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THE IMPORTANCE OF THE COMMON FAMILY BACKGROUND FOR THE SIMILARITY OF DIVORCE RISKS OF SIBLINGS: A MULTI-LEVEL EVENT HISTORY ANALYSIS ☆

Jaap Dronkers and Joop Hox

ABSTRACT

This study examines the effects of a family's and individual children's characteristics on the probability of having a divorce. Current research shows a clear indication of increased divorce risks if an individual's parents or siblings have experienced a divorce. Explanations include both shared family characteristics (including genetic effects) and common characteristics of the individual children involved. This study analyzes the effects of shared family background characteristics on the divorce risk of individuals. By analyzing siblings within families and including individual

children's characteristics in the analysis, it is possible to separate individual-level and family-level effects.

In addition to employing a multi-level structure of individual siblings nested within families, the data cited here are censored. For all individuals, the length of the marriage and the divorce status are known, but the divorce status is interpreted differently for individuals who have or have not experienced divorce. For divorced individuals, the final divorce status is known; for individuals who have not experienced divorce, the final marriage status is unknown or censored. The proper analysis model for such data is event history (also called survival) analysis. This study therefore employs a multi-level event history model.

Our results show that there is a similarity in the divorce risks of siblings from the same family, which is not explained away by the available child and family characteristics. This finding suggests that shared genetic and social heritage play an important role in the intergenerational transmission of divorce risks.

INTRODUCTION

There is a clear intergenerational transmission of divorce risks in many different societies: Children of divorced parents divorce significantly more often compared to children of nondivorced parents.[1] Several mechanisms within the family and common characteristics of the involved children can explain the existence of the relationship between parental and children's divorce risks as follows (McLanahan & Bumpass, 1988; Amato & Booth, 1991; Amato, 2001).

1. *Stress*. The stress that accompanies parental divorce or separation is a "push" factor that induces children to leave the parental home early, to get married early, and to have their own children at a young age more frequently. Leaving one's parental home, getting married, and having children at a young age are themselves events that increase the odds of divorce or separation. Thus it explains a positive relationship between parental and children's divorce risks.

2. *Socialization in the parental family*. The conditions of socialization in the parental home lead to the children developing certain attitudes and ways of behaving, which subsequently render them less capable to maintain their relationships, or teach them to leave an unsatisfactory relationship at an earlier stage. Experiencing a parental divorce or separation

socializes the children in this respect and can increase the odds of their divorce or separation. Thus it explains a positive relationship between parental and children's divorce risks.

3. *Economic deprivation*. The economic circumstances that follow a parental divorce affect the lives of the children in a negative way (with respect to educational and occupational attainment). Reduced economic circumstances can increase the risk of these children of divorced parents getting divorced themselves. Thus it explains a positive relationship between parental and children's divorce risks.

4. *Stigmatization* (Spruijt, 1993). The stigma of parental divorce will affect the life opportunities of their children in a negative way and thus decrease their chances of maintaining their own marriages. It might also explain a positive relationship between parental and children's divorce risks. This stigmatization mechanism should be less important for younger cohorts, due to the normalization of divorce in modern societies.

5. *Genetic heritage*. Parents and children share particular heritable personality traits, which can promote or hinder divorce in both the parents and their children (McGue & Lykken, 1992; Cramer, 1993). This factor might also explain a positive relationship between parental and children's divorce risks.

It is not yet clear whether this transmission can be explained by the common background of parents and children (like personality traits), which cannot be measured by identifying age at marriage, age of first child, educational attainment, occupational level, and birth cohort. It is necessary to estimate the importance of a common background for intergenerational transmission of divorce risks relative to the importance of the measured characteristics of the individuals. If the common background of parents and children remains important after controlling these individual characteristics, socialization by parents and siblings and the common genetic and social heritage of siblings are also relevant explanations of the intergenerational transmission of divorce risks. Divorce or separation is, in that case, not only an individual decision taken by individuals in solitude, but also a consequence of more general social and genetic characteristics of the involved persons.

We can partly estimate the importance of the unmeasured common background of parents and children by analyzing the similarity in the divorce risks of siblings and by trying to explain this similarity in terms of the measured characteristics of parents and their offspring. Analyzing similarities between the behavior patterns of siblings in relation to parental

characteristics, such as divorce or separation, is a good means of investigating the relative importance of families and of individuals within these families, as has been shown by many sibling studies (de Graaf & Huinink, 1992; van Eijck, 1996; Sieben, 2001). Another important advantage of sibling studies is that we do not need to measure all relevant characteristics of parents and children before reliably estimating the relative importance of family and children for the explanation of divorce. Until now, such an analysis of the similarity of divorce or separation risks of siblings has not been made.

This chapter is the first analysis that connects two traditions: sibling studies within the social stratification research and effects of divorce studies within family research. Amato (2001; Amato & Booth, 1991) does not mention a single sibling analysis in his well-known overviews.[2] There is no clear explanation why this combination has not been made earlier. A possible explanation might be the politically sensitive aspect of analyzing a common family background of divorce or separation, which might deter scholars from tackling this topic. Another possible explanation is the lack of useful data that cover both parents and all siblings from the general population sample. However, the Australian data of the National Social Science Family Survey of Australia of 1989–1990 represent one of the few surveys in the world to cover both parents and all siblings, and provide enough information on their marriage and divorce. The analysis model is a multi-level formation of divorce. The analysis model is a multi-level information on their marriage and divorce. The analysis model is a multi-level model with children (siblings) nested within families, and variables at both the sibling level and the family level. The analysis model we use is explained later in this chapter.

LITERATURE REVIEW

There is only one study of the effects of parental divorce on siblings (O'Connor, Plomin, Caspi, & DeFries, 2000), and that is a comparison between biological children and adopted children of divorced and nondivorced parents. McGue and Lykken (1992) and Jockin, McGue, and Lykken (1996) studied the effects of family factors on divorce by analyzing twins and nontwin siblings. The former researchers concluded that the difference in divorce risks between monozygotic and dizygotic twins indicates a strong influence of genetic factors in the event of divorce. The family background of both spouses contributes independently to the couples' divorce risk, suggesting that divorce might be largely the result of characteristics that the two spouses bring to the union rather than the result of

interaction effects. McGue and Lykken's (1992) findings also suggest that the adjustment difficulties seen with some children with divorced parents may be due to an interaction between genetic and environmental factors rather than environmental influences alone. Jockin et al. (1996) concluded that in women and men, respectively, 30% and 42% of the heritability of divorce risks consist of genetic factors affecting personality, and personality and divorce risk is correlated largely as a result of these common genetic influences.

An important advantage of sibling analyses is the potential to distinguish between the measured and unmeasured effects of family characteristics on individuals and to estimate the importance of the latter. These advantages can be important for two reasons:

1. The noninclusion of unmeasured family characteristics might lead to a misspecification of the effects of the measured family characteristics, because the measured and unmeasured characteristics are positively or negatively related with each other.

2. The measurement variances of both measured and unmeasured family characteristics open up the possibility of estimating the amounts of unexplained variances both at the individual and family levels. These give an indication of the remaining variance to be explained by the nonmeasured variables.

Sieben (2001) gives a summary of her comparison of the outcomes of sibling analyses and the outcomes of conventional analyses without siblings, applied to the measurement of family background on mobility across countries and cohorts. That summary is quite representative of the outcomes of other sibling studies on other populations:

First of all, the effects of measured aspects of family background are quite similar for the two kinds of analysis....Second, the percentage of explained variance does not differ very much between the two analyses. About 25% of the total variance in educational attainment is explained by including parents' educational attainment, father's occupational status, and the number of siblings in the models. The percentage of total variance in occupational status that can be explained by these measured effects of family background and one's educational attainment turns out to be about 40%....About 50% of the variance in educational attainment and 40% of the variance in occupational status can be attributed to the family. Measured effects of family background account for about 45% of total family impact on educational attainment, whereas 75% of total family background on occupational status is represented by these measured effects of family background and the family factor for educational attainment (Sieben, 2001, pp. 162–165).

This summary indicates that sibling analysis has certain advantages, especially if one expects a large amount of unexplained family variance due to the practice of measuring the processes that produce certain outcomes. Divorce risk is such an outcome, and one about which many assume that the various processes leading to a divorce are far more nuanced than the crude individual indicators used to measure these processes. Sibling analysis is a useful tool to measure the importance of the family variance. The basis of this family factor is the similarity in divorce risks of children from the same family and thus the effects of the divorce risks of the brothers and sisters of a family on the divorce risk of ego.

RESEARCH QUESTIONS

A higher similarity in the divorce risks of siblings, indicated by a positive effect of the divorce rate of brothers and sisters on the divorce risk of ego, can be explained with reference to five factors. These factors provide indicators for the measured characteristics of parents and siblings that need to be included in the analyses:

1. *Intergenerational transmission of divorce risks.* A consequence of a significant intergenerational transmission of divorce risks is a similarity in the divorce risks of siblings from the same family, because a parental divorce increases the divorce risks of all the parents' offspring. If the intergenerational transmission mechanism is an important explanation of the amount of similarity in divorce risks at the family level, the effect of the divorce rate of brothers and sisters on the divorce risk of ego should decrease significantly after controlling for parental divorce.

2. *Socialization in the parental family.* Because siblings receive more or less equal socialization from their parents, there is a high likelihood that they will develop common attitudes toward marriage and divorce, common behavior patterns, and common solution repertoires for marital problems. This common heritage renders them more or less able to maintain their relationships, teaching them either to leave an unsatisfactory relationship at an early stage or to make an extra effort to maintain and improve it. This leads to a similarity in the divorce risks of siblings. If age at first marriage is a good proxy for socialization of attitudes and behavior toward marriage in the parental family, the effect of the divorce rate of brothers and sisters on the divorce risk of ego should decrease significantly after controlling for age at first marriage.

3. *Socialization by siblings.* Siblings influence one another through imitation and interaction while living together in the parental home, and this influence continues after their departure. They have more attitudes, behavior patterns, and problem-solution repertoires in common than comparable individuals raised in different families. Furthermore, siblings can learn from the success or failure of one another's marriages. This learning will lead to similar divorce risks among siblings. If the level of divorce among the other married siblings is a good proxy for socialization of attitudes and behavior toward marriage by the other siblings, the effect of the divorce rate of brothers and sisters on the divorce risk of ego should explain significantly the effect of parental divorce and the common individual characteristics such as education.

4. *Common socioeconomic background of parents* (family size, father's occupation, father's and mother's education, siblings' education and occupations). The common socioeconomic background of their parents renders siblings more similar in their educational level and the number of children they produce than nonsiblings. If level of education and number of children influence the divorce risks of siblings, these factors will be more similar than the divorce risks of comparable individuals raised in different families. If their common socioeconomic background is an important explanation of the similarity in the divorce risks of siblings, the effect of the divorce rate of brothers and sisters on the divorce risk of ego should decrease after controlling for the socioeconomic background of the siblings and parents and the number of children in the parental family.

5. *Common genetic and social heritage.* Siblings share a number of genetically and socially transmissible personality traits that can either enhance or reduce their prospects of divorce, giving rise to similar divorce risks. If this explanation is correct, the effect of the divorce rate of brothers and sisters on the divorce risk of ego should hardly change by the controlling for other individual and parental characteristics.

Thus, the similarity in the divorce risks of siblings (indicated by the effect of the divorce rate of brothers and sisters on the divorce risk of ego) can be explained by measured common characteristics of the parents (parental divorce, family size, father's occupation, father's and mother's education, parental migrant background) and by overlaps in measured characteristics of the siblings (year of birth, age at marriage, education, occupation, number of children). However, it remains possible that the similarity in the divorce risks of siblings cannot be fully explained by these measured common parental characteristics and the overlap in siblings' measured

characteristics. If this is the case, we will still find, after controlling for the measured characteristics of parents and siblings, a significant effect of the divorce rate of brothers and sisters on the divorce risk of ego. The aim of this chapter is to establish whether there is a significant similarity in the divorce risks of siblings and, if so, to what degree this similarity can be explained by measured characteristics of parents and children.

The main research questions posed by this chapter are as follows:

1. Is there a similarity in the divorce risks of children from the same family (siblings) in Australia?
2. Can jointly measured parental characteristics and the overlap in measured characteristics of their children explain this similarity in the divorce risks of the children and, if not, how much is left?

HYPOTHESES ON THE EFFECT OF MEASURED CHARACTERISTICS

A positive relationship between the divorce risks of children from the same family can also be explained by the measured parental characteristics (parental divorce, family size, father's occupation, father's and mother's education, migration, working mothers) and the measured characteristics of the children (age of marriage, age at birth of first child, political choice, occupation, education, children, gender, year of birth, percentage of married siblings who have divorced). To guide our analysis of the similarities in the divorce risks of children, we formulate a number of hypotheses on these effects of the parents' and children's characteristics on the divorce risk of the latter (Amato & Booth, 1991; Amato, 2001). Although testing these hypotheses is not the aim of our analyses, because these variables are already often applied in divorce research, the results can be interesting in relation to other Australian research on the effects of divorce on children (Pryor & Rodgers, 2001).

We have five hypotheses formulated on the family characteristics, which might affect the divorce risks of all children within that family:

- The *parental divorce* can hamper the socialization of the children in learning how to maintain an intimate relationship in a difficult time and thus increase the divorce risk of the children. The parental divorce might also teach the children that divorce is an acceptable way out of an unsatisfactory marriage and thus also increase the divorce risk of the children.

- A large *parental family size* can be an indication of traditional parental values and attitudes toward family and divorce, which may influence the values and attitudes of children toward family and divorce and thus decrease the divorce risks of children in large families.
- A high *occupational level of the father* can provide more financial and social capital to the children by giving them more possibilities to end an unsatisfactory marriage and thus increase the divorce risks of children with fathers having higher occupational levels.
- Regarding the *migration history* of the children, we have two contradictory hypotheses. The first hypothesis is that migration entails a drastic change in the living conditions, which can increase uncertainty about values, norms, and preferences (the anomie of *Durkheim*). This uncertainty can destabilize marriage and thus increase the divorce risk of children who are not born in Australia. The second hypothesis assumes that migration requires all resources of the migrants to make their migration successful. This need of resources does not allow the migrants to spend the scarce resources for less pressing problems such as solving an unsatisfactory marriage and thus decreases the divorce risk of children who are not born in Australia.
- If *the mother of the child works* while her children are still young, it might indicate a less adequate socialization of her children or less traditional values in the parental family. Both factors can increase the divorce risk of children in families where the mother worked while her children were still young.

We have also hypotheses formulated on the sibling characteristics that might affect the divorce risks of individual children:

- The *percentage of divorced siblings* reflects cultural values and attitudes, not in the least toward family and divorce, which might be shared by children from the same family. As a consequence, children with more divorced siblings might divorce more quickly than children with fewer divorced siblings.
- The *political choice* of children often reflects cultural values and attitudes, not in the least toward family and divorce: Left-leaning voters more often have less traditional values and attitudes and are less traditionally religious. As a consequence, they might divorce more quickly than right-wing voters. Another explanation of the left-leaning voting of divorced people is that they depend more heavily on social welfare than nondivorced people and are thus more inclined to vote left.

- A high *occupational level* of children can provide them with more financial and social capital and thus gives them more possibilities to end an unsatisfactory marriage and consequently a higher divorce risk.
- *Having children* increases the negative consequences of divorce, especially for women because they get the care for the children in the vast majority of the cases. Thus, women with children (who in the majority of the cases initiate the divorce) will be reluctant to seek that divorce. Thus, having children might decrease the divorce risks. Conversely, having children indicates a higher prior investment in the relationship by both spouses and thus a higher loss for both spouses in breaking up their marriage.
- Children born at the beginning of the twentieth century have lower odds to be divorced than children born around the middle of the twentieth century because of the general *increase in the divorce rates* in the last century. The youngest children born in the 1960s will have a lower divorce risk than children born earlier because they had not yet the opportunity to divorce.

METHOD: DATA

Our data come from the National Social Science Family Survey of Australia of 1989–1990. Through this national representative survey on the adult Australian population, detailed information was collected, including data on the educational attainment, social context, and economic background of respondents, such as parental education, occupational status of the father, parental family size, family form, and other relevant characteristics of 4,513 men and women in Australia. Each respondent also answered all of these questions about his or her parents and siblings. The respondents gave information about a maximum of three siblings, even if there were more siblings in the family. As a consequence of this data selection procedure, information is not available about all siblings, but only about the three selected by the respondent. All siblings were recoded in the same way as the respondents, and they were combined in a new file with respondents or siblings as the unit of analysis. In that new file, respondents and siblings from the same family had the same values for their parental characteristics but different values for their child characteristics. We selected only those respondents or siblings for whom one of them was married or had been married (remaining *N* families = 3,797 with a total of 10,808 married or divorced children). Thus families with only one married respondent or sibling were not excluded.

As a consequence of missing values in core variables – year of marriage, family size, age at first marriage, years of education, year of birth, and

gender – we lost an additional 4,504 children. The duration of the marriage was the variable with the highest number of missing values (4,189) due to the fact that many respondents did not know the marriage duration of their siblings. The missing values on the variables of father's occupational status, mother's educational level, father's educational level, left-oriented political choice, and occupational status were replaced by the average score of these variables. After this replacement of the missing values on these noncore variables, we had a sample of 3,221 families with a total of 6,305 respondents and siblings.

We use the following variables at the children level or the family level. The means and standard deviations of these variables are shown in Table 1.

Children Level

1. *Divorce* of child (respondent or sibling) (dependent variable; used in the construction of the marriage-year file).
2. *Length of marriage*: from zero to year of divorce or death or to year of interview (time variant).
3. *Age at first marriage* of child.
4. *Child born before first marriage* of child: none, yes.
5. *Year of marriage at birth of first child* of child[3] (time variant).
6. *Left-oriented political choice* of child: Labor Party; none, other; Liberal or Nationalist.
7. *Occupational status* of child: Kelley's Worldwide Status Scores, ranging from 0 to 100, which are conceptually similar to Duncan's SEI scores (Kelley, 1990, pp. 344–346).
8. *Years of education* of child.
9. *Gender* of child: male, female.
10. *Year of birth* of child.
11. *Percentage of divorced children in parental family*, excluding ego. The percentage is 100% if all other married children (ego not included) of the parental family are divorced. It is 0% if none of the other children of the parental family are divorced.

Family Level

1. *Family size*: total number of brothers and sisters.
2. *Father's occupational status*: Kelley's Worldwide Status Scores, ranging from 0 to 100, which are conceptually similar to Duncan's SEI scores (Kelley, 1990, pp. 344–346).

Table 1. Descriptive Statistics of the Variables.

	N	Mean	Standard Deviation
Children level			
Length of marriage	6,305	20.50	14.30
Percentage divorced	6,305	0.14	0.35
Age by first marriage	6,305	23.60	4.60
Percentage with child born before first marriage	6,305	0.03	0.17
Percentage with children	6,305	0.86	0.34
Left political orientation	6,305	51.90	45.00
Occupational status	6,305	50.40	23.10
Years of education	6,305	10.60	2.90
Percentage female	6,305	0.52	0.50
Year of birth	6,305	42.80	14.50
Percentage of married and divorced siblings, exclusive ego	6,305	11.50	27.20
Family level			
Family size	6,305	4.40	2.10
Father's occupational status	6,305	37.20	25.60
Percentage migrant from an English-speaking country	6,305	0.12	0.33
Percentage migrant from Mediterranean countries	6,305	0.04	0.19
Percentage migrant from Eastern Europe	6,305	0.01	0.12
Percentage migrant from Third World	6,305	0.04	0.20
Percentage migrant from North and West Europe	6,305	0.02	0.14
Mother's educational level	6,305	8.70	3.20
Father's educational level	6,305	8.90	3.30
Percentage with parents divorced: respondent with	6,305	0.03	0.16
Percentage with father dead: respondent with only mother at age 15	6,305	0.04	0.20
Percentage with stepparent at age 15	6,305	0.05	0.22
Percentage whose mother worked full-time at age 6 and 10	6,305	0.08	0.02
Percentage whose mother worked part-time at age 6 and 10	6,305	0.08	0.02
Percentage whose mother worked full-time at age 6 and part-time at age 10	6,305	0.09	0.08
Percentage whose mother was at home at the age 6	6,305	0.08	0.03
Percentage whose mother was at work at age 6 and home at age 10	6,305	0.09	0.01

3–7. Native country of respondent: five dummy variables: English-speaking nations outside Australia; Mediterranean countries; Eastern Europe; northwest Europe; other nations outside Australia (see Borgers, Dronkers, Rollenberg, Evans, & Kelley, 1995). Reference category: born in Australia.

8. Mother's educational level: none; some primary education; primary education completed; left education at age 14 or 15; more secondary education; secondary education completed; some tertiary education; university.

9. Father's educational level: see mother's educational level.

10–12. Family form of the respondent at the age of 15 years of the respondent: three dummy variables: only with mother after divorce; only with mother after death of father; stepfamily created by remarriage after death or divorce. Reference category: living with both natural parents.

13–17. Mother working outside home while respondent at the age of 6 and 10: five dummy variables: working full-time while respondent at age 10; working part-time at ages 6 and 10; working full-time at age 10; working full-time at age 6 and part-time at age 10; at home at age 6 and working full-time at age 10. Reference category: at home at ages of 6 and 10.

Table 1 shows that 14% of all children in this national representative survey have been divorced, while 11.5% of their siblings have also been divorced. Their parents divorced less quickly: Only 3% of the parents were divorced at the moment that the respondents were 15 years old. Death of a parent was more common: 4% of the respondents had a dead father at the age of 15. We do not know the cause of living in a stepfamily (5%), but probably death of one of the parents will be the main cause.

ANALYSIS MODEL

We use multi-level analysis (MLA) to distinguish between the individual level (respondent and siblings) and the family level (parents). This MLA is more appropriate for sibling analysis than the more commonly used LIS-REL (Hauser & Wong, 1989), because MLA can distinguish more reliably between the different analytical levels and thus can avoid the statistical pitfalls associated with the nested nature of data on individuals in families (Hox, 2002).

Divorce risk is a right-censored characteristic in this Australian sample, because the respondents and a majority of their siblings are not yet dead. Thus the correct view of nondivorced respondents and siblings is that the final outcome (divorce or not) is not yet established. The recommended

mode of analysis for right-censored observations is event history analysis, also known as survival analysis (Singer & Willet, 1993).

Thus our analysis is a combination of multi-level and event history analysis. The combination of marriage-year/child is the lowest level, the respondent and sibling level is the next level, and the family level is the highest level. To analyze these data, the data file is restructured into a three-level data structure: families, siblings nested within families, and marriage-years nested within siblings. The series of marriage-years ends either with an observed divorce or as a right-censored variable. The lowest level can be conceptualized as a series of independent trials in which the event does or does not occur. This results in a discrete-time analysis; in each interval t, we observe a binary response variable that indicates whether divorce occurred. This representation allows us to use models for binary response variables in a multi-level context (Hox, 2002).

We make the usual assumption that the censoring is noninformative, meaning that the censoring mechanism is not related to the time-to-event. The hazard function $h(t)$ is the probability of the event occurring in interval t conditional upon no earlier occurrence. In our case, the time variable t is the length of the marriage at time t. The hazard is modeled using a logistic regression of the following form:

$$\text{logit}(h_{ij}(t)) = \alpha(t) + \beta x_{ij}(t) + \beta z_j + u_{0j} \qquad (1)$$

In this equation, $\alpha(t)$ is the baseline hazard at marriage-year t, x_{ij} represents the sibling-level predictors, and z_j represents the family level predictors. The value of u_{0j} incorporates the family level residual errors; since this is a logit model for binary outcomes, there is no sibling-level error term (cf. Hox, 2002). The regression coefficient α for the effect of marriage length may or may not vary across individuals or families; in our case, there was a between-family variation that disappeared when all available predictors were included in the model. The regression coefficients β for the sibling-level predictors may or may not vary across families. In our case, there was no higher-level variation of these regression coefficients; consequently, in Eq. (1) they carry no subscript for families. The model was estimated using MLwiN (Rasbash et al., 2000). The estimation method used was Marginal Quasi Likelihood estimation for binary data (Goldstein, 2003; Hox, 2002) with asymptotic standard errors for significance tests of separate parameters.

Fig. 1 presents the multi-level event history model in graphical form. It contains three levels: families, siblings (children), and the repeated
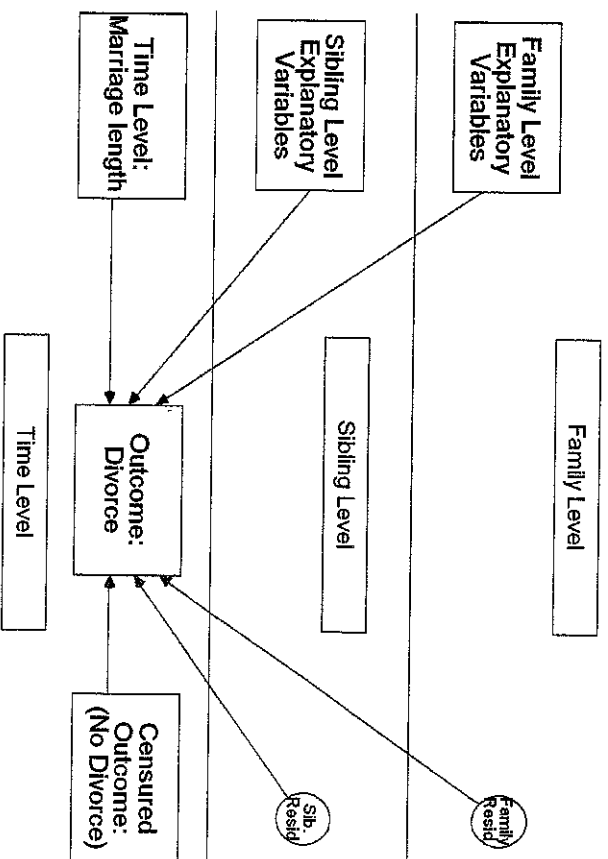
Fig. 1.   Graphical Representation of Multi-Level Event History Model.

information over time. The outcome variable is at the time level: Either a divorce is observed or the event is censored. At the time level, only one explanatory variable is used: the length of the marriage. This explanatory variable is essential because it represents the length of time that the couple has been "at risk." There are also explanatory variables at the sibling level and the family level, which were listed earlier in this chapter. Note that Fig. 1 includes two residual error terms: one at the sibling level and one at the family level. It is this more complicated error structure that makes the use of multi-level modeling necessary.

RESULTS

Before we can start the multi-level analyses of the importance of the family for the divorce risks of children, we must show the relationship between the divorce risk of a child and the percentages of married sibling who have divorced. Table 2 shows that such a relation does, indeed, exist: The higher the percentage of divorced siblings, the more often the child is also divorced

Table 2. Relationship between the Divorce Risk of a Married Child and the Percentage Married and Divorced Siblings (Exclusive Ego).

	Not Divorced Child (%)	Divorced Child (%)	Total N (= 100%)
0% divorced siblings	86.5	13.5	5,162
33.3% divorced siblings	86.6	13.4	305
50% divorced siblings	82.7	17.3	387
66.7% divorced siblings	78.2	21.8	55
100% divorced siblings	80.1	19.9	396

$\chi^2 = 18.77$; $df = 4$; $p < 0.005$; $\gamma = 0.15$.

(13.5%, if no married sibling is divorced; 21.8%, if 66.7% of siblings are divorced).

Having a marriage-year-person file we have to control for year of marriage in all equations. The parameter of this variable has the usual direction: The longer a union exists, the lower the risk of divorce. Divorce risks are especially high in the early years of the union.

Table 3 presents the regression coefficients and associated standard errors for several consecutive models. Unless otherwise indicated, all effects are significant at the 0.05 level. Model 1 of Table 3 is a repetition of Table 2: It shows that having a higher percentage of divorced siblings increases significantly the divorce risks of ego. Model 2 shows the positive effect of having divorced parents on the divorce risk of their children: Children of divorced parents also divorce more. Model 3 (the combined effect of divorced parents and percentage of divorced siblings) shows that both family characteristics are highly independent in their effect on divorce risks. The strength of their parameters hardly changes by controlling for the other characteristic, and both remain highly significant (model 4). Their parameters also hardly change after adding the individual characteristics of the children to the equation. Although some of these individual characteristics are significant (age at first marriage; having children; years of education; year of birth), they are not responsible for the effects of percentage of divorced siblings or divorced parents. The latter effects are thus not spurious: The same holds true for the family characteristics that are added to the equation in model 5. The vast majority of these family characteristics have no significant effects on the divorce risk; only having a mother who works full-time decreases the divorce risk of children significantly.

These results show that there is a similarity in the divorce risks of children from the same family in Australia and that this similarity cannot be

Table 3. Divorce-Risks of Ego Explained by Parental Divorce, Divorce of Siblings, and Individual and Family Characteristics (Logistic Regression on Marriage-Year-Person File within Multi-Level).

	Model				
	1	2	3	4	5
Marriage-year level					
Length of marriage × 10 (time varying)	−0.33 (0.03)	−0.34 (0.03)	−0.34 (0.03)	−0.04 (0.04)	−0.04 (0.04)
Children level					
Percentage divorced siblings × 10	0.05 (0.01)		0.05 (0.01)	0.04 (0.01)	0.04 (0.01)
Age by first marriage				−0.03 (0.01)	−0.03 (0.01)
Child born before first marriage				0.21 (0.22)	0.20 (0.22)
Children				−0.21 (0.08)	−0.20 (0.08)
Left political orientation × 10				0.00 (0.01)	0.00 (0.01)
Occupational status × 10				−0.01 (0.02)	−0.01 (0.02)
Years of education × 10				−0.04 (0.01)	−0.04 (0.02)
Female				−0.05 (0.07)	−0.04 (0.07)
Year of birth				0.04 (0.00)	0.04 (0.00)
Family level					
Parents divorced: only mother at age 15		0.56 (0.17)	0.53 (0.17)	0.50 (0.18)	0.43 (0.17)
Family size					−0.01 (0.02)
Father's occupational status × 10					0.02 (0.02)
Migrant from an English-speaking country					0.05 (0.10)
Migrant from Mediterranean country					−0.19 (0.21)
Migrant from Eastern Europe					0.15 (0.27)
Migrant from Third World					−0.11 (0.18)
Migrant from North and West Europe					−0.21 (0.26)
Mother's educational level × 10					−0.08 (0.14)
Father's educational level × 10					0.07 (0.13)

Table 3. (Continued)

			Model		
	1	2	3	4	5
Father dead at age 15					−0.14 (0.19)
Respondent with stepparent at age 15					−0.06 (0.16)
Mother worked full-time at age 6 and 10					**−0.03 (0.01)**
Mother worked part-time at age 6 and 10					−0.02 (0.02)
Mother worked full-time age 6 and part-time 10					0.08 (0.06)
Mother was at home at age 6 and worked at 10					−0.01 (0.01)
Mother was at work at age 6 and home at age 10					−0.04 (0.03)

Note: Values in bold are significant at the 0.05 level.

explained by the overlap in measured characteristics of the siblings or by their jointly measured parental characteristics.

Table 3 shows some other interesting results. Even after controlling for individual and family characteristics, year of birth has a significant parameter. The younger the person, the higher his or her divorce risk. Clearly, there is a secular trend in Australia of increasing divorce risks that cannot be explained by changes in individual and family characteristics such as educational level or mothers entering the workforce.

Having children decreases the divorce risk, either because of a larger reluctance to divorce with children or because of the higher investment in the union made by both parties in creating children.

Occupational status has no significant effect on the divorce risk, but educational level has. The higher the educational level, the higher the divorce risk. This relationship suggests that cultural knowledge and resources open up more possibilities to end an unsatisfactory marriage and provide more financial and social capital, as indicated by occupational status. Parental occupational status or educational levels are irrelevant for the divorce risk of their children.

Political choice is not related to divorce risk. This finding contradicts the notion that divorce risks are strongly related to values and attitudes toward society.

Being a migrant does not increase the divorce risk significantly compared with the risk for native Australians. The possible increase in uncertainty about values, norms, and preferences seems to be neutralized by the need to use all scarce resources for the success of the migration and thus not for ending an unsatisfactory marriage.

Contrary to what might be expected, having a working mother has no significant positive effect on the divorce risks of her children. Indeed, the only significant effect runs against the expectation: Having a full-time working mother decreases the divorce risk of her children significantly. A possible explanation is that the power balance in the parental family is more equal, thanks to the mother's full-time work. This power sharing teaches the children that a more equal division of labor between husband and wife is possible. That knowledge increases the chances that the power balance will be less unequal in the children's own marriages and thus that their unions will be less prone to conflicts related to the gender division of labor and thus to disruption.

The parameters of the other individual characteristics are obvious, given the research literature on divorce: Marrying young increases the risk of divorce. But having a child born before one's first marriage is not significant after controlling for the other individual characteristics, nor does family size have a significant effect on divorce risk.

CONCLUSION

The two main research questions of this chapter can be answered positively. There is a similarity in the divorce risks of children from the same family in Australia, and measured parental characteristics (parental divorce, common socioeconomic background of the parents) and the overlap in measured characteristics of their children (educational level, age at first marriage) cannot explain this similarity in the divorce risks. Nevertheless, it is possible that unmeasured family characteristics such as common socialization can explain this similarity in divorce risks. However, we find it difficult to propose unmeasured characteristics of socialization in the parental family or by the siblings that are not related to the measured characteristics that we already included in the equation (educational level, age at marriage, parental divorce, and political choice). Such an unmeasured characteristic should

be unrelated to the already included characteristics; otherwise, adding an unmeasured but related characteristic probably cannot explain the similarity of divorce risks within families.

This suggests that the similarity in divorce risks also might be the consequence of the common genetic and social heritage of the siblings. More often than nonsiblings, they share the same genetically and socially transmissible personality traits (like the "big five") that are related to divorce risk and thus to more similar divorce risks. Our results also suggest that an interaction between genetic and environmental factors, rather than environmental influences alone (as is assumed in many theories of divorce), might be responsible for divorce risk differences in the population.

The model used in this chapter is a general model for multi-level event history. It would also apply to situations where individuals in organizations are followed in a panel design, with outcome variables such as career changes or events such as leaving the organization, to be predicted by both individual-level and organizational-level explanatory variables. The specific analysis model used requires multi-level software for binary outcomes and at least three available levels, a description that applies to most modern multi-level software. Hedeker, Siddiqui, and Hu (2000) have published software for multi-level grouped-time survival analysis that can also be used to analyze our model. Goldstein (2003) discusses several approaches to multi-level event history analysis that can be analyzed using MLwiN in combination with special macros.

NOTES

1. "Divorce" also includes separation of a cohabitating couple with children. From the point of view of the children, the exact juridical bond between their parents (marriage or cohabitation) is not highly relevant for their experience of a parental breakup (divorce or separation).

2. Amato confirmed in a personal communication that such a sibling analysis does not exist. The analyses that come close are twin analyses.

3. If the respondent or sibling had a child before the first marriage, this variable was coded zero.

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SIBLING EFFECTS ON DIVORCE: COMMON FAMILY BACKGROUND, COMMON GENETIC HERITAGE, OR CONTINUING INTERACTION AMONG ADULT SIBLINGS

Michael P. Farrell

ABSTRACT

This article highlights some of Dronkers and Hox's significant findings
about family background and sibling effects on divorce. It proposes that in
addition to siblings' common family background and genetic heritage,
their interaction over the life course may influence their attitudes toward
marriage and divorce. The influence of sibling modeling and interaction
over the life course may vary, depending on the gender and birth order of
siblings.

CONTRIBUTIONS OF DRONKERS AND HOX'S CHAPTER

Dronkers and Hox's study (this volume) is highly original both in the re-
search questions they address and in their methodological approach for