Divorce and parity progression following the death of a child: A population-based prospective study

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ABSTRACT

Results from previous studies that have examined whether the loss of a child influences the relationship stability between parents are inconclusive. A reason might be that bereaved parents of reproductive age are inclined to give birth to a new child. This constructive action could be considered a way to cope with the loss or induced by a pre-determined aim to have a family of a particular size. Using longitudinal Finnish register data that make it possible to construct couples from the moment they marry and become parents, we analyse the association between child loss and parental separation by allowing for compensatory behaviour in terms of new births. We prospectively follow more than 100,000 couples for a maximum period of fifteen years and estimate risk ratios of divorce and parity progression, respectively, between bereaved and non-bereaved couples. We find that a minor child's death has only a modest influence on marital stability, whereas its association with parity progression is considerable. It is hence likely that giving birth to a new child may buffer against any negative consequences on relationship quality among bereaved parents.

Keywords: Bereavement; Marriage; Divorce; Finland; Registry data

INTRODUCTION

The death of a child is a particularly rare and unexpected event in economically advanced societies. It is therefore also considered one of the most stressful and traumatic life events a person may encounter, especially when the event occurs at young age (Li et al., 2002). Studies suggest that parents suffer more intense grief after the death of a child compared to the bereavement following the death of either a spouse or a parent (Middleton et al., 1998; Sanders, 1979; Sirki et al., 2000). While several previous scholars have examined the consequences of child death on mortality and health problems among parents (Hendrickson, 2009; Li et al., 2003:2005; Rostila et al., 2012) few have studied how child loss affects the future of the remaining family in terms of relationship stability between parents. The sparse existing evidence is also inconclusive since methodological limitations associated with sampling and difficulties in tracking divorced couples make it difficult to draw clear conclusions about the loss of a child and marital disruption (Murphy et al., 2003).

The previous literature suggests different possibilities in which stressful life events, such as the death of a child, may affect the relationship between partners. One is that child death may lead to an increased risk of separation through the strain that is caused by the event on the relationship as well as through the mental and psychiatric health problems parents' experience individually (Li et al., 2005; Rubin, 1983; Vance, 1991). Another possibility, on the contrary, is that stressful life events may increase cohesion and improve the quality of the relationship (Najman et al., 1993), meaning that child loss brings the partners closer together.

Yet any association between bereavement and subsequent parental separation must account for the fact that union dissolution is strongly related to family size, and that losing a child might affect future fertility. Parents of fertile age who lose a minor child might be strongly

inclined to give birth to a new child (Olmsted & Poznanski, 1972). This constructive action could be a way to cope with the loss, or be induced by a pre-determined aim to have a family of a particular size (Johnson, 1985; Mitchell et al., 1996; Videka-Sherman, 1982). The death of a child may consequently influence the likelihood of giving birth to a new child and this, in turn, could have significant consequences for the relationship between the bereaved parents. The previous literature has theoretically discussed, although rarely empirically examined, this possibility. The endogeneity of fertility and divorce obviously complicates matters, and might be a reason to why there is no consistent evidence in support of an effect of bereavement on parental separation. An in-depth empirical inquiry into the association between parental bereavement and separation therefore needs to prospectively follow the couples.

Using Finnish register based and longitudinal data that make it possible to construct couples from the moments they marry and become parents, we provide the first more detailed analyses concerned with the question of how a minor child's death relates to the parental divorce risk and to parity progression. Like the other Nordic countries, Finland is characterised as a society that has one of the lowest child mortality rates in the world, modest fertility levels, and an extensive and well-functioning welfare system. The data used cover a period starting in the early 1970s, and include a number of socioeconomic and demographic background variables of both parents. Our contribution is that we analyse the association between child loss and parental separation by allowing for compensatory behaviour in terms of new births, and prospectively follow each couple over parities. Deaths of small children are in focus, because approximately 70 per cent of all deaths among those aged less than 15 years occur during the first two years of life, hence when compensatory behaviour in terms of new births is still possible.

THEORETICAL BACKGROUND AND PREVIOUS RESEARCH

There are several possible links between the loss of a child and the parental separation risk (Oliver, 1999). One fundamental reason is that the tragedy of losing a child produces strain in the relationship, which becomes serious enough to result in separation (Schwab, 1998). The death of a young child often contributes to feelings of guilt associated with the inability to fulfil the parental role as "protector". In the context of the relationship between parents, they may blame each other for the loss of the child, especially when the child died from an unnatural cause, such as an accident or suicide (Miles & Demi, 1991-1992; Schwab, 1998). The mental and psychiatric health problems that most parents experience following the loss could produce additional strain on the relationship. Accordingly, previous studies have found that child loss has significant consequences for anxiety, depression and sleep disturbances, and mental health and psychiatric hospitalization of parents (Li et al., 2005; Murphy et al., 2014; Rubin, 1984; Vance, 1991). These psychological outcomes are likely to influence interaction patterns and relationship quality (Najman et al., 1996) and might thereby result in an elevated separation risk. Bereaved parents assume a more negative view of the world (Johnson, 1985; Matthews & Marwit, 2003), more often display symptoms of alcohol abuse (Vanc et al., 1995) and more frequently show negative emotions such as anger and desire for retribution and conflict within the relationship (Drenovsky, 1994; Gilbert, 1989; Gilbert & Smart, 1992). Marital intimacy also seems to show a decline in the years following the death (Lang et al., 1996). Given that the loss of a child is a much unexpected event, the social support system may be unprepared to respond appropriately to the grieving parents' needs, which leave them unsupported and vulnerable (Fletcher, 2002). Parents affected must not only deal with sadness and grief following the loss of a child, but also restructured family roles such as grieving siblings, which could lead to additional strain in the relationship (Fletcher, 2002). Such stressors could have implications for marital stability and the risk of divorce for

several years, considering that the grieving period may last for a very long time or even indefinitely (Rubin, 1993). Although the intensity of the grief decreases somewhat over time there might be consequences of these negative behaviours and feelings several years after the loss (Lang, Gottlieb & Ansel, 1996).

Stressful life events might nevertheless also increase cohesion by improving relationship quality and hence lead to a lowered or unchanged risk of separation after the death of a child (Najman et al., 1993). Hence bereavement might serve as a source of relationship cohesion (Anderson et al., 2005; Carroll & Shaefar, 1994). It has even been argued that the majority of marital relationships survive the strain brought about by a child's death and are strengthened in the long run (Schwab, 1998). If a very traumatic shared experience produces commitment to the spousal relationship this would reduce the divorce risk among bereaved couples (Lyngstad, 2013). The spouses experience the tragedy and trauma together and might hence be inspired to stay together by their common traumatic experience. Later marital and everyday problems may then seem small compared to the experience of a lost child. Klass (1986) argues that the death of a child creates a new deeper bond between spouses but at the same time this event can also cause estrangement in the relationship.

A possibility that has been insufficiently empirically examined is that losing a child might influence fertility decisions, which in turn could moderate the association between child loss and the parental separation risk. Hence, a study of the interrelation between child loss and parental separation must be concerned also with the link between child loss and parity progression. An unchanged or lower risk of separation among couples after the loss of a child may be explained by the fact that couples who experience the loss of a child are more inclined to give birth to a new child. This might be a reason to why there is no consistent evidence in

support of an effect of bereavement on parental separation. The "replacement child" refers to a child who is used by the parents as a substitute for a sibling who has died (Olmsted & Poznanski, 1972). This constructive action could be considered a way to cope with the loss, or because the parents aim at a pre-determined norm of having family of a particular size (Mitchell et al., 1996; Videka-Sherman, 1982). The new child's entry into the family may interrupt, distort, and delay the mourning process (Legg & Sherick, 1976). Additional children in the family may have a protective effect on the relationship between parents since they may buffer against some of the adverse effects by losing the only child (Lyngstad, 2013) and facilitate the psychological adjustment to the loss (Videka-Sherman, 1982). However, the strategy could also have unexpected costs. Bereaved parents who give birth to a new child might experience also estrangement, anger, and less openness as they deal with the loss a child, perhaps because more children overtax the resources. Dealing with remaining grieving children might therefore be stressful for parents and lead to more strain in the relationship (Lyngstad, 2013). Additional children within the family could therefore be protective against the harmful consequences of child death but also serve as an additional source of strain.

Empirical research on parental separation after the loss of a child is more limited than might be expected. There is no conclusive evidence that bereaved parents separate as a result of a child's death, or that the birth of a new child contributes to this relationship. Most empirical papers have used small-scale datasets from surveys, clinical descriptions of participants in grief support groups, or retrospective reports (Eilegård & Kreicbergs, 2010; Lehman et al., 1987; Murphy et al., 2003; Najman et al., 1993; Rogers et al., 2008; Sirkiä et al., 2000). Previous studies on child loss and separation consequently show rather mixed results.

Rogers et al. (2008) found that marital disruption was more likely among 428 parents who lost a child between infancy and the age of 34 as compared to a control group of non-bereaved parents of similar background. Another study indicated that the divorce rate among bereaved parents was as much as eight times higher than that of non-bereaved parents (Lehman et al., 1987). Najman et al. (1993) found an increased marital breakdown risk 6-8 months after infant death, whereas the results of Gold et al. (2010) suggest that parents' relationships have a higher risk of dissolving after miscarriage and stillbirth as compared to live births. Accordingly, some other research suggests marital tension and relationship breakdown as a consequence of child loss (Schwab, 1990:1998).

There are nevertheless contrasting findings as well, suggesting no increase in the divorce risk following child loss. Eilegard & Kreicbergs (2010) reported that marital dissolution was not more common among parents who lose a child to cancer than among non-bereaved parents. Mitchell et al. (1996) found that mothers who lost a baby from sudden infant death did not have an elevated risk of marital breakdown, but that the bereaved mothers more frequently replaced the child by having another birth, particularly if it was the youngest child in the sibling group who died. Studies examining the risk of divorce among parents who have children with serious and life threatening illnesses reach similar conclusions. The majority of these studies suggest that serious illnesses among children do not lead to a higher risk of parental separation (Lansky et al., 1978; Grant et al., 2012; Syse et al., 2010), while few studies argue that this really might be the case (Joesch & Smith, 1997).

Only a few studies are based on large-scale data from administrative records. Since such data are virtually free of sample attrition and self-reporting bias, the results can be expected to be generalised to a broader population. Existing evidence from Sweden (van den Berg et al.,

2012) and Norway (Lyngstad, 2013) suggest that bereaved parents have a higher risk of separation than non-bereaved parents. The difference as compared to non-bereaved parents is observed across several family sizes and seems to strengthen somewhat over time, whereas post-bereavement fertility do not seem to affect the divorce risk (Lyngstad, 2013).

METHODS

The data used in this paper (with permission TK-53-186-09) come from the Finnish population register files known as "Palapeli" (Statistics Finland, 2014). These files were formed by combining information from Statistics Finland's longitudinal population census file, the longitudinal employment statistics file, the register of completed education and degrees, marriages and divorces, moves between dwellings, and birth of children. For a random sample of reference persons we have linkage to all their partners and biological children. Information about demographic events, that is births, deaths, marriages, entry into a union, separations, and migration is at the annual level. For each reference person and for the partner there is annual information from the period 1971-2003. The dataset we have access to contains an eight per cent sample of the Finnish-speaking population born 1920-1988, plus an identically constructed 50 per cent sample representing the Swedish-speaking population group, which amounts to barely six per cent of the country's total population. In the analyses, each sample is weighted according to its sampling proportion. The weights are also adjusted to account for the fact that some couples appear twice in the data, which is the case if both spouses appear as reference persons.

In total, there are 123,435 unique and unweighted marriages in the data. Of all these couples, who are in their first marriages, 101,278 can be observed for at least ten years, and 71,129 of the marriages were intact after ten years. Since child mortality is low, bereavement is a rare

event. During the first five years of marriage, 824 couples experienced the death of a child, and during the first ten years, 1,024 couples. The child deaths are naturally concentrated to the first few weeks after birth.

We begin by estimating one-year divorce risks, which is a standard approach; see e.g. Lyngstad (2013). These models account for duration of marriage, wife's educational level, wife's age, parity, period, ethno-linguistic affiliation, and bereavement status (whether or not a couple have experienced the death of a child). The observations consist of marriages that have lasted at most 15 years, and amount to 1,321,035, whereof 11,901 can be categorised as having experience of a child's death. Corresponding analyses are undertaken for the risk of parity progression.

Since this standard approach treats each year in the data as an independent cross section with retrospective information only, there is no follow-up. That will lead to erroneous conclusions about the interrelation between a child's death and the parental divorce risk, because bereavement is strongly related to parity progression.

We therefore proceed by prospectively observing the couples after marriage, and illustrate that bereaved and non-bereaved couples are similar with regard to the parity distribution of live children. With Cox regressions we undertake also analyses that estimate the divorce risk and the risk of parity progression after the birth of each new child in the sibling order, while standardising for the effects of the same control variables as mentioned above. The focus here is on risk ratios between bereaved and non-bereaved couples. The couples are classified according to whether or not they experienced the death of a child within one year after the birth of the youngest child. Process time starts from the year following the birth of the

youngest child, and the couples are observed for at most fifteen years. This setup thus allows for the possibility of compensatory behaviour in terms of new births since the couples by definition recently gave birth to a child and are thus of reproductive age.

RESULTS

When simply comparing the divorce risk of bereaved couples to all other couples at each point in time, after standardising for the effects of the control variables, the risk ratio is 0.94 (95% CI: 0.81-1.08). If childless couples are excluded and a variable for the number of live-born children is added, the ratio is 1.47 (95% CI: 1.32-1.62). The reason to why these estimates (not shown in table) diverge is that the divorce risk is strongly related to parity. To obtain parity-specific estimates we therefore interact parity and bereavement, which gives the results summarised in Table 1, where childless couples serve as the reference category. We see that for both bereaved and non-bereaved couples, the divorce risk falls notably with the number of children. At each parity, the divorce risk is higher for bereaved couples than for non-bereaved ones, with a ratio that ranges between 1.25 and 1.48, corresponding to previous estimates based on Norwegian register data (Lyngstad, 2013). However, a fundamental problem with this approach is that it does not account for the fact that bereavement and parity progression are interrelated. Table 2, which has a similar setup as Table 1, but gives the risk of parity progression, shows that at each parity, couples who lose a child have a much higher probability of becoming parents again as compared to couples who have not lost a child. Particularly at parity one and parity two the risk ratio is very high, or approximately five, but at parity three also as high as 2.2. Failure to account for this compensating behaviour will lead to erroneous conclusions with regard to the association between child loss and divorce.

(Table 1 here)

(Table 2 here)

Table 3 gives the unstandardized parity distributions for bereaved and non-bereaved couples ten years after marriage, or for those who divorced, at the time of the divorce. It hints that bereaved couples are strongly inclined to have new children, and that parity progression related to bereavement even tend to dominate the association between child loss and parental separation on total fertility. The parity distribution of live children is similar for bereaved and non-bereaved parents. For instance, approximately 29 per cent of the bereaved couples are at parity two (one live child), while barely 26 per cent of the non-bereaved couples are at parity one (one live child). The average number of children is in fact 2.00 in both the bereaved and the non-bereaved group.

(Table 3 here)

Preferred models to estimate therefore prospectively study the bereavement-related divorce risk not only by family size but also according to time since the birth of the youngest child. Bereavement here refers to the death of a child within one year after the birth of the youngest child in the sibling group, since all these families are evidently still of reproductive age. We can also see which child in the sibling order who died. Doing so, and observing the couples up to 15 years after the most recent child's birth we find that, for couples who gave birth to their first child, there is no increase in the separation risk associated with child loss (Table 4). The adjusted risk ratio between bereaved and non-bereaved parents is 1.01 (95% CI: 0.82-1.24). For couples who gave birth to their second and third child, the adjusted risk ratio is between 1.07 and 1.20, depending on family size and which of the children in the sibling order died, but all of these estimates come with a wide confidence interval.

(Table 4 here)

Replacement fertility, on the other hand, is strongly related to bereavement, meaning that parity progression is highly influenced by the death of a child. This is illustrated by Table 5, which gives unstandardized parity distributions for bereaved and non-bereaved couples ten

years after the birth of the first, second, and third child, respectively. We see that 26 per cent of the bereaved couples are at parity two (one live child), which should be compared to 25 per cent of the non-bereaved ones at parity one. Similarly, 41 per cent of the bereaved ones are at parity three, while 49 per cent of the non-bereaved ones are at parity two, and 16 per cent of the bereaved ones are at parity four, while 20 per cent of the non-bereaved ones are at parity three. Most couples appear to aim at having two live children, which is not too surprising, considering the strong two-child norm in the Nordic countries (Andersson et al., 2006). Observing couples after the birth of the second child, as many as 46 per cent of those whose first child died are found at parity three, and 44 per cent of those whose second child died. These are numbers that are lower than the comparable 64 per cent for non-bereaved couples at parity two. However, the compensating behaviour appears to be stronger if it is the most recent, and not an earlier born, child who died. At parity four and higher, couples observed after the birth of the second or third child are consistently found at higher parities if a later-born child has died than if an earlier-born child has died.

(Table 5 here)

The above conclusions remain the same when we account for the background variables and estimate relative risks of parity progression by bereavement since the birth of each new child. The results are summarised in Table 6. At parity one, the ratio of the risk of parity progression between bereaved and non-bereaved couples is 2.24. At parity two the risk ratio is even larger, or 2.74 if the first child died and 4.51 if the second child died. The larger ratio as compared with parity one is because the norm is to have more than one child, meaning that couples in both groups are strongly inclined to have additional children. Also at parity three, however, there is a notable difference in the risk of parity progression between bereaved and non-bereaved persons. If the first child dies, the ratio is 1.22, if the second child dies it is 1.51, and if the third child dies it is 2.61. Hence, the association between child loss and parity

progression is stronger if it was a younger child who died. Since we control for wife's age, this pattern is likely not driven by fecundity, but rather seem related to a higher inclination to have another child if a child dies at younger age. Hence also bereaved couples seem to aim at a pre-determined or minimum number of live children.

(Table 6 here)

CONCLUSION

Many previous studies have examined the consequences of child death on mortality and health problems among parents (Hendrickson, 2009; Li et al., 2003:2005; Rostila et al., 2012), while few have analysed how child loss affects the future of the remaining family in terms of relationship stability between parents. The death of a child may although influence also the likelihood of giving birth to a new child within the family, which could be a way to cope with the loss, or arise because the parents aim at a pre-determined norm of having a family of a particular size (Johnson, 1985; Mitchell et al., 1996; Videka-Sherman, 1982).

Using Finnish register based and longitudinal data that make it possible to construct couples from the moments they marry and become parents, this study provided the first more detailed analysis concerned with the question of how a minor child's death relates to the parental divorce risk and to parity progression. In particular, we analyse the association between child loss and parental separation by allowing for compensatory behaviour in terms of new births, and hereby prospectively follow each couple over parities.

One fundamental reason for an elevated separation risk of bereaved parents is often argued to be that the tragedy of losing a child produces strain in the relationship, which becomes serious enough to result in separation (Schwab, 1998). In the context of the relationship between

parents, they may blame each other for the loss of the child, especially when the child died from an unnatural cause (Miles & Demi, 1986; Schwab, 1998). The mental and psychiatric health problems that most parents experience following the loss could produce additional strain on the relationship. However, it has been argued also that stressful life events might improve relationship quality and cohesion and hence lead to a lowered or unchanged risk of separation after the death of a child (Anderson et al., 2005; Carroll & Shaefar, 1994; Najman et al., 1993).

Our findings show that a minor child's death has only modest influence on marital stability, hence providing weak support for the strain or cohesion arguments. It might of course be that these supposed counteracting mechanisms level each other out, and that the relationship quality before the loss of a child may contribute to different outcomes. Relationships characterised by high quality and a supportive environment between spouses may have a greater likelihood of surviving the traumatic event of losing a child and potentially even be strengthened in the longer run. On the contrary, the loss of a child may lead to additional strain among couples who already before the death of a child had problems or conflicts and thereby represent a definite factor which finally results in separation. Yet a more reasonable interpretation is that the true effect of child death on marital stability is modest, because it is strongly related to the likelihood of giving birth to a new child (Mitchell et al., 1996).

In support of the latter argument, we found only a modest association between child loss and separation, which is because bereaved couples are highly inclined to give birth to a new child if they are of reproductive age. Hence also bereaved couples seem to aim at a pre-determined or minimum number of live children. This behaviour may interrupt, distort, and delay any mourning process that might affect relationship quality and hence the divorce risk (see Legg,

1976). Additional children in the family may also have a protective effect on the parental relationship since they may buffer against some of the adverse effects by losing the only child (Lyngstad, 2013), and facilitate the psychological adjustment to the loss that contributes to the relationship quality (Videka-Sherman, 1982). The compensatory behaviour that we, unlike previous studies, explicitly have allowed for is evidently a reason to why there has been no consistent evidence in support of an effect of bereavement on parental separation in the previous literature.

Some limitations of this study should although be noted. Detailed information on personal and relational characteristics between parents, including relationship quality, is required to uncover the actual causal mechanisms that link child deaths to parental divorce and the decision to give birth to a new child. This was unfortunately not included in the registry data used. With the data at hand, we could not explicitly study if giving birth to a new child interrupts, distorts or delays the grief process, or whether it increases the relationship quality and cohesion between parents. It is important to consider also that giving birth to a new child may indicate that parents are coping fairly well with the traumatic event and that they might have a working relationship with each other, while couples who experience a major relationship crisis after the loss of a child is unlikely to give birth to another child (Lyngstad, 2013). Hence it is not evident that the replacement child *per se* contributes to a lower risk of separation, but rather that parents who are better equipped to survive the death of a child together decide to give birth to a new child. Also it needs to be stressed that we have not been concerned with effects in the long term, or those associated with the loss of a youngster or adult child. To allow for compensatory behaviour in terms of new births, our focus was on couples of reproductive age, and we observed them no longer than at most fifteen years after the birth of the youngest child.

To conclude, we have provided new insights into some family dynamics that have not been sufficiently covered in the previous literature. Our analyses reveal that a minor child's death has only a modest influence on marital stability, whereas its association with parity progression is considerable, meaning that also bereaved couples seem to aim at a pre-determined or minimum number of live children. It is hence likely that giving birth to a new child may buffer against any negative consequences on relationship quality among bereaved parents. These findings might have consequences not only for knowledge on the association between bereavement and relationship stability, but they could potentially contribute also to further understanding of the mechanisms behind collateral health

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Table 1. Relative divorce risks by bereavement and parity (with 95% confidence intervals), without follow-up

	Bereaved	Non-bereaved	Row ratio
Parity			
0	-	1	-
1	1.21 (0.85-1.73)	0.97 (0.93-1.01)	1.25
2	0.71 (0.55-0.92)	0.54 (0.51-0.56)	1.33
3	0.56 (0.43-0.71)	0.38 (0.35-0.40)	1.48
4+	0.40 (0.26-0.62)	0.30 (0.27-0.35)	1.31
n, observations	1,321,035		

Bereavement refers to whether or not a couple has experienced the death of a child prior to the calendar year of observation.
The risks are adjusted for marriage duration, educational level and at marriage of the wife, period, parity, and ethno-linguistic affiliation.
Included are marriages no longer than 15 years.

Table 2. Relative risks of parity progression by bereavement and parity (with 95% confidence intervals), without follow-up

	Bereaved	Non-bereaved	Row ratio
Parity			
0	-	1	-
1	3.17 (2.87-3.50)	0.69 (0.68-0.70)	4.58
2	1.25 (1.16-1.35)	0.23 (0.22-0.23)	5.54
3	0.46 (0.41-0.50)	0.21 (0.21-0.22)	2.16
4+	0.66 (0.57-0.77)	0.58 (0.55-0.60)	1.15
n, observations	1,321,035		

Bereavement refers to whether or not a couple has experienced the death of a child prior to the calendar year of observation.
The risks are adjusted for marriage duration, educational level and at marriage of the wife, period, parity, and ethno-linguistic affiliation.
Included are marriages no longer than 15 years.

Table 3. Parity distribution by bereavement (%), ten years after marriage

	Berea-ved	Non-berea-ved
Parity		
0	-	6.8
1	8.9	25.6
2	28.9	46.9
3	39.1	16.6
4	17.1	2.9
5+	6.0	1.1
Total	100.0	100.0
n, couples	1,061	100,217

Bereaved are here couples who have lost a child during the first two years of marriage.
For couples who divorced within ten years of marriage, parity is measured at the time of the divorce.

Table 4. Association between bereavement and divorce risk by parity, with follow-up

	Relative risk	95% confidence interval	n, couples	n, divorces
Parity one				
The child survives	1		106,697	18,974
The child dies	1.01	(0.82-1.24)	513	96
Parity two				
Both children survive	1		79,829	12,307
1st child dies	1.07	(0.87-1.33)	509	92
2nd child dies	1.12	(0.88-1.42)	434	73
Parity three				
All children survive	1		29,227	3,737
1st child dies	1.22	(0.94-1.59)	383	63
2nd child dies	1.20	(0.91-1.57)	378	59
3rd child dies	1.08	(0.70-1.66)	167	26

Bereavement refers to the death of a child within one year after the birth of the youngest child in the sibling group.
Models are estimated separately starting from the year following the birth of the first child, the second child, and the third child, respectively.
The risks are adjusted for marriage duration, educational level and age of the wife, period, and ethno-linguistic affiliation.
Included are durations no longer than 15 years after the birth of the index child.

Table 5. Parity distribution by bereavement (%), ten years after the birth of the first, second, and third child, respectively

	Families with at least one live birth		Families with at least two live births			Families with at least three live births			
	1st child died	Non-berea-ved	1st child died	2nd child died	Non-berea-ved	1st child died	2nd child died	3rd child died	Non-berea-ved
Parity									
1	11.8	25.1	-	-	-	-	-	-	-
2	26.4	48.8	31.2	23.7	63.9	-	-	-	-
3	40.9	20.2	46.4	44.1	27.0	65.3	61.7	42.4	74.3
4	15.8	4.2	16.6	21.4	6.4	23.1	26.7	34.7	17.7
5	3.9	0.8	5.1	7.8	1.4	9.4	9.6	12.4	4.2
6	1.2	0.8	0.7	3.0	1.3	2.2	2.1	10.6	3.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
n, couples	531	106,718	509	434	79,829	384	378	173	29,231

Table 6. Association between bereavement and risk of parity progression by parity, with follow-up

	Rela-tive risk	95% confidence interval	n, coup-les	n, births
Parity one				
The child survives	1		106,697	80,623
The child dies	2.24	(2.04-2.47)	513	447
Parity two				
Both children survive	1		79,829	29,771
1st child dies	2.74	(2.45-3.06)	509	346
2nd child dies	4.51	(4.01-5.07)	434	313
Parity three				
All children survive	1		29,227	7,499
1st child dies	1.22	(1.02-1.46)	383	137
2nd child dies	1.51	(1.27-1.79)	378	150
3rd child dies	2.61	(2.07-3.27)	167	104

Bereavement refers to the death of a child within one year after the birth of the youngest child in the sibling group.
Models are estimated separately starting from the year following the birth of the first child, the second child, and the third child, respectively.
The risks are adjusted for marriage duration, educational level and age of the wife, period, and ethno-linguistic affiliation.
Included are durations no longer than 15 years after the birth of the index child.