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A Within-Family Comparison using Swedish Register Data

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How does Birth Order and Number of Siblings Affect Fertility?
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ABSTRACT: This study uses Swedish register data to estimate two research questions, (1) how birth order effects completed fertility and (2) how intergenerational transmission of fertility differs by birth order. To answer these questions we apply two different methodological approaches. For our first research question we use sibling comparisons, and for our second question we stratify our population by birth order. The estimations are based on all fully biologically related siblings in Sweden whose mothers were born between 1915-1935 (index cohorts born between 1932-1988; N=1,472,813). We further examine if there are differences by gender for these relationships. Results show that higher birth order has a negative effect on completed fertility. Earlier born women have overall higher fertility than later born women. However, later born women are more likely to have a first child, and later born men are more likely to have a first and second child, while they are less likely to have children at higher parities. Parents' completed fertility shows a positive effect on the younger generation's completed fertility, which is somewhat more pronounced for first born compared to all later born. Women display stronger differences by birth order than men for both our research questions.

KEYWORDS: Fertility, birth order, intergenerational transmission of fertility, Sweden, sibling comparison

INTRODUCTION

Researchers have consistently found that the role of family background has important implications for future childbearing patterns. Both the conditions during upbringing and the values acquired from parents have been linked to subsequent fertility behavior and attitudes (Barber 2001; Cherlin, Kiernan and Chase-Lansdale 1995; Dahlberg 2013; Duncan, Freedman, Coble and Slesinger 1965; Galster, Marcotte, Mandell, Wolman and Augustine 2007; Thornton 1980). Such influences can both be direct and indirect. As individuals are socialized into the values about childbearing and attitudes that their parents have, parents plausibly have a direct impact on later fertility outcomes. Parental socioeconomic background on the other hand influences the future life course, including fertility patterns, of the child more indirectly. It is also possible that structural factors in the family of upbringing such as number of siblings may have important implications later in life (Kolk 2014a; Murphy 1999) due to factors such as limited pool of parental resources (Blake 1981; Hertwig, Davis and Sulloway 2002), or sibling rivalry (Sulloway 1996).

Socialization plays an important role in explaining childhood effects on later life outcomes and especially fertility (Barber 2000; Barber 2001). Via socialization parents affect their children's preferences, attitudes, values and behavior (Barber 2000). This process of parent-child similarities can be explained either through parental role modeling, or based on shared social background and opportunity structures (Bengtson 1975). Sociologists and psychologists have also suggested that such processes work differently in families of different sizes, and that they may differ according to the birth order of the child (Dunn 2007; McHale, Updegraff and Whiteman 2012). Researchers have also consistently found that the family size of origin is correlated with men's and women's own fertility later in life (Anderton, Tsuya, Bean and Mineau 1987; Murphy 1999; Murphy and Knudsen 2002; Murphy and Wang 2001).

In this study we focus on how the sibling composition in the family of origin affects future fertility. We focus both on a child's order in the sibling set, as well as how the birth order of the child interacts with the number of other siblings in the family. Researchers have been increasingly interested in sibling order and its association with a large variety of outcomes such as health, education, non-cognitive skills or IQ, and recently found support for such effects using sibling comparisons (Barclay and Myrskylä 2014; Barclay and Kolk 2015; Black, Devereux and Salvanes 2005; Black, Devereux and Salvanes 2011; Härkönen 2014; Kalmijn and Kraaykamp

2005). While a large volume of research has examined birth order effects on adult socioeconomic and health outcomes, very little research has examined if birth order is associated with later family behavior. Because birth order is directly related to the family experience in upbringing it is very plausible that there is an important relation between birth order and later family related outcomes.

Our study aims to answer two specific questions. First, we are estimating the net effect of birth order on fertility, and avoid confounding from characteristics which are shared within the family of origin. Much research on birth order effects that was established in the 70s was not yielding many positive birth order results (Ernst and Angst 1983). However, this research on birth order effects mainly used between-family comparisons instead of within-family comparisons, in which only siblings are compared to each other. Additionally, a lot of these studies did not control for family size and/or used reported information on siblings, which introduced different kinds of bias to this research. To our knowledge no previous study has analyzed birth order effects on fertility outcomes, let alone using this methodology. We are using a within-family approach to isolate birth order effects on fertility outcomes. Second, birth order effects in intergenerational transmission of fertility are examined. Intergenerational transmission of completed fertility means that high parental fertility leads to high fertility among the next generation as well. Theories on birth order and childhood development suggests that the relative role of parents' impact on preferences will vary across birth orders, which was one of the central concerns in research on intergenerational transmission of fertility in the 1960s and 1970s e.g (Hendershot 1969; Johnson and Stokes 1976). There has, however, been no research on this topic using very large representative data. Additionally, only limited interest in birth order and intergenerational transmission has been shown in more recent studies (an exception being Booth and Kee 2009b).

We use Swedish register data and base our analysis on all fully biologically related siblings in Sweden of both sexes whose mothers were born between 1915-1935. Our study makes three contributions to research on birth order, fertility and intergenerational transmission. First, by applying a within-family comparison based on a unique sibling identifier we examine if there is a causal relationship between birth order and fertility. Second, we focus specifically on parent-child correlations in completed fertility by birth order. Third, we study within-family differences to later family outcomes instead of socioeconomic or health outcomes. In the following we give an overview on how and why birth order could matter for fertility related to our first research question. We then discuss previous research on intergenerational transmission of fertility before proceeding with a description of the data, method and results.

WHY BIRTH ORDER MATTERS FOR FERTILITY

There are different reasons to assume that social and psychological mechanisms within families may relate to birth order effects in fertility. We are going to present different approaches that explain how birth order might be connected to fertility outcomes. The first one focuses on a socioeconomic argument, the second approach considers a psychological argument concerning personality traits, and how socialization processes may differ by family structure.

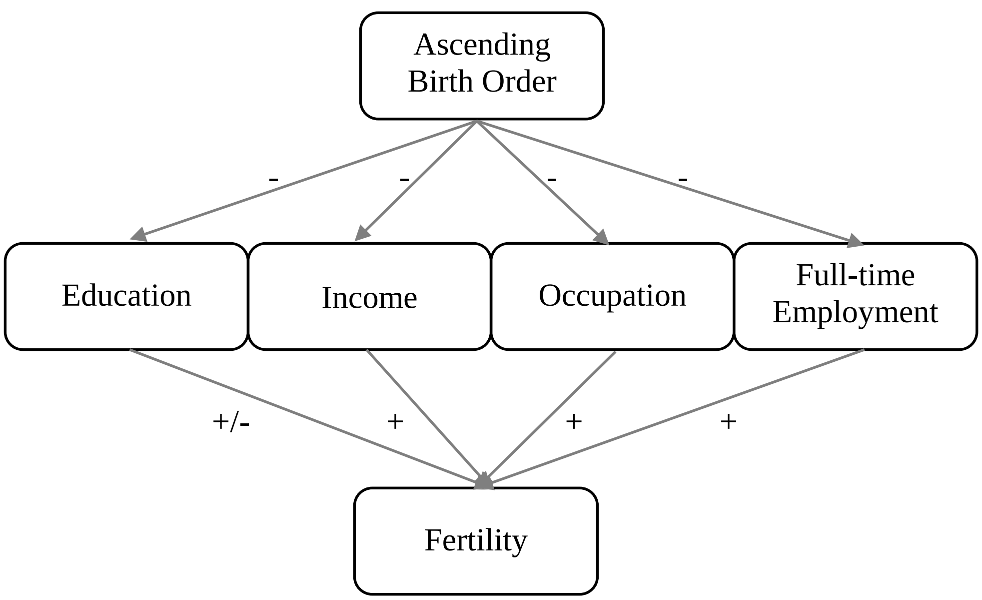
A large body of research suggests an association between birth order and socioeconomic outcomes (Black et al. 2005; Kalmijn and Kraaykamp 2005). Older research using between-family designs found ambiguous results of birth order on socioeconomic outcomes, later studies using a within-family comparison design, however, show consistently a positive effect of being earlier born on several socioeconomic outcomes compared to later born siblings (see figure 1). Several studies using the fixed-effects approach find that later birth order leads to lower educational attainment (Barclay 2015; Black et al. 2005; De Haan 2010; Kantarevic and Mechoulan 2006) as well as lower educational aspiration (Bu 2014). Additionally, Black et al. (2005) find strong birth order effects for earnings and full-time employment, especially for women. These results suggest lower earnings and lower likelihood of full-time employment for later born. Theories that explain why earlier borns cope better than later borns are based on both social and psychological mechanisms. An important explanation suggests that parents' resources (including non-economic resources such as time and attention) are fixed, and consequently more children lead to less available resources for each child. This dilution of parental resources results in a cumulative advantage of earlier born children over later born children, and explains their favorable higher outcomes (Hertwig et al. 2002). Zajonc and Markus (1975) confluence model of intellectual development argues that first born develop cognitively at a quicker pace due to intellectual stimulation, since early born children interact solely with parents until siblings are born, while later born children interact with both parents and other children. However, the support for negative outcomes associated with additional siblings is weak in contemporary

Sweden (Åslund and Grönqvist 2010; Baranowska-Rataj, Barclay and Kolk 2015), when applying semi-experimental designs. Furthermore, researchers have argued that older siblings have a role model position, suggesting that later born children are more influenced by older siblings than vice versa (Harakeh, Engels, Vermulst, De Vries and Scholte 2007). The optimal stopping theory suggests a continuation of childbearing by parents until a "low-quality" child is born (Newman 2008). Therefore, last born siblings could show poorer health or educational outcomes. Additionally, physiological explanations for worse outcomes of later born are considered in the literature.

As summarized above, birth order research on socioeconomic outcomes suggests that first and early born have an advantage over later born. Socioeconomic factors are important explanatory factors for fertility outcomes, but such associations vary substantively across dimension of socioeconomic status and context. In most countries researchers have found that the bivariate association between longer education and fertility is negative (Skirbekk 2008), though importantly this is not true in the Swedish context (Andersson et al. 2009; Hoem, Neyer and Andersson 2006) where the association is neutral for men and women, and Norwegian data suggests that it might even be positive men of later cohorts (Kravdal and Rindfuss 2008). While the relationship for education is mixed, other status indicators such as employment and income appears to be positively associated with fertility in Sweden, both at the individual (Duvander and Andersson 2003), and national level (Andersson 2000). Income at age 45 appears to be positively associated with fertility for men whereas there is a weak positive gradient for women (Boschini, Hakansson, Rosen and Sjogren 2011). In summary research on education, income, occupation and employment indicates an overall positive effect on fertility in a Swedish context. This effect is likely stronger for men than for women. As a result figure 1 depicts the hypothesis that being earlier born has a positive effect on fertility through socioeconomic status advantages.

While the overall association between status and fertility in Sweden is positive, there are some differences by gender and parity. Swedish and Norwegian data indicate that highly educated men are positively selected into parity 1 and 2, with a neutral pattern at later parities, whereas highly educated women are negatively selected into parity 1 and 4+ though these differences largely disappear in Sweden in the latest cohorts (Boschini et al. 2011; Kravdal and Rindfuss 2008). Income and employment patterns are harder to draw strong conclusions from as regression analyses only use income at the time or risk of childbearing, but such results indicate that low income is associated with higher transition hazards (parity age-specific fertility rates) at parity 0, but that high (though, not very high income) is associated with higher transition hazards at later parities for both men and women (Kolk 2014a). However, it seems likely that such effects reflect earlier onset of childbearing among individuals with lower income, rather than lower eventual childlessness. Overall, parity patterns suggests that there should be a positive gradient between socioeconomic status at early parties for men, while for women there is a more ambiguous pattern where the overall gradient might be rather flat or slightly positive, while transitions into parity 1 and higher parities might have a negative relationship with childbearing.

Figure 1: Summary of previous research on how socioeconomic factors mediate the relationship between birth order and fertility



Psychological and social perspectives on birth order differences have a common basis, namely how the developmental processes in childhood are affected by the order in the sibling set. Siblings share the most important influences that determine their development and later life outcomes, such as parental socioeconomic background, family stability, neighborhood effects, and - to a large degree - genes. However, despite this common background siblings still differ considerably. This indicates that the experiences within the family are distinct for different siblings, and one important factor that differs for siblings within the family is birth order. If parents treat and socialize first born children different from later born children this would imply different conditions of siblings during upbringing. The same holds true for the quality of the relationship between siblings and the degree to which they socialize each other. It is plausible that such factors might be more important for fertility outcomes than how birth order affects cognitive abilities, health, and later socioeconomic outcomes.

Early developmental psychology and psychoanalytical research focused on differences in personality traits primarily represented by the psychoanalyst Adler, and his theory of individual psychology (Adler 1928; Freese, Powell and Steelman 1999; Whiteman, McHale and Soli 2011). Adler suggests that sibling relationships are important for personality development, and that the transition from being an only child to having siblings causes first born children to conform stronger to their parents, develop a taste for power and be more conservative (Adler 1928). He argued that the feeling of inferiority leads to competition and rivalry between siblings for parent's attention and resources. So in order to lower the potential conflict and rivalry siblings eventually differentiate into different niches within the family, and develop different personality traits (Whiteman et al. 2011).

An implication of Adler's theory that first born siblings conform stronger to their parents to protect their position would indicate differential parenting and in return may affect later born siblings to be more rebellious. Differential parenting and more affectionate, warm interactions with one sibling than another can result in poorer sibling relationships or adjustment issues (Feinberg and Hetherington 2001). The perception of unfairness between siblings has been connected to outcomes beyond the sibling relationship, such as adjustment problems (McHale et al. 2012).

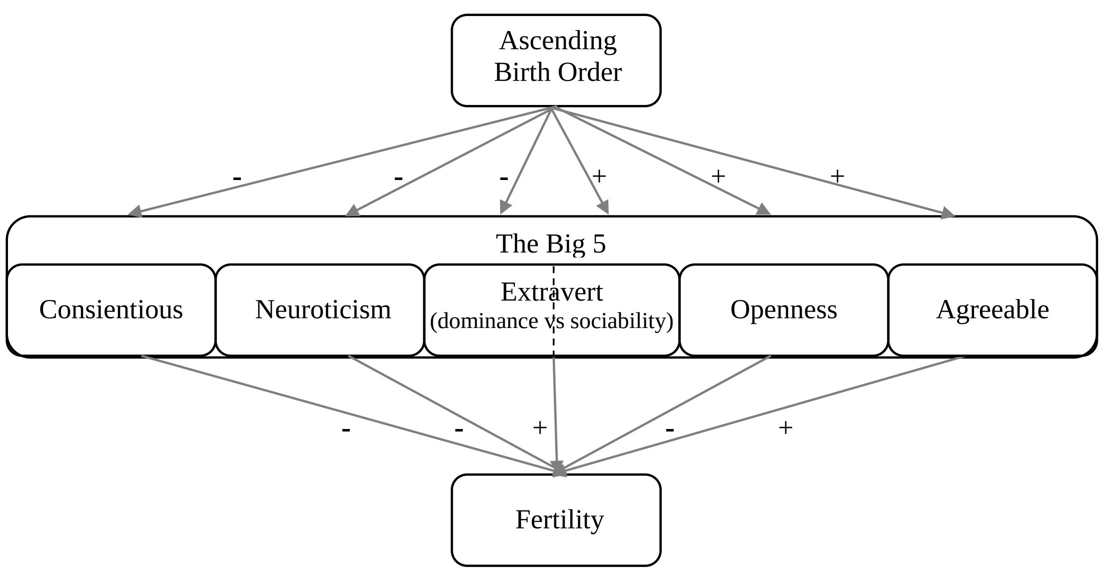
Psychological theories suggest that first born children to a larger degree appeal to their parents' norms and expectations in being a compliant and successful child. However, it is not obvious what implications being a compliant and successful child would have for fertility outcomes and preferences. Parental expectations might differ substantively both across parents as well as based on the sex of the child. As discussed earlier, higher socioeconomic success is most likely associated with slightly higher childbearing in contemporary Sweden. It is also very likely that being a successful child for sons means expectations of socioeconomic success in the first place and a family has a subsequent priority. While daughters to a larger degree might face expectations for establishing a family life earlier, the pressure might decrease with younger daughters, in particular if older daughters have children. Gendered parental expectations potentially provide reason to expect differences in the extent to which brothers and sisters react to birth order constellations (Kammeyer 1966). Such influences would suggest that early birth order has a more positive effect on fertility outcomes for women than for men.

Sulloway's family-niche model builds on Adler's theory and uses sibling rivalry as the main explanatory factor for sibling relations and personality differences between siblings. To assure their access to parental resources siblings would differentiate into niches. Consequently, he predicts personality differences between siblings based on their position in the family, namely earlier born are expected to be more conservative and later born more rebellious (Sulloway 1996). In relation to the Big 5 personality traits Sulloway expects first born children to be more conscientious and neurotic and later born children to be more agreeable and open. He has opposing views on the degree of extraversion depending on dominance (leadership abilities) or social extraversion (see figure 2).

An extensive amount of research on birth order and personality has been conducted. This research angle is also the most discussed and criticized within birth order analysis (Ernst and Angst 1983). We will use this branch of research to highlight a different pathway in which birth order could affect fertility. Several studies using between family analyses cannot find a link between birth order and personality, using the big 5 model of personality traits; openness, conscientiousness, extraversion, agreeableness, and neuroticism (Bleske-Rechek and Kelley 2014; Marini and Kurtz 2011; Rohrer, Egloff and Schmukle 2015). However, studies using a within-family design show support for Sulloway's niche hypothesis (Beck, Burnet and Vosper 2006; Dixon, Reyes, Leppert and Pappas 2008; Healey and Ellis 2007; Paulhus et al. 1999).

Turning to the Big 5 personality effects on fertility, most research finds high extraversion to be correlated with high fertility for both sexes (Jokela, Alvergne, Pollet and Lummaa 2011; Jokela 2012; Skirbekk and Blekesaune 2014). This is explained with an outgoing and sociable personality being is associated with making friends, finding a partner and becoming a parent. They also find that neuroticism is associated with lower fertility. In contrast to being sociable, anxiety and negative emotions are associated with lower relationship likelihood, quality and with ambivalence in childbearing intentions (Jokela, Kivimäki, Elovainio and Keltikangas-Järvinen 2009). Results suggest high openness to lead to lower fertility (Jokela 2012; Skirbekk and Blekesaune 2014). The negative effect of openness to experience on fertility is explained by higher educational attainment and non-traditional values in connection with higher levels of self-realization (Jokela et al. 2011; Skirbekk and Blekesaune 2014). High conscientiousness is shown to be connected to lower fertility, especially for women, as such individuals are typically achieving and career oriented which in return may imply postponement or lower childbearing. Being agreeable increases fertility for women, but less clearly for men (Jokela et al. 2011; Jokela 2012). Related traits such as being empathic, caring, kind, and considerate are suggested to be associated with a positive probability in finding a partner, having children and to lower ambivalence in childbearing intentions (Jokela et al. 2011). Figure 2 depicts associations between birth order and personality as well as the assumed effects of the Big 5 personality traits on fertility shown by previous literature. On balance one would expect earlier born children to have lower fertility compared to their later born siblings.

Figure 2: Summary of previous research on how personality traits mediate the relationship between birth order and fertility



Other theoretical approaches are related to how socialization of childbearing preferences may relate to childbearing and birth order. Individual behavior and attitudes are the results of socialization, which may be related both to direct parental engagement and teaching, and to observation of parents as role models. The extent to which siblings learn from and model each other depends on their relationship quality as well as on the constellation since older and same gender siblings more often are seen as role models (Whiteman et al. 2011). Hence, first born siblings are more likely to serve as role models, given that later born siblings are more influenced by and attached to their older siblings than vice versa (Whiteman et al. 2011). While psychologists have examined if birth order affects the relationship between siblings and personality development of a child, much less research has focused on the structural characteristics, such as if number of siblings and birth order affects socialization of fertility preferences within the family of origin (Steelman, Powell, Werum and Carter 2002). Such influences are important to understand the relationship between the family of origin and fertility preferences (Axinn, Clarkberg and Thornton 1994; Thornton 1980). The degree of orientation towards family life, which likely is related to fertility outcomes (Barber, Axinn and Thornton 2002), might as well depend on both numbers of siblings as suggested by research on intergenerational transmission of fertility (Booth and Kee 2009b; Murphy 1999), as well as factors related to birth order. This relationship of parents and children sharing the same preferences could operate though different pathways. If a child has younger siblings they may have a more caretaking role towards other siblings, and therefore more family oriented preferences. On the other hand, younger siblings are exposed to a larger family for longer parts of their childhood, which likewise could lead to a high family orientation. Such factors might also differ according to gender. Cools and Hart (2015) suggest that a high number of siblings might reduce later childbearing for women, as they observe the strains of childbearing on their mother, while men might not show such a response. Anderton et al. (1987) similarly speculated that women with many younger siblings would adopt a more caretaking role in the family of origin, which may lead them to observe the strains associated with childbearing. They find some evidence that earlier birth order reduces fertility for women.

Direct sibling effects on childbearing behavior may also be important. Obviously the family of origin and the relationship to parents frames fertility decisions of individuals, but in addition siblings childbearing has been found to affect individuals childbearing as well (White and Bernadi 2008). This so called contagious effect of fertility between siblings implies an increased likelihood of childbearing when a sibling recently had a birth (Kuziemko 2006; Lyngstad and Prskawetz 2010). In the context of birth order differences this could mean that later born siblings follow the fertility patterns of their older siblings. This would imply that younger siblings start their fertility careers earlier, than older siblings, if there is a clear temporal link between timing of childbearing of siblings in the same family.

WHY BIRTH ORDER MATTERS FOR INTERGENERATIONAL TRANSMISSION OF FERTILITY

Above we discussed why the order among when a person was born might affect fertility. Below we discuss if there is an interaction between the number of siblings a person grows up with and the birth order of that individual for predicting later fertility outcomes. Birth order has been suggested to mediate the relationship and transmission from parents to children. In research on intergenerational transmission of fertility in the 1960s and 1970s birth order was one of the key explanatory variables of interest (Hendershot 1969; Johnson and Stokes 1976; McAllister, Stokes and Knapp 1974), largely motivated by theories of more conformity to parental behavior and preferences among first and early born. Intergenerational transmission of fertility (a correlation between number of siblings and own fertility) has been found by various researchers for a large number of societies (Murphy 1999; Murphy 2013). The continuity across generations is primarily explained through childhood socialization and transmission of socioeconomic status (Barber 2000; Barber 2001). Parents pass on attitudes, preferences and are seen as role models. Childhood circumstances are important for what children learn and adopt from their parents, but these circumstances are not the same for each sibling. If the childhood experience differs substantively by birth order, it is reasonable to expect that this will result in differences in intergenerational transmission by birth order.

According to Adler’s as well as Sulloway’s niche model, first born children typically model their parents’ behavior and follow their lead. This would not only be shown in differences in outcomes by birth order, but would also predict that first born resemble their parents to a larger degree than later born. This suggests that one would find a stronger transmission effect (a stronger correlation between the trait of a parent and the same trait of a child) of various behaviors such as children for early born children. Middle children are expected to be good at negotiating, but also to turn to friends outside the family. This in return would weaken the parent's influence in an intergenerational transmission perspective. Last/later born children are assumed to face less rigorous parenting, which is suggested to make them more carefree and separate themselves by being rebellious. There is some empirical evidence for such a relationship (Schachter 1964). If later born children oppose their parent's role model no or little intergenerational transmission of fertility behavior would be found. Hence, the niche model gives reason to expect earlier born children to resemble their parents' fertility behavior stronger than later born children. Another reason for a stronger bond could be due to more quality time spent (daily) with first born children (Price 2008). There is additional theory and evidence from the 1960s suggesting that first born women are particularly likely to serve as "conservators of traditional culture" (Kammeyer 1966; Rossi 1965). Therefore, it is possible that the effect of birth order as mediator of fertility might be particularly strong for women.

Another pathway for intergenerational fertility correlations is if traits such as socioeconomic status are transferred across generations, which is related to fertility. For example, there is evidence of large intergenerational correlations in education, as well as substantive evidence for birth order effects. Stratification and fertility literature has focused on the direct effect of birth order (and parental age which is closely related) on various outcomes, few studies have directly tested if birth order mediates the strength of the intergenerational relationship. Booth & Kee (2009a) showed no mediation of birth order in the strength of the intergenerational relationship in education across generations.

Intergenerational transmission research on fertility, mainly using birth order as a control, found evidence that first born children are stronger affected by their parents than later born children (Murphy 1999). Research from the 1960s and 1970s found empirical support for stronger birth order effects of first born (Hendershot 1969; Johnson and Stokes 1976; McAllister et al. 1974). In this regard Fasang and Raab (2014) for example find that early-born children are more likely to be stronger affected by intergenerational transmission, while later-born children are more probable to be part of the intergenerational contrast group. Booth and Kee (2009b) support a stronger, but non-significant, correlation between fertility for first born children as well. However, Murphy and Knudsen (2002) do not find evidence for this birth order effect.

RESEARCH DESIGN

In this study we want to analyse both the effect of birth order on fertility, as well as how birth order mediates the relationship between number of siblings and fertility. However, such an approach is not straightforward. Birth order, the size of the family of origin, and other parental characteristics are all interrelated, and a careful approach is necessary to disentangle the different effects.

Previous research has paid more attention to the number of siblings as a predictor of family size than birth order. And several studies find that family size influences own fertility (Kotte and Ludwig 2011; Murphy 1999; Murphy and Wang 2001). Birth order and family size are directly connected, as for example fourth born will always grow up in a family of at least four children. Family size is endogenous and entirely based on parent's preferences. Therefore, it is likely that parents that choose to have many or few children are selected in various ways, and that the children of these parents for similar reasons also are selected. To solve such issues, we use a within-family comparison analysis for our research question. A within-family approach is only comparing siblings to each other instead of comparing individuals between families, which means that factors shared between siblings such as parents' socioeconomic status and number of siblings are controlled for and differences between families cannot bias the results. This is done using fixed-effects regression models. We will create models in which birth order is calculated by comparisons from all siblings, while the research design implies that we only compare siblings of the same sex in our models.

For our second research question we are aiming at both the family size and the birth order effect. As the number of siblings is the same for all siblings in a family it is not possible to use a within family comparison to study this question. In order to distinguish those two effects we are separating birth order groups and run the analysis for each birth order independently. This way we are able to get at different effects of parental characteristics on earlier and later born siblings. If we compare 4th born, with 1st born, the first will be sampled from families of size 4 and larger, while the latter will be sampled from a population of size 1 and larger. But instead of regressing the number of siblings on own fertility, we examine the relationship between individuals with different number of subsequent siblings after their own birth order (younger siblings) and eventual fertility. We present such results with separate models for each birth order, where the slope in the graph represents the strength of the correlation. Such an approach is less commonly used in research on intergenerational transmission of fertility, but the results are functionally indistinguishable from using number of siblings. Using additional siblings for regressions by birth order makes it easier to visually asses the results. Additionally, there is no difference to correlating parental and children's fertility - as per definition the correlation shows the effect of one additional sibling on number of children, especially when doing it by birth order.

We also adjust for maternal age in our models. In general very young maternal age is associated with negative child outcomes in education, cognitive abilities and health (Conley 2001; Geronimus, Korenman and Hillemeier 1994). Similar to family size and birth order, mother's age and birth order are directly related as later born children are always born to older mothers. This interrelation could be especially problematic when it comes to the birth order effect on children's socioeconomic status outcomes. Assuming that increasing mother's age has a positive effect on children's educational outcomes and increasing birth order has a negative effect, would suggest a counteracting effect on children's socioeconomic status that needs to be controlled for. Further, mother's age at birth for each individual functions as a proxy for birth spacing. A larger age gap between siblings is supposed to be associated with less birth order effects (Beck et al. 2006; Sulloway 1996), so controlling for spacing is crucial.

DATA AND METHODS

We use administrative population registers for the complete population of Sweden. Swedish individuals are connected by means of a personal identity number, allowing accurate linkages across generations for all births inside Sweden. Our analysis population consist of all Swedish born individuals with a mother born between 1915-1935 (parental generation). Our younger generation is born between 1932 and 1988 with almost 99% is born between 1937 and 1971, thus allowing us to examine completed fertility for virtually all members of the younger generation. This study population is chosen to maximise the proportion of the younger generation have completed their fertility. Although both our older and younger cohorts cover very different historical times, the cohort fertility rate in Sweden was very stable over these periods (appendix, figure A8). We only look at individuals and their full siblings, in families in which there are no maternal or paternal half-siblings. We also restrict our study population to Swedish born individuals that were alive or had never out-migrated from Sweden at age 45. Measures on the number of siblings of the younger generation (the fertility of our older generation), and birth order are calculated by means of the Swedish multigenerational register.

All our analyses are done using ordinary least square (OLS) regression, in which number of children of the younger generation is our dependent variable. Complementarily we are running linear probability models for each parity transition in order to be able to identify differences by parity transitions, to see what effects birth order have on the eventual fertility distribution. For our first research question aiming at the effect of birth order on fertility we use sibling fixed effect models, based on a unique sibling identifier for every sibling group sharing the same father and mother. Such an approach cannot be used to estimate the effect of number of siblings on fertility, our second research question, as the number of other siblings is fixed in a sibling group. Therefore, we stratify our population by birth order for the second part of our analysis as described in the research design section. This implies running different regression models on number of children as a dependent variable with number of additional sibling born after your own birth in models stratified by birth order. Information about our study population can be found in Table 1. In appendix table A2 we present a flow chart on how our different sample restrictions affects our eventual population.

Table 1: Descriptive Statistics of the population under study

Variable		N	%
Fertility Younger Generation	0	228,457	16.76
	1	192,742	14.14
	2	566,861	41.59
	3	279,262	20.49
	4	71,481	5.24
	5	17,162	1.26
	6	4,668	0.34
	7	1,425	0.10
	8	515	0.04
	9	194	0.01
	10+	171	0.01
Fertility Parental Generation/ Sibship Size	1	150,058	11.01
	2	482,835	35.43
	3	370,423	27.18
	4	191,803	14.07
	5	86,219	6.33
	6	40,764	2.99
	7	20,035	1.47
	8	10,063	0.74
	9	5,2	0.38
	10+	5,538	0.41
Birth Order Younger Generation	1	593,081	43.51
	2	441,935	32.43
	3	200,287	14.70
	4	77,018	5.65
	5	29,169	2.14
	6	11,91	0.87
	7	5,168	0.38
	8	2,324	0.17
	9	1,071	0.08
	10+	975	0.07
Year of Birth Younger Generation	1932-1936	9,32	0.68
	1937-1941	73,857	5.42
	1942-1946	228,881	16.79
	1947-1951	317,775	23.32
	1952-1956	318,739	23.39
	1957-1961	241,389	17.71
	1962-1966	129,309	9.49
	1967-1971	38,063	2.79
	1972-1976	5,322	0.39
	1977-1981	273	0.02
	1982-1988	10	0.00
Year of Birth Father	1885-1894	878	0.06
	1895-1904	16,673	1.22
	1905-1914	262,777	19.28
	1915-1924	638,725	46.86
	1925-1934	419,522	30.78
	1935-1944	24,303	1.78
	1945-1951	60	0.00
Year of Birth Mother	1915-1924	709,265	52.04
	1925-1935	653,673	47.96
Gender	Men	696,395	51.10
	Women	666,543	48.90
	Total	1,362,938	100

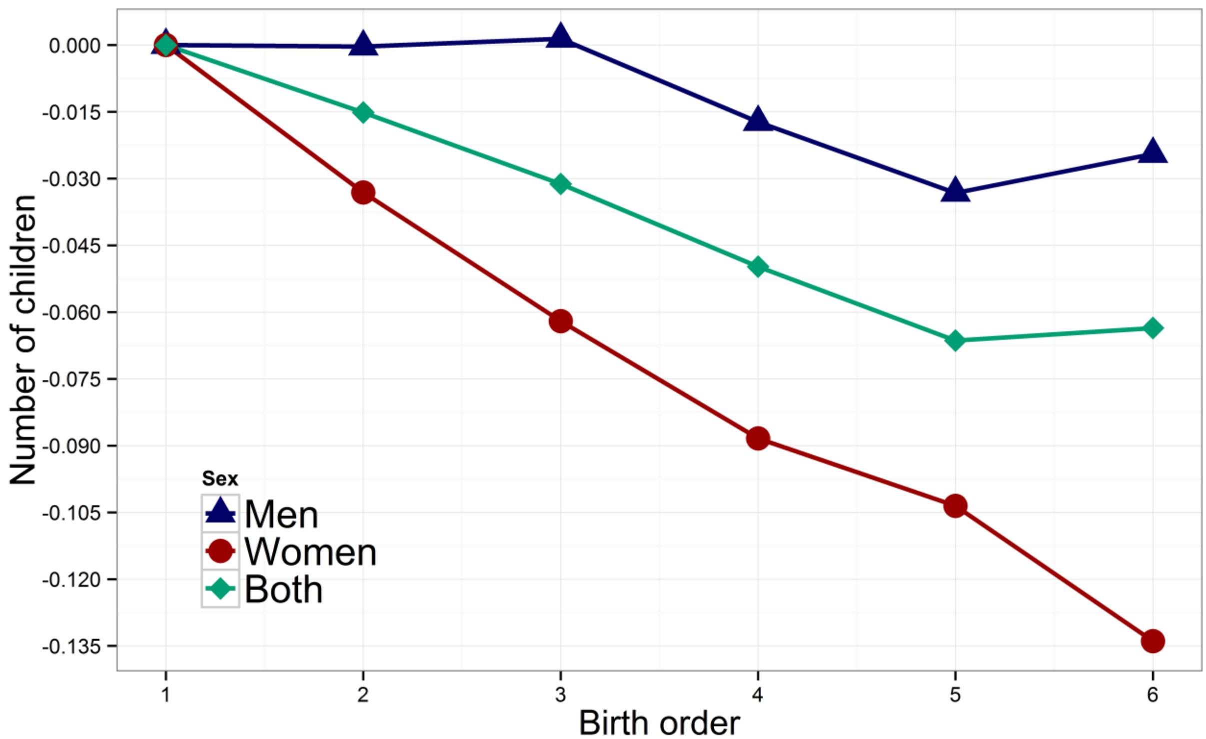
Note: Swedish register data, authors' own calculations

RESULTS

BIRTH ORDER AND FERTILITY

To answer our first research question on how birth order affects fertility, we run family fixed-effects models. First, figure 3 shows the results of the OLS fixed-effects regression with number of children as the dependent variable. We restrict the presented results to birth order smaller than 6, as larger birth orders represent a very small fraction of all individuals for our cohorts. One can see that a higher birth order is associated with fewer children for women. The effect is increasing linearly with 6th born women having 0.13 fewer children compared to first born women. For the completed fertility of men on the other hand we find effects that are close to zero for all birth orders, with only a small negative effect for birth order 4 and higher. Our results of a difference of 0.13 between 1st born and 6th born are equivalent to a change in 0.11 standard deviations in fertility for our outcome variable. Our results therefore overall suggest that birth order has a clear negative relationship with early born women having more children than later born women. For men we find no effect at all between birth order and fertility. Our results for women are based on comparison with sisters in the family of origin, and our results for men on comparisons with brothers. We also ran analyses for both sexes comparing all siblings, and including a covariate for sex, which predictably show results in between those presented for men and women. When using between-family comparisons for this analysis a much stronger and positive effect for both men and women is shown, providing proof that the within-family approach is necessary to capture actual birth order effects (see figure A9).

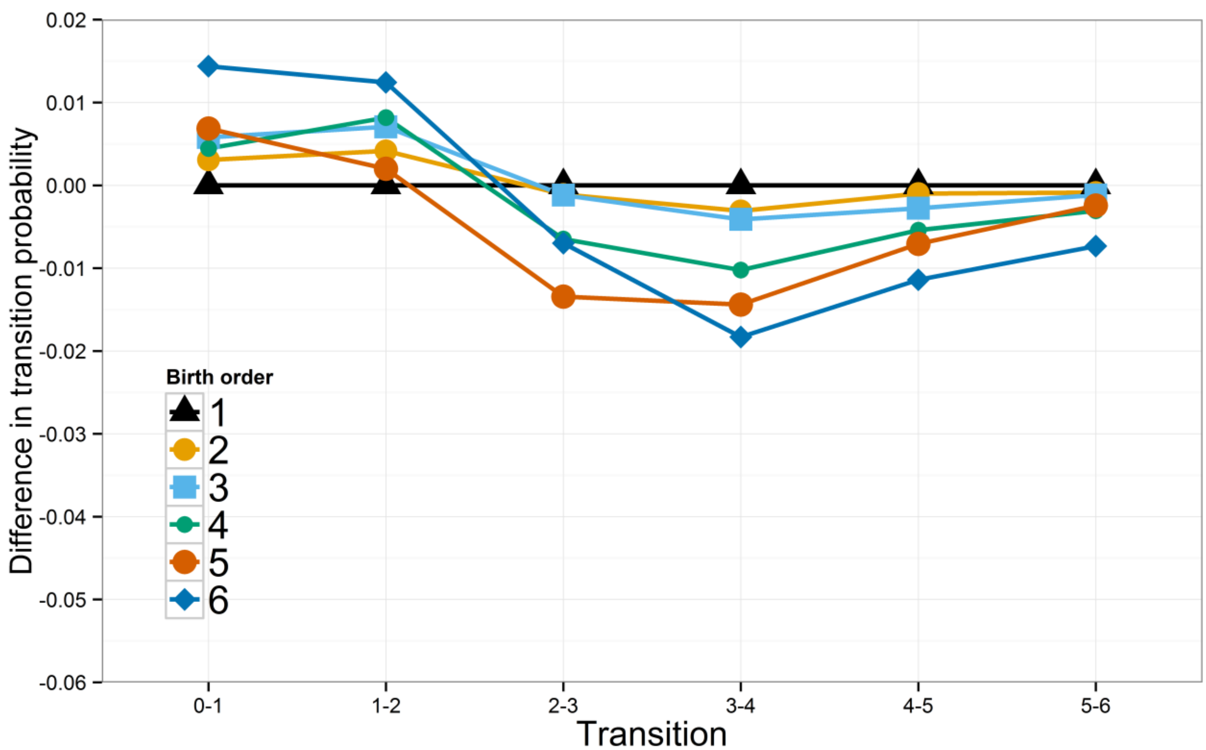
Figure 3: OLS regression on number of children by birth order, sibling fixed-effects models, Swedish born men and women with a mother born between 1915 and 1935.



Controlled for year of birth and mother's age at birth (and gender for overall regression)
Note: Swedish register data, authors' own calculations

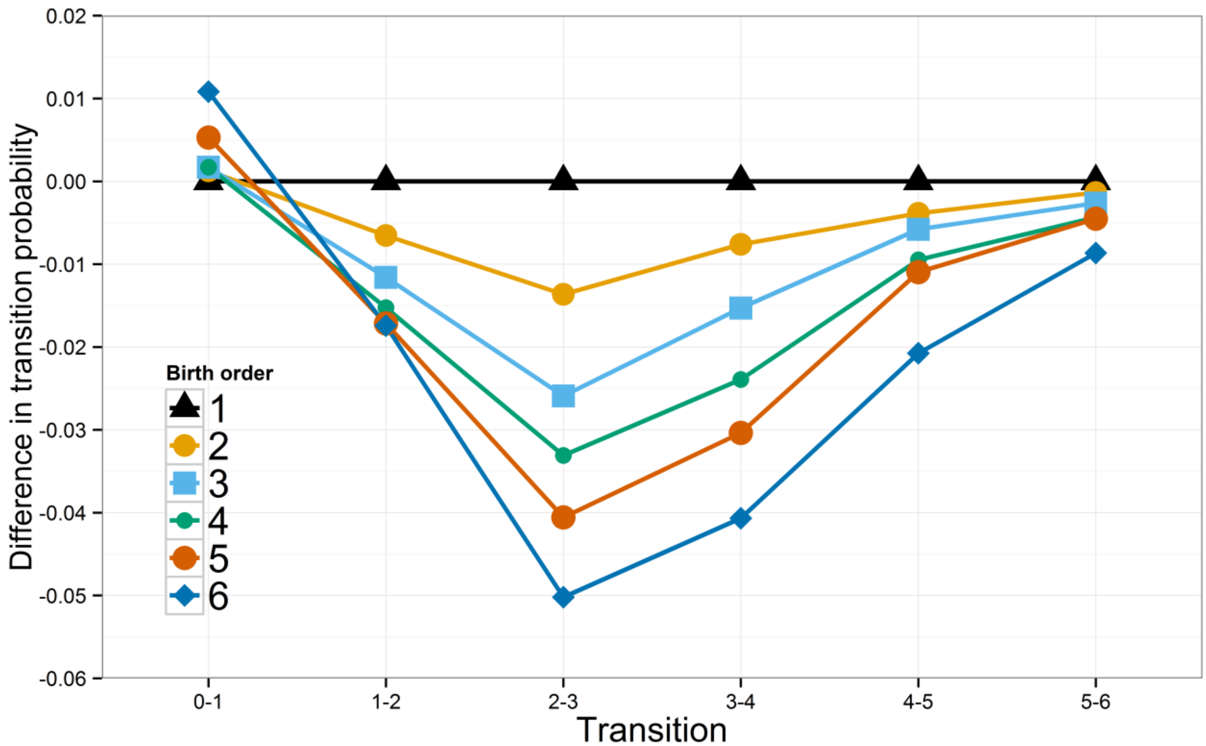
In a next step, we are extending this analysis to examine transitions at different parities by birth order. Looking at each parity transition enables us to show non-linear relationships between a person's birth order and the distribution of their eventual number of children. Figure 4 depicts these results for men, and shows different birth order effect for men at different parities, which was not possible to see in the results for completed fertility. With first born men being the reference, the probability of having a first and a second child is increasing the higher the birth order. The results show that 6^{th} born men are 2 percent more likely to have a first child than first born men. This relationship reverses with transitions to higher births. This means that first born men are more likely to be childless and less likely to have one and two children compared to their younger siblings. Simultaneously, first born men are more likely to have three and more children than later born men. These differences in parity transitions cancel each other out leading to the effect close to zero for men shown in figure 3. The results for women in figure 5 show a similar pattern, but here - with exception for transition to parenthood - the negative influences are stronger. Women of higher birth order are slightly more likely to have a first child compared to first born women. But this relationship reverses again with transitions to second and higher births. The higher the birth order the lower is the likelihood for a second or higher birth compared to first born women. This relationship is strongest for third parity transition, when 6th born women are almost 5 percent less likely to have a third child than first born women. The overall positive association between birth order for women in figure 3 therefore consists of a small negative effect for entry into parenthood, and a more substantive positive influence at later parities. Interestingly, these results indicate that men and women of higher birth order are less likely to be childless, and at the same time are less likely to have two or more children compared to first born individuals. The tables to all our results can be found in the appendix (Table A3-A5).

Figure 4: OLS regression on transitions to different parities by birth order, sibling fixed-effects models, Swedish born men with a mother born between 1915 and 1935.



Controlled for year of birth and mother's age at birth
Note: Swedish register data, authors' own calculations

Figure 5: OLS regression on transitions to different parities by birth order, sibling fixed-effects models, Swedish born women with a mother born between 1915 and 1935.



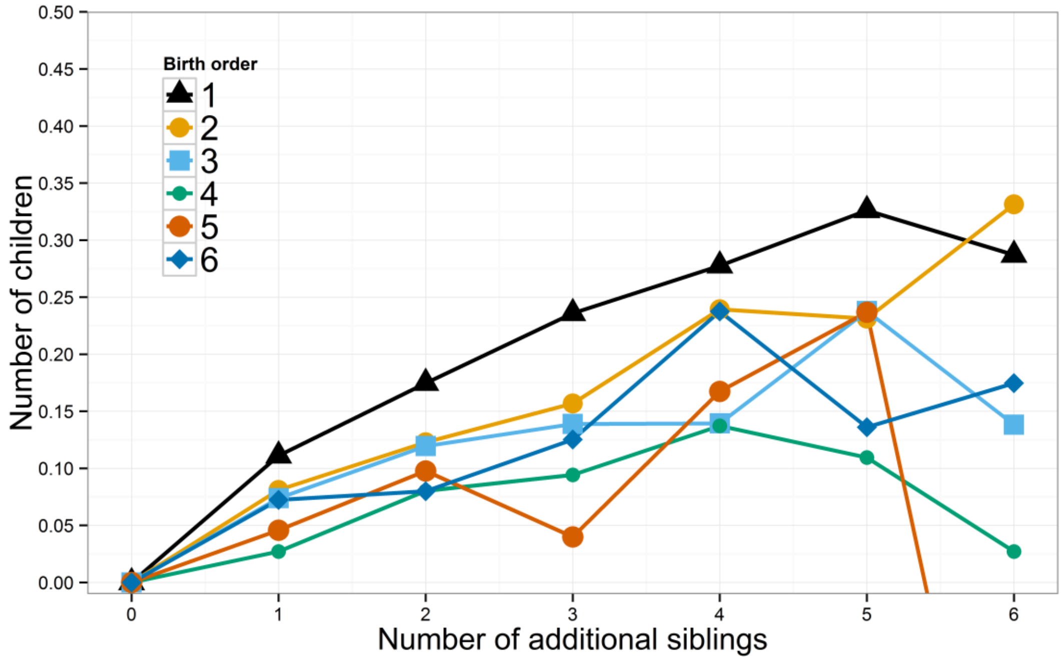
Controlled for year of birth and mother's age at birth
Note: Swedish register data, authors' own calculations

BIRTH ORDER AND INTERGENERATIONAL TRANSMISSION OF FERTILITY

Following our analyses on the influence of birth order on fertility, as a second step we analyze if there is an interaction between number of siblings and birth order when studying fertility. Previous research and theoretical approaches have suggested that the effects of parental characteristics might be larger for early born individuals. Intergenerational transmission of completed fertility has been shown for Sweden and our results are consistent with previous research (Dahlberg 2013; Kolk 2014a). A positive almost linear effect of family size of origin can be seen for individuals childbearing (Pearson Correlation: 0.1027; Pearson Correlation with controls for year of birth and mother's age at birth: 0.1065). Figure A10 in the appendix shows the association between parents' fertility and their children's fertility for men and women. Again women seem to be stronger affected by their parents' fertility than men. We show this graph by parity transitions in our appendix as well (figure A11-A12). These results predictably show that most of this effect is related to transitions with more variation.

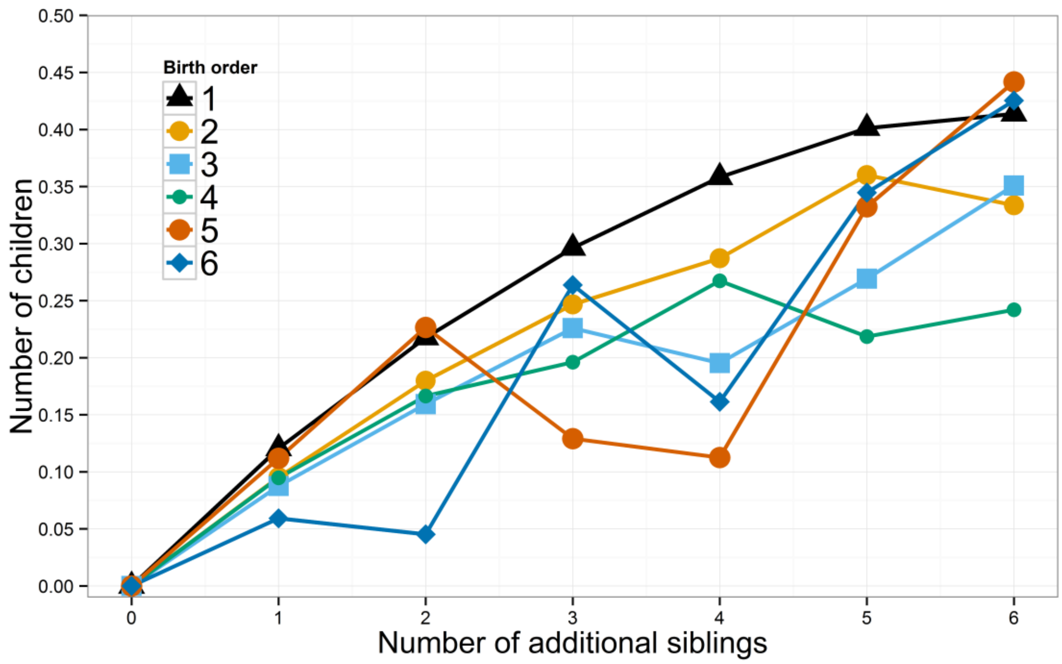
To identify if first born individuals actually show a stronger intergenerational transmission of completed fertility than later born children we stratify our population by birth order, examining subsequent siblings born after the index person as described in our research design section. In this context figure 6 and 7 depict the effects of number of additional siblings for men and women, and again the tables to these results can be found in the appendix (Table A6-A7). Over all birth orders the graph for women shows more children the more additional siblings a woman has. First born women seem to be slightly more affected by higher numbers of siblings than second, third, or fourth born women. Higher birth orders start to fluctuate a bit in their effects. Therefore, first born women's fertility is slightly stronger associated with their number of additional siblings. Similarly, men show a positive association between number of additional siblings and number of children. Altogether, the positive effect of siblings on fertility is stronger for women than for men. Nevertheless, compared to women the difference between first born and later born men is somewhat more pronounced. First born men are quite clearly more affected by higher number of siblings than later born men. Overall the results presented in figures 7 and 8 are robust across different model specifications, including models which have total number of siblings, instead of additional siblings as independent covariates. Overall our results give some support to the idea of stronger intergenerational transmission of fertility of first born, though the effects are rather small, and results for later birth orders are ambiguous.

Figure 6: OLS regressions on number of children by additional siblings, stratified by birth order, Swedish born men with a mother born between 1915 and 1935.



Controlled for year of birth and mother's age at birth
Note: Swedish register data, authors' own calculations

Figure 7: OLS regressions on number of children by additional siblings, stratified by birth order, Swedish born women with a mother born between 1915 and 1935.



Controlled for year of birth and mother's age at birth
Note: Swedish register data, authors' own calculations

CONCLUSION

In this study we were interested in the direct effect of birth order on fertility (1) and if intergenerational transmission of fertility varies by birth order (2). Our first research question concerned the general effect of birth order on fertility. Analysis of within-family comparisons using Swedish register data enables us to control for all shared factors between siblings including unobserved heterogeneity and allows less biased results. Sibling fixed-effects OLS models show a negative effect of increasing birth order on completed fertility especially for women, while we find no substantive association for men. We also examined if birth order effects varied according to parity transition, and found that this was the case for both men and women. For men being later born is associated with higher likelihoods for transitions to first and second births, and with lower likelihoods for higher parity transitions beyond two, where the two effects largely cancel out when examining completed fertility. The results for women look similar, but only the transition to a first birth is more likely for later born women while all transitions from a second birth on are less likely. Overall these results indicate that first born men and women are more likely to be childless, less likely to only have one respectively two children, and more likely to have higher parity transitions. For women this translates into lower completed fertility for later born. All our results are statistically significant, and moderate in size.

The resource dilution hypothesis - cumulative advantage of earlier born over later born due to parent's fixed resources - as well as the confluence hypothesis, lead to the assumption that earlier born individuals have higher completed fertility. With respect to psychological research on personality and birth order on the other hand one would expect a negative effect of being earlier born on fertility outcomes. Our results for women on the effect of birth order on total family size are consistent with explanations focusing on how higher birth order might be related to worse outcomes in adulthood, and that this might lead to lower fertility. However, we note that later birth order is associated with a higher probability to be a parent, while a smaller eventual family size. Typically research on the association between socioeconomic status and fertility shows that high status individuals are less likely to be childless, but also less likely to have a very large number of children. As such, our results are not consistent with socioeconomic status as the primarily pathway to explain our results for the relationship between fertility and birth order, as later birth order typically is associated with worse socioeconomic outcomes.

Our results on a negative association between fertility and increasing birth order, is consistent with parts of the socialization based predictions for women. Early born women that grow up with younger siblings seem to end up with higher fertility than their sisters who experienced older siblings. Higher fertility for early born women, but not men, is consistent with gendered expectations on part of the parents in which first born women but not men, face stronger parental encouragement or pressure to establish a family. Such a pressure that might be smaller for later born daughters as the parents at that point might already have at least one grandchild. Another possibility is that this could just reflect higher family orientation among women that grow up with younger siblings, though a similar pattern is not found for men. Our findings are also consistent with research from the 1960s that suggests that first born women adopt traditional female gender roles, such as unusual high fertility, to a higher degree than later born women (Kammeyer 1966).

Second, we were interested in birth order effects on intergenerational transmission of fertility. Birth order, and socialization theory suggests a stronger intergenerational resemblance for first born children, but few studies have directly examined if this is the case. Stratifying the population by birth order, which means to run different regression models for each birth order, helps us find different effects of parental characteristics on earlier and later born siblings. We find that first born children somewhat stronger resemble their parents in fertility outcomes. However, the results are not particularly strong, and there are few or no differences between all other birth orders beyond the first born. As such, our results are not consistent with research on intergenerational transmission of fertility that has found such effects (Booth and Kee 2009b; Hendershot 1969; Johnson and Stokes 1976).

Our findings of a negative relationship between increasing birth order and fertility for women fits into other recent research that has found birth order effects for various later life outcomes (e.g. Barclay and Myrskylä 2014; Barclay and Kolk 2015; Black et al. 2005). Our results also highlight the necessity of a within family approach as the between family association is reverse of what we find after applying fixed effects models. Birth order is related to the environment in the family of origin, and it is perhaps not surprising that such experiences are related to later decisions about family formation. We note that these effects also are different for the decision to become a parent, as for decisions to have a comparatively large family, and also that our effects are more important for women. As such, our research is useful as a comparison point between research in psychology focusing on personality and preferences, with research looking at quantitative outcomes in adulthood. More research should aim to further understand why birth order in childhood appears to affect decisions about family formation in adulthood. The theoretical approaches applied here hypothesize two opposite directions of the relationship, which is why we might underestimate the birth order effect. Trying to disentangle possible pathways for birth order to operate might give more insight in how birth order affects fertility.

Acknowledgements:

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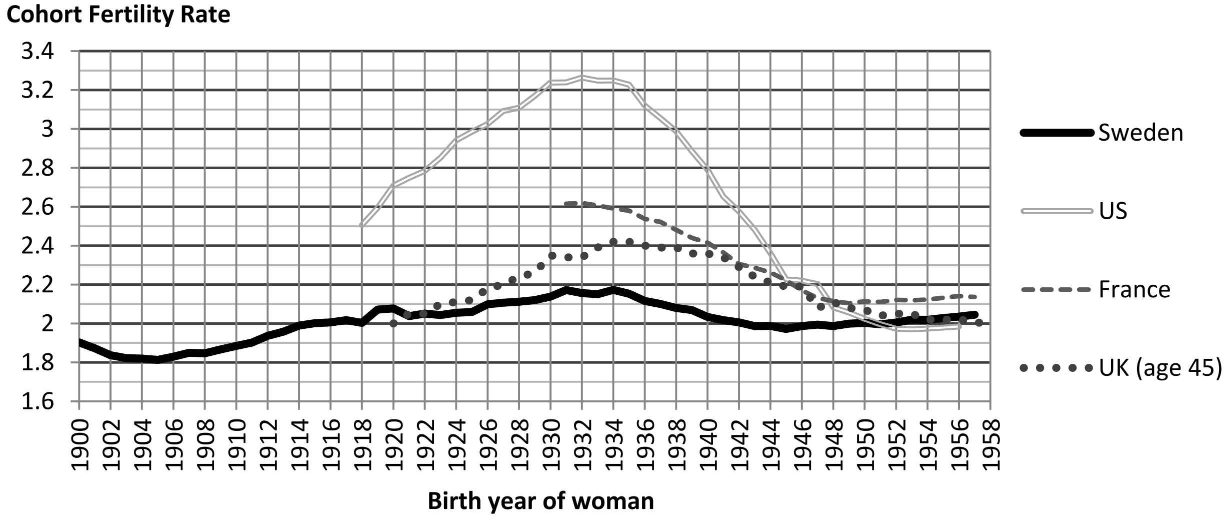
APPENDIX

Figure A8: Cohort Fertility Rate in Sweden, France, the US and the UK, 1900-1958



Source: Kolk 2014b

Table A2: Sample restrictions

Birth order effects on fertility (Fixed effects OLS)

	Men		Women		Total
Exclusion Criteria	N	N excluded	N	N excluded	N
Total in Swedish registers with a mother born between 1915-1935 & parent ID's known	1,066,370		1,014,569		2,080,939
Swedish born (Mother, Father, Index Person)	880,465	185,905	840,790	173,779	1,721,255
Never-migrated at age 45	869,332	11,133	824,837	15,953	1,694,169
Alive by age 45	848,645	20,687	814,077	10,760	1,662,722
No half siblings	696,395	152,250	666,543	147,534	1,362,938
No only children	620,203	76,192	592,677	73,866	**1,212,880**

Birth order effects on intergenerational transmission of fertility (OLS)

	Men		Women		Total
Exclusion Criteria	N	N excluded	N	N excluded	N
Total in Swedish registers with a mother born between 1915-1935 & parent ID's known	1,066,370		1,014,569		2,080,939
Swedish born (Mother, Father, Index Person)	880,465	185,905	840,790	173,779	1,721,255
Never-migrated at age 45	869,332	11,133	824,837	15,953	1,694,169
Alive by age 45	848,645	20,687	814,077	10,760	1,662,722
No half siblings	696,395	152,250	666,543	147,534	**1,362,938**

Table A3: OLS regression on number of children by birth order, sibling fixed-effects models, Swedish men and women born in 1932-1988

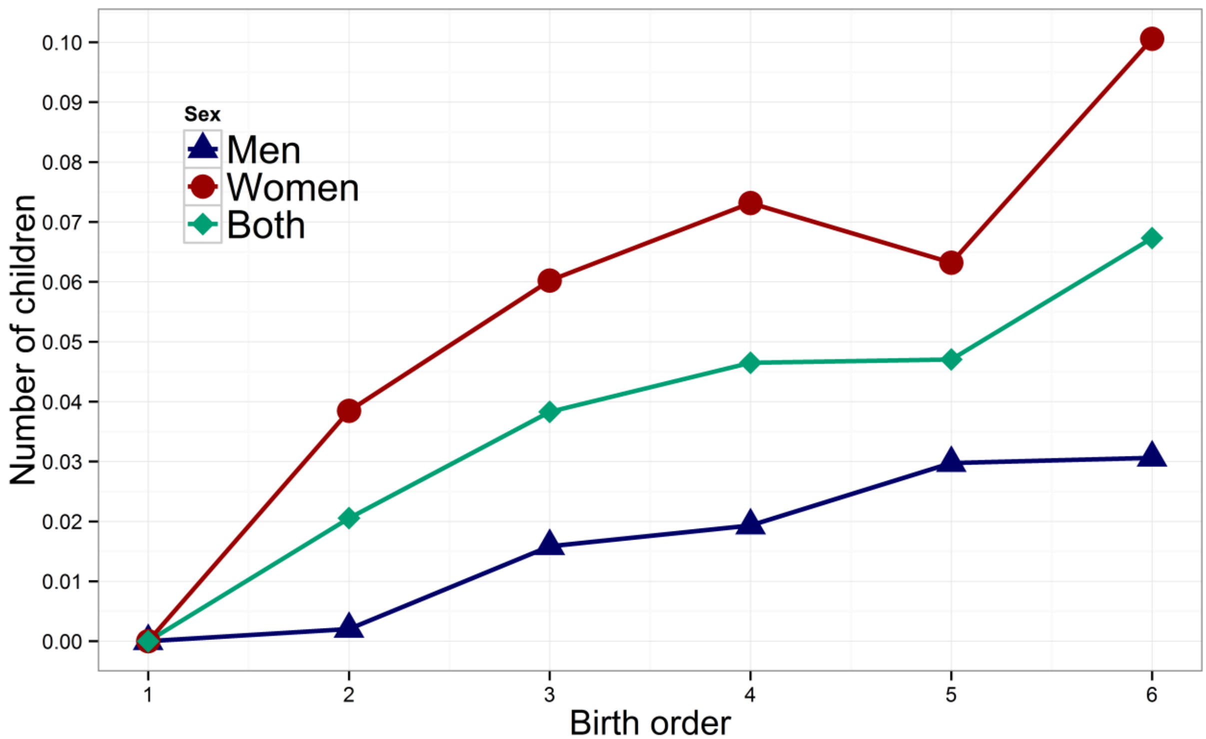
Variables		**All**	**Men**	**Women**
Birth Order	1	0	0	0
	2	-0.015***	-0.000	-0.033***
		(0.004)	(0.006)	(0.006)
	3	-0.031***	0.001	-0.062***
		(0.006)	(0.010)	(0.010)
	4	-0.050***	-0.017	-0.088***
		(0.008)	(0.015)	(0.014)
	5	-0.066***	-0.033*	-0.103***
		(0.011)	(0.020)	(0.019)
	6	-0.064***	-0.024	-0.133***
		(0.015)	(0.025)	(0.023)
	7	-0.068***	0.034	-0.164***
		(0.021)	(0.033)	(0.031)
	8	-0.089***	-0.067	-0.120***
		(0.028)	(0.045)	(0.042)
	9	-0.037	0.012	-0.109*
		(0.040)	(0.064)	(0.056)
	10	-0.139***	0.056	-0.305***
		(0.044)	(0.069)	(0.065)
Year of Birth	1932-1936	0	0	0
	1937-1941	-0.025	0.010	-0.054*
		(0.018)	(0.032)	(0.029)
	1942-1946	-0.026	0.018	-0.052*
		(0.019)	(0.034)	(0.031)
	1947-1951	0.011	0.075**	-0.021
		(0.021)	(0.038)	(0.034)
	1952-1956	0.058**	0.123***	0.035
		(0.023)	(0.043)	(0.040)
	1957-1961	0.073***	0.133***	0.082*
		(0.027)	(0.049)	(0.044)
	1962-1966	0.028	0.082	0.039
		(0.030)	(0.055)	(0.051)
	1967-1971	-0.129***	-0.076	-0.088
		(0.034)	(0.062)	(0.058)
	1972-1976	-0.550***	-0.476***	-0.503***
		(0.043)	(0.077)	(0.072)
	1977-1981	-1.005***	-0.643***	-1.235***
		(0.102)	(0.182)	(0.170)
	1982-1988	-1.781***	-2.089**	-1.171*
		(0.427)	(0.852)	(0.606)
Mother's age at birth				
	13-16	0.172***	0.078	0.167*
		(0.052)	(0.093)	(0.087)
	17-18	0.120***	0.188***	0.063**
		(0.015)	(0.027)	(0.024)
	19-20	0.090***	0.126***	0.062***
		(0.009)	(0.017)	(0.016)
	21-22	0.052***	0.083***	0.038***
		(0.007)	(0.013)	(0.012)
	23-24	0.027***	0.038***	0.020**
		(0.005)	(0.010)	(0.009)

Variables		All	Men	Women
	25-26	0	0	0
	27-28	-0.018***	-0.032***	-0.017*
		(0.005)	(0.010)	(0.009)
	29-30	-0.041***	-0.079***	-0.032***
		(0.006)	(0.011)	(0.010)
	31-32	-0.072***	-0.119***	-0.042***
		(0.008)	(0.015)	(0.014)
	33-34	-0.093***	-0.155***	-0.072***
		(0.010)	(0.018)	(0.017)
	35-36	-0.122***	-0.197***	-0.086***
		(0.012)	(0.021)	(0.020)
	37-38	-0.161***	-0.247***	-0.146***
		(0.014)	(0.026)	(0.024)
	39-40	-0.184***	-0.297***	-0.129***
		(0.016)	(0.030)	(0.028)
	41-42	-0.229***	-0.344***	-0.168***
		(0.020)	(0.036)	(0.034)
	43-44	-0.256***	-0.375***	-0.187***
		(0.026)	(0.047)	(0.044)
	45-46	-0.293***	-0.403***	-0.212***
		(0.042)	(0.075)	(0.067)
	47-48	-0.238***	-0.246	-0.263*
		(0.091)	(0.150)	(0.155)
	49-53	-0.026	-0.023	-0.004
		(0.236)	(0.382)	(0.435)
Sex	Male	0		
	Female	0.147***		
		(0.002)		
Constant		1.845***	1.800***	2.011***
		(0.022)	(0.039)	(0.036)
Observations		1,362,938	696,395	666,543
R-squared		0.01103	0.00948	0.00683
Number of sibling sets		607121	450681	439596

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: Swedish register data, authors' own calculations

Figure A9: OLS regression on number of children by birth order, non-fixed effects, Swedish men and women born in 1932-1988



Controlled for year of birth, number of siblings and mother's age at birth (and gender for overall regression)

Note: Swedish register data, authors’ own calculations

Table A4: Linear Probability Models for Parity Transitions, sibling fixed effects, robust standard errors, Swedish men born in 1932-1988

		Men					
Variables		Transition 0-1	Transition 1-2	Transition 2-3	Transition 3-4	Transition 4-5	Transition 5-6
Birth Order							
	1	0	0	0	0	0	0
	2	0.00306	0.00415*	-0.00109	-0.00309**	-0.00099	-0.00086**
		(0.00208)	(0.00246)	(0.00237)	(0.00145)	(0.00079)	(0.00044)
	3	0.00579*	0.00706*	-0.00118	-0.00411*	-0.00277**	-0.00117
		(0.00341)	(0.00404)	(0.00391)	(0.00243)	(0.00134)	(0.00075)
	4	0.00446	0.00817	-0.00648	-0.01023***	-0.00541***	-0.00306***
		(0.00476)	(0.00564)	(0.00551)	(0.00345)	(0.00195)	(0.00108)
	5	0.00687	0.00201	-0.01344*	-0.01439***	-0.00706***	-0.00244
		(0.00628)	(0.00742)	(0.00726)	(0.00465)	(0.00268)	(0.00157)
	6	0.01438*	0.01243	-0.00699	-0.01832***	-0.01140***	-0.00733***
		(0.00820)	(0.00972)	(0.00960)	(0.00630)	(0.00363)	(0.00209)
	7	0.01761	0.02541**	0.02096*	-0.01043	-0.00432	-0.00393
		(0.01093)	(0.01265)	(0.01266)	(0.00858)	(0.00524)	(0.00314)
	8	0.03064**	0.01550	-0.01986	-0.04342***	-0.02442***	-0.01098***
		(0.01486)	(0.01722)	(0.01697)	(0.01145)	(0.00641)	(0.00391)
	9	0.01315	0.01357	0.01231	-0.00496	-0.00502	-0.00273
		(0.02104)	(0.02453)	(0.02354)	(0.01719)	(0.01089)	(0.00738)
	10	0.02223	0.03216	0.01754	0.00156	0.00945	-0.00014
		(0.02388)	(0.02700)	(0.02703)	(0.01984)	(0.01248)	(0.00815)
Year of Birth							
	1932-1936	0	0	0	0	0	0
	1937-1941	0.01836**	0.01630	-0.01754	-0.01159	-0.00315	0.00298
		(0.00915)	(0.01173)	(0.01210)	(0.00814)	(0.00505)	(0.00275)
	1942-1946	0.02721***	0.01831	-0.02311*	-0.00890	-0.00383	0.00288
		(0.00995)	(0.01266)	(0.01292)	(0.00864)	(0.00526)	(0.00286)
	1947-1951	0.02946***	0.02426*	0.00493	0.00416	-0.00024	0.00424
		(0.01120)	(0.01408)	(0.01424)	(0.00941)	(0.00565)	(0.00308)
	1952-1956	0.03204**	0.03692**	0.02795*	0.01259	0.00040	0.00497
		(0.01287)	(0.01597)	(0.01602)	(0.01044)	(0.00619)	(0.00339)
	1957-1961	0.04012***	0.05110***	0.02109	0.00897	-0.00093	0.00434
		(0.01472)	(0.01809)	(0.01803)	(0.01161)	(0.00680)	(0.00374)
	1962-1966	0.04199**	0.03952*	-0.00857	-0.00007	-0.00451	0.00379
		(0.01680)	(0.02048)	(0.02028)	(0.01292)	(0.00749)	(0.00412)

Variables		Men					
		Transition 0-1	Transition 1-2	Transition 2-3	Transition 3-4	Transition 4-5	Transition 5-6
	1967-1971	0.00925	-0.01804	-0.05726**	-0.01430	-0.00805	0.00326
		(0.01931)	(0.02334)	(0.02283)	(0.01438)	(0.00824)	(0.00454)
	1972-1976	-0.11520***	-0.18836***	-0.12963***	-0.03152*	-0.01519	0.00063
		(0.02523)	(0.02897)	(0.02691)	(0.01645)	(0.00932)	(0.00531)
	1977-1981	-0.21026***	-0.25883***	-0.15649***	-0.03471	-0.00312	0.00743
		(0.06747)	(0.06205)	(0.04580)	(0.02443)	(0.01076)	(0.00572)
	1982-1988	-0.86045***	-0.97842***	-0.19808*	-0.06410	-0.00440	-0.00014
		(0.06770)	(0.07071)	(0.10773)	(0.08196)	(0.02131)	(0.01426)
Mother's age at birth							
	13-16	0.02824	-0.00018	0.01727	0.02554	0.00018	0.00397
		(0.02549)	(0.03278)	(0.03581)	(0.02802)	(0.01673)	(0.01025)
	17-18	0.04595***	0.05658***	0.03641***	0.02860***	0.00975**	0.00543**
		(0.00798)	(0.00988)	(0.00989)	(0.00648)	(0.00383)	(0.00221)
	19-20	0.03459***	0.04105***	0.02775***	0.01364***	0.00510**	0.00305**
		(0.00518)	(0.00637)	(0.00629)	(0.00393)	(0.00222)	(0.00124)
	21-22	0.02259***	0.02466***	0.01742***	0.01209***	0.00410**	0.00163*
		(0.00386)	(0.00470)	(0.00462)	(0.00286)	(0.00160)	(0.00088)
	23-24	0.01192***	0.01363***	0.00393	0.00470**	0.00284**	0.00100
		(0.00301)	(0.00366)	(0.00362)	(0.00223)	(0.00123)	(0.00068)
	25-26	0	0	0	0	0	0
	27-28	-0.01390***	-0.01021***	-0.00832**	-0.00055	0.00087	0.00050
		(0.00301)	(0.00362)	(0.00353)	(0.00216)	(0.00117)	(0.00065)
	29-30	-0.02905***	-0.02595***	-0.01781***	-0.00578**	-0.00077	0.00028
		(0.00367)	(0.00439)	(0.00426)	(0.00260)	(0.00141)	(0.00080)
	31-32	-0.03629***	-0.03778***	-0.03163***	-0.01118***	-0.00150	-0.00031
		(0.00468)	(0.00556)	(0.00536)	(0.00327)	(0.00180)	(0.00099)
	33-34	-0.05320***	-0.05062***	-0.03447***	-0.01436***	-0.00272	-0.00016
		(0.00571)	(0.00678)	(0.00655)	(0.00403)	(0.00220)	(0.00123)
	35-36	-0.06854***	-0.06405***	-0.04492***	-0.01846***	-0.00168	0.00013
		(0.00685)	(0.00809)	(0.00778)	(0.00476)	(0.00262)	(0.00146)
	37-38	-0.07960***	-0.08072***	-0.05498***	-0.02435***	-0.00494	-0.00164
		(0.00816)	(0.00963)	(0.00924)	(0.00563)	(0.00307)	(0.00174)
	39-40	-0.10099***	-0.10261***	-0.06025***	-0.02825***	-0.00488	-0.00131
		(0.00958)	(0.01119)	(0.01071)	(0.00648)	(0.00358)	(0.00197)
	41-42	-0.11485***	-0.11409***	-0.06921***	-0.03081***	-0.00894**	-0.00422*
		(0.01183)	(0.01358)	(0.01298)	(0.00783)	(0.00427)	(0.00240)
	43-44	-0.12348***	-0.11915***	-0.08849***	-0.03613***	-0.00614	-0.00278
		(0.01556)	(0.01779)	(0.01630)	(0.00979)	(0.00515)	(0.00292)

Variables	Men					
	Transition 0-1	Transition 1-2	Transition 2-3	Transition 3-4	Transition 4-5	Transition 5-6
45-46	-0.16532***	-0.14741***	-0.07890***	-0.00840	0.00194	-0.00318
	(0.02555)	(0.02825)	(0.02625)	(0.01542)	(0.00874)	(0.00538)
47-48	-0.15807***	-0.04371	-0.04312	-0.02083	0.01111	0.00960
	(0.05316)	(0.05294)	(0.05138)	(0.02915)	(0.01893)	(0.01320)
49-53	-0.16718	-0.05066	-0.03401	0.08119	0.07324	0.06894
	(0.16920)	(0.17115)	(0.12165)	(0.08960)	(0.06553)	(0.06515)
Constant	0.78384***	0.64218***	0.27830***	0.07585***	0.02205***	0.00191
	(0.01155)	(0.01446)	(0.01460)	(0.00960)	(0.00576)	(0.00314)
Observations	696,395	696,395	696,395	696,395	696,395	696,395
R-squared	0.00736	0.00634	0.00516	0.00312	0.00143	0.00073
Number of biosiblingsetid	450,681	450,681	450,681	450,681	450,681	450,681

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: Swedish register data, authors' own calculations

Table A5: Linear Probability Models for Parity Transitions, sibling fixed effects, robust standard errors, Swedish women born in 1932-1988

		Women					
Variables		Transition 0-1	Transition 1-2	Transition 2-3	Transition 3-4	Transition 4-5	Transition 5-6
Birth Order							
	1	0	0	0	0	0	0
	2	0.00126	-0.00654***	-0.01364***	-0.00761***	-0.00386***	-0.00135***
		(0.00184)	(0.00241)	(0.00248)	(0.00147)	(0.00076)	(0.00043)
	3	0.00170	-0.01159***	-0.02591***	-0.01530***	-0.00579***	-0.00263***
		(0.00300)	(0.00394)	(0.00411)	(0.00248)	(0.00132)	(0.00074)
	4	0.00170	-0.01525***	-0.03310***	-0.02393***	-0.00947***	-0.00435***
		(0.00413)	(0.00547)	(0.00577)	(0.00352)	(0.00188)	(0.00106)
	5	0.00528	-0.01715**	-0.04057***	-0.03037***	-0.01095***	-0.00452***
		(0.00539)	(0.00717)	(0.00762)	(0.00479)	(0.00262)	(0.00150)
	6	0.01082	-0.01743*	-0.05021***	-0.04068***	-0.02075***	-0.00865***
		(0.00687)	(0.00912)	(0.00989)	(0.00643)	(0.00361)	(0.00215)
	7	-0.00108	-0.03547***	-0.05884***	-0.03647***	-0.01930***	-0.00578*
		(0.00930)	(0.01234)	(0.01308)	(0.00859)	(0.00502)	(0.00303)
	8	0.00615	-0.02571	-0.04547**	-0.03347***	-0.01130	-0.00642
		(0.01227)	(0.01636)	(0.01799)	(0.01211)	(0.00722)	(0.00427)
	9	0.02954*	-0.02434	-0.02508	-0.05638***	-0.02864***	-0.01037
		(0.01558)	(0.02085)	(0.02490)	(0.01743)	(0.01033)	(0.00632)
	10	0.00219	-0.06582**	-0.12251***	-0.05558***	-0.04777***	-0.01484*
		(0.01926)	(0.02568)	(0.02707)	(0.02061)	(0.01190)	(0.00807)
Year of Birth							
	1932-1936	0	0	0	0	0	0
	1937-1941	0.00912	0.00612	-0.02876**	-0.02250***	-0.01042**	-0.00338
		(0.00743)	(0.01114)	(0.01233)	(0.00825)	(0.00512)	(0.00302)
	1942-1946	0.02629***	0.02261*	-0.04200***	-0.03578***	-0.01464***	-0.00486
		(0.00822)	(0.01207)	(0.01321)	(0.00866)	(0.00527)	(0.00310)
	1947-1951	0.02732***	0.02474*	-0.02553*	-0.02977***	-0.01160**	-0.00363
		(0.00937)	(0.01349)	(0.01462)	(0.00942)	(0.00562)	(0.00329)
	1952-1956	0.02086*	0.02921*	0.00453	-0.01203	-0.00463	-0.00164
		(0.01085)	(0.01535)	(0.01650)	(0.01043)	(0.00610)	(0.00353)
	1957-1961	0.02581**	0.04384**	0.02054	-0.00799	-0.00057	-0.00006
		(0.01252)	(0.01744)	(0.01864)	(0.01163)	(0.00667)	(0.00384)
	1962-1966	0.02921**	0.04074**	-0.01305	-0.01910	-0.00093	0.00079
		(0.01440)	(0.01982)	(0.02103)	(0.01296)	(0.00732)	(0.00419)
	1967-1971	0.01282	0.00377	-0.05982**	-0.03812***	-0.00778	-0.00082
		(0.01659)	(0.02258)	(0.02374)	(0.01447)	(0.00804)	(0.00459)

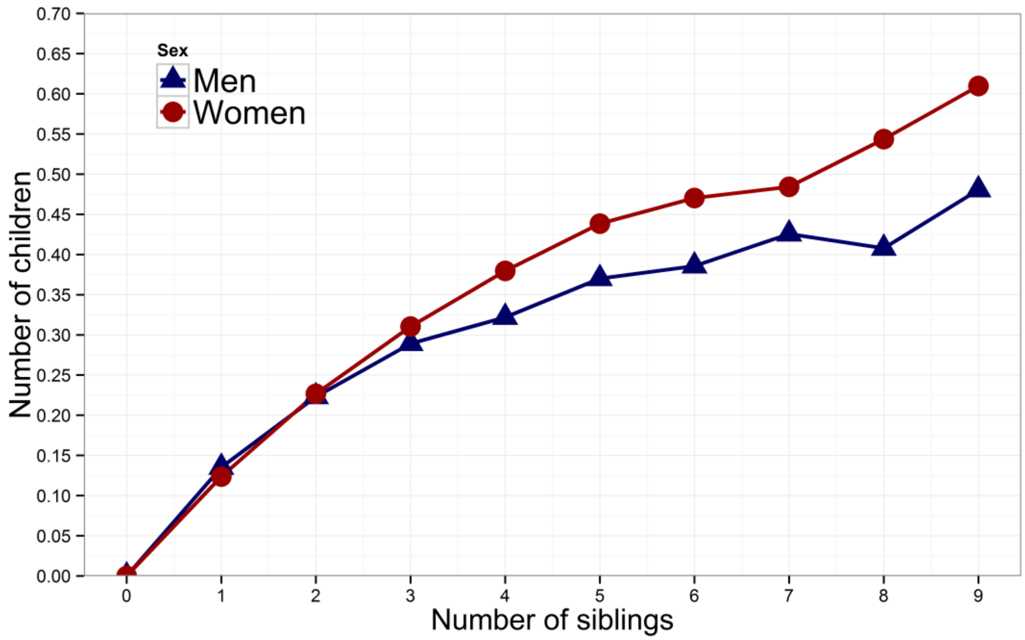
Variables		Women					
		Transition 0-1	Transition 1-2	Transition 2-3	Transition 3-4	Transition 4-5	Transition 5-6
	1972-1976	-0.08939***	-0.15509***	-0.17173***	-0.06268***	-0.01418	-0.00650
		(0.02254)	(0.02881)	(0.02872)	(0.01735)	(0.00938)	(0.00530)
	1977-1981	-0.37642***	-0.48539***	-0.20954***	-0.08510**	-0.02857	-0.02397*
		(0.06708)	(0.06790)	(0.05146)	(0.03888)	(0.01898)	(0.01289)
	1982-1988	-0.50035***	-0.34321**	-0.32057***	-0.00350	0.02130	-0.00723
		(0.17304)	(0.16862)	(0.11405)	(0.05447)	(0.03439)	(0.01712)
Mother's age at birth							
	13-16	0.05508**	0.03169	0.02910	-0.00302	0.02994*	0.01889*
		(0.02354)	(0.03480)	(0.03631)	(0.02478)	(0.01596)	(0.01145)
	17-18	0.03100***	0.01136	0.00612	0.00742	0.00483	0.00131
		(0.00666)	(0.00954)	(0.01023)	(0.00628)	(0.00353)	(0.00212)
	19-20	0.02260***	0.02076***	0.00885	0.00765*	0.00081	0.00010
		(0.00451)	(0.00617)	(0.00654)	(0.00395)	(0.00209)	(0.00120)
	21-22	0.01438***	0.01175***	0.00455	0.00382	0.00140	0.00115
		(0.00331)	(0.00453)	(0.00477)	(0.00285)	(0.00150)	(0.00084)
	23-24	0.00702***	0.00167	0.00507	0.00432*	0.00006	0.00025
		(0.00263)	(0.00356)	(0.00374)	(0.00223)	(0.00116)	(0.00064)
	25-26	0	0	0	0	0	0
	27-28	-0.00547**	-0.00616*	-0.00315	-0.00113	-0.00224**	0.00016
		(0.00266)	(0.00353)	(0.00368)	(0.00217)	(0.00112)	(0.00061)
	29-30	-0.01227***	-0.00999**	-0.00746*	-0.00141	-0.00095	-0.00046
		(0.00321)	(0.00428)	(0.00442)	(0.00259)	(0.00135)	(0.00075)
	31-32	-0.01489***	-0.00755	-0.00956*	-0.00433	-0.00499***	-0.00102
		(0.00410)	(0.00543)	(0.00562)	(0.00331)	(0.00173)	(0.00097)
	33-34	-0.02384***	-0.01505**	-0.02265***	-0.00652	-0.00342	-0.00134
		(0.00501)	(0.00664)	(0.00685)	(0.00410)	(0.00216)	(0.00122)
	35-36	-0.03064***	-0.02780***	-0.02028**	-0.00475	-0.00243	-0.00026
		(0.00595)	(0.00789)	(0.00816)	(0.00484)	(0.00254)	(0.00142)
	37-38	-0.04168***	-0.03742***	-0.03997***	-0.01558***	-0.00778**	-0.00253
		(0.00714)	(0.00938)	(0.00968)	(0.00576)	(0.00304)	(0.00173)
	39-40	-0.05027***	-0.03012***	-0.02834**	-0.01146*	-0.00526	-0.00221
		(0.00840)	(0.01098)	(0.01133)	(0.00668)	(0.00357)	(0.00202)
	41-42	-0.06698***	-0.05214***	-0.02214	-0.01144	-0.01208***	-0.00234
		(0.01033)	(0.01337)	(0.01367)	(0.00816)	(0.00435)	(0.00247)
	43-44	-0.06391***	-0.05295***	-0.04329**	-0.01623	-0.00837	0.00086
		(0.01381)	(0.01738)	(0.01742)	(0.01035)	(0.00578)	(0.00320)
	45-46	-0.09481***	-0.03638	-0.04517*	-0.01948	-0.01404	-0.00285
		(0.02381)	(0.02840)	(0.02714)	(0.01592)	(0.00912)	(0.00602)

		Women					
Variables		Transition 0-1	Transition 1-2	Transition 2-3	Transition 3-4	Transition 4-5	Transition 5-6
	47-48	-0.06465	-0.12370*	-0.08535	-0.01796	-0.02353	0.01932
		(0.05218)	(0.06750)	(0.06297)	(0.03903)	(0.02358)	(0.01585)
	49-53	-0.04526	-0.00225	-0.00162	0.07572	0.02649	-0.02843
		(0.04656)	(0.15682)	(0.22414)	(0.18552)	(0.12475)	(0.03069)
Constant		0.85050***	0.70835***	0.31355***	0.09768***	0.02816***	0.00839**
		(0.00967)	(0.01384)	(0.01500)	(0.00961)	(0.00570)	(0.00332)
Observations		666,543	666,543	666,543	666,543	666,543	666,543
R-squared		0.00409	0.00326	0.00481	0.00356	0.00182	0.00079
Number of biosiblingsetid		439,596	439,596	439,596	439,596	439,596	439,596

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

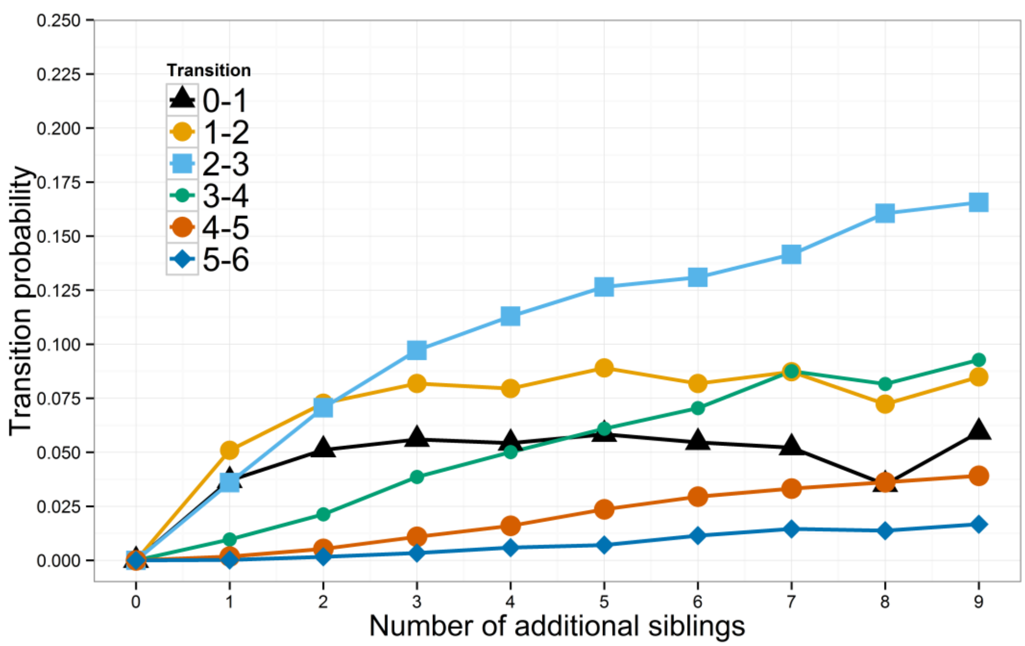
Note: Swedish register data, authors' own calculations

Figure A10: Number of children by number of siblings for men and women relative only children, Swedish born men and women with a mother born between 1915 and 1935.



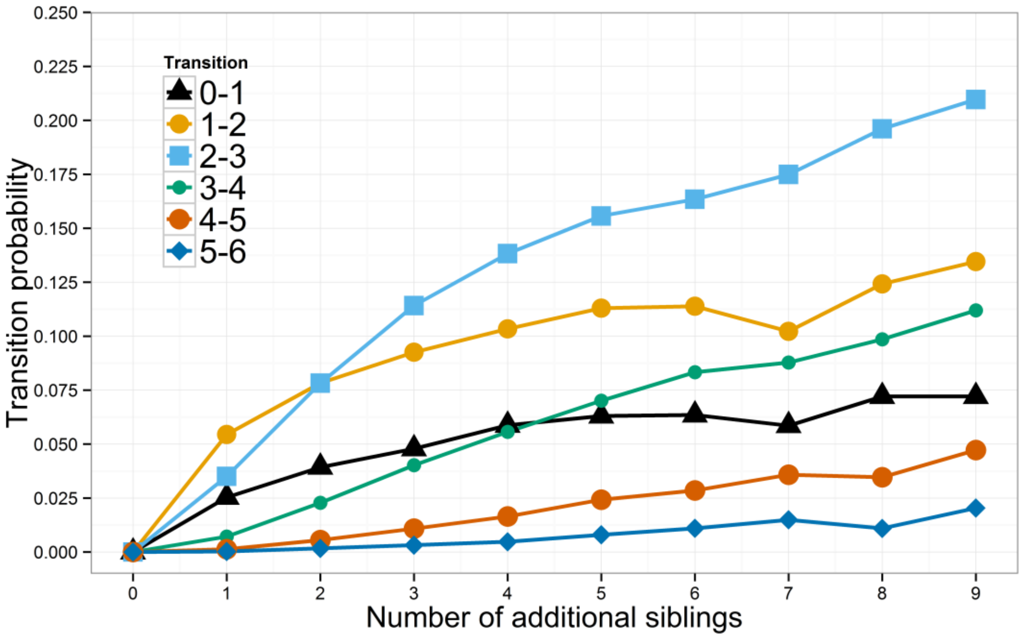
Controlled for year of birth and mother's age at birth
Note: Swedish register data, authors' own calculations

Figure A11: Transitions to higher parities by number of siblings, Swedish men born in 1932-1988



Controlled for year of birth and mother's age at birth
Note: Swedish register data, authors' own calculations

Figure A12: Transitions to higher parities by number of siblings, Swedish women born in 1932-1988



Controlled for year of birth and mother's age at birth
Note: Swedish register data, authors' own calculations

Table A6: OLS Regression on number of children by number of additional siblings, stratified by Birth Order, Swedish men born in 1932-1988

	Men					
Variables	Birth Order 1	Birth Order 2	Birth Order 3	Birth Order 4	Birth Order 5	Birth Order 6
Number of additional Siblings						
0	0	0	0	0	0	0
1	0.11104***	0.08097***	0.07385***	0.02716	0.04579	0.07232
	(0.00584)	(0.00622)	(0.00995)	(0.01707)	(0.02837)	(0.04516)
2	0.17466***	0.12279***	0.11950***	0.08027***	0.09769**	0.07997
	(0.00690)	(0.00900)	(0.01520)	(0.02533)	(0.04072)	(0.06283)
3	0.23590***	0.15680***	0.13888***	0.09428**	0.03996	0.12526
	(0.00932)	(0.01404)	(0.02290)	(0.03702)	(0.05857)	(0.09029)
4	0.27757***	0.23939***	0.13939***	0.13718**	0.16745**	0.23747*
	(0.01419)	(0.02161)	(0.03444)	(0.05401)	(0.08234)	(0.12784)
5	0.32605***	0.23117***	0.23778***	0.10940	0.23684**	0.13608
	(0.02169)	(0.03280)	(0.05038)	(0.07862)	(0.11978)	(0.19380)
6	0.28699***	0.33132***	0.13826*	0.02704	-0.36419**	0.17462
	(0.03243)	(0.04807)	(0.07339)	(0.11125)	(0.17684)	(0.22089)
7	0.36744***	0.14987**	0.48276***	0.25893	0.28951	0.81839**
	(0.04836)	(0.07297)	(0.10752)	(0.16953)	(0.21449)	(0.38413)
8	0.34179***	0.09310	-0.08013	-0.11929	-0.09060	0.65235
	(0.07359)	(0.10118)	(0.15394)	(0.20070)	(0.33648)	(0.48717)
9	0.51207***	0.24047	0.25619	-0.10572	0.90204*	1.05860
	(0.11220)	(0.15956)	(0.20944)	(0.28995)	(0.47628)	(1.36301)
10	0.36949**	0.51042***	0.48839*	0.59984	-0.00781	-0.07049
	(0.17032)	(0.19126)	(0.27402)	(0.48998)	(1.33714)	(0.79853)
11	0.37695	1.14119***	-0.22996	-1.23841*	1.12163	
	(0.23202)	(0.31611)	(0.63153)	(0.64763)	(1.34086)	
12	0.22588	0.72447	0.52263	-1.95840		
	(0.28933)	(0.49974)	(0.88707)	(1.29300)		
13	-0.72997	-1.90973	1.02970	4.04312***		
	(0.46394)	(1.22348)	(1.25448)	(0.91416)		
14	-0.83345		1.03554			
	(0.86778)		(0.88707)			
15	-0.89149	0.05563				
	(0.86780)	(1.22363)				
16	-1.93002					
	(1.22736)					

Variables		Men					
		Birth Order 1	Birth Order 2	Birth Order 3	Birth Order 4	Birth Order 5	Birth Order 6
Year of Birth							
	1932-1936	0	0	0	0	0	0
	1937-1941	-0.01954	-0.06438	0.02278			
		(0.02084)	(0.06480)	(0.27984)			
	1942-1946	-0.05590***	-0.07770	-0.02550	-0.04352	-0.04993	-0.04781
		(0.02027)	(0.06396)	(0.27881)	(0.08316)	(0.19105)	(0.63050)
	1947-1951	-0.06026***	-0.08882	-0.02526	-0.02294	-0.03557	0.07525
		(0.02024)	(0.06385)	(0.27872)	(0.08198)	(0.18889)	(0.62577)
	1952-1956	-0.08051***	-0.09119	-0.01547	-0.00176	-0.03356	0.07277
		(0.02042)	(0.06389)	(0.27873)	(0.08190)	(0.18893)	(0.62588)
	1957-1961	-0.14786***	-0.15616**	-0.08710	-0.06044	-0.08797	0.07619
		(0.02112)	(0.06407)	(0.27882)	(0.08232)	(0.18933)	(0.62607)
	1962-1966	-0.25177***	-0.26583***	-0.18217	-0.15686*	-0.21893	-0.05599
		(0.02328)	(0.06437)	(0.27890)	(0.08321)	(0.19052)	(0.62704)
	1967-1971	-0.52710***	-0.50947***	-0.42965	-0.41736***	-0.47519**	-0.22417
		(0.03267)	(0.06611)	(0.27926)	(0.08545)	(0.19314)	(0.62906)
	1972-1976	-0.83883***	-0.91845***	-0.90720***	-0.85090***	-0.91254***	-0.65174
		(0.06718)	(0.08161)	(0.28273)	(0.10142)	(0.20874)	(0.63909)
	1977-1981	-1.30414***	-1.43556***	-1.36931***	-1.31454***	-1.40804***	-1.19502
		(0.29562)	(0.28423)	(0.37364)	(0.25415)	(0.39862)	(0.77592)
	1982-1988		-2.00947		-1.51149*		
			(1.49983)		(0.79014)		
Mother's age at birth							
	13-16	0.22282***	-1.97915				
		(0.05859)	(1.22346)				
	17-18	0.13702***	0.16475**	-0.05960			
		(0.01448)	(0.06399)	(0.41962)			
	19-20	0.09904***	0.06357***	-0.03267	0.48881	-2.08971	
		(0.00922)	(0.01998)	(0.07190)	(0.31477)	(1.34949)	
	21-22	0.06002***	0.04225***	0.06465**	0.00822	0.54092	
		(0.00804)	(0.01241)	(0.02957)	(0.08362)	(0.35054)	
	23-24	0.02467***	0.03005***	0.03029	0.04851	-0.12145	-0.08835
		(0.00768)	(0.01025)	(0.02071)	(0.04690)	(0.11143)	(0.34451)
	25-26	0	0	0	0	0	0
	27-28	-0.03248***	-0.00287	-0.00532	0.02856	-0.00838	0.23909*
		(0.00813)	(0.00925)	(0.01677)	(0.03334)	(0.06672)	(0.13810)
	29-30	-0.07661***	-0.04373***	-0.01609	0.00408	-0.07541	0.13315

	Men					
Variables	Birth Order 1	Birth Order 2	Birth Order 3	Birth Order 4	Birth Order 5	Birth Order 6
	(0.00921)	(0.00952)	(0.01652)	(0.03254)	(0.06386)	(0.12862)
31-32	-0.12174***	-0.07660***	-0.04768***	-0.04443	-0.09074	0.12893
	(0.01105)	(0.01027)	(0.01687)	(0.03255)	(0.06415)	(0.12611)
33-34	-0.16321***	-0.10752***	-0.06154***	-0.04688	-0.05422	0.20862
	(0.01375)	(0.01152)	(0.01761)	(0.03330)	(0.06401)	(0.12711)
35-36	-0.17536***	-0.15801***	-0.07034***	-0.05639	-0.10482	0.08848
	(0.01723)	(0.01358)	(0.01883)	(0.03433)	(0.06519)	(0.12776)
37-38	-0.21366***	-0.16686***	-0.11897***	-0.11171***	-0.15039**	0.14309
	(0.02172)	(0.01703)	(0.02097)	(0.03609)	(0.06738)	(0.13056)
39-40	-0.22268***	-0.24165***	-0.14495***	-0.14624***	-0.16113**	0.08552
	(0.02952)	(0.02258)	(0.02479)	(0.03917)	(0.07034)	(0.13339)
41-42	-0.25879***	-0.25366***	-0.14913***	-0.14314***	-0.17267**	-0.10323
	(0.04272)	(0.03377)	(0.03356)	(0.04650)	(0.07751)	(0.14057)
43-44	-0.27440***	-0.30691***	-0.30146***	-0.13525**	-0.25841***	-0.03169
	(0.07151)	(0.05934)	(0.05444)	(0.06229)	(0.09381)	(0.15536)
45-46	-0.23821*	-0.25051**	-0.44273***	-0.19400*	-0.01306	0.14074
	(0.14289)	(0.12185)	(0.11195)	(0.11251)	(0.14914)	(0.20966)
47-48	-0.60240	-0.12465	-0.47382**	-0.45883*	0.01068	0.46232
	(0.40948)	(0.30659)	(0.23428)	(0.24882)	(0.31415)	(0.37512)
49-53	1.38997	0.06429	2.49851***	0.19493	-0.20269	
	(0.86848)	(0.86529)	(0.88709)	(0.57905)	(0.67131)	
Constant	1.79300***	1.94518***	1.93114***	1.97033***	2.04975***	1.73206***
	(0.02108)	(0.06416)	(0.27899)	(0.08246)	(0.18718)	(0.62032)
Observations	302,475	226,331	102,580	39,297	14,834	5,999
R-squared	0.02044	0.01931	0.02079	0.02139	0.02474	0.02216

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: Swedish register data, authors' own calculations

Table A7: OLS Regression on number of children by number of additional siblings, stratified by Birth Order, Swedish women born in 1932-1988

	Women					
Variables	Birth Order 1	Birth Order 2	Birth Order 3	Birth Order 4	Birth Order 5	Birth Order 6
Number of additional Siblings						
0	0	0	0	0	0	0
1	0.12054***	0.09529***	0.08757***	0.09476***	0.11185***	0.05926
	(0.00542)	(0.00580)	(0.00927)	(0.01572)	(0.02624)	(0.04179)
2	0.21763***	0.17981***	0.15933***	0.16653***	0.22657***	0.04528
	(0.00642)	(0.00838)	(0.01420)	(0.02310)	(0.03714)	(0.05748)
3	0.29617***	0.24664***	0.22592***	0.19612***	0.12904**	0.26374***
	(0.00867)	(0.01299)	(0.02131)	(0.03363)	(0.05240)	(0.07931)
4	0.35810***	0.28717***	0.19530***	0.26741***	0.11251	0.16138
	(0.01301)	(0.02000)	(0.03155)	(0.04901)	(0.07610)	(0.11517)
5	0.40121***	0.36001***	0.26925***	0.21856***	0.33227***	0.34468**
	(0.01986)	(0.03017)	(0.04744)	(0.07009)	(0.10930)	(0.16645)
6	0.41376***	0.33357***	0.35092***	0.24197**	0.44176***	0.42537**
	(0.03027)	(0.04566)	(0.06955)	(0.10836)	(0.16505)	(0.20779)
7	0.52222***	0.42660***	0.44699***	0.09181	0.33230*	-0.30565
	(0.04542)	(0.06486)	(0.10341)	(0.15927)	(0.19683)	(0.26911)
8	0.57188***	0.52323***	0.30183*	-0.07570	0.39970	0.89393
	(0.06455)	(0.10607)	(0.16573)	(0.19898)	(0.29534)	(0.56941)
9	0.62460***	0.54847***	0.45993***	0.19583	1.17910**	0.54552
	(0.09340)	(0.15122)	(0.17728)	(0.31372)	(0.54603)	(0.62574)
10	0.90336***	0.34134*	0.62405**	-0.50006	0.55348	-0.21749
	(0.14337)	(0.18024)	(0.29606)	(0.52461)	(0.61291)	(1.24546)
11	0.69865***	0.03023	0.28336	-0.06090	-0.44287	0.25316
	(0.16159)	(0.24822)	(0.38223)	(1.17054)	(0.70537)	(0.88076)
12	0.24044	0.15820	1.95036***	1.08808	0.37006	
	(0.28892)	(0.41954)	(0.66133)	(0.69078)	(0.85669)	
13	0.44864	-0.21292	1.23739*			
	(0.45684)	(0.55545)	(0.66168)			
14	0.07889	0.25579				
	(0.64601)	(0.55491)				
15	2.60496***					
	(0.79108)					
16	0.13929					
	(1.11874)					

Variables		Women					
		Birth Order 1	Birth Order 2	Birth Order 3	Birth Order 4	Birth Order 5	Birth Order 6
Year of Birth							
	1932-1936	0	0	0	0	0	0
	1937-1941	-0.06010***	0.04217	-0.19291			
		(0.01872)	(0.05629)	(0.22053)			
	1942-1946	-0.08528***	-0.01514	-0.20947	-0.07379	0.26519	-1.26409**
		(0.01822)	(0.05545)	(0.21930)	(0.07831)	(0.19400)	(0.52966)
	1947-1951	-0.06570***	-0.01497	-0.19449	-0.07742	0.23795	-1.25255**
		(0.01817)	(0.05536)	(0.21922)	(0.07724)	(0.19184)	(0.52750)
	1952-1956	-0.03733**	0.02125	-0.17430	-0.05339	0.24846	-1.25564**
		(0.01835)	(0.05539)	(0.21922)	(0.07724)	(0.19175)	(0.52722)
	1957-1961	-0.03356*	0.02346	-0.14726	0.01622	0.35829*	-1.17480**
		(0.01903)	(0.05557)	(0.21932)	(0.07758)	(0.19205)	(0.52737)
	1962-1966	-0.13368***	-0.05029	-0.21140	-0.04112	0.33666*	-1.19124**
		(0.02109)	(0.05588)	(0.21941)	(0.07840)	(0.19300)	(0.52835)
	1967-1971	-0.29178***	-0.22381***	-0.37366*	-0.17787**	0.16175	-1.24174**
		(0.02989)	(0.05765)	(0.21983)	(0.08046)	(0.19512)	(0.53021)
	1972-1976	-0.71587***	-0.62976***	-0.83695***	-0.56247***	-0.26369	-1.74190***
		(0.06430)	(0.07273)	(0.22407)	(0.09452)	(0.20850)	(0.53989)
	1977-1981	-1.22904***	-1.33660***	-1.46089***	-1.57110***	-1.30471***	-2.35581***
		(0.23167)	(0.22876)	(0.31281)	(0.26474)	(0.36001)	(0.67441)
	1982-1988				-1.96300**	-2.36741*	
					(0.86812)	(1.36887)	
Mother's age at birth							
	13-16	0.16360***	0.08192				
		(0.05407)	(0.45348)				
	17-18	0.12852***	0.09176	0.00678	-1.06090		
		(0.01337)	(0.05915)	(0.51244)	(1.17054)		
	19-20	0.09765***	0.07124***	0.13388*	-0.47639		
		(0.00855)	(0.01819)	(0.07035)	(0.42361)		
	21-22	0.06295***	0.04027***	0.05720**	0.07439	-0.00908	
		(0.00749)	(0.01148)	(0.02714)	(0.08020)	(0.26634)	
	23-24	0.03375***	0.03023***	0.02200	0.01857	-0.01545	-0.43627
		(0.00717)	(0.00951)	(0.01930)	(0.04213)	(0.10305)	(0.27250)
	25-26	0	0	0	0	0	0
	27-28	-0.02634***	-0.01315	-0.05027***	-0.05620*	-0.01003	0.02894
		(0.00759)	(0.00860)	(0.01567)	(0.03021)	(0.06225)	(0.13049)
	29-30	-0.06363***	-0.03539***	-0.03324**	-0.04307	-0.03144	-0.10125
		(0.00856)	(0.00882)	(0.01541)	(0.02943)	(0.05933)	(0.12370)

Variables		Women					
		Birth Order 1	Birth Order 2	Birth Order 3	Birth Order 4	Birth Order 5	Birth Order 6
	31-32	-0.07960***	-0.07473***	-0.05144***	-0.05980**	-0.07779	0.02143
		(0.01029)	(0.00957)	(0.01573)	(0.02960)	(0.05944)	(0.12195)
	33-34	-0.09959***	-0.08644***	-0.08862***	-0.11193***	-0.10879*	-0.13980
		(0.01285)	(0.01071)	(0.01646)	(0.03018)	(0.05990)	(0.12251)
	35-36	-0.12823***	-0.12019***	-0.10230***	-0.08933***	-0.02967	-0.14732
		(0.01604)	(0.01270)	(0.01756)	(0.03114)	(0.06103)	(0.12340)
	37-38	-0.17065***	-0.15089***	-0.13246***	-0.14361***	-0.05720	-0.20938*
		(0.02059)	(0.01575)	(0.01970)	(0.03281)	(0.06291)	(0.12490)
	39-40	-0.13603***	-0.15835***	-0.14439***	-0.14580***	-0.12269*	-0.12874
		(0.02753)	(0.02098)	(0.02343)	(0.03580)	(0.06600)	(0.12833)
	41-42	-0.11907***	-0.21463***	-0.16209***	-0.19230***	-0.10763	-0.13630
		(0.03949)	(0.03096)	(0.03056)	(0.04272)	(0.07186)	(0.13354)
	43-44	-0.23447***	-0.15002***	-0.24891***	-0.16920***	-0.21174**	-0.12517
		(0.06576)	(0.05298)	(0.04977)	(0.05920)	(0.08731)	(0.15006)
	45-46	-0.15811	-0.14114	-0.16800*	-0.11161	-0.18692	-0.36385*
		(0.14070)	(0.11686)	(0.09397)	(0.10046)	(0.14068)	(0.19875)
	47-48	-0.63943	-0.51161	-0.40210*	-0.17532	0.52236	-0.33699
		(0.42315)	(0.33540)	(0.21025)	(0.25252)	(0.34435)	(0.32711)
	49-53					0.53350	0.80065
						(0.61283)	(1.24949)
Constant		1.86346***	1.92243***	2.20813***	2.13832***	1.83391***	3.44110***
		(0.01897)	(0.05567)	(0.21953)	(0.07747)	(0.18980)	(0.52003)
Observations		290,606	215,604	97,707	37,721	14,335	5,911
R-squared		0.01938	0.01607	0.01499	0.01480	0.01689	0.01839

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Note: Swedish register data, authors' own calculations