Changing Sibling Relationships after Parents' Death: The Role of Solidarity and Kinkeeping

Matthijs Kalmijn & Thomas Leopold

University of Amsterdam & Netherlands Interdisciplinary Demographic Institute

April 5, 2018

Abstract: This study examined two hypotheses about changes in contact and conflict among adult siblings after the death of parents. The solidarity hypothesis predicts a short-term strengthening of sibling relationships after parental death, whereas the kinkeeping hypothesis predicts a long-term weakening of sibling relationships after parental death. Hypotheses were tested with fixed-effects regression models drawing on four waves of the Netherlands Kinship Panel Study (2003-2015). This survey combined data on sibling ties with data on intergenerational ties to (surviving) parents. Consistent with the solidarity hypothesis, results showed that sibling contact intensified after parental death. The increase lasted longer after losing the first parent and was partially explained by changes in contact with and support to the surviving parent. After the death of the second parent, contact and conflict between siblings increased but these effects were short-lived. In line with the kinkeeping hypothesis, sibling relations among adult orphans faded in the long run.

Keywords: siblings, death, intergenerational relationships, parents.

Address: Department of Sociology, University of Amsterdam, Nieuwe Achtergracht 166, Building REC B/C, Room B6.08, 1018 WV Amsterdam, the Netherlands (matthijskalmijn@gmail.com and t.leopold@uva.nl).

Sibling contact and parental death

In studies on family relationships, there has been increasing attention to the relationships between adult siblings. These studies generally show that the sibling tie is an enduring source of affection and support (Cicirelli, 1994; Eriksen & Gerstel, 2002; Spitze & Trent, 2006; Voorpostel & Blieszner, 2008), although the relationship is also constrained by infrequent contact and large geographical distances (Voorpostel & Van der Lippe, 2007) and, in a minority of cases, plagued by conflict and rivalry (Suitor, Sechrist, & Pillemer, 2007). Another and larger line of research has examined the consequences of parental death for the wellbeing of surviving family members, in particular the spouse and the children. These studies focus on the ways in which people cope with and adjust to the loss of spouses and parents (Leopold & Lechner, 2015; Marks, Jun, & Song, 2007; Stroebe, Schut, & Stroebe, 2007; Wortman, Cohen Silver, & Kessler, 1993). Few studies have looked at the intersection of the two themes. In this paper, we examine one aspect of this intersection: how the death of parents affects sibling relationships. We broaden the unit of analysis in the typical sibling study from the dyad to the family network and in doing so, provide new insights into how extended families in western society function.

Based on theories about family solidarity (Bengtson & Roberts, 1991; Silverstein & Bengtson, 1997) and kinkeeping (Hagestad, 1986; Rosenthal, 1985), we derive hypotheses on how sibling relationships change after a parent dies. Our hypotheses posit contrasting effects of losing the first and second parent on cohesion among the family members left behind: According to the solidarity hypothesis, the death of the first parent fosters cohesion among adult siblings, an effect that partly results from increases in intergenerational solidarity with the surviving parent. According to the kinkeeping hypothesis, the death of the second parent weakens cohesion among adult siblings, as the primary role position to integrate the family network is left vacant.

An empirical test of these hypotheses contributes to our general understanding of family cohesion because it allows us to assess the extent to which the presence of common ancestors integrates – and their death disintegrates – the larger family network in which conjugal families are embedded. To examine our hypotheses, we draw on four-wave panel data from a national sample of adult children and their siblings in the Netherlands. Using fixed-effects models we present a detailed dynamic view of changes in sibling ties before and after the death of the first and the second parent. As outcome measures, we studied contact and conflict between siblings. Contact is relatively easy to measure, varies considerably among sibling pairs and among families, and is closely associated with social, emotional, and practical support (Hank, 2007). Conflict is also recognized as an important dimension of intergenerational relations and sibling ties (Luescher, 2002; Steinbach, 2008; Van Gaalen & Dykstra, 2006).

BACKGROUND

Previous Research

A few earlier studies examined aspects of the question that we raise. A cross-sectional analysis of the *National Survey of Families and Households* in the U.S. showed that siblings had more contact with, and more affection for, each other when one or both parents were still alive compared to siblings whose parents were no longer alive (White & Riedmann, 1992). An analysis of the same data showed that siblings had more conflict when one or both parents had died (Fuller-Thomson, 2000). A recent re-analysis of these data showed that parental death resulted in a decline in support exchange between siblings but no significant change in contact (Spitze & Trent, 2016). In a two-wave longitudinal study of American high school graduates, closeness between siblings declined slightly when a parent died between the waves (Khodyakov & Carr, 2009).

Sibling contact and parental death

A number of studies examined the living status of parents as a control variable in more general analyses of differences between or changes in sibling ties. These studies indicated that sibling ties were weaker when parents were no longer alive (Voorpostel, van der Lippe, & Flap, 2012; White, 2001). Overall, it seems that negative effects of parental death on sibling relationships prevail but the effects that were found were often small and not robust across outcomes and designs.

Theoretical Background and Hypotheses

In the literature, there are different theoretical perspectives on the adult sibling relationship. One perspective sees siblings primarily as *family*. Because siblings are biologically related and raised together, people generally feel a concern and responsibility for the well-being of their siblings and they will support siblings in need of support (Voorpostel, 2007; White & Riedmann, 1992). The way the sibling tie functions fits with the solidarity and convoy models of family relationships which argue that family ties can remain dormant for long periods of time but are activated in times of crisis or when important life events occur. A second perspective regards siblings as *friends* (Connidis, 1989). Siblings are often similar in age and usually have a long history together. This typically results in a close tie that is in some sense comparable to a friendship tie. Although the sibling tie is ascribed rather than chosen, the way it functions may still resemble a friendship. Many studies have examined similarities and differences between friendship ties and sibling ties (Floyd, 1995).

A third perspective sees siblings as *rivals* (Suitor et al., 2009). Resources in the parental home are limited and this implies competition between siblings for the attention, support, and affection of their parents. Sibling rivalry has most often been studied among younger children but it can also persist or resurface at later ages. The literature on sibling rivalry emphasizes conflicts between siblings. Finally, a fourth perspective focuses on the

entire set of siblings, what is sometimes called the *sibling configuration* (Blake, 1989). This literature is often concerned with stratification outcomes like schooling and income and examines effects of sibship size, gender composition of siblings, and average spacing between siblings (Steelman, Powell, Werum, & Carter, 2002).

In this study, we draw on various aspects of these perspectives in order to develop testable hypotheses on the effects of parental death. We tested three sets of hypotheses. The first set was derived from the model of intergenerational solidarity (Bengtson & Roberts, 1991). According to this model, family members, including siblings, rely on each other for social and practical support when needed. Extended family members such as siblings are part of a "latent kin matrix" that is activated in times of crisis (Riley & Riley, 1993). This can occur both before and after the death of a parent, given that death is often preceded by illness. As a reference period for our analysis, we focus on the situation some years before the death, reflecting the 'normal' pattern of sibling contact.

The death of a parent is a crisis for the surviving family members which creates a need for mutual support. Siblings can be expected to respond to this need by increasing contact (Connidis, 1992). As Umberson (2003: 172) observed in a large-scale quantitative and qualitative study of parental death, a "sense of shared grief and loss often occurs in relationships with family members, especially siblings, who knew and loved the unique person who died. A sense of shared loss facilitates empathy; it helps siblings to understand the depth of one another's pain." The associated change in sibling cohesion would be reflected in an *increasing frequency of contact between siblings after the death of a parent* (H1).

Another implication of the solidarity perspective lies not in the sibling dyad but in the surrounding family network. The death of a parent not only increases the need for support among siblings, but it may also create a need to support the dying parent as well as a need to

support the surviving parent (Umberson, 2003). Support to the surviving parent can be practical, social, and emotional. Siblings may see each other more often because they need to coordinate the support they provide to the surviving parent (Finch & Mason, 1993). Moreover, contact between siblings may increase if siblings jointly support the surviving parent. Changes in the sibling tie are then a byproduct of changes in the parent-child tie: Siblings do not reach out to help each other, it is the surviving parent that brings them together. In line with this idea, previous research has shown that support exchanged between adult children and their parents was positively correlated with support exchanged among adult siblings (Voorpostel & Blieszner, 2008).

To test this specific aspect of the solidarity model, we distinguish between the death of the first and second parent. We expect that *the increase in contact between siblings is stronger when the first parent dies than when the second parent dies* (H2). Moreover, for the death of the first parent, we expect that *the increase in contact between siblings is mediated by changes in their contact with and support to the surviving parent* (H3).

Our second set of hypotheses is derived from the theory of kinkeeping (Fuller-Thomson, 2000; Hagestad, 1986; Rosenthal, 1985). Kinkeeping refers to all activities that sustain family ties and ensure cohesion and stability of the family network. Performing the kinkeeper role often requires substantial effort such as keeping regular contact with various family members, offering financial and practical support, and organizing events such as family reunions, birthday parties, and other occasions where adult children and their own families meet. As kinkeepers, parents foster cohesion among the conjugal families that their children have built. Although the kinkeeper role is commonly assigned to women and kin work is normatively defined as "women's work," men also report feelings of obligation to perform this role and engage in kinkeeping activities, albeit not to the same degree as women (Rosenthal 1985).

Regarding our study focus, the loss of a kinkeeper is most consequential when the second parent dies and children make the transition to being an (adult) orphan. As discussed above, a surviving parent with whom adult siblings share a positive relationship continues to connect the family network. When the last parent dies, siblings lose a crucial source of cohesion. As a result of typical age gaps in couples and women's longer life expectancy, this parent is most often the mother. Although an adult sibling may step into the kinkeeper role (Umberson 2003), there are no clear norms in western families about whether, by whom, and to what extent, the vacant position will be filled. If the extended family network does not or not fully compensate for the loss of a kinkeeper, adult siblings may gradually lose contact (Fuller-Thomson, 2000). Based on these considerations, we expect that *after the second parent's death, the frequency of contact between siblings declines in the long run to levels below those that were present before death* (H4). In other words, after an initial increase following the loss of the second parent, we expect sibling contact to decline in the longer term.

Many studies on sibling ties have emphasized negative aspects of the relationship, such as conflicts between siblings, parents who favor certain children over others, and children who compete for attention, recognition, and resources (Suitor, Sechrist, Plikuhn, Pardo, & Pillemer, 2008). Although conflicts are most prevalent when siblings are young and living at home (Brody, 1998), some authors have argued that sibling conflicts re-emerge later in life, especially in times of family crisis (Lashewicz & Keating, 2009). The death of a parent may create new opportunities for bonding, but also for conflict. If estranged siblings are forced to resume contact, this can lead to a revival of their tensions. The death of a parent and the preceding period of illness often means that siblings have to negotiate caring responsibilities (Connidis & Kemp, 2008; Finch & Mason, 1993). Studies show that sibling conflict often emerges in the context of caring for elderly parents (Ingersoll-Dayton, Neal,

Ha, & Hammer, 2003), especially when siblings do not contribute equally (Khodyakov & Carr, 2009). Finally, sibling conflict may emerge over the distribution of the inheritance. In the Netherlands, equal division is the default but parents may deviate from this model either formally (in a will) or informally.

While an increase in conflict around the time of death may be expected, there are also reasons to believe that the long-term effect will be different. Especially when the last parent dies and the kinkeeper role remains vacant, we expect that contact gradually declines. Because contact is a prerequisite for conflict, we expect conflict to decline as well, even when it was stirred up around the time of death. This notion is in contrast with the idea that relationships become more problematic after parents die (Khodyakov & Carr, 2009). Instead, we suggest a pattern of fading rather than deteriorating sibling relationships. Our hypotheses are that conflict between siblings after the death of a parent *increases in the short term* (H5) and *declines in the long term* (H6). The long-term effect only applies to the situation after the death of the second parent.

METHOD

Data and Sample

We used data from the Netherlands Kinship Panel Study (Dykstra et al., 2007; Dykstra, Kalmijn, Komter, Liefbroer, & Mulder, 2005; Hogerbrugge et al., 2015; Merz et al., 2012). This survey is based on a nationally representative sample of individuals in the Netherlands. Data were collected in four waves (2002 – 2004, 2006 – 2007, 2010 – 2011, and 2014 – 2015). The first three waves were based on face-to-face interviews, the last wave was conducted with web questionnaires. The number of respondents was 8,161 in the first wave and wave-to-wave panel retention rates were 75%, 72%, and 65%, respectively. For an

interval of three to four years between waves, this is reasonable although it is lower than what has been achieved in annual panel surveys in the U.S. and Germany.

We selected a sample of respondents who participated in the first two or more waves (n = 6,091) and who had at least one living parent in the first wave with valid information on their year of birth (n = 4,017). We deleted 33 respondents who experienced the death of their parent at a very young or very old age (younger than 30 or older than 70). We also deleted 172 respondents who had no (living) sibling(s). The remaining sample size was N = 3,812.

This analytic sample consisted of two subsamples. The *event sample* included respondents who lost one or both parents across the observation window (n = 1,211); 732 respondents experienced the death of the mother and 641 respondents experienced the death of the father during the observation window (162 respondents experienced the death of both parents). In addition to the event sample we kept a *control sample* consisting of respondents who did not experience parental death across the observation window and who had at least one living parent in the first wave (n = 2,601). This reference group contributed to estimating the effect of age – an important control variable in our analysis – on the outcome measures (White, 2001).

In the interview, respondents were asked to list all of their siblings and were subsequently asked to report about their contact with each sibling. To save interview time, the measures for conflict (and other aspects of the relationship that are not used here) were limited to two siblings. If a respondent had more than two siblings, two were selected randomly for questions about conflict. We had no data on how much contact the siblings had with each other, i.e., our data were respondent-centered. Based on this dyadic information, we expanded the dataset to sibling dyads containing 10,367 unique sibling dyads for analyses about contact (an average of 2.7 siblings per respondent) and 6,186 unique sibling dyads for analyses about conflict (an average of 1.6 siblings). To take into account that multiple

siblings were analyzed for each respondent, we adjusted the standard errors in the fixed-effects models for clustering at the family level.

To analyze the effects of parental death on contact and conflict, we created a person-year file. Because the interviews (for a given wave) were not always held in the same calendar year, a person-year file was more appropriate than a person-wave file. Moreover, if a parent died between waves, we were able to use information about the year in which this occurred. This allowed us to examine the time before and after death in years. The level of contact and conflict (as well as all other wave-specific measures) were assumed to apply to the entire calendar year in which the interview took place. The average number of years between waves was 3.62. Years in which no interview took place were left out of the person-year file (unbalanced panel). Year-to-year data on contact would have been superior but these were not available. Given the variation in interview years and variation in death years of parents, our data were sufficiently detailed to estimate year-to-year changes in contact at the aggregate level.

Note that there were some ambiguities if the parent died in a calendar year that was also an interview year. In most of these cases, the parent died before the interview and the information from that interview represents a post-death measure. In some cases, especially when the interview was conducted early in the year, the parent died in the interview year but after the interview. In these cases, the information from that interview represents a pre-death measure. This occurred in 9% of the cases in which the father died and in 11% of the cases in which the mother died. In all of these cases, the pre-death measure applied to a situation shortly before death. We replicated the models while deleting these cases and found the same pattern of effects, albeit somewhat stronger effects for the first parent's death.

Measures

Sibling contact and parental death

Table 1 presents descriptive statistics and measurement details for all variables included in the models. Measures of contact, conflict, and support (to parents) were obtained from an existing tradition of research on family solidarity in the context of aging (Bengtson et al., 2006; Dykstra et al., 2006; Szydlik, 2016), although the exact wording of items can differ across countries and surveys.

- Table 1 -

Dependent variables. The frequency of contact was measured for all siblings. Contact information was missing if the sibling lived in the same household and these dyads were dropped. We used two contact measures: (a) the frequency of *face-to-face contact* in the past 12 months, and (b) the frequency of *phone contact* (including letters and emails) in the past 12 months. Respondents answered on a 7-point scale. Following earlier work on parent-child contact (Waite & Harrison, 1992), we recoded the categories into the approximate number of contact times per year in days per year as follows: never = 0, once = 1, a few times = 4, at least monthly = 12, at least weekly = 52, several times a week = 104, and about daily = 300. The result was logged to address right-skew ('never' was recoded to 1 to allow for the transformation) and to provide an interpretation of regression effects in terms of relative changes. *Conflict* was assessed for two randomly chosen siblings and measured with a question on the frequency of conflicts, strains or disagreements with a sibling in the past three months. Respondents could answer 'never', 'once or twice', or 'frequently'. Given the low levels of conflict, we combined 'once or twice' and 'frequently' into one category and contrast it with 'never.'

Independent Variables. To represent the effects of the first and second parent's death on the outcome measures, we used (a) indicator variables changing from 0 in all years preceding the death year to 1 in the death year and all following years, and (b) duration variables set to 0 for the year of death and then counting the years after death. This analytical

setup allowed us to separate transition effects from duration effects (Kalmijn, 2017; Leopold & Kalmijn, 2016). We excluded observations occurring one or two years before the death year of either parent to ensure that the reference period for the pre-death level of contact and conflict reflected a "normal" situation of the family. We conducted additional analyses to examine the functional shape of duration effects including a set of dummy variables for years after death and different parametrizations (linear, quadratic, cubic, and quartic). We found that a linear measure provided the best fit to the data for the duration after the first parent's death and a quadratic specification provided the best fit for the duration after the second parent's death. We added a linear specification for the second parent's death as a reference model.

Mediator Variables. In models for the effects of the first parent's death, we included two mediator variables to test Hypothesis 4, which stated that changes in sibling contact were explained by changes in the relationship with the surviving parent. These variables measured two aspects of the relationship between the respondent and his or her surviving parent: (a) *support* exchanged with the parent, measured by a standardized index calculated on the basis of eight items about the frequency of giving and receiving practical support, the frequency of giving and receiving household support, the frequency of giving and receiving good advice, and the frequency of giving and receiving emotional support (Cronbach's Alpha varied between 0.71 and 0.74 depending on the wave); (b) *face-to-face contact* with the parent, measured in the same way as the respective outcome measure for sibling contact. The correlation between these mediator variables was r = 0.5 (measured in the dyad-year file). For observations in which mother and father were still alive, we used the mean of the parents.

Control Variables. Given that the indicators for parental death were confounded with age, it was important to control for age-related changes in sibling relationships. We examined different parametrizations of age effects on sibling relationships and used linear and quadratic

specifications to estimate the effect of age on sibling contact and conflict. Although higher-level polynomials provided a better fit to the data, these improvements were incremental and did not affect the estimates of interest. In the models, we centered the age variables at the sample mean (45.5 years).

Models

To analyze the dyad-year data, we used fixed-effects models with cluster-robust standard error for dyads nested in families. Fixed-effects models relate change over time in sibling relationships only to change over time in the independent variables (Petersen, 2004). Only variables that vary over time enter the fixed-effects models. Given our study focus on family dynamics, we did not use multi-level models to account for the nested data structure of sibling dyads within families. Instead, we corrected the standard errors for clustering at the family level.

For the analysis of face-to-face contact and phone contact we estimated fixed-effects linear regression models. For the analysis of conflict we estimated fixed-effects conditional logit models and fixed-effects linear regression models. The linear regression model on the dichotomous outcome is a linear probability model. Given the skewness of the outcome, however, logit models could add meaningful detail to the results since they are more sensitive to relative changes in the probability of having conflict. Note that the sample size drops considerably in a fixed-effects logit model since only cases with change in the dependent variable are included (Petersen, 2004). To avoid confounding the effects of losing the first and second parent, we excluded all observations after the second parent's death from the models pertaining to the first parent's death.

To examine mediator effects of the relationship to the surviving parent, we estimated two models for the effects of the first parent's death on face-to-face contact and phone

contact. The unadjusted models excluded the mediator variables (Models 1a and 2a) and the adjusted models added the mediator variables (Models 1b and 2b). To examine the mediation effect, we provide a significance test for the indirect effect of parental death on contact via support for and contact with the surviving parent. This test was obtained using the *khb* regression technique available in Stata (Kohler & Karlson, 2012). To implement this module, we estimated the fixed-effects model as an OLS linear regression model based on within-transformed data (i.e., each variable is subtracted from its person-specific mean), which is equivalent to a fixed-effects model (Petersen, 2004) and compatible with the *khb* module. The OLS model estimated on within-transformed data was corrected for clustering of dyads within families.

In the models for the effects of the second parent's death, we complemented the fully specified models with quadratic duration effects (Models 3b, 4b, 6b) by reference models with linear duration effects (Models 3a, 4a, 6a).

RESULTS

Before discussing the regression results, we take a descriptive look at our outcome variables in Table 2. Face-to-face contact with siblings varied considerably. In almost half of the sibling dyads, there was at least monthly contact. Weekly contact (or more) was less common (16%), especially when compared to relationships between parents and adult children for which 50% reported weekly contact in the Netherlands (Kalmijn, 2006). In a significant minority of the sibling dyads there was no contact at all or just once in the past year (13%). In another large segment (40%), there was only occasional contact ("a few times"). The descriptive statistics shown in Table 2 do not point to major differences between the frequency of face-to-face contact and phone contact. Finally, the descriptives show that conflict in sibling relationships was rare. Any conflict was reported only in 10% of

observations and frequent conflict only in 2% of observations. Although sibling conflict may be somewhat underreported, these numbers suggest that sibling ties were generally harmonious. Note however that the recall period for conflict in the NKPS questionnaire is relatively short (referring to the past three months). The correlations between contact and conflict was modest but positive, in line with our expectations (r = .08).

- Table 2 -

The fixed-effects models are shown in Table 3 (sibling contact) and Table 4 (sibling conflict). In Figure 1 and Figure 2, we illustrate our main findings from these models in terms of average marginal effects. We started by estimating the effects of parental death on sibling contact (Table 3). The effect of the *year of death* represents the transition effect, i.e., the average immediate impact of losing a parent, compared to the reference period comprising observations of at least two years before the death. The effect of the *years after death* represents the duration effect, i.e., the average within-dyad change in contact for every year after losing a parent.

- Table 3 -

The unadjusted model for logged face-to-face contact with siblings (Model 1a) showed an increase in frequency of approximately 17 percent in the year of losing the first parent. This was followed by a statistically insignificant decline in subsequent years, indicating that the increase in siblings' face-to-face and phone contact was long-term. A similar pattern was found for logged phone contact (Model 2a): a positive transition effect and an insignificant duration effect. Note that given our sample restrictions for the models on the first parent's death, these findings applied to situations in which the second parent was still alive.

In the adjusted models for logged face-to-face contact (Model 1b) and logged phone contact (Model 2b), we added our measures for the relationship with the surviving parent.

Both measures were positively associated with changes in sibling's face-to-face contact, but only the effect of face-to-face contact with the surviving parent was substantial in size and statistically significant. Because both contact variables were logged, the coefficient can be interpreted as an elasticity, indicating that a 100% increase in face-to-face contact with the surviving parent was associated with a 19% increase in face-to-face contact with siblings. A comparison between Model 1a and 1b showed that the transition effect on sibling contact declined from 0.17 to 0.10. Hence, intensified contact with the surviving parent explained approximately half of the increase in siblings' face-to-face contact found in the death year of the first parent. Our test for mediation, reported at the bottom of the table, shows that this reduction was statistically significant.

For siblings' phone contact, the effects of contact with and support to the surviving parent were positive and statistically significant (Model 2b). The effect found for the contact measure was less pronounced than in Model 1b, indicating that a 100% increase in face-to-face contact with the surviving parent was associated with a 6% increase in phone contact with siblings. The effects for the support index showed that an increase of one standard deviation in support to the surviving parent was associated with an 8% increase in phone contact with siblings. Taken together, these measures explained some of the increase in siblings' phone contact found for the death year of the first parent, but mediation was less pronounced compared to face-to-face contact. The transition effect declined from 0.16 to 0.12, a statistically significant but modest decline.

Figure 1 illustrates all findings on changes in sibling contact following the death of the first parent. The figure not only shows the transition effects (the black 'unadjusted' line) but also the extent to which these effects declined after controlling for changes in measures for contact and solidarity with the surviving parent (the grey 'adjusted' line).

- Figure 1 -

Next, we turn to the effects of the death of the second parent on siblings' face-to-face contact (Model 3) and phone contact (Model 4). In Model 3b, we observed a positive transition effect and a negative duration effect of the second parent's death. The quadratic term was positive but the main pattern was a downward slope, as the linear model (3a) shows. This indicates that face-to-face contact increased after the death of the second parent but declined strongly in subsequent years. Although these declines leveled off, as indicated by the positive effects of squared duration in Model 3b, face-to-face contact levels dropped substantially below those found while the parent was still alive. These long-term effects are illustrated in Figure 2. For face-to-face contact, we found a long-term decline in sibling contact of approximately 30 percent (the marginal effect after seven years is close to -.30, as the figure shows).

For phone contact, we observed a similar pattern: a positive transition effect followed by a negative duration effect. The increase in phone contact was stronger than the increase in face-to-face contact: the coefficient indicated an increase of more than 20 percent compared with the reference period. For phone contact, long-term declines were less pronounced but still amounted to approximately 15 percent. In sum, we see a pattern of temporary increases in contact after the death of the second parent followed by long-term declines in contact to levels below levels observed while the second parent was still alive.

- Figure 2 –

In additional analyses (not shown), we examined whether the effect of the second parent's death was due to the fact that in the majority of these cases (75% in our data), the mother died after the father. Although this was consistent with our perspective on mothers as primary kinkeepers, we further explored whether the long-term decline in sibling contact was even stronger after the loss of the mother. However, we found no significant interactions between the indicators for the second parent's death (transition and duration effects) and the

gender of the second parent on the frequency of face-to-face and phone contact between siblings. This suggests that the pattern observed in our data was due to the second parent's, rather than the mother's, death.

In Table 4 we present the findings of our fixed-effects logit models (5, 6a, 6b) and fixed-effects linear probability models (7, 8a, 8b) for changes in sibling conflict. For the death of the first parent, we found no significant changes. Sibling conflict was generally rare and did not change in response to the first parent's death. For the loss of the second parent, we found a statistically insignificant initial increase in sibling conflict, followed by a gradual decline below the levels found in the reference period. The negative duration effect on conflict was statistically significant. Average marginal effects (not shown) indicated that the prevalence of sibling conflict approached zero in the years after the second parent's death. The linear and logit models both revealed the significant decline after the second parent's death. The logit model indicated a stronger initial increase in conflict than the linear model, but this can be attributed to the fact that the logit model captures relative changes. Conflict is uncommon so that a small absolute increase in conflict can be substantial in relative terms.

- Table 4 -

CONCLUSION AND DISCUSSION

Our overall pattern of findings is consistent with most but not all expectations deduced from the solidarity perspective. Hypothesis 1 was supported, as sibling contact generally increased in the year in which siblings lost a parent. Hypothesis 2 received support as well. Positive effects on sibling contact were stronger for the first parent's death, which is in line with the idea that sibling contact increases in part because the surviving parent needs support. However, this applied only to face-to-face contact. Hypothesis 3 about the mediating role of relationships to the surviving parent was most clearly supported for siblings' face-to-face

contact, where almost half of the increases found were due to changes in solidarity with the remaining parent. Yet for both types of contact, independent effects on sibling relationships, albeit moderate in size, remained after adjusting for changes in intergenerational relationships. Overall, these findings support the intergenerational solidarity perspective on sibling ties, suggesting that sibling solidarity is to a large extent governed by parents and resides not solely between siblings.

The second set of hypotheses was based on the notion of kinkeeping. Hypothesis 4 addressed the kinkeeper effect, positing that the loss of the second parent reduces sibling cohesion in the long term. This hypothesis was corroborated. Both measures of contact indicated long-term declines, and these effects were substantial in size for face-to-face contact. Moreover, the frequency of contact after the second parent's death declined to levels that were considerably lower than the levels observed while one or two parents were still alive. Additional analyses showed that the effect of the second parent's death was not due to the fact that this parent is often the mother.

We found no support for Hypothesis 5 which argued that parental death temporarily stirs up conflict between siblings. Instead, the pattern we found was consistent with Hypothesis 6, indicating a decline in conflict after death. Together with the decline in contact, we interpret this as evidence for fading instead of deteriorating sibling relationships following the loss of an integrative actor in the family network. An important implication of this pattern is that growth and cohesion of the extended family network is limited. Initially, conjugal families are connected by strong sibling ties, but the death of parents will gradually undermine these connections and give room for new families, formed lower in the family tree, to connect and build a new extended family network.

In concluding, it is important to position our paper in the current literature on the link between parental death and sibling relations. Our analysis has provided more clarity about

this link in a number of ways. Previous studies that examined this link have reported weak and uneven effects (Khodyakov & Carr, 2009; Voorpostel et al., 2012; White, 2001; White & Riedmann, 1992). This inconsistent picture may be due to the complex dynamics associated with the effects of parental death. As shown in our analysis, short-term effects differ from effects found in the longer term. Moreover, the consequences of losing the first and the second parent differ in important and theoretically meaningful ways, as demonstrated by our evidence on long-term positive effects of the first parent's death and long-term negative effects of the second parent's death. Given that previous studies used designs that were less detailed – often caused by the limited number of waves that authors had at their disposal – these contrasting effects may have canceled each other out. Of course, our findings apply to the Netherlands whereas the previous findings in this literature largely apply to the American context.

Our analysis provides yet another example for the benefits of going beyond the dyadic approach to family relationships (Voorpostel & Blieszner, 2008), as changes in one relationship depend on changes in another. The linked lives principle in the study of families is best addressed in analyses that cover the extended family network more comprehensively than the common focus on vertical or horizontal ties. As shown in our analysis, changes in horizontal ties between siblings followed to a large extent from changes in vertical ties between siblings and their parents. One important implication is that sibling ties can be understood better when they are studied in the context of the larger family network. Such an approach would also ideally also include the role of siblings' partners and children, leading to a complex set of family dyads at three generational levels. In such networks, sibling dyads will influence, and be influenced by, other dyads in the network. Although such network data are difficult to collect, especially in population surveys, the methodological tools for analyzing such data already exist in the network literature.

We conclude with limitations and questions for further study. One limitation is that we examined only the Dutch context. Although the Netherlands represent a typical Western European case, it remains to be seen if our results replicate in the U.S. or other European countries. Another limitation concerns our outcome measures. Contact may entail not only harmonious interactions but also ambivalence and tension. Although we included conflict as an outcome – which did not suggest that there were frequent tensions between siblings – our measure was still rather basic. A broader set of measures on the negative dimension of intergenerational relations (Connidis, 2015) could provide better insight into relationship quality more generally. We also note that conflict was measured for only two siblings, with only one item, and only for a short recall period of time (the last three months), resulting in a rather low frequency of conflict. Future studies could use more elaborate measures to examine changes in sibling conflict in greater detail. Another limitation is that our measures of contact in the sibling tie were all based on reports by the respondent (single reporter). Ideally, one would like to have reports from both sides of the dyad, this will reduce measurement error and provide a more accurate estimate of the frequency of contact. Moreover, the mediation effect we found may have been stronger when we would have had reports from the siblings on how much support they provided to the surviving parent; currently we only know this for the respondent. A final limitation concerns the evidence on the solidarity hypothesis. Our interpretation is that solidarity with the surviving parent promotes sibling contact. Although this interpretation is corroborated by an overall pattern of stronger mediation for face-to-face contact and weaker mediation for phone contact, we cannot rule out the alternative interpretation that increased sibling contact promotes solidarity with the surviving parent.

Finally, we note that future research could focus more directly on kinkeeping and family cohesion. Although our study has provided initial insight into the role of older parents

as integrative figures that connect conjugal families, we lacked direct measures of kinkeeper figures and kinkeeping activities in the family network before and after the death of parents. Longitudinal information about how proximate and extended kin enter, leave, and pass on role positions in the family network would allow future analysts to reveal more about the dynamics of kinkeeping and the importance of kinkeepers for maintaining cohesion across the intertwined life courses of family members.

REFERENCES

Bengtson, V. L., Biblarz, T., Clarke, E., Giarrusso, R., Roberts, R., Richlin-Klonsky, J., & Silverstein, M. (2006). Intergenerational Relationships and Aging: Families, Cohorts, and Social Change.

Bengtson, V. L., & Roberts, R. E. L. (1991). Intergenerational Solidarity in Aging Families - an Example of Formal Theory Construction. *Journal of Marriage and the Family, 53*(4), 856-870.

Blake, J. (1989). *Family Size and Achievement.* University of California, Berkeley, CA.

Brody, G. H. (1998). Sibling Relationship Quality: Its Causes and Consequences. *Annual Review of Psychology, 49*, 1-24. doi: 10.1146/annurev.psych.49.1.1

Cicirelli, V. G. (1994). Sibling Relations in Cross-Cultural Perspective. *Journal of Marriage and the Family, 56*, 7-20.

Connidis, I. A. (1989). Siblings as Friends in Later Life. *American Behavioral Scientist, 33*(1), 81-93. doi: 10.1177/0002764289033001008

Connidis, I. A. (1992). Life Transitions and the Adult Sibling Tie: A Qualitative Study. *Journal of Marriage and the Family, 54*(4), 972-982. doi: 10.2307/353176

Connidis, I. A. (2015). Exploring Ambivalence in Family Ties: Progress and Prospects. *Journal of Marriage and Family, 77*(1), 77-95. doi: 10.1111/jomf.12150

Connidis, I. A., & Kemp, C. L. (2008). Negotiating Actual and Anticipated Parental Support: Multiple Sibling Voices in Three-Generation Families. *Journal of Aging Studies, 22*(3), 229-238. doi: 10.1016/j.jaging.2007.06.002

Dykstra, P. A., Kalmijn, M., Knijn, T. C. M., Komter, A. E., Liefbroer, A. C., & Mulder, C. H. (2006). *Family Solidarity in the Netherlands*. Amsterdam: Dutch University Press.

Dykstra, P. A., Kalmijn, M., Knijn, T. C. M., Komter, A. E., Liefbroer, A. C., & Mulder, C. H. (2007). *Codebook of the Netherlands Kinship Panel Study Wave 2*. The Hague: Netherlands Interdisciplinary Demographic Institute.

Dykstra, P. A., Kalmijn, M., Komter, A. E., Liefbroer, A., & Mulder, C. H. (2005). Codebook of the Netherlands Kinship Panel Study, a Multi-Actor, Multi-Method Panel Study on Solidarity in Family Relationships, Wave 1 *NKPS Working Paper No. 4*. The Hague: Netherlands Interdisciplinary Demographic Institute.

Eriksen, S., & Gerstel, N. (2002). A Labor of Love or Labor Itself - Care Work among Adult Brothers and Sisters. *Journal of Family Issues, 23*(7), 836-856. doi: 10.1177/019251302236597

Finch, J., & Mason, J. (1993). *Negotiating Family Responsibilities*: Tavistock/Routledge.

Floyd, K. (1995). Gender and Closness among Friends and Siblings. *Journal of Psychology, 129*(2), 193-202. doi: 10.1080/00223980.1995.9914958

Fuller-Thomson, E. (2000). Loss of the Kin-Keeper?: Sibling Conflict Following Parental Death. *Omega-Journal of Death and Dying, 40*(4), 547-559. doi: 10.2190/j357-qf31-f0fc-pv4u

Hagestad, G. O. (1986). The Family: Women and Grandparents as Kinkeepers. In A. Pifer & L. Bronte (Eds.), *Our Aging Society: Paradox and Promise*. New York: Norton.

Hank, K. (2007). Proximity and Contacts between Older Parents and Their Children: A European Comparison. *Journal of Marriage and Family, 69*(1), 157-173. doi: 10.1111/j.1741-3737.2006.00351.x

Hogerbrugge, M. J. A., De Hoon, S., Dykstra, P. A., Komter, A. E., Liefbroer, A. C., & Mulder, C. H. (2015). *Codebook of the Netherlands Kinship Panel Study Wave 4*. The Hague: Netherlands Interdisciplinary Demographic Institute.

Ingersoll-Dayton, B., Neal, M. B., Ha, J. H., & Hammer, L. B. (2003). Redressing Inequity in Parent Care among Siblings. *Journal of Marriage and Family, 65*(1), 201-212. doi: 10.1111/j.1741-3737.2003.00201.x

Kalmijn, M. (2006). Educational Inequality and Family Relationships: Influences on Contact and Proximity. *European Sociological Review, 22*(1), 1-16. doi: 10.1093/esr/jci036

Kalmijn, M. (2017). The Ambiguous Link between Marriage and Health: A Dynamic Reanalysis of Loss and Gain Effects. *Social Forces, 95*(4), 1607-1636. doi: 10.1093/sf/sox015

Khodyakov, D., & Carr, D. (2009). The Impact of Late-Life Parental Death on Adult Sibling Relationships Do Parents' Advance Directives Help or Hurt? *Research on Aging, 31*(5), 495-519. doi: 10.1177/0164027509337193

Kohler, U., & Karlson, K. (2012). Khb: Stata Module to Decompose Total Effects into Direct and Indirect Via Khb-Method *Statistical Software Components*. Boston: Boston College Department of Economics.

Lashewicz, B., & Keating, N. (2009). Tensions among Siblings in Parent Care. *European Journal of Ageing, 6*(2), 127-135. doi: 10.1007/s10433-009-0109-9

Leopold, T., & Kalmijn, M. (2016). Is Divorce More Painful When Couples Have Children? Evidence from Long-Term Panel Data on Multiple Domains of Well-Being. *Demography, 53*(6), 1717-1742. doi: 10.1007/s13524-016-0518-2

Leopold, T., & Lechner, C. M. (2015). Parents' Death and Adult Well-Being: Gender, Age, and Adaptation to Filial Bereavement. *Journal of Marriage and Family, 77*(3), 747-760. doi: 10.1111/jomf.12186

Luescher, K. (2002). Intergenerational Ambivalence: Further Steps in Theory and Research. *Journal of Marriage and Family, 64*(3), 585-593. doi: 10.1111/j.1741-3737.2002.00585.x

Marks, N. F., Jun, H., & Song, J. (2007). Death of Parents and Adult Psychological and Physical Well-Being - a Prospective Us National Study. *Journal of Family Issues, 28*(12), 1611-1638. doi: 10.1177/0192513x07302728

Merz, E.-M., Dykstra, P. A., Hogerbrugge, M. J. A., Komter, A. E., C., L. A., & Mulder, C. H. (2012). *Codebook of the Netherlands Kinship Panel Study Wave 3*. The Hague: Netherlands Interdisciplinary Demographic Institute.

Petersen, T. (2004). Analyzing Panel Data: Fixed- and Random-Effects Models. In M. Hardy & A. Bryman (Eds.), *Handbook of Data Analysis* (pp. 331-345). London: Sage.

Riley, M. W., & Riley, J. W., Jr. (1993). Connections: Kin and Cohort. In V. L. Bengtson & W. A. Achenbaum (Eds.), *The Changing Contract across Generations* (pp. 169-190). Hawthorne, NY: Aldine de Gruyter.

Rosenthal, C. J. (1985). Kinkeeping in the Familial Division of Labor. *Journal of Marriage and the Family, 47*, 965-974.

Silverstein, M., & Bengtson, V. L. (1997). Intergenerational Solidarity and the Structure of Adult Child-Parent Relationships in American Families. *American Journal of Sociology, 103*, 429-460.

Spitze, G., & Trent, K. (2006). Gender Differences in Adult Sibling Relations in Two-Child Families. *Journal of Marriage and Family, 68*(4), 977-992. doi: 10.1111/j.1741-3737.2006.00308.x

Spitze, G. D., & Trent, K. (2016). Changes in Individual Sibling Relationships in Response to Life Events. *Journal of Family Issues, advance access*.

Steelman, L. C., Powell, B., Werum, R., & Carter, S. (2002). Reconsidering the Effects of Sibling Configuration: Recent Advances and Challenges. *Annual Review of Sociology, 28*(1), 243-269. doi: 10.1146/annurev.soc.28.111301.093304

Steinbach, A. (2008). Intergenerational Solidarity and Ambivalence: Types of Relationships in German Families. *Journal of Comparative Family Studies, 39*(1), 115-+.

Stroebe, M., Schut, H., & Stroebe, W. (2007). Health Outcomes of Bereavement. *Lancet, 370*(9603), 1960-1973. doi: 10.1016/s0140-6736(07)61816-9

Suitor, J. J., Sechrist, J., & Pillemer, K. (2007). When Mothers Have Favourites: Conditions under Which Mothers Differentiate among Their Adult Children. *Canadian Journal on Aging-Revue Canadienne Du Vieillissement, 26*(2), 85-99.

Suitor, J. J., Sechrist, J., Plikuhn, M., Pardo, S. T., Gilligan, M., & Pillemer, K. (2009). The Role of Perceived Maternal Favoritism in Sibling Relations in Midlife. *Journal of Marriage and the Family, 71*(4), 1026-1038.

Suitor, J. J., Sechrist, J., Plikuhn, M., Pardo, S. T., & Pillemer, K. (2008). Within-Family Differences in Parent-Child Relations across the Life Course. *Current Directions in Psychological Science, 17*(5), 334-338.

Szydlik, M. (2016). *Sharing Lives: Adult Children and Parents*. Oxon: Routledge.

Umberson, D. (2003). *Death of a Parent: Transition to a New Adult Identity*. New York: Cambridge University Press.

Van Gaalen, R. I., & Dykstra, P. A. (2006). Solidarity and Conflicts between Adult Children and Parents: A Latent Class Approach. *Journal of Marriage and Family, 68*(4), 947-960.

Voorpostel, M. (2007). *Sibling Support : The Exchange of Help among Brothers and Sisters in the Netherlands*. Dissertation: Utrecht University.

Voorpostel, M., & Blieszner, R. (2008). Intergenerational Solidarity and Support between Adult Siblings. *Journal of Marriage and Family, 70*(1), 157-167.

Voorpostel, M., & Van der Lippe, T. (2007). Support between Siblings and between Friends: Two Worlds Apart? *Journal of Marriage and Family, 69*(5), 1271-1282. doi: 10.1111/j.1741-3737.2007.00446.x

Voorpostel, M., van der Lippe, T., & Flap, H. (2012). For Better or Worse: Negative Life Events and Sibling Relationships. *International Sociology, 27*(3), 330-348. doi: 10.1177/0268580911423051

Waite, L., & Harrison, S. C. (1992). Keeping in Touch: How Women in Mid-Life Allocate Social Contacts among Kith and Kin. *Social Forces, 70*, 637-655.

White, L. (2001). Sibling Relationships over the Life Course: A Panel Analysis. *Journal of Marriage and Family, 63*(2), 555-568. doi: 10.1111/j.1741-3737.2001.00555.x

White, L. K., & Riedmann, A. (1992). Ties among Adult Siblings. *Social Forces, 71*(1), 85-102. doi: 10.2307/2579967

Wortman, C. B., Cohen Silver, R., & Kessler, R. C. (1993). The Meaning of Loss and Adjustment to Bereavement. In M. Stroebe, W. Stroebe & R. O. Hansson (Eds.), *Handbook of Bereavement: Theory, Research and Intervention* (pp. 349-366). Cambridge: Cambridge University Press.

Sibling contact and parental death

<div align="center">Table 1. Descriptive Statistics</div>

	M	*SD*	Min	Max	*N*	Description
Dependent variables						
Face-to-face contact (ln)	2.15	1.16	0	5.7	30,289	Frequency of face-to-face contact to all non-coresident siblings in the past 12 months. Measured on a 7-point scale recoded into days per year (see text). Logged for the estimation.
Phone contact (ln)	2.18	1.27	0	5.7	30,289	Frequency of phone, email or mail contact to all non-coresident siblings in the past 12 months. Measured on a 7-point scale recoded into days per year.[a] Logged for the estimation.
Conflict	1.12	0.37	1	3	18,108	Frequency of conflict, strain or disagreements with non-coresident siblings in the past 3 months (2 random siblings). *Regularly* = 3, *A few times* = 2, *Never* = 1. Dichotomous version is 2 + 3 versus 1.
	0.10		0	1	18,108	
Variables for parental death						
Year of first parent's death	2007.5	3.1	2002	2014	1,761	Indicator variable changing from 0 to 1 in the year of the first parent's death. Descriptive statistics shown only for the year of death.
Years after first parent's death	4.46	2.87	1	12	2,786	Count variable for years after first parent's death. Zero in all years up to year of death. Descriptive statistics shown only for years after death.
Year of second parent's death	2007.8	3.1	2003	2014	2,586	Indicator variable changing from 0 to 1 in the year of the second parent's death. Descriptive statistics shown only for the year of death.
Years after second parent's death	4.16	2.69	1	11	4,077	Count variable for years after first parent's death. Zero in all years up to year of death. Descriptive statistics shown only for years after death.
Mediator variables						
F-t-f contact (surviving) parent(s)	48.59	62.58	0	300	25,786	Frequency of face-to-face contact in the past 12 months. Measured on a 7-point scale recoded into days per year.[a] Mean of mother and father used for years in which both parents were alive. Logged for the estimation.
Support (surviving) parent(s)	0.00	0.95	-2.21	2.59	26,513	Index calculated on the basis of eight items (frequency of giving and receiving practical support, household support, good advice, and emotional support). Mean of mother and father used for years in which both parents were alive. z-standardized.
Control variable						
Age	45.5	11.2	18	78	31,296	

Table 2. Frequency of Sibling Contact and Conflict in All Waves for All Dyads

Face-to-face contact	%	Cumulative
Daily	1.1	1.1
A few times a week	3.2	4.3
About once a week	11.3	15.6
About once a month	31.4	46.9
A few times	40.2	87.1
Once	5.3	92.4
Not at all	7.6	100.0
N		30,289
Phone contact	%	cumulative
Daily	1.2	1.2
A few times a week	4.1	5.3
About once a week	14.0	19.3
About once a month	28.7	47.9
A few times	37.6	85.5
Once	3.7	89.3
Not at all	10.8	100.0
N		30,289
Conflict	%	Cumulative
Several times	1.5	1.5
Once or twice	8.6	10.1
Not at all	89.9	100.0
N		18,108

Note: Netherlands Kinship Panel Study 2002-2014.

Sibling contact and parental death

	F-to-F contact Model 1a	F-to-F contact Model 1b	Phone contact Model 2a	Phone contact Model 2b	F-to-F contact Model 3a	F-to-F contact Model 3b	Phone contact Model 4a	Phone contact Model 4b
First parent's death								
Year of death	0.173*	0.100*	0.166*	0.123*				
	(.037)	(.037)	(.051)	(.051)				
Years after death	-0.010	-0.003	-0.018	-0.013				
	(.008)	(.009)	(.011)	(.011)				
Second parent's death								
Year of death					-0.006	0.068*	0.175*	0.208*
					(.030)	(.033)	(.039)	(.044)
Years after death					-0.040*	-0.099*	-0.045*	-0.072*
					(.005)	(.013)	(.007)	(.017)
Years after death squared						0.007*		0.003
						(.001)		(.002)
Other variables								
Personal contact surviving parent		0.189*		0.059*				
		(.017)		(.020)				
Support to surviving parent		0.022		0.075*				
		(.015)		(.020)				
Age centered and in decades	-0.236*	-0.214*	-0.064~	-0.070*	-0.241*	-0.242*	0.004	0.003
	(.027)	(.026)	(.035)	(.035)	(.017)	(.017)	(.021)	(.021)
Age squared	0.121*	0.104*	0.075*	0.065*	0.092*	0.091*	0.069*	0.068*
	(.014)	(.013)	(.017)	(.017)	(.009)	(.009)	(.011)	(.011)
Constant	1.965*	1.407*	2.147*	1.972*	2.052*	2.053*	2.095*	2.095*
	(.018)	(.055)	(.021)	(.065)	(.010)	(.010)	(.012)	(.012)
Mediation								
Of death effect		0.071*		0.042*				
		(.008)		(.008)				
Observations (dyad-years)	14,628	14,628	14,628	14,628	30,289	30,289	30,289	30,289
Dyads	5,223	5,223	5,223	5,223	10,338	10,338	10,338	10,338
F	75.67	68.20	14.18	14.95	119.42	99.56	21.61	17.57
S.d. between	1.057	0.949	1.116	1.087	1.065	1.065	1.135	1.135
S.d. within	0.633	0.622	0.784	0.781	0.631	0.630	0.785	0.785

Table 3. Fixed-Effects Regression of Changes in Contact with Siblings

Note: Netherlands Kinship Panel Study 2002-2014. Robust standard errors in parentheses. Outcome variables are logged. Standard errors in parentheses. Mediation by contact with and support to surviving parent.

* $p < 0.05$
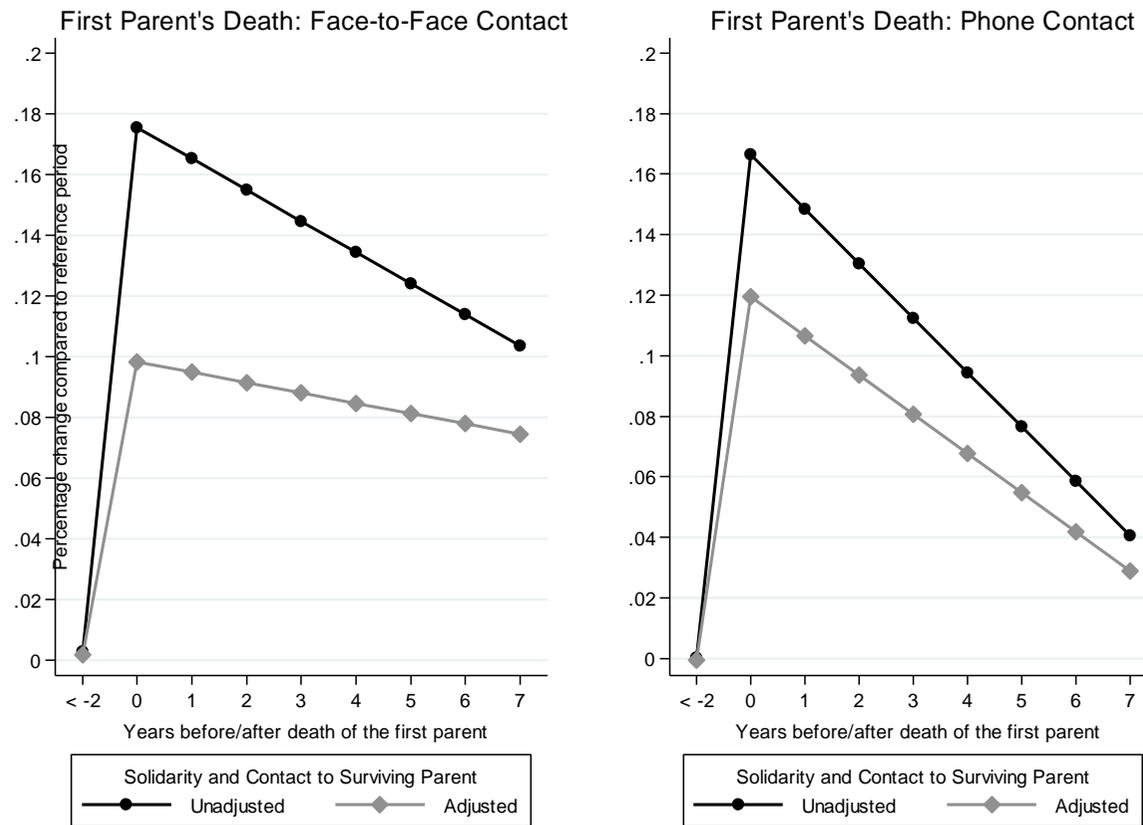
Sibling contact and parental death

	Logit Model 5	Logit Model 6a	Logit Model 6b	Linear probability Model 7	Linear probability Model 8a	Linear probability Model 8b
Table 4. Fixed-Effects Logit and Linear Probability Regression of Changes in Conflict with Siblings						
First parent's death						
Year of death	0.076			0.003		
	(.214)			(.017)		
Years after death	0.001			-0.001		
	(.047)			(.004)		
Second parent's death						
Year of death		0.284	0.400		0.010	0.020
		(.196)	(.223)		(.014)	(.018)
Years after death		-0.243*	-0.359*		-0.015*	-0.023*
		(.045)	(.116)		(.002)	(.007)
Years after death squared			0.014			0.001
			(.013)			(.001)
Other variables						
Age centered and	0.208	0.184	0.183	0.018	0.003	0.003
in decades	(.151)	(.094)	(.094)	(.014)	(.007)	(.007)
Age squared	0.398*	0.362*	0.361*	0.049*	0.029*	0.029*
	(.063)	(.044)	(.044)	(.008)	(.004)	(.004)
Constant				1.082*	0.072*	0.072*
				(.009)	(.004)	(.004)
Observations (dyad-years)	2,535	4,069	4,069	10275	18108	18108
Dyads	780	1,259	1,259	3518	6160	6160
F				11.93	18.31	14.67
Chi-2	56.28	89.51	90.70			
S.d. between				0.224	0.219	0.219
S.d. within				0.282	0.270	0.270

Note: Netherlands Kinship Panel Study 2002-2014. Robust standard errors in parentheses.

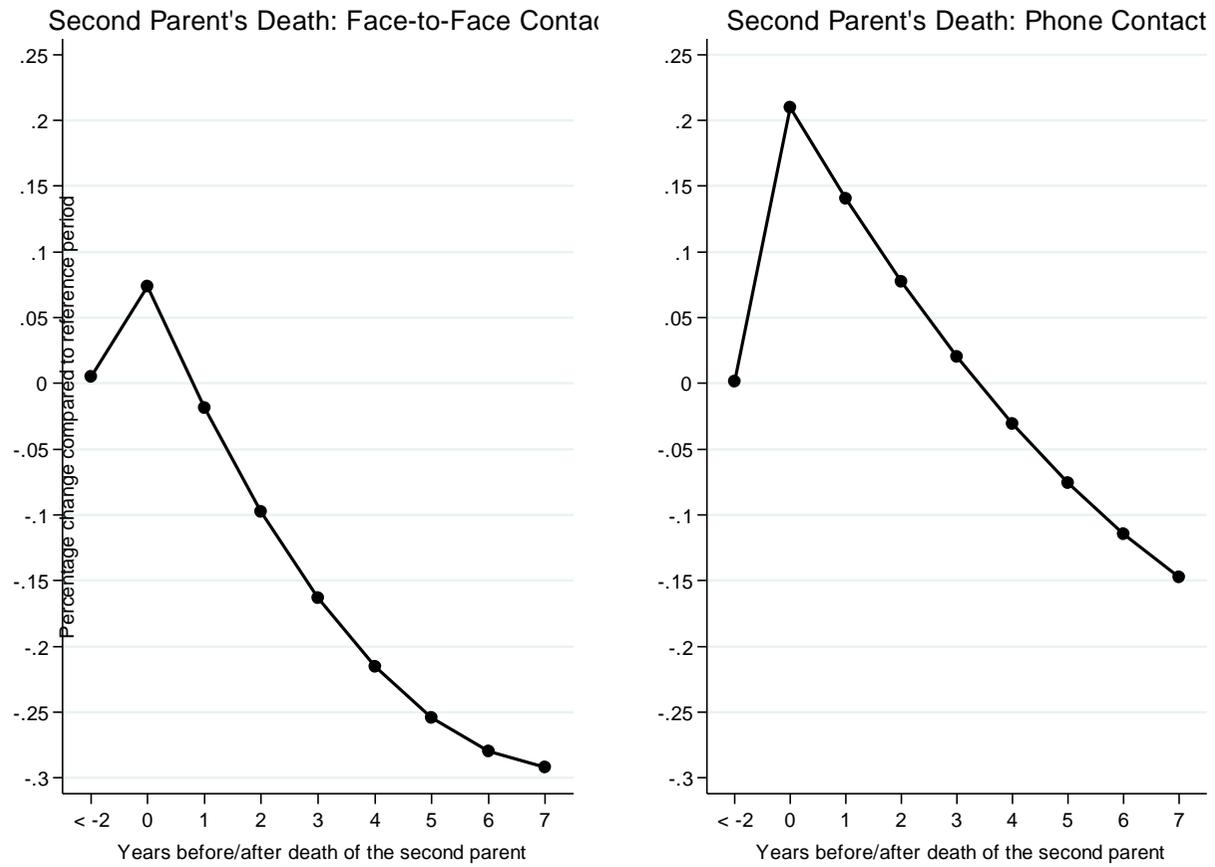* $p < 0.05$

Sibling contact and parental death

Figure 1. *First Parent's Death and Changes in Sibling Contact*

Note: Average marginal effects calculated from Models 1a/1b (left-hand plot)
and Models 2a/2b (right-hand plot).

Figure 2. *Second Parent's Death and Changes in Sibling Contact*

Note: Average marginal effects calculated from Model 3b (left-hand plot) and Model 4b (right-hand plot).