SIBLING CONSTELLATION OF THE FAMILY OF ORIGIN AND DIVORCE RISK IN ADULTHOOD

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ABSTRACT. This study examines whether the sibling constellation of the family of origin of individuals is related to the risk of divorce later in life. The duplication theorem has argued that individuals develop role preferences based upon their childhood experiences in the sibling group of origin, and particularly in response to their rank in the sibling group, and the gender composition of the sibling group. In turn, the relative compatibility of pairings of these role preferences between a husband and wife should influence the stability of their relationship. We use Swedish administrative register data and use event-history analysis examine divorce in first marriages over the period 1990 to 2012 amongst individuals born 1950 to 1994. The unit of analysis is the couple, and we adjust for a range of factors that previous research has shown to be associated with divorce risk. We find that pairings of an only born husband and an only born wife have the highest risk of divorce. Marriages where one of the partners was an only child have the second highest risk of divorce. Different combinations of pairings where both husband and wife come from multi-child sibling groups do not vary in terms of the risk of divorce. These results provide partial, but not full, support for the predictions of the duplication theorem.

INTRODUCTION

The characteristics of the family of origin have been found to extend their influence far into adulthood. Studies have shown that family size has an effect on educational attainment (Black et al., 2005), intelligence (Blake, 1989), as well as mortality (Smith et al., 2009). Other research has found that, independent of family size, birth order has a causal effect on educational attainment (Black et al., 2005), intelligence (Bjerkedal et al., 2007), and mortality (Barclay and Kolk, 2013). A great deal of research has also speculated about the extent to which the family of origin, and in particular birth order, can affect personality (Toman, 1961; Sulloway, 1996). However, only a small handful of studies have examined whether specific pairings of these family of origin characteristics in marriage is associated with the risk of marital dissolution (Toman, 1962; Weller et al., 1974; Vos and Hayden, 1985). This study uses Swedish population register data to examine how birth order pairings, family size pairings, and gender composition pairings influence divorce risk in first marriages between 1990 and 2012.

One theory that has been proposed to explain why birth order pairings in a romantic relationship should matter is the duplication theorem (Toman, 1961). The duplication theorem describes how early life experiences, in terms of an individual's own birth order and the gender composition of the sibling group of origin, help to determine role preferences (Toman, 1971). In childhood the experience of birth order accustoms first born individuals to feelings of seniority, and later borns to expect leadership and protection from their older peer (Toman, 1971). Gender composition, in turn, helps to shape the degree to which an individual is accustomed to spending time with an individual of the opposite sex, and the degree to which they are accustomed to leading, or being led by, an individual of the opposite sex (Toman, 1971). The dual importance of relative rank in the sibling group of origin, and the opportunity to interact with members of the opposite sex, determines the likelihood of relationship stability in Toman's duplication theorem.

If we take a heterosexual marriage between two individuals, both from two-child sibling groups, there are eight different sibling positions. There can be the older brother of a brother – b(b); the older brother of a sister – b(s); the younger brother of a brother – (b)b; the younger brother of a sister – (s)b; the older sister of a sister – s(s); the older sister of a brother – s(b); the younger sister of a sister – (s)s; and finally, the younger sister of a brother – (b)s. The duplication theorem states that complementarity between the experiences in the sibling group of origin and the future romantic relationship will imply the greatest chance of success in that relationship (Toman, 1971). So, for example, a man who was the older brother of a younger sister [b(s)], would be most compatible with the younger sister of an older brother [(b)s]. The duplication theorem does not argue that a man from an all-male sibling group cannot form or maintain a relationship with a woman, but does argue that it will be less stable than these complementary configurations.

Toman (1993) developed very specific predictions about how marital stability would vary according to what experience from the sibling group of origin each member of the couple brought to the marriage. These can be seen in Table 1, which is reproduced directly from Toman (1993, pages 88-89). These explicit ranked predictions make it easy to test whether there is empirical support for the duplication theorem. Toman argued that individuals from one child sibling groups, 'only borns', should have the highest risk of relationship instability, primarily due to a

TABLE 1. Predictions of Duplication Theorem, reproduced from Toman (1993, pages 88-89)

	Degrees of Complementarity	Basic Types	Other Examples
1a.	Neither partner has a rank or sex conflict with the other	b(s)/(b)s (s)b/s(b)	b(ss)/(b)s (ss)b/s(bbb)
1b.	Each partner has a least one sibling relationship that is neither in a rank nor in a sex conflict with at least one sibling relationship of the partner		b(sb)/(b)s (s)b(s)/s(bbs) (bs)b(s)/(b)s(bs)
2a.	Neither partner has a rank conflict (or only a partial one) and only one of the partnes has a sex conflict	b(s)/(s)s (s)b/s(s) b(b)/(b)s (b)b/s(b)	b(ss)/(s)s (b)b/s(bbb) b(s)/(s)s(s) b(b)/(b)s(b)
2b.	Both partners have either a complete (or partial) rank conflict, but no sex conflict, or both have a sex conflict, but no rank conflict (or only a partial one)	b(s)/s(b) (s)b/(b)s b(b)/(s)s (b)b/s(s)	(ss)b/(bbb)s (b)b(s)/s(bb) (b)b(b)/s(ss) (b)b(b)/(s)(ss)
2c.	Both partners have a complete rank conflict and one of the partners also has a sex conflict	b(s)/s(s) (s)b/(s)s b(b)/s(b) (b)b/(b)s	(ss)b/(ss)s b(bb)/s(bbb)
2d.	Both partners have a complete rank and sex conflict.	b(b)/s(s) (b)b/(s)s	b(bb)/s(s) (bb)b/(sss)s
3a.	One partner is an only child, the other has at least one sibling of the opposite sex	b(s)/s b/s(b) (s)b/s b/(b)s	(s)b(sb)/s b/s(bbb) (s)b(s)/s b/(b)s(s)
3b.	One partner is an only child, the other has only (one or more) siblings of the same sex as himself	b(b)/s b/s(s) (b)b/s b/(s)s	b(bb)/s b/(s)s(s)
3c.	Both partners are only children	b/s	

general lack of peer interaction in the home environment (Toman, 1993). There is some support for this theory amongst young children, with research finding that teachers rate only borns as having poorer social skills than their peers (Downey and Condron, 2004). Nevertheless, a meta-analysis of studies examining the relationship between only-born status and personality in adolescence indicates that there are no genuine personality differences between only borns and their peers from larger sibling groups (Polit and Falbo, 1987).

Despite this evidence, more recent research using the one-child policy in China as a natural experiment suggests that growing up as an only-born has a causal effect on trustworthiness, with only-borns being less trusting, and less trustworthy (Cameron et al., 2013). Furthermore,

the same study found only-borns to be less optimistic, less conscientious, and to have higher scores on neuroticism (Cameron et al., 2013). While the Swedish context is clearly substantially different from the Chinese context, this rare opportunity to study an exogenous influence on a decision made by parents that is usually endogenous, suggests that growing up as an only-born can have a substantial impact upon behaviour, and perhaps also personality. It can be imagined that trust and trustworthiness may be important factors for marital stability. If these results do indeed demonstrate the causal impact of growing up as an only-born, and if they are generalisable, then this would predict that only-borns would have higher divorce risks.

Aside from role preferences, previous research has also suggested that birth order may influence personality. Sulloway (1996) argued that competition for parental investment within the family caused siblings to adapt their behaviour so as to occupy particular niches within the family. First borns and only borns were the most likely to be aligned with their parents as they experienced a period of time where they were the only child within the home, and where they were the sole focus of parental care. This led them, on average, to identify with power and authority, and thereby to become more conservative and socially dominant than their later born siblings. Later born children, finding that they were disadvantaged from the very beginning in terms of size and strength, were naturally more inclined to develop a personality that was questioning of authority. Furthermore, in the scramble for parental investment, later borns were forced to become more creative, original and follow risks so as to achieve that goal.

Only a handful of studies have evaluated the relationship between birth order pairings in marriage and marital satisfaction. A study by Kemper (1966) also found that men with a younger sister married to women with an older brother reported higher marital satisfaction, consistent with Toman's duplication theorem. Weller et al. (1974) examined how birth order pairings in marriage was associated with happiness in the marriage amongst several hundred Israeli women. They found that marriages where either one or both of the spouses were only borns reported the highest rates of marital dissatisfaction. Weller et al. (1974) also found that the respondents who reported the highest level of marital satisfaction were rank and gender composition complementary, consistent with the predictions of Toman's duplication theorem. Finally, Toman (1971) reported that there was a higher proportion of low complementary pairings than high complementary pairings amongst his sample of divorced couples. Other studies, however, have found no relationship between birth order pairings and marital adjustment (Levinger and Sonnheim, 1965; Birtchnell and Mayhew, 1977; Vos and Hayden, 1985).

DATA AND METHODS

The data used for this study is Swedish administrative register data, and we focus first marriages among individuals born between 1950 and 1994. The unit of analysis is the couple. The period of time over which we observe marriage and divorce is 1990 to 2012. Although the marriage and divorce register is available from 1968-2012, we chose to focus on the period 1990 to 2012 because this period is where the data available for the control variables is at its highest quality. This means that we study all first marriages that occur from 1990 to 2012. The rationale behind choosing cohorts born 1950 to 1994 is that we wanted to be sure that the marriage that we study is the *first* marriage for both individuals in the relationship. Since the marriage register begins in 1968, those born in 1950 will have been 18 at that point in time, and so we can be

sure that the registers contain full and accurate information on their civil status over the entire life course.
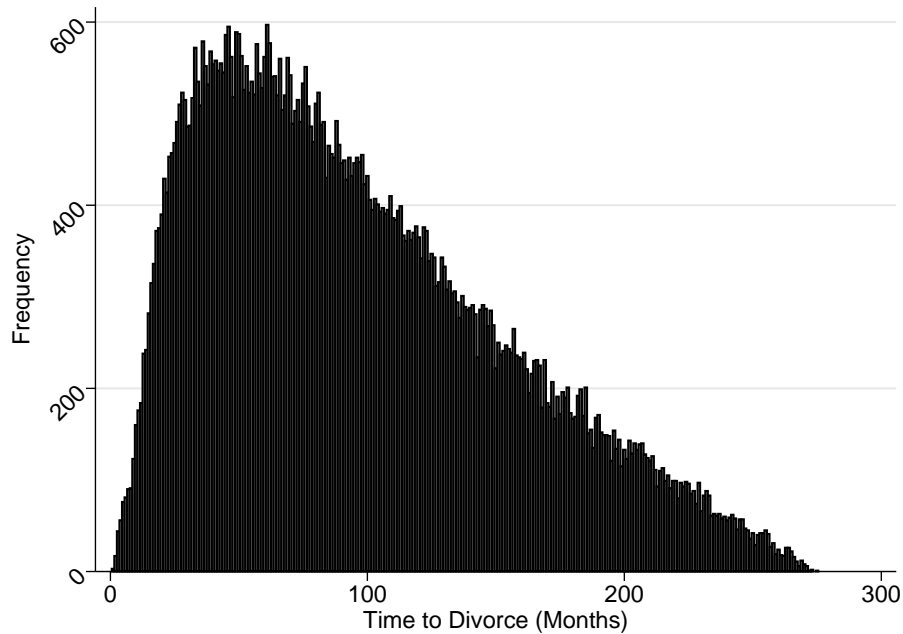

FIGURE 1. Time to Divorce, in Months.

We study time to divorce using piece-wise exponential event-history analysis. In our analyses we adjust for a number of covariates that previous reviews of the literature (Lyngstad and Jalovaara, 2010; Härkönen, 2014) have shown to be important factors in terms of divorce risk. These include: year of marriage; husband's age at the time of marriage; spousal age difference; whether the husband had children with a woman other than his future spouse before the marriage; whether the wife had children with a man other than her future spouse before the marriage; whether the couple had any children before the marriage; the number of children the couple have (time-varying); the husband's educational level (time-varying); and, the difference in the educational level between the husband and wife (time-varying).

RESULTS

Table 2 shows the results for divorce risk in first marriages in the period 1990 to 2012 amongst individuals born 1950 to 1994. The categorization used for birth order here is first, middle, or last, and we distinguish only borns from individuals from sibling groups with more than one birth. This analysis adjust for the control variables listed in the data section. Relative risks are shown in **bold** if the difference is statistically significant at the 95% level. Table 2 shows that relative to a partnership with two only-born individuals (the reference category is *italicized*, all other couple pairings have a lower risk of divorce. It is also clear that in couples where one of the partners was an only-born, the relative risk is higher than that found in couples where neither child was an only-born.

TABLE 2. Birth Order Pairings in Marriage and Relative Risk of Divorce in Sweden: First Marriages 1990-2012, Cohorts Born 1950-1994. First Borns, Middle Borns, and Last Borns come from Multi-child Sibling Groups. N=470,527, Divorces=75,807

		Wife			
		Only Born	First Born	Middle Born	Last Born
Husband	Only Born	*1.00*	**0.81**	**0.79**	**0.77**
	First Born	**0.88**	**0.45**	**0.45**	**0.43**
	Middle Born	**0.86**	**0.42**	**0.42**	**0.41**
	Last Born	**0.83**	**0.42**	**0.41**	**0.40**

Table 3 shows the results where we test the duplication theorem (Toman, 1993) in marriages where both couples came from a one- or two-child sibling group. Again, pairings where both individuals were only-borns are the reference category. The clearest pattern evident is similar to that seen in table 2, with all marriage pairings having a lower relative risk of divorce in comparison to a partnership between two only-born individuals. Table 3 also shows that couples where at least one of the partners was an only-born have a higher risk than those with another sibling. This is consistent with part of the predictions of the duplication theorem shown in table 1, which stated that couples with two only-born individuals should have the highest relationship instability, followed by couples where at least one of the pair was an only-born. However, there is no support in the results in table 3 for Toman's distinction between high and medium complementary types of marital pairings. That is, to give an example, the older brother of a younger sister married to the younger sister of an older brother [b(s)/(b)s], have a divorce risk similar to that of other couples made up of individuals who are both from sibling groups with more than one child.

Further indication that there is no significant difference between high and medium complementary pairings comes from the results shown in table 4. These results are based upon models where both individuals in the partnership came from a two-child sibling group. In this case the reference category is the older brother of a younger sister married to the younger sister of an older brother [b(s)/(b)s]. As can be seen, there are few statistically significant differences, and the pattern of relative risks do not consistently point in the direction predicted by that of the duplication theorem. For example, there is an elevated risk of divorce when a man with a younger sister [b(s)] is married to a sister with a younger brother [s(b)] or sister [s(s)], which would be consistent with a lack of rank complementarity, but the difference is not statistically significant for the same pairings if the man has a younger brother rather than a younger sister [b(b)]. More generally though, it can be seen that pairings between two first borns have an elevated relative risk of divorce, and pairings between two second-borns have a lower relative risk of divorce.

Table 5 shows the results for couples where both partners came from a sibling group with between 1 and 3 children. Broadly speaking, the clearest result is one that was already evident in tables 2 and 3, which is that marriages where both partners were only-borns have the highest risk of divorce. The group with the second highest risk of divorce are those couples where at least one of the partners was an only-born. It also appears that the risk of divorce is higher when both partners were first born in comparison to when either partner was last born, or both

TABLE 3. Birth Order and Gender Composition Pairings in Marriage and Relative Risk of Divorce in Sweden: First Marriages 1990-2012, Cohorts Born 1950-1994. Set Sizes 1 and 2. N=171,243, Divorces=28,123

		Wife				
		s	s(b)	s(s)	(b)s	(s)s
Husband	b	*1.00*	**0.83**	**0.81**	**0.80**	**0.79**
	b(b)	**0.85**	**0.69**	**0.69**	**0.65**	**0.65**
	b(s)	**0.92**	**0.76**	**0.72**	**0.65**	**0.67**
	(b)b	**0.83**	**0.68**	**0.64**	**0.62**	**0.60**
	(s)b	**0.80**	**0.68**	**0.62**	**0.63**	**0.65**

TABLE 4. Birth Order and Gender Composition Pairings in Marriage and Relative Risk of Divorce in Sweden: First Marriages 1990-2012, Cohorts Born 1950-1994. Set Sizes 2. N=100,601, Divorces=14,597

		Wife			
		s(b)	s(s)	(b)s	(s)s
Husband	b(b)	1.06	1.06	0.99	0.99
	b(s)	**1.16**	**1.09**	*1.00*	1.03
	(b)b	1.05	0.98	0.94	0.92
	(s)b	1.04	0.94	0.96	0.99

partners werer middle born. Table 5 presents many different coefficients, and so it may be useful to present the results from table 5 alongside Toman's predictions. These are shown in table 6 for the basic types of pairings that Toman makes predictions for. These results show that the most important result is that two only-borns have the highest risk of divorce, followed by partnerships where at least one of the partners was an only-born. There are no real differences, however, between couples where neither individual was an only-born.

TABLE 5. Birth Order and Gender Composition Pairings in Marriage and Relative Risk of Divorce in Sweden: First Marriages 1990-2012, Cohorts Born 1950-1994. Set Sizes 1 to 3. N=359,100, Divorces=56,763

Husband	Wife														
	s	s(b)	s(s)	s(ss)	s(sb)	s(b[b/s])	(b)s(b)	(s)s(s)	(s)s(b)	(b)s(s)	(b)s	(s)s	(ss)s	(bs)s	([b/s]b)s
b	1.00	0.82	0.81	0.72	0.80	0.80	0.76	0.74	0.78	0.79	0.80	0.78	0.69	0.73	0.77
b(b)	0.85	0.69	0.69	0.61	0.67	0.69	0.71	0.67	0.67	0.69	0.65	0.65	0.57	0.67	0.66
b(s)	0.92	0.76	0.72	0.65	0.66	0.68	0.68	0.57	0.67	0.64	0.67	0.67	0.57	0.73	0.64
b(bb)	0.81	0.73	0.60	0.71	0.63	0.53	0.63	0.72	0.61	0.54	0.66	0.70	0.47	0.59	0.60
b(bs)	0.81	0.67	0.74	0.48	0.39	0.67	0.73	0.68	0.60	0.44	0.55	0.69	0.70	0.44	0.57
b(s[b/s])	0.79	0.69	0.61	0.66	0.66	0.65	0.68	0.60	0.73	0.73	0.67	0.65	0.70	0.83	0.68
(b)b(b)	0.81	0.69	0.61	0.66	0.67	0.65	0.57	0.63	0.62	0.66	0.65	0.68	0.63	0.67	0.64
(b)b(s)	0.78	0.76	0.67	0.43	0.67	0.65	0.57	0.63	0.62	0.61	0.55	0.52	0.44	0.44	0.57
(s)b(s)	0.80	0.64	0.65	0.62	0.71	0.55	0.67	0.59	0.90	0.79	0.55	0.71	0.64	0.75	0.56
(s)b(b)	0.76	0.64	0.63	0.68	0.61	0.52	0.62	0.55	0.42	0.61	0.61	0.68	0.63	0.64	0.55
(b)b	0.80	0.66	0.65	0.62	0.71	0.55	0.67	0.59	0.73	0.66	0.55	0.71	0.64	0.67	0.56
(s)b	0.86	0.66	0.75	0.51	0.69	0.66	0.57	0.55	0.63	0.59	0.66	0.62	0.43	0.56	0.60
(bb)b	0.83	0.69	0.64	0.59	0.61	0.62	0.58	0.61	0.59	0.62	0.61	0.60	0.55	0.58	0.60
(sb)b	0.69	0.64	0.62	0.60	0.67	0.64	0.58	0.64	0.59	0.62	0.63	0.65	0.55	0.58	0.55
([b/s]s)b	0.82	0.66	0.64	0.40	0.66	0.66	0.48	0.63	0.46	0.76	0.61	0.73	0.46	0.54	0.50

Source: Swedish administrative register data, compiled by the author.

TABLE 6. Duplication Theorem: Basic Types and Results

	Degrees of Complementarity	Basic Types	RR	SE	95% CI
1a.	Neither partner has a rank or sex conflict with the other	b(s)/(b)s	0.76	0.03	0.70-0.81
		(s)b/s(b)	0.68	0.03	0.63-0.73
1b.	Each partner has a least one sibling relationship that is neither in a rank nor in a sex conflict with at least one sibling relationship of the partner				
2a.	Neither partner has a rank conflict (or only a partial one) and only one of the partnes has a sex conflict	b(s)/(s)s	0.67	0.03	0.62-0.73
		(s)b/s(s)	0.62	0.03	0.57-0.67
		b(b)/(b)s	0.65	0.03	0.60-0.70
		(b)b/s(b)	0.69	0.03	0.64-0.74
2b.	Bother partners have either a complete (or partial) rank conflict, but no sex conflict, or both have a sex conflict, but no rank conflict (or only a partial one)	b(s)/s(b)	0.76	0.03	0.70-0.81
		(s)b/(b)s	0.63	0.02	0.58-0.68
		b(b)/(s)s	0.65	0.03	0.60-0.70
		(b)b/s(s)	0.64	0.03	0.59-0.69
2c.	Both partners have a complete rank conflict and one of the partners also has a sex conflict	b(s)/s(s)	0.72	0.03	0.66-0.77
		(s)b/(s)s	0.65	0.03	0.60-0.70
		b(b)/s(b)	0.69	0.03	0.64-0.74
		(b)b/(b)s	0.61	0.02	0.57-0.66
2d.	Both partners have a complete rank and sex conflict.	b(b)/s(s)	0.69	0.03	0.64-0.75
		(b)b/(s)s	0.60	0.02	0.55-0.65
3a.	One partner is an only child, the other has at least one sibling of the opposite sex	b(s)/s	0.92	0.03	0.87-0.98
		b/s(b)	0.82	0.03	0.77-0.88
		(s)b/s	0.80	0.03	0.75-0.86
		b/(b)s	0.80	0.03	0.75-0.86
3b.	One partner is an only child, the other has only (one or more) siblings of the same sex as himself	b(b)/s	0.85	0.03	0.80-0.91
		b/s(s)	0.81	0.03	0.75-0.86
		(b)b/s	0.83	0.03	0.78-0.89
		b/(s)s	0.78	0.03	0.73-0.84
3c.	Both partners are only children	b/s	1.00		

Discussion

This study has found that the sibling constellation in the family of origin has an association with divorce risk in adulthood. The clearest result is that a partnership between two only-born individuals has the highest risk of divorce. Furthermore, marriages where at least one of the partners was an only-born have a lower risk that partnerships with two only-borns, but a higher risk than partnerships without any only-born individuals. These results provide partial support for the duplication theorem (Toman, 1993). Toman (1993) had predicted that partnerships with two only-born individuals would have the highest risk of marital instability, and partnerships with at least one only-born individual the next highest risk. However, his predictions about the relative importance of rank within, and the gender composition of, the sibling group of origin are not borne out by our results. Although we did not find complete support for the duplication theorem, Toman's prediction are highly detailed, and it should be noted that a theory is implicitly easier to disprove when it makes specific predictions (Western, 2001).

The vast majority of birth order research has adopted the approach used in this study, comparing individuals of different birth order across different families. However, this approach has proved controversial, with a number of researchers pointing out that almost all theories that predict a relationship between birth order and later life outcomes describe within-family processes (Rodgers, 2001). Furthermore, because families differ in many ways that are difficult to measure, studies of birth order that compare individuals across different families suffer from an unknown degree of residual confounding that are likely to bias the results. We have tried to address this issue by adjusting for a number of factors that previous research has shown are correlated with divorce risk. Nevertheless, there are important potential sources of residual confounding that remain. For example, studies show that women are more likely to divorce if they have only one child (Andersson, 1997). This would mean that only-borns would be more likely to experience the divorce of their parents. Research on the inter-generational transmission of divorce suggests that this would increase the probability that they would themselves would divorce (Kiernan and Cherlin, 1999). We will attempt to address this issue by adjusting for whether parents had any further children outside of the first relationship.

In addition to the intergenerational transmission of divorce, it should be noted that there is a strong two-child norm in Sweden (Andersson, 1999). It is possible that the parents who choose to have only one child are selected in some way that might be associated with an individual growing up as an only-born having a less happy childhood. This might results in an only-born individual being more likely to divorce in adulthood. In additional analyses it will also be possible to examine only partnerships where neither partner had parents who had children with more than one partner. This would be suggestive of union stability, and it would be possible to examine whether the pattern of results observed in our analyses so far would be consistent for individuals who grew up in more stable home environments. While this is not a perfect measure of union stability, cohabitation is Sweden is very common, and just measuring whether the parents of our index couples were divorced would not be able to fully capture parental union stability; indeed, many of them would never have been married in the first place (Trost, 1975).

As between-family comparisons require careful adjustment to account for confounding, some researchers have turned to sibling fixed effects, or within-family comparisons, to deal with this issue. We have also estimated within-family comparisons, not presented here, but these can only be done for sibling groups with at least two same-sex siblings. This means that we

cannot analyse the clearest pattern in our data, regarding the association of divorce with the presence of an only-born in the relationship, using a within-family comparison. The sample size is reduced dramatically in these within-family comparisons. The reason for this is that a within-family comparison requires variance in the outcome within the sibling group. This means that there must be at least two brothers or sisters in a sibling group, at least two of them should have married, and at least one of them must have divorced. Furthermore, if we take a sibling group with two brothers, they both must be married to an individual of the opposite sex with the same birth order (e.g. they must both be married to a first-born woman). The use of a within-family comparison clearly creates very specific selection criteria. Nevertheless, the results for the within-family comparisons of multi-child sibling groups indicate that there is no clear association between birth order and divorce risk, consistent with our between-family results for marriages between individuals from sibling groups with at least two children

An additional factor to consider is that we are studying divorce in Sweden. While there has been an increasing revival in the popularity of marriage in Sweden in recent years (Ohlsson-Wijk, 2011), it remains true that cohabitation rates in Sweden are very high in a comparative sense (Kiernan, 2002). Indeed, Sweden is the only country where the majority of first births occur in a cohabiting rather than a marital union (Thomson and Eriksson, 2013). While studying partnership dissolution in cohabiting unions would make an important contribution to the current study, at present it is only possible to know if a cohabiting but non-married couple are living together if they have a child together (Thomson and Eriksson, 2013). This means that we would have a very particular sample of cohabiting unions, presumably pre-selected on a degree of union stability as they will have chosen to have a child together. Nevertheless, it will also be possible to examine these cohabiting couples with children in the coming months.

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