

Family breakups beyond childhood: Later-life parental divorce and adult sibling ties

Beyda Çineli^{1,2} & Zafer Buyukkececi^{3,4}

¹ Centre for Demographic Studies, ² Autonomous University of Barcelona, Department of Sociology, ³ Koç University, Department of Sociology, ⁴ Max Planck Institute for Demographic Research

Address correspondence to: Beyda Çineli, CED, Universitat Autònoma de Barcelona (UAB) Carrer de Can n'Altayó, Edifici E2 08193 Bellaterra / Barcelona, Spain. Email: bcineli@ced.uab.es

— Article —

Abstract

Objective: This study examines how later-life parental divorce is associated with changes in adult sibling relationships, focusing on contact, emotional closeness, intimacy, and conflict.

Background: Divorce is becoming increasingly common among older adults which is referred to as “gray divorce”. Although couple dissolution has implications for broader family dynamics, less is known about how later-life parental divorce shapes relationships among adult children. Prior research on sibling relationships has primarily focused on childhood and adolescence and has often relied on cross-sectional designs. Understanding how later-life parental divorce relates to adult sibling ties is important, given the central role siblings play in providing emotional and practical support across the life course.

Method: We use four waves of longitudinal data from the German Family Panel and employ fixed-effects models to examine within-individual changes in sibling contact, emotional closeness, intimacy, and conflict following later-life parental divorce.

Results: The frequency of contact and emotional closeness between adult siblings decreases following later-life parental divorce. Additional analyses indicate that female–male and male–male sibling dyads are more likely to experience increased conflict after later-life parental divorce compared to female–female dyads.

Conclusion: Later-life parental divorce is associated with meaningful changes in adult sibling relationships, suggesting that its consequences extend beyond the dissolving couple. Contrary to the assumption that divorce in later life has limited implications for adult children, our findings indicate that it may reshape sibling dynamics in complex ways.

Key words: Family relationships, adult siblings, later-life parental divorce, fixed effects



1. Introduction

Divorce is becoming increasingly common among middle-aged and older adults in many Western countries. More than a quarter of divorces in the United States occur among adults aged 50 or older (Brown & Lin, 2012). These rates have also increased in several European countries, including Germany (Bundesinstitut für Bevölkerungsforschung, 2022; Buyukkececi & Leopold, 2024; Buyukkececi, 2025; ONS, 2017; Solaz, 2021). However, research on divorce in later life has garnered less attention in Europe compared to the United States. This gap in research is partly attributed to methodological challenges, as longitudinal data are essential for studying this phenomenon.

Partnership dissolution in later life has sparked concerns about the economic well-being, physical and mental health of older adults, as well as their access to social support and caregiving services (DeShane & Brown-Wilson, 1982; Brown & Wright, 2017). After a partnership dissolution in later life, the role of children typically expands as they become more involved in their parent's emotional, physical, financial, and social well-being. Without a spouse or partner to provide these essential forms of support, children often step in to fill the gap, making their involvement increasingly critical (Silverstein & Bengtson, 1997).

Yet, while children's involvement becomes crucial after a parental split, divorce can also strain family dynamics, potentially weakening not only the bond between parents and children but also relationships among siblings themselves. Some previous studies have focused on relationships between parents and their adult children after divorce (Aquilino, 1994; Daatland, 2007; Grundy, 2005; Tomassini et al., 2007; Kalmijn, 2008, 2013; Scott et al., 2007; Swiss & Le Bourdais, 2009; Cheadle et al., 2010; Yu et al., 2010). This body of research shows that divorce often reduces contact and emotional closeness between parents and adult children and highlights how interparental conflict and repartnering can further complicate these ties. However, compared with the extensive literature on parent-adult child relationships after divorce, research on parental divorce and adult sibling relationships remains more limited (Gilligan et al., 2020). Studies investigating the relationship between parental divorce and sibling relationships are mainly cross-sectional and have focused either on childhood and adolescence (Amato, 1987; MacKinnon, 1989) or on young adulthood (Milevsky, 2004, 2019; Riggio, 2001).

While research on sibling relationships beyond young adulthood has grown in recent years, comparatively fewer studies have examined how parental divorce shapes these ties across adulthood (Poortman & Voorpostel, 2009; Steinbach & Hank, 2018). Additionally, it should be taken into consideration that these more recent studies using cross-sectional analysis include individuals whose parents divorced or separated at a very young age in their samples. For example, Poortman and Voorpostel (2009) report that, on average, the divorce in their sample took place about 20 years ago. Hence, the findings of these studies should be interpreted as indicating whether the effects of parental divorce at a younger age persist or diminish in adulthood, rather than as reflecting the consequences of divorce occurring later in the parents' life course. In terms of late-life parental divorce, the evidence remains limited and is predominantly based on qualitative research. Greenwood (2014) conducted one of the few studies in this area, using 40 interviews to explore how late-life parental divorce affects adult sibling relationships.

The current study builds upon previous work by examining changes in full-sibling relationships in young and mid-adulthood, specifically focusing on individuals aged 18 to 48 and their siblings, after parental divorce, using longitudinal data. By situating our analysis within this growing body of research, we extend existing cross-sectional findings (e.g., Poortman & Voorpostel, 2009; Steinbach & Hank, 2018) by focusing on parental divorce occurring later in life and by adopting a dynamic life course perspective. To our knowledge, this is the first study to examine the consequences of parental divorce in later life on adult sibling relationships using longitudinal data. We go beyond cross-sectional approaches by modeling within-individual changes before and after the event, rather than relying solely on retrospective or cross-sectional comparisons. Considering pre- and post-event levels is particularly important because it allows researchers to control for unobserved time-invariant factors that may be correlated with both the outcome of interest and the event itself, thereby enabling a clearer assessment of the impact of parental divorce later in life.

We derived hypotheses based on family systems theory and tested these hypotheses empirically using four waves of data from the German Family Panel (pairfam; Brüderl et al., 2016), which allowed us to track how adult full-sibling relationships changed over time. In particular, our analyses focused on four outcome variables of full-sibling relationships: (i) sibling contact, (ii) emotional closeness, (iii) intimacy, and (iv) conflict. Using fixed-effects models at the dyadic level, we provide a dynamic view of changes in these four dimensions before and after parental divorce during adulthood. As a second step, we also tested whether

the effects of parental divorce on sibling relationships differ by life stage and the gender constellation of sibling dyads.

2. Sibling relationship quality over the life course

In recent years, research on adult sibling relationships has expanded considerably; however, important questions remain about how these ties evolve across the life course. Sibling relationships develop over the entire life course, not just during childhood and adolescence. It can be argued that siblings play a minor role in daily adult life (Wellman & Wortley, 1990). However, if we shift our perspective from daily life to a lifetime perspective, it becomes evident that siblings play a more significant role. Most siblings share a family background, genetic ties, social class, and a network of interlinked family relationships. Sibling relationships are also among the longest-lasting ties (Mikkelsen, 2006). Previous evidence shows that, on average, adults contact a sibling once or twice a month for 60–70 years after leaving home (White & Riedmann, 1992), and sibling ties are important sources of affection and support (Spitze & Trent, 2006; Tanskanen & Danielsbacka, 2014; Voorpostel & Blieszner, 2008). Therefore, although they may not always appear central in daily routines, sibling relationships are remarkable in terms of their durability.

2.1 *Structural and normative factors*

Previous research has shown that, despite siblings' lifelong ties, the quality of their relationships changes over time. For example, some relationships might grow closer over time while others might become more conflictual, especially during the transition from childhood to adolescence and young adulthood (Jensen et al., 2022; Kim et al., 2006). These changes usually depend on individual factors such as the time spent together or the physical distance between siblings (Hamwey et al., 2019), as well as life transitions such as employment, romantic relationships, and parenthood (Jensen et al., 2018; Kara et al., 2022; White, 2001). Tanskanen and Danielsbacka (2021) identify 11 key factors shaping adult sibling relationship quality: early family experiences, parental treatment, sibling constellations, age difference, geographical proximity, shared responsibilities, parenthood status, gender composition, family values, family structure changes, and life course events. Among these factors, gender composition and age difference are particularly important for understanding the effects of late-life parental divorce.

Previous research examining the effect of gender composition on relationship quality has found that, across all stages of adulthood, sister–sister dyads have the closest relationships, spend the most time together, and provide more support to each other than other gender constellations (Connidis, 2010; Gilligan et al., 2015; Stocker et al., 2020; White, 2001; White & Riedmann, 1992). Sisters are also found to feel more responsible for the unity of the family (Spitze & Trent, 2006) and to sustain strong relationships, particularly by being present at major events in their siblings' lives such as marriage, death, or birth, and during times of financial or emotional difficulties (Cicirelli, 1995).

Sibling age differences play an important role in shaping the quality and dynamics of sibling relationships. Research has shown that larger age gaps between siblings are often associated with greater relationship satisfaction, as siblings may experience less direct competition and more opportunities for supportive interactions (Furman & Buhrmester, 1985). Similarly, siblings with an age difference of four years or more tend to exhibit higher levels of affection, prosocial behavior, and mutual admiration, suggesting that greater spacing may facilitate more positive interactions (Buhrmester & Furman, 1990). At the same time, older siblings often assume more dominant or guiding roles in the relationship, which can influence the balance of power and the ways in which siblings engage with one another (Pike & Oliver, 2017). Together, these findings indicate that age spacing is a key structural factor shaping sibling relationship quality over the life course.

2.2 *Life stage differences: Emerging vs. mid-adulthood*

Life stage may also shape how adult siblings respond to parental divorce. Specifically, the stage of adulthood may determine the resources, responsibilities, and social roles that siblings can draw on when navigating

the challenges posed by parental divorce. During childhood, siblings are more likely to share activities and experiences, which might result in comparison (Brody et al., 1994), competition, and rivalry (Van Volkom et al., 2011). Conflict and rivalry might arise due to small age differences, as siblings may perceive each other as competitors for limited emotional or material resources (Milevsky et al., 2005). However, during adolescence, these patterns are likely to change due to a decrease in the shared environment and a possible increase in physical distance (Kim et al., 2006). With emerging adulthood, defined as the 18–29 age group (Arnett, 2007; Arnett et al., 2014), siblings tend to develop more mature relationships and to appreciate each other's company more (Conger & Little, 2010; White, 2001).

Previous research also distinguishes between young adult and older adult relationships, with findings showing that older adults are more likely to have positive relationships with their siblings compared to younger adults (Bedford et al., 2012; Connidis, 2010; White, 2001). For example, Stocker et al. (2020) found that levels of sibling conflict and parental favoritism among older adults were typically lower than those found in childhood, adolescence, and young adulthood. Previous research has also shown that adult siblings are more likely to exchange both emotional and instrumental support (Campbell et al., 1999; Eriksen & Gerstel, 2002; White, 2001; White & Riedmann, 1992). Moreover, older adults reported more positive views of family relationships in general (Winkeler et al., 2000). Hence, it can be argued that individuals evaluate their sibling relationships more favorably in later adulthood than during earlier stages of development.

3. Theoretical framework and previous findings on parental divorce and siblings

Family systems theory emphasizes the interconnected nature of family relationship dynamics (Minuchin, 1995). According to this theory, the three main subsystems—marital, parent–child, and sibling—may influence one another as well as the overall family system (Baham et al., 2008; Cox & Paley, 1997; Minuchin, 1995). In line with this theory, in cohesive nuclear families, the quality of the parent relationship is associated with the quality of sibling relationships (Milevsky, 2004; Poortman & Voorpostel, 2009).

However, there are competing theoretical perspectives regarding whether sibling relationships will be affected positively or negatively after parental separation. The buffering hypothesis suggests that siblings will develop closer relationships because they will seek support from each other during this stressful period (Bank & Kahn, 1982; Hetherington, 1988). According to this view, dormant family ties can become more active in times of crisis or critical life events such as parental divorce. On the other hand, the spillover hypothesis explains how family subsystems affect each other (Engfer, 1988; Repetti, 1987). From a social learning perspective, the spillover hypothesis suggests that children may learn conflictual interaction patterns from parental divorce or marital conflict, which can carry over into their relationships with siblings (Bandura, 1977). Consistent with this view, research has found that children and adolescents from divorced families are more likely to experience higher levels of conflict and hostility in their interactions with siblings (Amato, 1987; MacKinnon, 1989).

Regarding adult children's sibling relationships, the mechanisms of the spillover hypothesis are not sufficiently explored. However, some researchers (Campbell, 1995; Cooney, 1994; Lang & Pett, 1992) argue that adults might have a difficult time dealing with their parents' divorce because of the complexities of this stage in life. We anticipate that these potential mechanisms will not only affect the siblings individually but also influence the dynamics of their relationships. The most common theme expressed in qualitative studies is the issue of parentification or role reversals. Previous evidence shows that many adult children had to assume roles and tasks that were previously managed by mothers, including maintaining family traditions, holidays, and birthday gatherings when the mother was not present (Lang & Pett, 1992). Some were also expected to assume roles as caregivers, mediators, or confidants in relation to their parents (Campbell, 1995). Another common theme expressed by adult children of divorce is a feeling of pressure from parents to take sides, resulting in considerable stress (Cooney et al., 1986). Finally, some adult children of divorce were negatively affected because many aspects of family life were disrupted, including changes in family rituals, celebrations, and activities (Lang et al., 1992). These disruptions can diminish opportunities for bonding and shared experiences, leading to weakened family cohesion and a sense of loss in established routines and traditions. Research indicates that family rituals play a crucial role in maintaining family identity and emotional connection. When these rituals are altered or discontinued post-divorce, adult children may experience a sense of disconnection and grief over the loss of familiar family practices (Pett et al., 1992; Lang, 2010).

The previous evidence on adult sibling relationships after divorce is mainly cross-sectional, and in most of these studies the parental divorce or separation occurred when the siblings were younger. Within these limitations, the findings are mixed, with support for both the buffering and the spillover hypotheses. Some research on young adult siblings of divorced parents has found that they were less close and less supportive than siblings from non-divorced families, suggesting spillover effects of parental conflict into the sibling subsystem (Milevsky, 2004, 2019; Riggio, 2001; Hollifield & Conger, 2015). On the other hand, studies including older adults present ambivalent findings. For example, full siblings whose parents were separated were found to be emotionally closer than siblings from two-parent families (Poortman & Voorpostel, 2009; Steinbach & Hank, 2018). However, these studies also show that siblings from divorced families were more likely to experience conflict in adulthood than siblings from families with married parents. Qualitative evidence further suggests that adult sibling relationships may deteriorate when siblings “take sides” during the divorce process (Greenwood, 2014).

It should be taken into consideration that since the parental divorce in these studies took place when the siblings were younger, the evidence for positive aspects of sibling relationships can be interpreted as indicating that the negative effects of parental separation may wear off as siblings enter adulthood. Moreover, the observed associations between parental divorce and sibling relationships may be due to selection processes rather than the actual effects of parental separation.

4. Hypotheses

Parental divorce may influence adult sibling relationships through two potentially opposing mechanisms. The buffering hypothesis suggests that siblings may grow closer during this stressful period as they provide mutual support (Bank & Kahn, 1982; Hetherington, 1988). In contrast, the spillover hypothesis proposes that parental marital conflict may extend into the sibling subsystem, potentially weakening relationships (Engfer, 1988; Repetti, 1987). Given these contrasting mechanisms, the overall effect of parental divorce on adult sibling relationships is theoretically ambiguous. *Hypothesis 1* therefore states that parental divorce is associated with adult sibling relationships, but the direction and magnitude of this association remain an empirical question.

We next examine whether the effect varies by sibling gender composition. Previous research consistently finds that, across adulthood, sister–sister dyads report closer relationships than other gender compositions (Connidis, 2010; Gilligan et al., 2015; Stocker et al., 2020; White, 2001; White & Riedmann, 1992). Accordingly, *Hypothesis 2* proposes that sister–sister dyads will report higher contact frequency, emotional closeness, and intimacy, and lower conflict following parental divorce than other sibling compositions.

Age difference between siblings may also shape how parental divorce affects their relationship. Prior research suggests that smaller age gaps may increase rivalry and competition (Furman & Buhrmester, 1985; Buhrmester & Furman, 1990; Pike, 2016). Thus, *Hypothesis 3* states that siblings with smaller age differences will experience greater declines in contact frequency, emotional closeness, and intimacy, and potentially higher conflict following parental divorce compared with siblings with larger age differences.

Finally, differences in life stage may moderate the effects of parental divorce. Older adults are generally more likely to report positive sibling relationships than younger adults (Bedford & Avioli, 2012; Connidis, 2010; White, 2001). Therefore, *Hypothesis 4* proposes that adults in mid-adulthood will report higher contact frequency, emotional closeness, and intimacy, and lower conflict following parental divorce compared with emerging adults.

5. Method

5.1 Data and sample

Our empirical analyses are based on data from the German Family Panel (pairfam; Brüderl et al., 2016). Pairfam is designed as a stratified random sample of three nationally representative birth cohorts (1971–

1973; 1981–1983; 1991–1993). Launched in 2008, it is a multidisciplinary longitudinal study that focuses primarily on partnership and family dynamics in Germany and is surveyed annually. In Wave I (2008/2009), more than 12,000 computer-assisted interviews were conducted, followed by annual repeat interviews. While attrition was relatively high in Wave II (23%), it stabilized at around 10% in the later waves, which is common in the German context (see Müller & Castiglioni, 2015). The fifth wave of Pairfam included a sibling module in which individuals were asked to list all their siblings. Starting in Wave V, a biannual module collected information on respondents' relationships with up to four randomly selected siblings. Accordingly, our baseline for the longitudinal analyses across four waves was Wave V, and we further used data from Waves VII, IX, and XI.

To create an appropriate sample for the analyses, we made a number of selections. Of the 7,248 individuals who participated in Wave V, we retained those who reported at least one sibling ($n = 6,415$). Second, we restricted analyses to individuals who participated in at least two of the four waves examined ($n = 5,941$) and had at least one sibling with no missing birth year information ($n = 5,055$). Finally, because we focused on how parental divorce affected sibling relationships, we included only individuals whose both parents were alive and married in Wave V ($n = 3,100$) and who had full siblings ($n = 2,981$). Given the generational context of our sample, cohabitation among the parental age group was low. According to the Federal Statistical Office (Engstler & Menning, 2004), in 2000, only 3.3% of couples aged 50 or older in West Germany and 3.7% in East Germany were in non-marital partnerships. This finding aligns with our data, as less than 1% reported that their parents were unmarried but cohabiting. Consequently, our primary analyses focused on parental divorce rather than separation.

In our study, data on sibling relationships were self-reported by respondents in pairfam, meaning the analyses reflect the quality of relationships as perceived by the anchors. Anchors were asked to provide information about up to four siblings in subsequent waves (i.e., Waves VII, IX, and XI). Using these data, we created dyadic datasets, with the unit of analysis being sibling dyads. This approach allowed us to expand the dataset to include a total of 4,954 sibling dyads. Within this group, 222 dyads (involving 163 anchors) experienced parental divorce during the six-year observation period, while 4,732 dyads did not experience parental divorce in later life and served as the control group. Consequently, the final sample consisted of two subsamples: (i) respondents who experienced parental divorce (the event sample) and (ii) respondents who did not experience parental divorce during the observation period (the control sample). The latter group allowed us to capture age-related changes in the outcome measures (White, 2001).

5.2 Measures

The descriptive statistics of the variables included in the main models and the measurement details are presented in Table 1. In our analyses, we used four outcome measures, namely contact frequency, emotional closeness, intimacy, and conflict between sibling pairs. The operationalization of these sibling relationship outcomes is based on well-established measures, such as the Network of Relationship Inventory (NRI) developed by Furman and Buhrmester (1985), as well as previous studies utilizing the Pairfam dataset to assess sibling relationships (see Buyukkececi & Çineli, 2024; Hank, 2021; Steinbach & Hank, 2018). To measure the frequency of contact between siblings, we used a 7-point scale asking “How often are you in contact with your sibling, adding up all visits, letters, phone calls, etc.?” (response categories: 0 = “never,” 1 = “less often than several times per year,” 2 = “several times per year,” 3 = “1 to 3 times per month,” 4 = “once per week,” 5 = “several times per week,” and 6 = “daily”).

The second outcome measure, emotional closeness, was measured with a single item asking respondents how close they feel emotionally to each sibling these days (response categories: 1 = “not close at all,” 2 = “somewhat less close than average,” 3 = “about average,” 4 = “somewhat closer than average,” and 5 = “very close”). Intimacy is a composite measure of two items (Cronbach's $\alpha = 0.88$) taken from the Network of Relationship Inventory (NRI; Furman & Buhrmester, 1985): (i) how often do you tell your sibling what you are thinking, and (ii) how often do you share your secrets and private feelings with your sibling (response categories: 1 = “never,” 2 = “seldom,” 3 = “sometimes,” 4 = “often,” and 5 = “always”).

The final outcome variable, conflict, also included two NRI items (Cronbach's $\alpha = 0.86$): (i) how often do you and your sibling disagree and quarrel, and (ii) how often are you and your sibling annoyed or angry with each other (response categories: 1 = “never,” 2 = “seldom,” 3 = “sometimes,” 4 = “often,” and 5 = “always”). To facilitate comparability across the four outcomes, we z-standardized each measure so that it had a mean of 0 and a standard deviation of 1.

Table 1: Descriptive statistics

Variable	Mean	SD	Min	Max	n	Description
Dependent variables						
Frequency of contact (raw)	4.84	1.52	1	7	16,746	How often are you in contact with <i>the sibling</i> , including all visits, letters, phone calls, etc.?
(standardized)	0.00	1.00	-2.50	1.41	16,746	
Emotional closeness (raw)	3.58	1.00	1	5	16,473	How close do you feel to <i>the sibling</i> emotionally?
(standardized)	0.00	1.00	-2.40	1.41	16,473	
Intimacy (raw)	2.40	0.98	1	5	16,474	How often do you tell <i>the sibling</i> what you are thinking?
(standardized)	0.00	1.00	-1.23	3.63	16,474	How often do you share with <i>the sibling</i> your secrets and private feelings?
Conflict (raw)	2.03	0.82	1	5	16,462	How often do you and <i>the sibling</i> disagree and quarrel?
(standardized)	0.00	1.00	-1.38	2.65	16,462	How often are you and <i>the sibling</i> annoyed or angry with each other?
Outcome variable						
Parental divorce	0.02		0	1	17,010	Whether the parents are divorced
Control variables						
Age	32.27	8.59	18	48	17,546	
Travel time to sibling	2.99	1.64	1	6	16,454	How much time do you need to get to <i>the sibling's</i> dwelling?

Note: Pairfam (Wave 5-11), Release 7.0, authors' own calculations.

Our main predictor was a time-varying dummy indicating whether the parents of the sibling pairs were divorced in the respective wave. Because our analyses included only respondents whose parents were alive and married in the first observation period, this variable was coded 0 for all respondents in the first wave analyzed (i.e., Wave V). Moreover, we included two time-varying controls. We accounted for age effects using our control sample and by including linear and quadratic specifications of age in our models. Controlling for age in our fixed-effects models, while also including groups that do not experience parental divorce, enables us to effectively account for age-related effects on sibling relationships. As sibling dynamics can evolve significantly with age (Buyukkececi & Çineli, 2024), this adjustment is crucial for ensuring the robustness of our findings. Additionally, we included a control for travel time to siblings because our sample consists of both mid-adulthood adults and younger adults aged 20–30, a group likely to leave the parental home for various reasons such as embarking on a new job, pursuing higher education, cohabiting with a partner, getting married, or starting a family (Mulder, 2009). As a final step, we conducted a robustness check by controlling for travel time to parents, as well as accounting for siblings' own life events, namely marriage and having children. The inclusion of travel time to parents was motivated by the understanding that the degree of exposure to parental conflict can influence the extent to which adults are affected by parental divorce. Siblings' own life events were added because previous research shows that the frequency of contact between siblings increases with entry into marriage and parenthood (Buyukkececi & Çineli, 2024).

We also constructed a life-stage variable to test our third hypothesis, which predicts a difference between “young adulthood” (1991–1993 cohort coded as 0) and “mid-adulthood” (1981–1983 and 1971–1973 cohorts coded as 1). We distinguished between “young adulthood” and “mid-adulthood,” using the widely known distinction in developmental psychology that defines emerging adulthood as ages 18–29 (Arnett, 2007; Arnett et al., 2014). In our study, the 1991–1993 cohort corresponds to “young adulthood” and consists of individuals who were 18–29 years old during the observation period, while the 1981–1983 and 1971–1973 cohorts correspond to “mid-adulthood” and consist of individuals who were 30–39 and 40–49 years old, respectively, during the observation period.

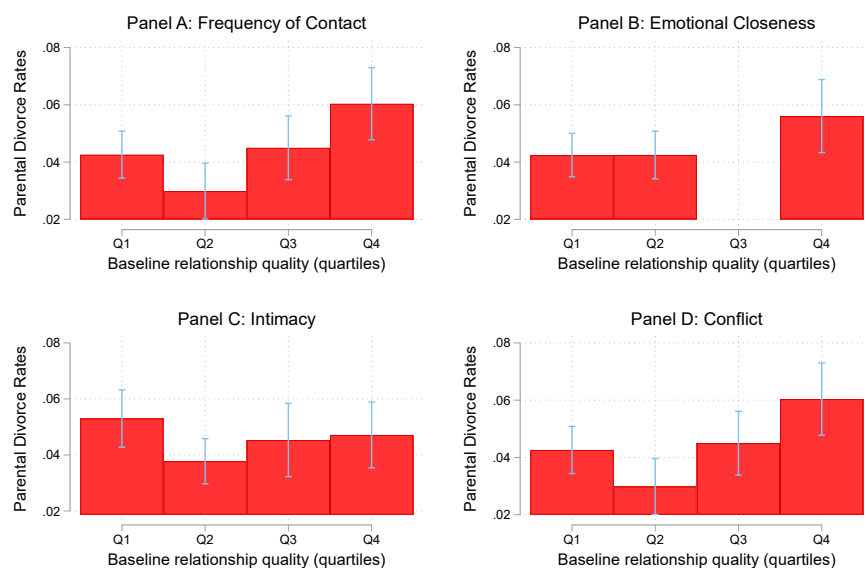
5.3 Models

To examine sibling relationships, we estimated fixed-effects linear regression models at the dyadic level. These models allowed us to eliminate all time-invariant factors by focusing on within-dyad variability and to examine changes over time in sibling relationships as a function of changes in the independent variables (Petersen, 2004). In our case, we compared how the relationship qualities of a sibling dyad changed before and after parental divorce, and only variables that changed over time entered the models. Furthermore, to test our second, third, and fourth hypotheses (i.e., whether the effect of parental divorce on sibling relationships differs by life stage, age difference, and gender composition of sibling dyads), we interacted the dummy for parental divorce with life stage, age difference, and siblings' gender composition. The number and proportion of sibling dyads experiencing parental divorce in later life, presented according to the anchor's life stage and the gender composition of the dyad, are shown in Table A1 in the Appendix.

6. Results

Figure 1 plots the share of sibling dyads that ever experience parental divorce during the observation period by quartiles of z-standardized baseline relationship scores from the initial wave (mean = 0, SD = 1). Contact frequency and conflict show a U-shaped association with subsequent divorce: both lower and higher baseline levels are linked to higher parental divorce rates, with the association stronger at the high end. Emotional closeness displays a weaker and less consistent pattern, and baseline intimacy is not systematically related to later divorce. These descriptive patterns suggest that some sibling dynamics prior to parental divorce may be linked to the event, consistent with evidence that broader family strain is associated with both divorce risk and sibling relationship quality (Poortman & Voorpostel, 2009).

Figure 1: Parental Divorce Rates by Baseline Sibling Relationship Quartiles



Note: Pairfam (Wave 5-11), Release 7.0, authors' own calculations. Quartiles are derived from standardized baseline (initial-wave) scores for each sibling relationship measure. Bars show the percentage of sibling dyads experiencing parental divorce during the follow-up period. For emotional closeness, ties at the cutpoints yielded an empty third quartile; the distribution is Q1 = 2,709 (43.6%), Q2 = 2,260 (36.4%), Q4 = 1,249 (20.1%), with no cases in Q3.

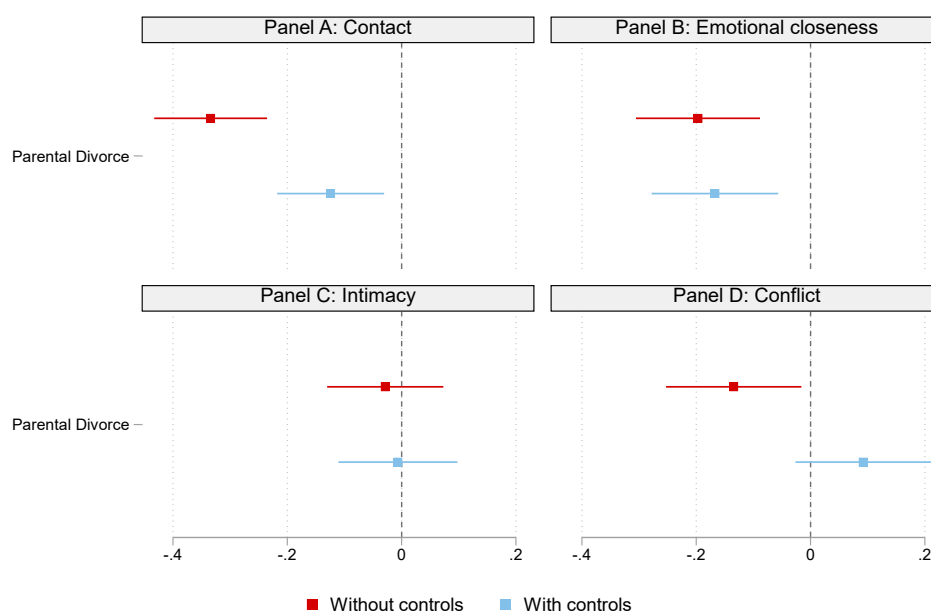
To further assess whether sibling relationships evolve differently depending on exposure to parental divorce, we compare life-course trajectories of dyads that experienced parental divorce in later life with those that did not (Appendix Figure A1). Dyads exposed to parental divorce tend to report lower contact,

emotional closeness, and intimacy, and higher conflict. However, these differences are not statistically significant across Panels A–D.

Because Figures 1 and A1 are descriptive and capture between-dyad differences, we next estimate within-dyad fixed-effects models that compare each dyad to itself over time. This approach examines whether changes in parental divorce status are associated with changes in contact, emotional closeness, intimacy, and conflict, while adjusting for age and other time-varying covariates.

Figure 2 summarizes the results of the fixed-effects linear regression models with and without the control variables for four different outcome measures. The full regression results are presented in Table A2 in the Appendix. As mentioned earlier, all outcomes are z-standardized (mean 0, SD 1), so coefficients can be interpreted as standard deviation changes in the respective sibling relationship following parental divorce. Among the four outcomes, models without controls indicate significant declines after parental divorce of 0.33 SD for contact frequency, 0.20 SD for emotional closeness, and 0.13 SD for intimacy. After adding controls, the estimated declines for contact (0.12 SD) and emotional closeness (0.17 SD) attenuate but remain significant. By contrast, the association for conflict becomes statistically insignificant and changes sign (from negative to positive) once curvilinear age effects and travel time between siblings are included.

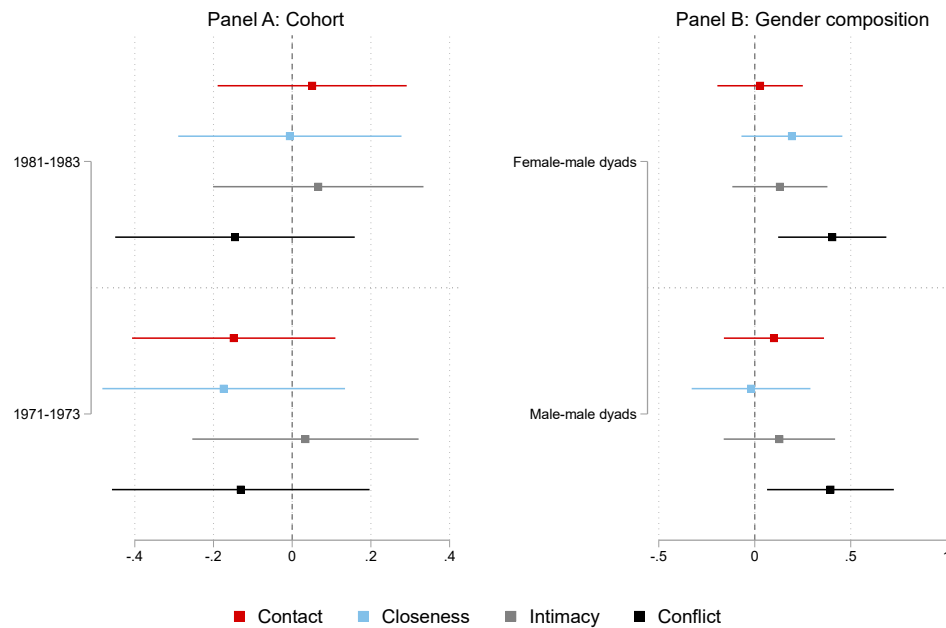
Figure 2: Fixed effects regressions of changes in sibling relationships with parental divorce



Note: Pairfam (Wave 5-11), Release 7.0, authors' own calculations.

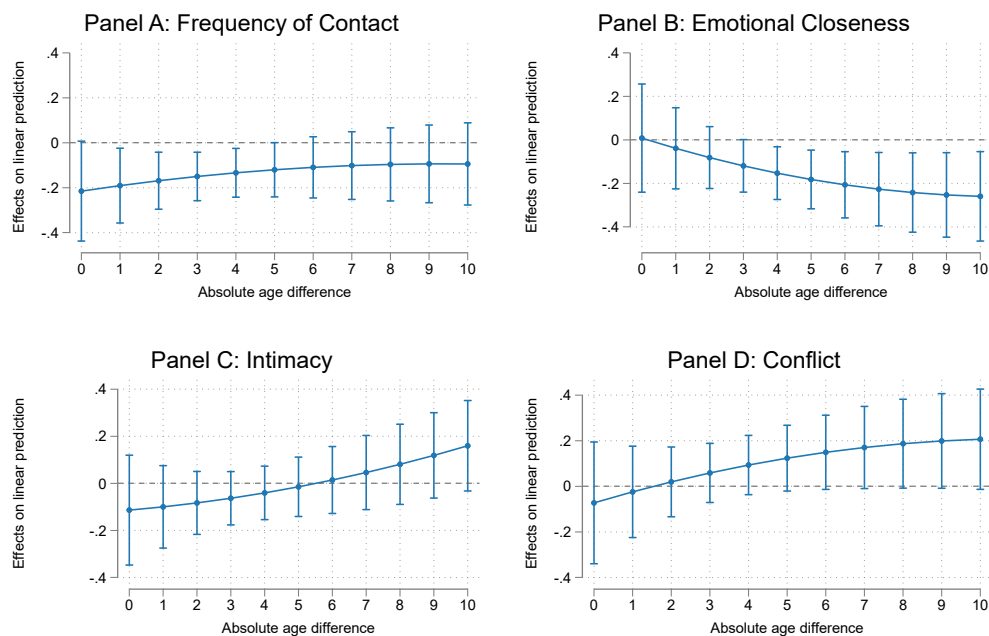
In the second step of our analyses, we examine whether the effects of parental divorce on sibling relationships differ by cohort, sibling gender composition, and age difference in three separate models, as shown in Panels A and B of Figure 3 (full estimates are presented in Tables A3 and A4 in the Appendix) and Panels A–D of Figure 4. The baseline categories were the most recent cohort (i.e., 1991–1993) and female–female dyads, respectively, and the results presented also included the control variables. The effects of parental divorce on the four outcome measures did not differ significantly between cohorts, as shown in Panel A of Figure 3.

Figure 3: Changes in sibling relationships with parental divorce (by cohort and gender composition)



Note: Pairfam (Wave 5-11), Release 7.0, authors' own calculations.

Figure 4: Changes in Sibling relationships with parental divorce (by absolute age difference between the sibling dyads)



Note: Pairfam (Wave 5-11), Release 7.0, authors' own calculations.

Regarding whether the effects of parental divorce are modified by sibling gender constellation, Panel B (Figure 3) shows that both female–male and male–male dyads exhibit higher levels of conflict after parental divorce compared to female–female dyads, as expected, while no significant differences were observed for the other three outcome measures with respect to sibling dyad gender composition. The association

between parental divorce and sibling relationships varied by absolute age difference, as shown in Figure 4. The decline in contact was stronger when siblings were closer in age, whereas emotional closeness showed a slightly stronger negative effect among siblings with larger age gaps. Intimacy tended to increase with larger age differences, while conflict remained largely unaffected.

To further support our conclusions, we conducted robustness checks. First, Figure A2 in the Appendix presents the estimated effects of parental divorce on the four outcomes while controlling for parental and marital statuses and travel time to parents. Notably, the figure reinforces our main findings, indicating that following parental divorce in later life, siblings tend to experience both decreased contact frequency and emotional closeness. Second, since divorce is a process with possible effects emerging even before its legal finalization, we conducted a robustness check by setting the baseline to two years before the parental divorce. The findings, displayed in Figure A3 of the Appendix, were consistent with our main conclusions, confirming the robustness of our results across these temporal adjustments.

We also examined whether other structural factors (e.g., full vs. half-sibling (Danielsbacka & Tanskanen, 2015; de Leeuw et al., 2025), and co-residence history) and normative factors (e.g., family values and beliefs about intergenerational support) moderated the consequences of parental divorce. While some patterns emerged, such as modest buffering effects of stronger family values, the overall conclusions remained consistent across subgroups. In addition, we conducted further sensitivity checks, including controlling for the quadratic term of siblings' ages, excluding siblings younger than 18 to focus specifically on adult dyads, and re-estimating models using only observations with complete information on outcomes and relevant covariates. These checks confirmed that our findings were robust and substantively unchanged. For clarity and conciseness, full details of these supplementary analyses and associated figures are available upon request.

7. Conclusion

In this paper, we examine how adult sibling relationships change after parental divorce in later life, analyzing four waves of longitudinal data from the German Family Panel (pairfam) and employing fixed-effects regression models. Motivated by increasing life expectancy and longer-lasting parent-child ties, we advocate for viewing parents as dynamic network partners whose actions can ripple through interconnected networks, including sibling relationships. Specifically, we focus on four outcome variables related to sibling relationships: sibling contact, emotional closeness, intimacy, and conflict. To our knowledge, this is the first paper to explore how adult sibling relationships change after parental divorce in later life using a longitudinal perspective.

We tested two opposing views: The first assumes that adult sibling ties strengthen following parental divorce, building on the buffering hypothesis (Bank & Kahn, 1982; Hetherington, 1988), whereas the second perspective posits that parental divorce weakens sibling relationships, drawing on the spillover hypothesis (Engfer, 1988). Descriptive patterns suggest that initial sibling dynamics are related to the likelihood of parental divorce during follow-up. In particular, higher initial contact and higher initial conflict are associated with higher subsequent divorce rates, whereas intimacy shows no systematic link. These baseline differences suggest selection into parental divorce, consistent with evidence that broader family strain shapes both divorce risk and sibling ties (Poortman & Voorpostel, 2009). To account for this selection, our main analyses estimate within-dyad fixed-effects models that track the same dyads over time and relate changes in parental divorce status to within-dyad changes in contact, emotional closeness, intimacy, and conflict, controlling for age, travel time, and other time-varying covariates. In these models, contact frequency and emotional closeness decline after parental divorce, while conflict does not show a consistent change.

Our fixed-effects models showed that the frequency of contact and emotional closeness among adult siblings decreased following parental divorce, even after considering various factors such as age and travel time between siblings. This result aligns with cross-sectional research on young adults, which showed that young adult siblings of divorced parents were less close and supportive than siblings from non-divorced families (Milevsky, 2004; Riggio, 2001). However, we did not find an overall negative effect on the conflict dimension, unlike research on children and adolescents, which revealed more conflict and hostility in sibling relationships (Amato, 1987; MacKinnon, 1989).

Although there was not a significant conflict effect in the main model, when we examined how this result varied by different gender compositions, we found that both female–male and male–male dyads experienced higher levels of conflict after parental divorce compared to female–female dyads. This result confirms previous research showing that sister–sister dyads are emotionally the closest, followed by sister–brother and brother–brother dyads (Riggio, 2000; Van Volkom et al., 2011), and that sisters feel more responsible for the unity of their family (Spitze & Trent, 2006). We also found that the consequences of parental divorce varied by age difference: contact declined more when siblings were closer in age, and intimacy tended to increase with larger age differences, consistent with prior studies suggesting that siblings close in age are more likely to experience rivalry, competition, and tension over shared resources (Furman & Buhrmester, 1985; Buhrmester & Furman, 1990; Pike, 2016). On the other hand, we did not find support for our third hypothesis, which predicted that older adults would be more affected than younger adults.

Our findings suggest that the family systems spillover hypothesis (Engfer, 1988; Repetti, 1987) extends to adult sibling dynamics, offering further support for its applicability in this context. This contrasts with the expectation that “even if sibling relationships were not protective in childhood and adolescence, in adulthood, siblings could have developed the skills necessary to support one another in the face of parents’ marital conflict” (Gilligan et al., 2020, p. 309). Thus, we argue that although older adults are more likely to have positive relationships (Bedford & Avioli, 2012; Connidis, 2010; White, 2001), their relationships can still become fragile in the case of a disruptive event like parental divorce (see also Hank & Steinbach, 2023). There are two potential mechanisms behind our findings. The first concerns the weakening of sibling relationships following parental divorce due to the diminishing prevalence or absence of a kin keeper. We would expect events organized by parents such as reunions, birthday parties, Christmas dinners, etc., to be less central after parental divorce. Second, parental divorce might weaken sibling relationship quality due to taking different sides in parents’ arguments or disagreements about potential new partners, new living arrangements, division of assets, as well as care responsibilities that may arise when older parents begin living alone.

These results also highlight the need to further investigate the underlying mechanisms of how family relationships change after parental divorce, especially for adult members of the family. Some scholars have downplayed the negative effects of divorce on adult children, assuming their maturity and life stage enable them to better cope with the familial disruption (Greenwood, 2014). However, other scholars have countered this assumption, revealing that divorce during adulthood can still trigger significant emotional and relational challenges (Campbell, 1995; Cooney, 1994; Lang & Pett, 1992). The effects of divorce on sibling relationships in adulthood remain understudied, particularly when viewed through the lens of the spillover hypothesis. This framework, often grounded in social learning theory, has been widely used to explain relational dynamics among children and adolescents. It suggests that children may model and internalize the behaviors they observe in their parents’ interactions. However, it may not fully capture the complexity of adulthood, which introduces unique challenges and dynamics, such as individual autonomy, caregiving responsibilities, and evolving familial roles.

The results also have policy-related implications. Previous research has shown that there is an association between sibling relationships and psychological well-being, which holds for childhood, adolescence, and early adulthood (Hollifield & Conger, 2015; McHale et al., 2012). Although research on adult siblings is scarce, previous findings show that the direction of the association is similar to that of earlier periods. For example, tension between siblings has been linked to depression in middle-aged adults (Gilligan et al., 2017). Another recent study adds to this evidence by showing that feelings of loneliness among adult siblings mediated the association between relationship quality and psychological well-being (Stocker et al., 2020). Taken together, these results suggest that the consequences of parental divorce for adult sibling relationships could be more severe under conditions such as loneliness or general health problems, which are more prevalent in later life.

Apart from the well-being aspect, positive sibling relationships are also important for organizing parental caregiving provided by adult children (Voorpostel & Blieszner, 2008). Therapists working with adult siblings should consider both the immediate impact of parental divorce in later life and the long-term effects on family caregiving systems. Encouraging communication between siblings and exploring the shared history of their relationship could offer significant benefits. From a policy perspective, providing support systems for families going through late-life parental divorces could reduce the emotional burden on

siblings by ensuring they have access to mental health resources, family counseling, or mediation services designed to improve sibling collaboration in caregiving.

Although the results of this study contribute to the literature on parental divorce and adult sibling relationships, there are a few limitations to consider. The main limitation of our study is that we could only observe the short-term effects of parental divorce among adult siblings, based on four waves of data covering six years of observation. Another key limitation is the inability to determine the exact onset of the separation period. This distinction is important because the emotional and logistical consequences for family members, particularly adult siblings, often start long before the formal legal process begins. Third, while the overall number of sibling dyads experiencing parental divorce was sufficient for our main analyses, the numbers in some subgroup analyses (e.g., by gender constellation or cohort) were relatively modest. These findings should therefore be interpreted in light of these limitations. Finally, we could not assess the mediating effects of parental conflict, as this measure was not included in our data. Previous research has shown that siblings from high-conflict families are more likely to experience conflict themselves. Poortman and Voorpostel (2009) argue that parental conflict is a much more important predictor than parental divorce per se. Research focusing on child outcomes also supports this argument, showing that child outcomes such as well-being and behavior are positively affected when high-conflict parents divorce (Morrison & Coiro, 1999; Strohschein, 2005).

What implications do the findings have for future research in this area? The pathways through which sibling relationships are affected must be thoroughly understood. Future research should clarify these pathways by extending buffering and spillover frameworks to adulthood and by modeling the parent–sibling–sibling triangle explicitly (de Bel et al., 2019). In particular, the quality of parent–child relationships is a likely moderator: when ties with a parent remain strong after divorce, negative spillovers to the sibling relationship may be diminished, whereas deteriorating parent–child ties may increase declines in contact and closeness between siblings. We also encourage future researchers to consider the reciprocal effects of sibling relationships on parental outcomes. For example, future research could examine whether conflict among siblings affects parents' relationships and how siblings' positive or negative relationships shape the organization of caregiving for older parents. Future research should extend these questions to capture both the predictors and consequences of changes in adult sibling relationships.

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Data availability statement

This study uses data from the German Family Panel (pairfam), release 12.0 (Brüderl et al., 2016). Pairfam is a publicly available longitudinal dataset provided by the pairfam consortium. The data can be accessed free of charge for scientific research purposes upon registration and acceptance of the data use agreement via the pairfam website (<https://www.pairfam.de>). The data are distributed through GESIS – Leibniz Institute for the Social Sciences and the Research Data Centre of the German Youth Institute (FDZ-DJI). Due to data protection regulations, the authors are not permitted to redistribute the dataset directly.

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Information in German

Deutscher Titel

Familientrennungen nach der Kindheit: Späte elterliche Scheidung und Geschwisterbeziehungen im Erwachsenenalter

Zusammenfassung

Fragestellung: Diese Studie untersucht, inwiefern eine elterliche Scheidung im späteren Lebensverlauf mit Veränderungen in den Beziehungen zwischen erwachsenen Geschwistern zusammenhängt, wobei der Fokus auf Kontakt, emotionaler Nähe, Intimität und Konflikt liegt.

Hintergrund: Scheidungen unter älteren Erwachsenen werden zunehmend häufiger, ein Phänomen, das als „Gray Divorce“ bezeichnet wird. Obwohl die Auflösung einer Partnerschaft Auswirkungen auf breitere familiäre Dynamiken hat, ist bislang wenig darüber bekannt, wie eine elterliche Scheidung im späteren Lebensverlauf die Beziehungen zwischen erwachsenen Kindern beeinflusst. Frühere Forschung zu Geschwisterbeziehungen konzentriert sich überwiegend auf die Kindheit und Jugend und basiert häufig auf Querschnittsdaten. Ein besseres Verständnis darüber, wie elterliche Scheidung im späteren Lebensverlauf mit Beziehungen zwischen erwachsenen Geschwistern zusammenhängt, ist wichtig, da Geschwister über den Lebensverlauf hinweg eine zentrale Rolle bei emotionaler und praktischer Unterstützung spielen.

Methode: Wir verwenden vier Wellen längsschnittlicher Daten aus dem German Family Panel (pairfam) und wenden Fixed-Effects-Modelle an, um intraindividuelle Veränderungen im Geschwisterkontakt, emotionaler Nähe, Intimität und Konflikt nach einer elterlichen Scheidung im späteren Lebensverlauf zu untersuchen.

Ergebnisse: Die Häufigkeit des Kontakts sowie die emotionale Nähe zwischen erwachsenen Geschwistern nehmen nach einer elterlichen Scheidung im späteren Lebensverlauf ab. Zusätzliche Analysen zeigen, dass Schwester–Bruder– und Bruder–Bruder–Dyaden im Vergleich zu Schwester–Schwester–Dyaden mit höherer Wahrscheinlichkeit zunehmende Konflikte nach einer elterlichen Scheidung im späteren Lebensverlauf erleben.

Schlussfolgerung: Eine elterliche Scheidung im späteren Lebensverlauf geht mit bedeutsamen Veränderungen in den Beziehungen zwischen erwachsenen Geschwistern einher und deutet darauf hin, dass ihre Folgen über das sich scheidende Paar hinausreichen. Entgegen der Annahme, dass Scheidungen im höheren Alter nur begrenzte Auswirkungen auf erwachsene Kinder haben, zeigen unsere Ergebnisse, dass sie die Dynamiken zwischen Geschwistern auf komplexe Weise verändern können.

Schlagwörter: Familienbeziehungen; erwachsene Geschwister; elterliche Scheidung im späteren Lebensverlauf; Fixed-Effects-Modelle.

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Beyda Çineli: <https://orcid.org/0000-0001-5692-8682>

Zafer Buyukkececi: <https://orcid.org/0000-0002-3763-2568>



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