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Associations between older maternal age, use of sanctions, and children's socio-emotional development through 7, 11, and 15 years

Tea Trillingsgaard and Dion Sommer

Department of Psychology and Behavioural Sciences, Aarhus University, Aarhus, Denmark

ABSTRACT

In developed countries more women are giving birth later in life and this trend has been linked with perinatal medical risks as well as with improved psychosocial adaptation. This study examined whether older maternal age was associated with less use of sanctions and with positive child outcome at age 7, 11, and 15. A random population sample of 4741 mothers from the Danish Longitudinal Survey of Children was used. Data were obtained through face-to-face interviews and self-report questionnaires. Older maternal age was associated with less frequent use of verbal and physical sanctions towards children at age 7 and 11. At age 15 this association remained significant for verbal sanctions but not physical sanctions. Older maternal age was associated with fewer behavioral, social and emotional difficulties in children at age 7 and at age 11 but not at age 15. The associations reported were significant independently of all observed demographic and socioeconomic characteristics.

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Developed countries are witnessing a marked change in the pattern of childbearing as increasing numbers of women postpone childbearing until their 30s and 40s. This demographic trend has been attributed to several reasons, such as longer life span, greater accessibility to education and career opportunities for women, and the existence of effective means of birth control (Dencik, Jørgensen, & Sommer, 2008). With Denmark as one example, the mean childbearing age has been steadily increasing since the 1970s, and reached 30.9 years in 2015, the highest since the advent of modern contraception (Statistics Denmark, 2016, March 29). As follows from these statistics, the majority of Danish children are now born to women who passed 30 years of age and the proportion of children born to mothers aged 40 or above has quadrupled since 1985.

CONTACT Tea Trillingsgaard teatri@psy.au.dk

Older maternal age is associated with increased risk of complications during pregnancy and childbirth, and these risk factors have been extensively researched (for a review, see Carolan & Frankowska, 2011). Among established findings are that older mothers more frequently experience the requirement of assisted reproductive technologies, and have higher risk of abortion, preterm labor, fetal malformation, and maternal cardio metabolic disease (Cavazos-Rehg et al., 2015; Kenny et al., 2013; Schmidt, Sobotka, Bentzen, Andersen, & ESHRE Reproduction & Society, Task Force, 2012).

Unlike perinatal medical risks, the risk of maternal psychopathology during the postpartum period has been found to decrease with older maternal age (Bottino, Nadanovsky, Moraes, Reichenheim, & Lobato, 2012). With a few notable exceptions (see Bornstein, Putnick, Suwalsky, & Gini, 2006), empirical studies generally find adaptive benefits of older maternal age when examining psychosocial aspects of the transition to parenthood, such as lower levels of pregnancy worry (Trillingsgaard, Elklit, Shevlin, & Maimburg, 2011) more positive affect towards parenting (Sommer, 2001), and more positive parenting behaviors (Ragozin, Basham, Crnic, Greenberg, & Robinson, 1982). An important question relates to whether or not the apparent early adaptive benefits of older maternal age continues to have positive influence on psychosocial aspects of parenting and child development beyond the transition to parenthood.

Several socioeconomic and demographic factors may confound conclusions drawn in studies on the effect of age on parenting and child outcome. First, mothers who postpone childbearing are generally more educated than their counterparts (Schmidt et al., 2012) and educational attainment is linked to better child health and a number of parenting-related behaviors (Currie & Moretti, 2003). Second, a secure employment status may characterize older mothers and this can affect child outcome through increased access to material and social resources (Bradley & Corwyn, 2002). Third, older mothers are likely to enter parenthood more settled in terms of a stable marital relationship, and there are known associates between the marital relationship and child development (Cummings & Davies, 1994). Whereas many studies report on association between maternal age and demographics such as education, employment, or marital status, few statistically control for all of them, clarifying what proportion of variance that can be explained by age in and of itself.

There are, however, interesting theoretical arguments for doing statistical analyses on the effect of age on psychosocial functioning. Older maternal age may be conceived of as a proxy for personal maturity (Camberis, McMahon, Gibson, & Boivin, 2014). Personal development and growth bring a multitude of benefits including greater psychological flexibility and personality integration (Manners & Durkin, 2001; Mercer, 1986), more positive overall emotional well-being, greater emotional stability, and greater tolerance for complexity in emotional experience (Carstensen et al., 2011). Older adults also tend to be more forgiving (Cheng & Yim, 2008) and older mothers report more psychological

hardiness, which again is linked with responsive infant parenting (Camberis et al., 2014; Camberis, McMahon, Gibson, & Boivin, 2016).

Among these findings, there are several indices that older maternal age may not only favor the early emotional adaptation of the mothers, but also their style of parenting which influence the long-term environment for the children's emotional and behavioral development. When more mature psychological resources are available to older mothers, they may tend to adopt a more authoritative parenting style, described by Baumrind as balancing freedom and control (Baumrind, 2013). Authoritative parents use functional control (e.g. impose goal oriented maturity demands) but avoid the use of coercive power assertion such as verbal sanctions, physical sanctions, and arbitrary discipline (Baumrind, 2013; Sorkhabi, 2013). Low use of sanctions represent one aspect of authoritative parenting that may contribute positively to the socioemotional family environment and, ultimately, to positive child development outcome (Bornstein et al., 2006).

Three recent studies provide the first empirical support for the maturity assumption, holding all potential confounding variables constant in analyses. First, Barnes, Gardiner, Sutcliffe, and Melhuish (2014) examined the link between older maternal age and parenting behaviors of 3-year-olds in two national U.K. cohorts, and found that although both younger and older mothers had high levels of household chaos, other effects of older age were beneficial. They found a linear decrease in both parent-child conflict and negative parenting with increasing maternal age. The association with use of harsh discipline was curvilinear, being low for teenage mother, highest for mothers in their mid-twenties, and then declining to its' lowest level after 40. Positive and responsive parenting increased until age 40 and then leveled off. Second, including data from the same cohorts at both 9 months, 3 years, and 5 years, Sutcliffe, Barnes, Belsky, Gardiner, and Melhuish (2012) found that child health and developmental outcomes were more advantageous for children born to older mothers. Specifically, Sutcliffe and colleagues reported improved vocabulary and fewer behavioral, social, and emotional difficulties in children of 3 and 5 years of age. They also found lowered risk of unintentional injury, admission to hospital, and non-immunization in children of 9 months and 3 years of age. In this study, the association between maternal age and child behavioral, social, and emotional difficulties were linear at child age 5 and curvilinear at child age 3 with the benefit of maternal age leveling off after age 40. Third, Schlomer and Belsky (2012) examined longitudinal family data from a national U.S. cohort and found that older maternal age (and stable romantic relationships) was related to maternal sensitivity toward the child at age 10 which again was related to the child's perceptions of maternal hostility at age 15. Schlomer and Belsky drew on evolutionary theory to interpret these findings and they suggested that maternal older age aligns with a shift in reproductive strategy from investing in future reproduction (new partners, new children) to investing in extant offspring (spending more time and energy on existing children). At the same time, data

from their study also align with the maturity hypothesis, and in this regard point toward potential effects of older maternal age on child and parenting outcome well beyond the preschool years.

As authors of some of the mentioned studies suggest, research on psychosocial aspects of child development may end up finding that the advantages of older parents eventually outweigh the biological risks (Barnes et al., 2014). Yet, as of today research on age effects on parenting and child development beyond the child's fifth year is sparce. While developmental theory suggests that early gains (and losses) with regard to psychosocial functioning will likely have far-reaching implications (Main, Hesse, & Kaplan, 2005; Sroufe, Egeland, Carlson, & Collins, 2005), the possibility exists that some disadvantages of older maternal age (such as the reductions of physical well-being and health) catch up with families as the mothers age. Younger mothers may have more energy and they gain the maturity of older mothers as the children grow. If, for instance, older mothers experience some reductionsin parenting resources (e.g. energy, health) as they and their children age, this could alter the association between older maternal age and child outcome during the course of mid or late childhood.

In this study, we tested the overall assumption that older maternal age is associated with improved psychosocial health in families beyond the preschool years. In particular, we hypothesized that older maternal age would be associated with less use of sanctions in verbal and physical discipline and with positive child socio-emotional development at age 7, 11 and 15. We also hypothesized that older maternal age would be associated with fewer contacts to obtain non-normative family benefits through social services. *Older* maternal age is variously defined in other research. In this study we examined age as a continuous variable to allow investigation of linear and non-linear age trends. Hypothetically, with maternal age as the independent variable and parenting and child outcome as dependent variable, the association may be either (a) a positive linear relationship (e.g. constant advantages of older maternal age), (b) a curvilinear or otherwise non-linear relationship (e.g. advantage of older maternal age that levels off after any particular age) or (c) no relationship. Previous studies have found evidence of all three possible relations in early childhood depending on the specific outcome (Bornstein et al., 2006; Bornstein & Putnick, 2007; Ragozin et al., 1982; Sutcliffe et al., 2012). We chose an exploratory approach to the question of whether the tested associations would form linear or curvilinear relationships.

Methods

Participants

The study included participants from the Danish Longitudinal Survey of Children (DALSC). This survey was designed by researchers from SFI (the Danish National

Centre for Social Research), in cooperation with researchers from other research institutions, among these the last author. In 1995, a representative sample of 6000 children was randomly recruited through registers of all Danish births. Children were eligible for the DALSC if born between March 15 and October 31 in 1995 and if their mother had a Danish citizenship (for full description of methodology see SFI, 1997). Children placed immediately in foster care were excluded, but children placed in care at later time points remained in the study (note that in these cases the number of children in the household can equal zero). The children were 5–6 months of age at recruitment and were followed through 3, 7, 11, and 15 years. For this study we used the latter three data points. The mean child bearing age of mothers was 30.4 (SD = 4.6) and ranged from 17 to 47.

Data collection

Data were collected by SFI using trained interviewers in full face-to-face structured interview in the respondent's home at all-time points except the latest (15 years), at which data were collected through either online or mailed self-report questionnaires. All data from this study were based on maternal response. Mothers were allowed to drop-out from the study both temporarily and permanently. If, for instance, a family moved abroad and returned, this family dropped out and then re-entered the sample.

Measures

A large number of measures in brief formats were included in the DALSC study. To be able to benchmark current findings with those of Sutcliffe et al. (2012), this study includes outcome and control variables that were either identical with, or closest possible proxy to the measures in the previous study.

Maternal childbearing age was calculated by subtracting the birth date of the mother from the birth date of the child. This age variable is distinct from maternal study age, which was reported at each data point. Maternal childbearing age was entered in models as a continuous variable.

Child behavioral, social and emotional difficulties were assessed with the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997). The SDQ is a behavioral screening questionnaire including 25 items that are applicable for parental report on children of 4–16 years of age. Scores are obtained within the following areas (1) emotional symptoms (5 items), (2) conduct problems (5 items), (3) hyperactivity/inattention (5 items), (4) peer relationship problems (5 items), (5) prosocial behavior (5 items). For the current report, we used the total difficulties subscale which is generated as a sum score of the scales 1–4 with higher scores indicating more behavioral, social and emotional difficulties.

On this subscale, chronbach's alpha coefficients ranged from .80 to .82 in the current study.

Parental use of sanctions was assessed with a list of commonly used sanctions (SFI, 1997; Sommer, 2010). During the 7-year interview, mothers were asked how often (never, rarely, once a week) they used each of four verbal and four physical strategies to teach the child right from wrong. The list of verbal sanctions included 'tell the child, that he/she did something wrong', 'scold', 'send to bedroom or ground child' and 'take away privileges or rewards'. The list of physical sanctions included 'grabbed child or shook child', 'slapped child on face', 'slapped child on hand' and 'spanked child on the bottom'. The items on verbal sanction parallel the domain of non-violent discipline used in the Parent–Child Conflict Tactics Scale whereas the four physical sanctions parallel the most common items classified as minor physical assault (CTSPC; Straus, Hamby, Finkelhor, Moore, & Runyan, 1998). The list of sanctions was used at the 7, 11, and 15 years data collection with some adaptations to match the age of the children (e.g. the item 'send your child to bedroom' was changed to 'ground your child'). The item 'slapped child on hand' were left out after the 7-year survey and the items 'withdrawal of privileges' and 'spank child on the bottom' were left out after the 11 year survey. The sum score was calculated as the item average and the range of this was consistent across surveys. Due to the low number of items inter-item correlations was used to examine reliability. Inter-item correlations ranged from .10 to .52 for the list of verbal sanctions and .14–.60 for the list of physical sanctions.

Contact with social services was assessed with a single item asking if the respondent had any type of contact with the social services of the municipality since the last survey. These contacts can include non-normative family benefits (seeking general financial aid or compensation of handicap expenses) or help initiated by the authorities (providing parenting support or surveillance of the family).

Control variables covered observed characteristics of the mothers and children and were measured longitudinally and current value (e.g. educational level obtained at each data point) was entered in the models. Observed mother characteristics were: years of schooling, level of education, employment, marital status, and native language. Observed child characteristics were: number of children in household, child gender, child birthweight, and duration of breastfeeding.

Statistical analysis

Prior to analyses, the data was screened for errors. The percentage of missing data was fairly small (3–6%). Thus the Expectation Maximation algorithm (Bunting, Adamson, & Mulhall, 2002), which has been demonstrated to be an effective method of dealing with missing data, was performed to impute

missing data on all included scales. Analyses were conducted in SPSS, version 22. Four categorical predictors were dummy coded into values 0 and 1: Education (4 levels) and years of schooling (3 levels) ethnicity (3 levels) and marital status (3 levels). We predicted the three continuous outcome variables (SDQ difficulty score, verbal and physical sanctions) using a standard multiple regression approach. We predicted the one binary outcome variables (contact with social services) using a logistic regression approach. Regression models included the following covariates: Years of schooling, level of education, employment, marital status, native language, number of siblings in household, child gender, child birth weight, and duration of breastfeeding.

To select the best fitting model, we fitted initially a linear model, then added high order terms successively for maternal age, until the highest order term was no longer statistically significant, at which point we adopted the previous model. All final models were linear for maternal age. No issues of multicollinearity among covariates were observed. Some regression models violated the assumption of homoscedasticy, and this bias was addressed by using corrected and accelerated confidence intervals (BCA) and significance tests of the model parameters.

Results

Characteristics of the sample at each data point are presented in Table 1.

Descriptives

The sample of mothers of seven-year-old children ($N = 4741$) represented 88% of the families that were recruited when the children were infants in 1996. The response rates in percent for mothers at each of the three data points were 88.0, 82.7, 71.5, respectively. The mean child-bearing age (at birth of the child) in the 7 year sample was 30.4 (SD = 4.6), ranged from 17 to 47, and was stable in the samples across time points. This mean was a bit higher than the mean child-bearing age of all Danish women giving birth in 1996 ($M = 29.4$, Danish Statistics, 2016). We have no indications that younger mothers were more likely to drop out from the study. Raw outcome data stratified in maternal childbearing age groups are presented in Table 2. The age bands (<22, 23–26 etc.) were made in parallel to those used by Sutcliffe et al. (2012) to allow comparison between studies.

From visual inspection of the raw data in Table 2, it appears that the overall use of verbal sanctions, use of physical sanctions and child difficulties decreased as the children aged, and these decreases seemed to occur across all maternal age bands. Table 3 shows the bivariate, crosssectional relations of all model variables. Perhaps most notable and as expected maternal childbearing age was negatively correlated with all other model variables including child difficulties.

Table 1. Descriptive statistics.

		7 years	11 years	15 years
Variables		*N* = 4741	*N* = 4552	*N* = 4000
Male sex[a]		2485 (52.4)	2375 (52.2)	2076 (51.9)
Breast fed[a]		3099 (68.4)	3023 (69.1)	2706 (70.4)
Marital status[a]	Single parent	610 (12.9)	744 (16.3)	744 (18.7)
	Living with other than bio father	344 (7.3)	567 (12.5)	598 (15)
	Living with bio father	3786 (79.9)	3241 (71.2)	2643 (66.3)
Mother unemployed[a]		480 (10.1)	458 (10.1)	644 (16.1)
Maternal native language[a]	Danish	4678 (98.7)	4488 (98.6)	3944 (98.6)
	Western European/ American	24 (.5)	24 (.5)	19 (.5)
	Other	38 (.8)	39 (.9)	36 (.9)
Children in household[a]	0	10 (.2)	11 (.2)	20 (.5)
	1	506 (10.7)	663 (14.6)	890 (22.3)
	2	2614 (55.2)	2446 (53.7)	1971 (49.3)
	≥3	1609 (34)	1431 (31.4)	1119 (28)
Maternal schooling[a]	Completed less than 9th year	38 (.8)	31 (.7)	20 (.5)
	Completed 9th/10th year	2479 (53.8)	2308 (53.5)	1399 (35.1)
	Completed secondary schooling	2095 (45.4)	1977 (45.8)	2565 (64.4)
Maternal higher education[a]	No education	657 (14.2)	550 (13.2)	562 (14.1)
	Vocational/less than three years	2673 (57.6)	2389 (57.4)	1779 (44.7)
	Bachelor's degree	980 (21.1)	909 (21.9)	1249 (31.4)
	Master's degree/PhD	331 (7.1)	312 (7.5)	394 (9.9)
Birth weight (g)[b]		3519 (602.6)	3521 (602.9)	3535 (590.6)
Maternal age (years)[b]		37.39 (4.58)	41.43 (4.56)	45.5 (4.49)
Child's SDQ score[b]		6.71 (5.28)	6.21 (5.17)	5.44 (4.56)
Maternal use of sanctions[b]	Verbal sanctions	2.41 (.35)	2.15 (.36)	1.94 (.42)
	Physical sanctions	1.15 (.21)	1.11 (.2)	1.02 (.1)

Notes: SDQ = strengths and difficulties questionnaire (Goodman, 1997). Breast-fed = child was breast fed for at least 4 months.
[a]Numbers with percentage in the parenthesis. [b]Mean with standard deviation in the parenthesis.

There also were moderate correlations between child difficulties and contact to social services as well as small to moderate correlations between the child difficulties and use of verbal and physical sanctions. Finally, there were very small to small correlations between either measure of sanctions and contact to social services.

Results from the final models are seen in Tables 4 and 5.

Child behavioral, social, and emotional difficulties

There was a significant linear relationship between older maternal age and the strengths and difficulties total problem score at 7 and 11 years, with scores decreasing as maternal age increased, indicating better social development for children of older mothers. In the adjusted models, the score for children of

Table 2. Main outcomes stratified by maternal child-bearing age.

	Maternal age band				
Outcome variable	<22	22–<26	26–<30	30–33	>33
SDQ, total difficulties[a]					
7 years	9.5 (6.72)	8.27 (5.93)	6.74 (4.96)	6.26 (4.94)	5.45 (4.88)
11 years	8.9 (6.34)	7.32 (5.69)	6.16 (4.9)	5.94 (4.98)	5.25 (4.87)
15 years	6.61 (4.86)	6.21 (4.78)	5.33 (4.52)	5.31 (4.38)	5.01 (4.55)
Mother's use of sanctions[a]					
Verbal sanctions					
7 years	2.47 (.35)	2.47 (.34)	2.43 (.34)	2.41 (.35)	2.33 (.37)
11 years	2.25 (.36)	2.22 (.36)	2.15 (.36)	2.16 (.35)	2.08 (.35)
15 years	2.05 (.35)	1.98 (.41)	1.93 (.42)	1.94 (.41)	1.89 (.47)
Physical sanctions					
7 years	1.14 (.19)	1.16 (.22)	1.15 (.21)	1.15 (.21)	1.12 (.2)
11 years	1.13 (.26)	1.13 (.21)	1.12 (.19)	1.12 (.2)	1.09 (.17)
15 years	1.01 (.06)	1.02 (.11)	1.01 (.09)	1.02 (.11)	1.01 (.08)
Contacted social services[a]					
7 years	46 (26.3)	166 (21.8)	230 (14.9)	168 (12.2)	136 (15.6)
11 years	36 (20.9)	132 (18.6)	193 (12.9)	175 (13.1)	90 (23.8)
15 years	30 (23.4)	120 (19.7)	170 (12.9)	152 (12.9)	91 (12.4)

Notes: Numbers represents raw means (standard deviations in parenthesis).
[a]Represents number of families reporting contact with social service (percentage in parenthesis).

Table 3. Cross-sectional intercorrelations of study variables at age 7, 11, and 15.

		1	2	3	4
1. Maternal childbearing age		–			
2. Child total difficulties	7 years	−.188*	–		
	11 years	−.144*			
	15 years	−.073*			
3. Verbal sanctions	7 years	−.126*	.269*	–	
	11 years	−.118*	.303*		
	15 years	−.053*	.285*		
4. Physical sanctions	7 years	−.051*	.239*	.320*	–
	11 years	−.065*	.207*	.305*	
	15 years	−.006	.178*	.152*	
5. Contact social services	7 years	−.068*	.316*	.081*	.051*
	11 years	−.070*	.417*	.102*	.074*
	15 years	−.064*	.444*	.110*	.110*

Note: Intercorrelations at same data point.
*$p < .01$.

mothers aged 25 was .35 standard deviations higher than for children of mothers aged 40 at 7 years. The corresponding difference was .25 standard deviations 11 years. At 15 years the relation between maternal age and the strengths and difficulties total problem score was no longer significant.

Parental use of sanctions

The use of verbal sanctions decreased with older maternal age, and this linear relationship was significant across age 7, 11 and 15. At 7 years of age the use of verbal sanctions in adjusted models for mothers aged 25 was .35 standard

Table 4. Results from final linear regression models.

Scale outcomes by maternal age	Unstandardized coefficients (95% CI)	SE B	Standardized coefficients	*p* value
SDQ total difficulties score				
7 years	−.649 (−.822, −.469)	.086	−.116	.001
11 years	−.469 (−.641, −.280)	.092	−.085	.001
15 years	−.077 (−.248, .106)	.087	−.015	.376
Verbal sanctions				
7 years	−.045 (−.059, −.033)	.006	−.117	.000
11 years	−.035 (−.049, −.022)	.007	−.089	.001
15 years	−.023 (−.042, −.005)	.009	−.049	.006
Physical sanctions				
7 years	−.009 (.000, .004)	.004	−.038	.018
11 years	−.011 (−.018, −.003)	.004	−.050	.006
15 years	.000 (−.003, .004)	.002	.004	.835

Notes: Coefficients are per 5 year of maternal age. Confidence intervals are bias corrected and accelerated (BCa) and based on 1000 bootstrap samples. Covariates in all models included years of schooling, level of higher education, employment, marital status, native language, number of siblings in household, child gender, child birth weight, and duration of breastfeeding.

Table 5. Results from final logistic regression models.

Outcomes by maternal age	Unstandardized coefficients (95% CI)	SE B	Odds ratio	*p* value
Contact with social services				
7 years	−.062 (−.156, .034)	.049	.940	.221
11 years	−.039 (−.143, −.066)	.054	.962	.458
15 years	−.071 (−.18, .036)	.057	.932	.211

Notes: Coefficients are per 5 year of maternal age. Confidence intervals are bias corrected and accelerated (BCa) and based on 1000 bootstrap samples. Covariates in all models include years of schooling, level of higher education, employment, marital status, native language, number of siblings in household, child gender, childbirth weight, and duration of breastfeeding.

deviation higher than for mothers aged 40, and at 11 and 15 years the corresponding differences were .27, and .15 respectively. The use of physical sanctions also decreased with maternal age, yet only at age 7 and 11. No significant relationship was found between use of physical sanctions and maternal age when children were 15 years old. At 7 years the use of physical sanctions for mothers aged 25 was .11 standard deviation higher than for children of mothers aged 40 and above, and the corresponding difference was .15 standard deviation at 11 years.

Contact with social services

The raw percentage of children in contact with social services was high for mothers in the youngest age group. When children were seven years old more than one in four families with mothers in the youngest age group were in contact with social services (26.3%, Table 2). In spite of this, there was no linear relationship between maternal age and contact with social services once the covariates were entered in the model.

Discussion

In results from this study, older maternal age was associated with fewer behavioral, social and emotional difficulties in children at 7 and 11 years of age, but not at age 15. Older mothers reported less frequent use of physical sanctions at 7 and 11 years of age and less use of verbal sanctions at 7, 11 and 15 years of age. These associations were independent of all other observed maternal characteristics such as education, employment, marital status and native language and child characteristics such as gender, birth weight and number of siblings. No association of maternal age and contact with social services was found when control variables were entered in the model.

These findings add to previous results reported by Sutcliffe et al. (2012) and Barnes et al. (2014) by extending the age span during which older maternal age appear to be associated with more positive parenting and fewer behavioral, social and emotional difficulties. Sutcliffe et al. (2012) found the strength of the association between maternal age and child difficulties to decrease from age 3 to 5 and in the current study we found a further decrease from age 7 to 11 and no significant findings at age 15. Although cautious interpretation must be made when comparing coefficients across data points[1] and samples, there seems to be a trend toward a decreasing relationship between maternal age and child difficulties as children age. Unlike studies by Barnes, Sutcliffe and colleagues, the current study found no curvilinear relationships.

As noted by Barnes et al. (2014) the two U.K. samples over-represented families from disadvantaged backgrounds, which may have more risk factors that could influence parenting and child outcome. The current study replicated findings from Sutcliffe et al. (2012) and Barnes et al. (2014) in a Danish sample in which mothers were overall older and less disadvantaged. The fact the findings replicate under conditions that would potentially limit the magnitude of the association between age and child outcome speak to the generalizability of results.

Among strength of the current study, results are obtained with a standardized measure of child socio-emotional development across 8 years from a large population sample. With this data, the present study provides some of the most convincing evidence to date that older motherhood is linked with positive child development beyond preschool years. Despite these strengths of this study, the interpretation of results must account for potential sources of bias. First, the present study relies upon parental report with regard to child behavior and parenting discipline. With this method, we are not allowed to disentangle child behavior from parenting to examine the mechanisms through which parent and child behavior may interact. Other approaches such as *in vivo* observation of child-parent interaction would be valuable in this regard.

1As described in the method section, some changes were made in the wording of sanction items between 7 and 11 years and between 11 and 15 years.

Yet, self-report assessment of parent- and child behavior has been shown to provide valid measures of their underlying constructs (Goodman, Meltzer, & Bailey, 1998; Lee, Lansford, Pettit, Bates, & Dodge, 2012). This study obtained most data through full face-to-face interviews conducted by skilled interviewers in the respondents' home which may further strengthen the quality of the data. In contrast to the validated measures on child behavior, contact with social services was assessed with single self-report item, potentially limiting the sensitivity on this construct. Thus the current null-finding should be replicated using register-based data on families' aid from social service agencies prior to final disregard of the hypothesis.

Why do women who have deferred childbearing beyond their twenties seem to do well – not only during transition to parenthood – but also in the longer run in terms of disciplining less and raising children with fewer difficulties? As presented above, maturity tends to bring personal growth in terms of more stable emotional well-being, greater psychological hardiness and flexibility, higher level of personal integration,greater tolerance for complexity in emotional experience, and improved ability to forgive (Camberis et al., 2016; Carstensen et al., 2011; Cheng & Yim, 2008; Manners & Durkin, 2001; Mercer, 1986) If these aspects of maturity allow mothers to adopt a sound balance between freedom and control in their parenting style, the theory of the more authoritative parenting style may help explain maturity effects on long run child outcomes (Baumrind, 2013). The authoritative parenting style has been linked with children's, adolescent's and youth's positive development within the temperamental, conduct, peer and prosocial domains (Cavell, Harrist, & Del Vecchio, 2013; Morris, Cui, & Steinberg, 2013; Sorkhabi, 2013). The current study found correlations between the higher use sanctions and lower child adjustment within socio-emotional domains at 7, 11, and 15 years (Table 3). Whether the effect of maternal maturity on child outcome is mediated by an increased use of the authoritative parenting style, remains an important hypothesis for testing.

The gradual fading of the older mother effect can be explained by the juxtaposed process of individual autonomy and peer influence between 7 and 15 years. Although cognitive social domain theorists (e.g. Nucci, 2008; Smetana, 2002, 2005) argue that an intensive parent-adolescent conflict/difficulty period is to be expected, this study found decreasing levels of both maternal use of sanctions and fewer child difficulties as the children grew. Thus the current data does not relate older maternal age to level of adolescent turmoil.

With the recent trend toward older maternal childbearing age in most Western developed countries, evidence on medical as well as psychosocial risks and advantages are important. Holding level of education and social status variables constant – this study suggests that important aspects of maturity in mothers may be of long-term benefit to the maternal parenting style as well as to the socio-emotional development of the growing child.

Disclosure statement

No potential conflict of interest was reported by the authors.

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