



Birth order and relationship quality between adult children and parents: No evidence for the neglected middleborn hypothesis

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Abstract

The neglected middleborn hypothesis predicts that middleborn children should have a worse relationship quality with their parents compared to firstborn and lastborn children. However, prior studies investigating this question have produced mixed results. In this study, the neglected middleborn hypothesis was tested using a large-scale, population-based sample of younger adults from Germany. Relationship quality was measured by contact frequency, emotional closeness, intimacy and amount of conflict participants reported towards their mothers and their fathers. It was found that middleborns reported less intimacy towards their mothers than lastborns. However, in all other cases, middleborns did not differ from firstborns or lastborns in their relationship quality with their mothers and fathers. Thus, the study did not find convincing support for the neglected middleborn effect.

Keywords: birth order, children, Germany, parents

Introduction

For over a century, scientists and lay people have been interested in the impact of birth order on personality and intelligence (Damian & Roberts, 2015a; 2015b). In addition, during recent decades there has been an ongoing debate on whether birth order shapes social behaviour among family members (Pollet & Hoben, 2011). In this study, we investigate whether birth order is associated with relationship quality between parents and adult children, as posited by several scholars (e.g. Salmon, 1999; Sulloway, 1996). More specifically, we test the neglected middleborn hypothesis, which predicts that

middleborns report worse relationship quality with parents than do firstborns or lastborns (Pollet & Nettle, 2009).

Why can middleborns be predicted to have a lower level of relationship quality with their parents compared to other birth orders? One answer may lie in the fact that only firstborns have spent time in the family without the presence of other siblings, and in early childhood, they have benefited from the absence of sibling rivalry related to sibling competition over parental resources and attention (Salmon & Hehman, 2014). In addition, only lastborns have grown up in families without the risk that parental investment will be diluted as a result of the presence of younger siblings (*ibid.*). Thus, firstborns and lastborns occupy advantageous positions compared to middleborns, which can be predicted to lead to parental favouritism. Prior studies have, however, produced mixed results (see Pollet & Hoben, 2011 for a review).

A set of studies using non-representative samples of university students has found that middleborns receive less parental investment, rate their parents as less supportive and are less close to their parents compared to firstborns and lastborns (e.g. Salmon & Daly, 1998; Salmon, 2003; Rohde et al., 2003). However, some other small-scale studies have not found evidence for the neglected middleborn hypothesis. For instance, Hardman and colleagues (2007) used data on school-aged children and younger adults to test the neglected middleborn hypothesis. The main purpose of their investigation was to replicate the findings of the prior study by Salmon and Daly (1998), however, they did not find support for the birth order effects in either study generation. The mixed findings could be related to small sample size and the fact that these studies were able to take into account only limited amount of background variables.

Pollet and Nettle (2009) tested the hypothesis with a large-scale, nationally representative Dutch sample. Relationship quality was assessed via a single question by asking from the respondents how they describe their relation with mothers and fathers, respectively. The relationship quality measure had three categories: not great or reasonable good, good and very good. As the neglected middleborn effect could be related to the sibship size, they limited their investigation to individuals who had only two siblings because the likelihood of being coded as firstborn, middleborn or lastborn is not equal across families with larger sibship size. Limiting investigations to participants with only two siblings efficiently controlled for any effects related to sibship size. Using this strategy, Pollet and Nettle (*ibid.*) were unable to detect differences between firstborns, middleborns and laterborns in their relationship quality with parents. The aim of the present study is to replicate the prior study by Pollet and Nettle (*ibid.*). To this end, we used a large-scale and population-based sample of younger adults from Germany.

Material and methods

The neglected middleborn hypothesis was investigated using data from the German Family Panel (Pairfam), which provides information on three birth cohorts that were born in 1971–1973, 1981–1983 and 1991–1993 (see Brüderl et al., 2016; Huinink et al., 2011 for the full data description). The fifth-round data collected in 2012–2013, when the respondents were between 18 and 42 years old ($M = 29.5$, $SD = 8.37$), was used because it contained a sibling module. As the neglected middleborn effect could be related to sibship size, the present study followed Pollet and Nettle's (2009) example and included only individuals who had exactly two siblings in order to control for any effects associated with sibship size. Moreover, only biological siblings were included in the analyses, and twins were excluded. Finally, only one sibling in family participated in the study. This selection process resulted in a total of 1,060 respondents in the study sample concerning respondent relationship with the mother, and 922 respondents in the sample concerning respondent relationship with the father.

The dependent variables measured relationship quality between parents and adult children using four measures: contact frequency, emotional closeness, intimacy, and amount of conflict. All of these questions were asked in relation to the respondents' mothers and fathers, respectively. Contact frequency was measured by asking the participants how often they had had contact with their mothers/fathers, taking into account different types of contact, namely visits, telephone calls, letters, and so forth (on a scale from 0 = never to 6 = daily). Emotional closeness was measured by asking how close the respondents felt to their mothers/fathers (on a scale from 0 = not at all close to 4 = very close). Intimacy was assessed with two questions: how often the respondents told their mothers/fathers what they were thinking, and how often they shared secrets or private feelings with mothers/fathers (Cronbach's alpha for mothers 0.81, and 0.78 for fathers). Conflict occurrence was also assessed with two measures: how often the respondents and their parents were annoyed with each other and how often the respondents and their parents disagreed or quarrelled (Cronbach's alpha for mothers 0.80, and 0.82 for fathers). The values for intimacy and conflict ranged from 0 = never to 4 = always.

The main independent variable measured birth order. Respondents were asked to report their own year of birth as well as those of their siblings. Based on these reports, it was calculated whether respondents were firstborns, middleborns or lastborns. In the analyses, middleborns were used as the reference category. In all models, several factors potentially shaping relationship quality between siblings were controlled for: respondent's sex, age, ethnic background, years of education, sex composition of siblings, parental age, and parental cohabitation status (Table 1).

Table 1. *Descriptive statistics*

	Mother %/mean	SD	Father %/mean	SD
Birth order				
Middleborns	31.7		31.3	
Firstborns	32.7		33.7	
Lastborns	35.6		34.9	
Respondent's sex				
Male	46.9		46.8	
Female	53.1		53.3	
Respondent age	29.5	8.37	28.6	8.18
Respondent ethnic background				
German native	80.2		80.5	
Other	19.8		19.5	
Respondent years of education	12.6	3.41	12.6	3.52
Sex composition of siblings				
Brothers only	28.3		28.3	
Sisters only	25.5		25.3	
Brother and sister	46.2		46.2	
Respondent lives with mother/father				
No	67.8		66.4	
Yes	32.2		33.6	
Maternal/paternal age	56.9	8.98	58.9	9.15
Maternal/paternal cohabitation status				
Respondent's father/mother	77.8		88.9	
No partner	13.8		4.6	
Other partner	8.4		6.5	

Linear regression analysis was used to study associations between birth order and parents-adult child relationship quality. Although the dependent variables were not always normally distributed, logit models were not used due to their limitations (see Mood, 2010 for discussion). That said, we ran sensitivity analyses using logistic regression models with dichotomous variables (contact frequency: 0 = other, 1 = at least weekly; emotional closeness: 0 = other, 1 = close or very close; intimacy: 0 = other, 1 = often or always; conflict: 0 = other, 1 = often or always). These sensitivity analyses provided results similar to the main analyses (Appendix Table 1). Thus, one can consider the results quite robust.

Results

In seven regression models out of eight, no differences between middleborns and other birth orders were detected (Tables 2 and 3). Middleborns reported less intimacy towards mothers compared to lastborns (Table 2). Similar effects were detected also in unadjusted models (Appendix Table 2). In sum, these results suggest a lack of systematic birth order effects in the case of relationship quality between adult children and parents.

Table 2. Birth order and relationship quality with mother

	Contact frequency			Emotional closeness			Intimacy			Conflict		
	β	95% CI		β	95% CI		β	95% CI		β	95% CI	
		lower	upper		lower	upper		lower	upper		lower	upper
Birth order												
Middleborns	ref			ref			ref			ref		
Firstborns	0.02	-0.12	0.16	-0.03	-0.17	0.10	0.07	-0.06	0.21	0.07	-0.04	0.19
Lastborns	0.10	-0.05	0.24	0.04	-0.10	0.18	0.24**	0.10	0.38	-0.02	-0.14	0.10
Respondent's sex												
Male	ref			ref				ref				ref
Female	0.29***	0.18	0.40	0.20***	0.10	0.31	0.52***	0.42	0.63	0.24***	0.15	0.33
Respondent age	-0.004	-0.02	0.01	-0.01	-0.03	0.002	-0.01	-0.03	0.001	-0.02**	-0.03	-0.01
Respondent ethnic background												
German native	ref			ref			ref			ref		
Other	0.03	-0.10	0.17	0.19**	0.07	0.32	0.11	-0.02	0.24	-0.005	-0.12	0.11
Respondent years of education	-0.03***	-0.05	-0.02	-0.005	-0.02	0.01	0.002	-0.02	0.02	0.002	-0.01	0.02
Sex composition of siblings												
Brothers only	ref			ref			ref			ref		
Sisters only	0.08	-0.07	0.23	-0.08	-0.21	0.06	-0.12	-0.26	0.02	-0.03	-0.15	0.09
Brother and sister	0.02	-0.11	0.15	-0.04	-0.16	0.08	-0.15*	-0.28	-0.03	0.05	-0.06	0.15
Respondent lives with mother												
No	ref			ref			ref			ref		
Yes	0.99***	0.84	1.16	0.17*	0.01	0.32	-0.07	-0.22	0.09	0.30***	0.17	0.44
Maternal age	-0.02	-0.01	0.02	0.003	-0.01	0.02	-0.01	-0.02	0.003	0.01	-0.002	0.02
Maternal cohabitation status												
Respondent's father	ref			ref			ref			ref		
No partner	0.13	-0.03	0.29	0.09	-0.06	0.25	0.03	-0.12	0.19	0.06	-0.07	0.19
Other partner	-0.24**	-0.43	-0.04	-0.19*	-0.38	-0.01	-0.04	-0.23	0.15	0.14	-0.02	0.31
Adjusted R2	0.29			0.06				0.13				0.10

* $p < .05$, ** $p < .01$, *** $p < .001$.

Table 3. Birth order and relationship quality with father

	Contact frequency			Emotional closeness			Intimacy			Conflict		
	β	95% CI		β	95% CI		β	95% CI		β	95% CI	
		lower	upper		lower	upper		lower	upper		lower	upper
Birth order												
Middleborns	ref			ref			ref			ref		
Firstborns	0.0005	-0.16	0.16	-0.08	-0.24	0.07	0.01	-0.12	0.14	0.02	-0.10	0.14
Lastborns	-0.04	-0.21	0.13	-0.05	-0.21	0.11	0.07	-0.07	0.21	-0.07	-0.20	0.05
Respondent's sex												
Male	ref			ref			ref			ref		
Female	0.14*	0.01	0.27	-0.02	-0.14	0.10	0.16**	0.06	0.27	0.11**	0.01	0.20
Respondent age	-0.01	-0.03	0.005	-0.003	-0.02	0.01	-0.01	-0.02	0.004	-0.02**	-0.03	-0.003
Respondent ethnic background												
German native	ref			ref			ref			ref		
Other	-0.19*	-0.35	-0.02	-0.01	-0.17	0.14	-0.04	-0.18	0.09	-0.05	-0.17	0.07
Respondent years of education	-0.04***	-0.06	-0.02	-0.002	-0.02	0.02	0.02	-0.0003	0.03	-0.02**	-0.03	-0.003
Sex composition of siblings												
Brothers only	ref			ref			ref			ref		
Sisters only	0.09	-0.09	0.26	0.03	-0.13	0.19	-0.01	-0.15	0.13	-0.08	-0.21	0.04
Brother and sister	-0.04	-0.19	0.11	-0.07	-0.21	0.08	-0.13*	-0.25	-0.004	0.03	-0.08	0.14
Respondent lives with father												
No	ref			ref			ref			ref		
Yes	1.13***	0.95	1.31	0.02	-0.15	0.19	-0.06	-0.21	0.09	0.24**	0.10	0.37
Paternal age	0.01	-0.01	0.02	-0.004	-0.02	0.01	-0.002	-0.01	0.01	0.01*	-0.002	0.02
Paternal cohabitation status												
Respondent's mother	ref			ref			ref			ref		
No partner	-0.63***	-0.94	-0.32	-0.29	-0.58	0.001	-0.003	-0.25	0.25	0.18	-0.05	0.41
Other partner	-1.10***	-1.36	-0.83	-0.62***	-0.87	-0.38	-0.42***	-0.64	-0.21	0.08	-0.11	0.28
Adjusted R2	0.36			0.04			0.04			0.08		

* $p < .05$, ** $p < .01$., *** $p < .001$.

Several factors were associated with the relationship quality between adult children and mothers (Table 2). Females reported more contact, emotional closeness, and intimacy as well as more conflict than did males. As the respondent's age increased, conflict decreased. Increased years of education were associated with decreased contact with the mother. Respondents who had brothers and sisters reported less intimacy towards mothers compared to respondents who had brothers only, irrespective of respondent gender. Respondents who co-resided with their mothers reported more contact, emotional closeness and conflict with them. Finally, when mothers had a new partner (i.e. not the respondent's father), participants reported less contact and emotional closeness compared to those whose mothers were together with respondent's father.

Table 3 reports factors associated with relationship quality between adult children and fathers. Females reported more contact, intimacy and conflict with fathers than did males. Both increased age and increased years of education correlated with a decreased amount of conflict and increased years of education also with decreased amount of contact. Respondents with brothers and sisters reported less intimacy towards their father compared to respondents with brothers only. Respondents who co-resided with their fathers reported more contact and conflict with them. When fathers cohabited with the respondent's mother, there was more contact, emotional closeness and intimacy than when respondent's mother lived with a new partner. Moreover, respondents with fathers with no partner reported less contact towards their fathers compared to respondents with fathers who still were together with respondent's mother.

Discussion

The present study tested the neglected middleborn hypothesis, which predicts that middleborn children have a worse relationship quality with their parents compared to firstborn and lastborn children. Relationship quality between parents and adult children was indicated by contact frequency, emotional closeness, intimacy, and amount of conflict. In line with the neglected middleborn hypothesis we found that middleborns reported less intimacy towards mothers than lastborns. This could be explained by that the firstborns and lastborns have an advantageous position compared to middleborns. Firstborns have lived in the family without the presence of other siblings and may have benefited from the absence of sibling competition. On the other hand, lastborns may have benefited from the fact that they have had no risk that parental investment will channelled towards younger siblings. That said, however, in all other cases, no support was found for the predictions that middleborns differ from firstborns or lastborns in their relationship quality with mothers and fathers. Thus, the present study did not find convincing support for the neglected middleborn hypothesis. This is in line with a previous study that used a large-scale sample from the Netherlands (Pollet & Nettle, 2009), but in contrast to some previous studies using small-scale, non-representative samples (e.g. Salmon, 2003).

Compared to many existing investigations, the current study has several strengths. Most previous studies investigating the association between birth order and parental favouritism have used small-scale samples of university students (but see Pollet & Nettle, 2009). Here, a large-scale, population-based sample of younger adults from Germany was used, meaning that the results can be considered more reliable. In previous studies, relationship quality between parents and adult children has rarely been measured with several different variables; we used four different variables. Moreover, the analyses were limited to individuals with only two siblings, which efficiently controlled for any potential effects related to sibship size (Pollet & Nettle, 2009). Lastly, several factors potentially shaping sibling relationship quality were taken into account, making the results more robust.

The present study also has its limitations. Including only participants with two siblings tends to decrease the statistical power. However, reduced sample size may not be an issue here because we still have quite large sample. Here we have investigated the relationship quality with the data of adult children but future studies should investigate the neglected middleborn hypothesis from the parents' perspective in order to discover whether parents report favouring children based on birth order. Finally, longitudinal studies investigating associations between birth order and parental favouritism during the life course and potential changes related to it are needed. Because prior studies considering university students have found support for the neglected middleborn effect but studies using adult samples have not, it could be that the effect is present only during very specific life stage.

There has long been a debate over the impacts of birth order on individual characteristics and social behaviour (Damian & Roberts, 2015a; 2015b). This research examined how adult children perceive their relationship with their parents, but found no convincing support for the neglected middleborn hypothesis. Hence, in line with several prior studies, we can conclude that the birth order effects tend to be either weak or negligible.

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References

- Brüderl, J., Hank, K., Huinink, J., Nauck, B., Neyer, F. J., Walper, S., Alt, P., Buhr, P., Castiglioni, L., Fiedrich, S., Finn, C., Hajek, K., Herzig, M., Huyer-May, B., Lenke, R., Müller, B., Peter, T., Salzburger, V., Schmiedeberg, C., Schütze, P., Schumann, N., Thönnissen, C., Wetzell, M., & Wilhelm, B. (2016). The German Family Panel (Pairfam). GESIS Data Archive, Cologne. ZA5678 Data file Version 7.0.0. <http://dx.doi.org/10.4232/pairfam.5678.7.0.0>.
- Damian, R. I., & Roberts, B. W. (2015a). Settling the debate on birth order and personality. *Proceedings of the National Academy of Sciences*, 112(46), 14119–14120. <https://doi.org/10.1073/pnas.1519064112>
- Damian, R. I., & Roberts, B. W. (2015b). The associations of birth order with personality and intelligence in a representative sample of US high school students. *Journal of Research in Personality*, 58, 96–105. <https://doi.org/10.1016/j.jrp.2015.05.005>
- Hardman, D., Villiers, C., & Roby, S. (2007). Another look at birth order and familial sentiment: Are middleborns really different? *Journal of Evolutionary Psychology*, 5, 197–211. <https://doi.org/10.1556/JEP.2007.1007>
- Huinink, J., Brüderl, J., Nauck, B., Walper, S., Castiglioni, L., & Feldhaus, M. (2011). Panel Analysis of intimate relationships and family Dynamics (pairfam): conceptual framework and design. *Journal of Family Research*, 23, 77–101.
- Pollet, T. V., & Hoben, A. D. (2011). An evolutionary perspective on siblings: Rivals and resources. *The Oxford Handbook of Evolutionary Family Psychology*, pp. 128–148. Editor and city add. <https://doi.org/10.1016/j.paid.2007.05.021>
- Pollet, T.V., & Nettle, D. (2007). Birth order and face-to-face contact with a sibling: Firstborns have more contact than laterborns. *Personality and Individual Differences*, 43, 1796–1806. <https://doi.org/10.1016/j.paid.2007.05.021>
- Pollet, T.V., & Nettle, D. (2009). Birth order and family relationships in adult life: Firstborns report better sibling relationships than later borns. *Journal of Social and Personal Relationships*, 26, 1029–1046. <https://doi.org/10.1177/0265407509347940>
- Rohde, P. A., Atzwanger, K., Butovskaya, M. et al. (2003). Perceived parental favoritism, closeness to kin, and the rebel of the family: The effects of birth order and sex. *Evolution and Human Behaviour*, 24, 261–276. [https://doi.org/10.1016/S1090-5138\(03\)00033-3](https://doi.org/10.1016/S1090-5138(03)00033-3)
- Salmon, C. A. (1999). On the impact of sex and birth order on contact with kin. *Human Nature*, 10, 183–197. <https://doi.org/10.1007/s12110-999-1014-9>
- Salmon, C. A. (2003). Birth order and relationships: Family, friends, and sexual partners. *Human Nature*, 14, 73–88. <https://doi.org/10.1007/s12110-003-1017-x>
- Salmon, C. A., & Daly, M. (1998). Birth order and familial sentiment: Middleborns are different. *Evolution and Human Behavior*, 19, 299–312. [https://doi.org/10.1016/S1090-5138\(98\)00022-1](https://doi.org/10.1016/S1090-5138(98)00022-1)
- Salmon, C. A. & Hehman, J. A. (2014). The evolutionary psychology of sibling conflict and siblicide. In Shackelford, T. K. & Hansen, R. D. (Eds) *The Evolution of Violence*. Springer, New York, pp. 137–157. https://doi.org/10.1007/978-1-4614-9314-3_8
- Sulloway, F. J. (1996). *Born to Rebel: Birth Order, Family Dynamics, and Creative Lives*. London: Abacus.
- Trivers, R. L. (1974). Parent-offspring conflict. *American Zoologist*, 14, 249–264. <https://doi.org/10.1093/icb/14.1.249>