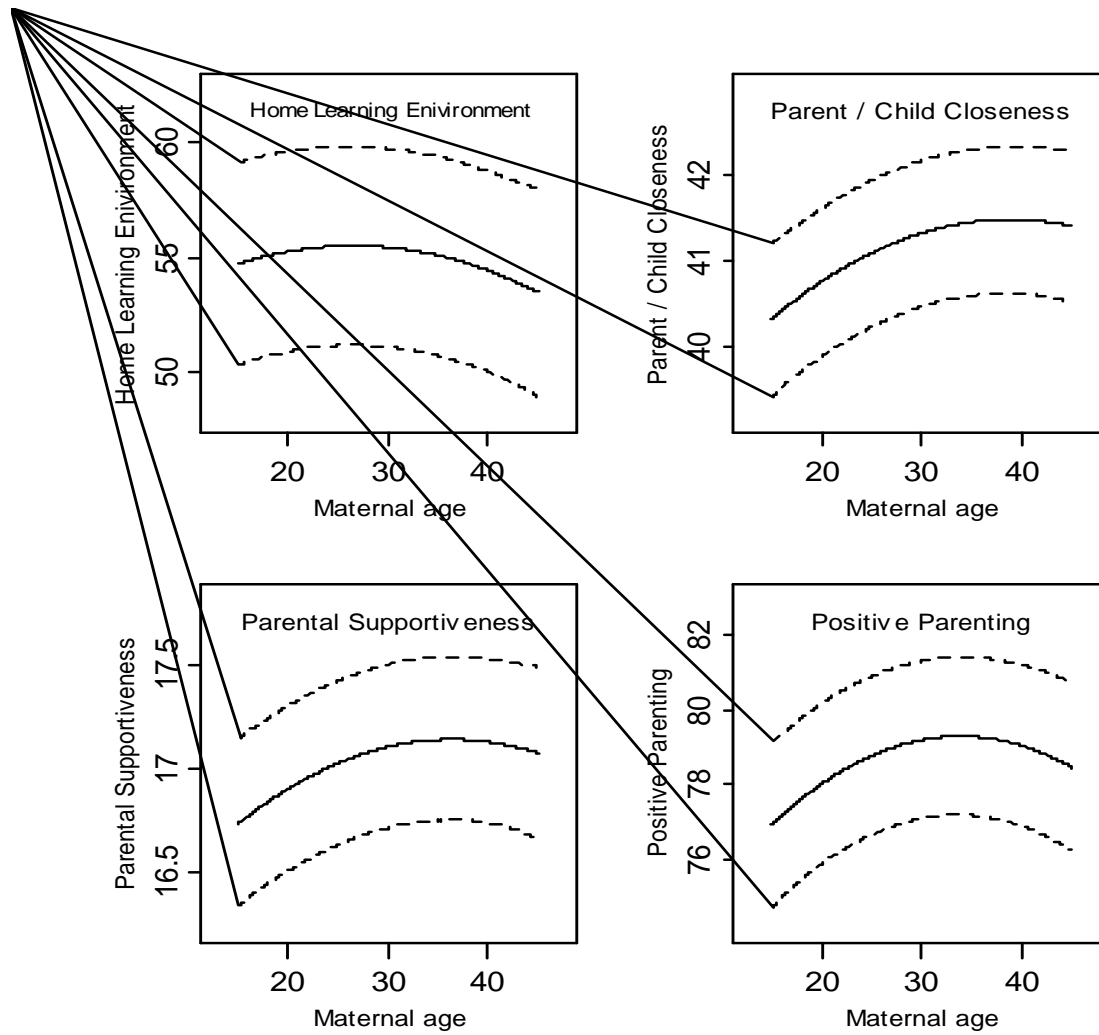


Figure 2. Regression lines for components of ‘positive parenting’ and the composite scale. Dashed lines represent 95% confidence intervals.