



Child Gender and the Risk of Divorce

Andrea Breitenbach^{1*}

¹*Institute of Sociology, Department of Social Science, University of Frankfurt am Main
Campus Westend- PEG Gebäude, Grüneburgplatz 1, 60232 Frankfurt, Germany.*

Author's contribution

This whole work was carried out by the author AB.

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ABSTRACT

Very few studies have dealt with the role of children's gender on divorce rates. However, this was first highlighted by the pioneering research by Morgan, Lye, and Condran [1]. The authors assume that the birth of girls contributes to lower marriage stability than that of sons. However, it should be kept in mind that children's gender cannot directly affect marital stability because parents cannot determine the sex of their progenies at birth. This important aspect is not taken up by Morgan, even though they explain the role of the sex of children on marriage stability with the preference of sons over daughters. In this study, the focus is on the analysis of gender preference structures and their influence is investigated on the risk of divorce by means of data from the Family Survey.

An analysis of the theoretical background of several studies reveals that the issue of children's gender and divorce rates can be linked with an underlying preference among parents for a specific gender in their children. If children of the preferred gender are born, the divorce rates should be lower than compared to cases of the birth of non-preferred gender. On the basis of the data gathered from Family Survey, several hypotheses on gender preferences and related gender-specific divorce rates have been formulated. Though the results partially confirm the hypotheses, they also offer important implications for further investigations into gender-preference structures and divorce rates.

Keywords: *Divorce; marriage stability; child gender; gender preferences.*

*Corresponding author: Email: a.breitenbach@soz.uni-frankfurt.de;

1. INTRODUCTION

Is the risk of divorce lower for couples with sons than for couples with daughters? The role of children's gender on marital stability came under the focus of research on divorce following the results of a study by Morgan, Lye, and Condran[1]. By analysing the data of the Current Population Survey, the researchers found a higher risk of divorce among couples with daughters than among those with sons. According to their interpretation of the result, sons led to marital stability because of higher involvement of fathers in raising children of the male gender. A similar conclusion was arrived at by Morgan and Pollard [2]. In contrast, the only two studies that have investigated the effect of a child's gender on divorce risk in Germany came up with different results. In the first study, Wagner [3] used the Life Course Study to determine significant correlations only for West German marriages from 1936 to 1948. He concluded that a son reduced the divorce risk significantly by nearly 40% as opposed to a daughter. The other study by Diekmann and Schmidheiny [4] basis on the Fertility and Family Survey. They investigated the hypothesis in 18 countries, including Germany. The results of their surveys, however, did not confirm the hypothesis that sons led to greater marital stability among their parents as opposed to girls.

A closer look into the aforementioned studies reveals that marital stability is not affected directly by a child's gender. There must be other underlying reasons as parents cannot influence the child's gender before birth. One reason can be the parents' preference for a child with a certain gender. In other words, if parents favour a specific gender or a certain gender combination in their children, the risk of divorce decreases with the existence of the favoured gender or gender combination. This means that marital stability is affected by the congruence between the preference for a certain gender and the existence of children of this gender in the marriage. This implies that gender-specific divorces should reflect different gender-preference structures.

Following this assumption, the aforementioned studies are replicated with the data of the Family Survey and further hypotheses are investigated to determine how possible gender-preference structures among parents or of a child's gender can raise or lower the risk of divorce. Since the preference structures are comparable in Germany with those of the USA and other western countries, the results for the marital stability should be similar. Moreover, the results of this study are useful for future research as they indicate new ways for the study on divorce.

Additionally, the importance of a very precise differentiation, when operationalizing the variables of an investigation into divorce risks, becomes obvious. For the examination of the impact of a child's gender on divorce risk, it is necessary to consider only children born biologically to the same set of parents, in order to eliminate the impact of other children, e.g. of stepchildren. Other surveys have shown that an imprecise differentiation of child-parent relations changes the outcome. For this reason, the analyses are performed for legitimate children first, and all children of a couple and compared afterwards.

First of all, relevant theories and hypotheses on gender preference structures as well as ad hoc hypotheses will be analysed.

Gender preference structures are found mostly in research on fertility. Therefore, knowledge of fertility research must be included.

2. CHILD GENDER IN FAMILY RESEARCH

The study by Morgan et al.[1], which was the first to look into the correlation between a child's gender and marital stability, presumed that fathers invest more time in raising them than in the case of daughters. The more the fathers' participation in childcare, the marital stability is higher. In more recent survey groups, however, a decline of gender-related effects of sons could be observed. According to Morgan and Pollard [2], this change was due to changing family-role structures, which lead to an increasing egalitarian ratio in the relation of fathers to their sons and daughters. The authors altogether examined three hypotheses, two of which are examined in this paper.

Hypothesis (1): Sons decrease the divorce risk more than daughters.

Hypothesis (2): The gender of children does not affect marital stability in younger cohorts.

Morgan et al. justify these hypotheses theoretically by basing their arguments on Durkheim and family economics of Gary S. Becker. Whereas Durkheim speaks of an increase of marital solidarity due to the existence of sons in marriages, Becker argues that the parents' preference for a certain gender in their children induces a higher utility rate. In both cases, the cause of the "increase of marital solidarity" or the "rise in utility rate" is the child's masculine gender. Yet, this implies an underlying gender preference. For this reason, it is necessary for this investigation to examine the approaches to gender preference structures. These are especially found in the area of research on fertility. In societies that favor a specific gender in children, one can find congruence between the parents' gender preference and how the existence of this gender affects fertility and marital stability. And marital stability should be higher because it promotes marital happiness/satisfaction that results from getting (by chance) one's desired sex composition. Therefore, the knowledge of preference structures in a particular society is essential for an investigation into the correlation between gender preference structures and divorce risk. For example, if there is a preference for male children, then sons should reduce the divorce risk more than daughters. [5,6]. First, this paper would take a look into family economics and subsequently discuss approaches of fertility research.

Family economics offers various explanations on the utility of children in marriages in terms of commodities and marriage-specific capital. In addition to a detailed discussion of the effects of different child-parent relations and marital stability, in my opinion family economics offers pioneering approaches to explain the influence of a child's gender or of gender preference on marital stability. In societies with gender preferences, fertility is dependent on the birth of the preferred gender, and marital stability increases as a result. Parents in these societies also give birth to more children than their counterparts in societies without preference structures. This is because the first child born to the parents may not always belong to the favored gender, and therefore further children conceived in order to give birth to the preferred gender. Andersson, Hank, and Vikat [7] state a reason for gender preference patterns for boys:

"The desire for a son is the father of many daughters" (Seidl, 1995; cited by [8]).

According to Becker, there is a notably higher preference for sons than for daughters in developing countries, where sons offer higher economic security and utility rates than daughters: Becker says that instead of talking about preference (especially in later works) for sons, the term "higher value of sons for their parents" should be used [3]. Additionally, more capital is invested in the preferred gender, in this case son. But with the increase in wealth in modern societies, the preference for sons has relatively declined and resources invested in children are divided more equally among both genders. For this reason, a gender preference

does not exist in relatively wealthy societies and the child's gender does not affect marital stability. By means of family economics can be derived the following hypothesis:

Hypothesis (3): In Germany, a child's gender does not have an impact on marital stability.

Fertility research deals with investigations into preference structures. The value-of-children approach offers a socio-psychological aspect to gender preference. Moreover, there are suppositions in sociology that fall in the ambit of the term "gender-preference hypotheses." They reflect the results of empirical studies. There are also assumptions on gender preference that are based only on ad hoc hypotheses and not on a sufficient theoretical foundation. Theoretically, five gender preferences are possible: a son preference, a daughter preference, a mixed gender preference, a preference for children of the same gender or no preference for a certain gender. Hereinafter, the paper will discuss the preference patterns that exist in modern societies like Germany.

The value-of-children approach, constituted by Hoffman and Hoffman [9], explains attitudes of parents towards children and their fertility behaviour, specifically in the context of society. The presumptions focus on the psychological utility of children for their parents. The utility or value of children is based on different components and varies according to the type of society, people or institutions. In the context of the societal conditions in Germany, especially with regard to social security systems, the psychological and work utilities of children recede in importance. While emotional utility rises, status utility reduces at the same time. Moreover, no gender preference exists at the birth of children in countries with affinal family relations, like Germany. Therefore, the gender of children does not have any effect on marital stability. This deduction is similar to Hypothesis 3.

From the perspective of sociological fertility research, there are various assumptions on gender preference, which are partly contradictory. The paper will now briefly discuss these assumptions. International empirical studies come up with heterogeneous results: In the Scandinavian countries of Denmark, Norway, Sweden, and Finland, a mixed-gender preference is predominant [7,10,11,12]. Only in the case of one-child families, a daughter preference is visible in Denmark, Norway, and Sweden, whereas Finnish couples prefer sons [7]. The preference of two children of different genders in western countries is confirmed by a literature analysis for western countries [13]. This applies to the USA, Canada, and Australia as well. The only exception to this was found in a study by Dahl and Moretti [14]: Men prefer sons, vice versa women prefer daughters [14,15]. Hank and Kohler [16] also detected a mixed-gender preference in nine European countries by using Fertility and Family Survey. They found a preference for girls in Portugal, Lithuania, and the Czech Republic, but could not find any gender preference at all in five countries, including Germany. However, the studies found a preference for a mixed-gender relation in Germany when using the data of Allbus. Yet, differentiating analyses show a daughter preference for women and people with a higher educational level. In more recent cohorts, this is changing into a son preference [16]. In contrast, Brockmann [17] (with SOEP data) detected a son preference among older couples as opposed to a daughter preference among younger couples). Hank, Andersson, and Kohler [18] study childless people and parents in Germany with regard to their gender preference. The authors find a mixed-gender preference among childless people, but preference for a son among parents who already have a daughter. In Denmark, Finland, Norway, and Sweden, no gender preference for the second child can be found irrespective of the gender of the first child. Therefore, no hypothesis can be deduced because of the different outcomes of these studies. Note that the impact on a third child in cases where two children already exist is not presented here because most parents have less than two children.

The Complementary-costs Hypothesis, named after the study by Leigh [19], shows a different gender preference pattern. It presumes that the cost of childcare is dependent on whether parents have sons or daughters. For example, toys or clothes could be passed on to younger siblings of the same gender. This means less cost in terms of childcare compared to families with mixed-gender children. Parents therefore prefer an even gender ratio, and the existence of the favored gender of children in turn increases marital stability. This supposition leads to:

3. CHILD GENDER AND DIVORCE

Very few studies, just two in the case of Germany, examined the correlation between the child's gender and marital stability. However, there is a series of studies on the relation between gender preference and fertility. These were brought into perspective in the preceding chapter so as to give an overview on prevailing preference structures. Hereinafter, the relevant studies on children's gender and marital stability will be presented.

Studies that investigate the impact of a child's gender on marital stability do not come up with consistent evidence. Morgan, Lye, and Condran [1] detect a negative effect of sons on divorce risk, which decreases in more recent cohorts. Katzev, Warner, and Acock [20] as well as Morgan and Pollard [2] confirm the assumption of Morgan, Lye, and Condran [1] for the USA. Diekmann and Schmidheiny [4] knowledge the possibility of an α -error due to sample variability, and Andersson and Woldemicael [10] add:

One has always to be aware that even when there is no real effect of a variable in a population, then every 20th sample or so based on that population will produce a statistically significant finding if investigators report their findings at a probability level of 5%. In addition, since scientific journals are more willing to publish material that report positive findings than material that report the absence of effects, it is the former type of results that will appear to the public.

However, Bedard and Deschênes [21] do not find any significant influence of a child's gender on marital stability in more recent cohorts in USA. In older cohorts (1960–1989), daughters as well as sons reduce the risk of divorce. In the case of sons, the divorce risk is between 0.5 and 0.7% lower than with daughters, depending on the cohort. In contrast, Wu [22] detects a lowering in divorce risk by 3 to 5% due to the existence of daughters as compared to the divorce risk among couples with sons in Canada. Yet, both genders reduce divorce risk significantly by nearly 50%. For Sweden, Andersson and Woldemicael [10] determine that divorce risk is lowered by -4 in marriages with a mixed-gender ratio between one to two children, since no significant result can be found with the birth of sons. Although daughters reduce the divorce risk a little more than sons, the outcome is not significant.

According to Wagner [3], a son reduced the divorce risk for West German marriage generations (1936–1948) significantly by -39% in comparison to a daughter. For other cohorts, no significant relations could be determined. Diekmann and Schmidheiny [4] study the hypothesis of Morgan and Pollard for 18 countries, but they could not confirm it. In Germany, no significant results were apparent for one-child families. West German couples with two children of different genders had a lower divorce risk of -52 % in comparison to childless couples. Whereas in East Germany, the results of a mixed gender ratio were not significant (With regard to childless couples compared to those with one child and mixed gender relations with couples with two children). Based on the studies presented here, no relation between a child's gender and divorce risk can be determined.

4. MATERIALS AND METHODS

This study is based on the data provided by the third wave of the Family Survey of the German Youth Institute in 2000. This wave comprises two sub-samples. The first is a “replicative survey” or a cross-section survey of 8,091 private households in Germany. The second is a panel sample of 2002 respondents, who had already participated in both the previous waves. The replicative survey is a representative survey of the German-speaking residential population in the age group of 18 to 55 years. For the survey, 6,613 people were interviewed in the old federate states and 1,478 people in the new ones. The panel survey was a repetitive survey of respondents living in West Germany, who were interviewed in 1988 and 1994.

In order to guarantee representative analyses and to enable an East-West comparison, the panel survey will be excluded from the calculations for the moment.

In order to eliminate the impacts of other cultural backgrounds, people born in foreign countries, internal migrants for over 16 years (from West to East Germany and vice versa, in order to guarantee a definite attribution to a West or East German biography) or emigrants were excluded. The analysis gave relevance to first marriages that are still intact, respondents living apart without being divorced, marriages that were terminated by the death of one partner as well as first marriages that ended in divorce (Note: By analysing only first marriages, influences from selected effects are excluded). All marriages, which have no valid statement on the year of marriage, the year of divorce, the year of separation or the date of death, are excluded. Thus, the sample is reduced to 4,210 marriages, which provide the basis of the following analyses. Until the survey period, 18.36% of all marriages (773 people) were divorced. These included 17.30% in the old federate states and 23.10% in the new federate states.

Divorce risk is investigated in order to measure marital stability. In this study, the dependent variable is the duration of marriage, i.e. the risk of divorce estimated on the basis of the duration of marriage by means of Event History Analysis. Moreover, the data set enables

Table 1. Sample selection family survey 2000

	West	East	Total
Total sample	8790	1528	10318
Replicative Survey	6613	1478	8091
German Responders'	6225	1461	7686
Without German Resettles' and foreign-born people	5701	1427	7128
Without Resettles' (West/East, over 15)	5627	1420	7047
First Marriages	3435	775	4210
Separate First Marriages	713	202	915
Divorced First Marriages	594	179	773

**Cases without a valid date of marriage, date of separation, date of divorce or date of death were excluded. Since the information on the marital status of the partner might be incorrect, it is not known, whether this is the first marriage of the partner too (DJI, 2009).*

controlling important determinants of the divorce risk, and they therefore enter the analysis as covariates. For multivariate analyses, two different models were calculated. These were a basic model and an extended model, which was extended by five variables on the attitude toward children. The depending variable is the duration of marriage. The duration until the

divorce is calculated in the case of divorced respondents; the duration until the death of the spouse is considered for widows and widowers; and in the case of the married ones, December 31, 2000 is the scheduled end date because the interview date is not included in the data set.

Table 2. Mean values of other covariates

	West	East	Total
Length of marriage before divorce (years)	10.27	8.55	9.87
Length of cohabitation (years)	1.41	1.15	1.38
Length of relationship before household formation (years)	2.14	2.19	2.11
Age at marriage of husband (years)	26.69	24.42	26.32
Age at marriage of wife (years)	24.04	22.38	23.79
Home ownership (0/1)	36.26	25.78	34.33
Church attendance (0/1)	17.41	3.35	14.83
Religious ceremony (0/1)	69.61	22.65	60.98
Marriage cohort 1961-1970 (0/1)	12.52	14.05	12.79
Marriage cohort 1971-80 (0/1)	25.64	34.06	27.19
Marriage cohort 1981-90 (0/1)	33.51	35.59	33.90
Marriage cohort 1991-2000 (0/1)	28.33	16.31	26.12
Large city (0/1)	63.12	51.07	60.91
Education homogamy (0/1)	76.93	77.14	76.79
Both catholic (0/1)	38.48	0.90	30.79
Fathers education (years)	9.42	9.46	9.43
Education of wife (years)	9.85	9.98	9.88
Education of husband (years)	10.00	10.01	10.00
Getting to know I: acquaintances, friends, relatives (0/1)	29.32	29.46	29.35
Getting to know II: school, education, occupation, hobbies	39.82	33.18	38.60
Getting to know III: holiday, display, pub or disco (0/1)	30.86	37.36	32.05
Married several times (0/1)	6.91	7.54	7.03
Family-oriented partnership (0/1)	24.69	37.13	26.98
Attitude to reconciling of work and family life (index) ^a	0.80	0.66	0.78
Attitude to role of mother (index) ^a	0.54	0.53	0.55
Child-orientated couples ^{b,c}	0.93	0.95	0.94
Economic benefit of children ^d	0.52	0.63	0.54

^a0.2 = "very egalitarian" to 1 = "very traditional"; ^b could also be interpreted as emotional utility of children; ^c 0.25 = "little child oriented" to 1 = "very child oriented"; ^d 0.25 "little interested in the economic utility of children" to 1 = "very interested in the economic utility of children"

For the major independent variable, the child's gender, all possible combinations are calculated for the first, second and third child, and this results in 15 dummy variables with the reference category "couples without children." Additionally, different covariates are considered among married couples from 1971 to 1980, from 1981 to 1990 and from 1991 to 2000 with the reference category from 1961 to 1970 being "cohabitation duration", "duration from beginning of relationship to foundation of an own household", "age at marriage", "home ownership", "church wedding", "frequency of church attendance", "educational homogamy", "both catholic",

“education of father”, “education of wife, at the beginning of marriage”, “education of husband, at the beginning of marriage”, “place of getting to know”, “plural marriage”.

For the extended model, further variables are included. These variables are “family oriented relationship type,” “attitude on compatibility of career and family,” “attitude to mother role,” “child oriented couples,” “economical utility of children.” Table 2 displays the average of these variables, divided in West Germany and East Germany as well as hole Germany.

This paper uses the t-ln(t2)-model from Klein [23] – a modified sickle model – for event history analysis. Following the non-monotone course of the sickle model of Diekmann and Mitter [24], this more flexible model was designed. Compared to the sickle function, it projects the maximum in a better way. The model presumes a constant divorce rate during marriage, whereas a non-monotone course is built by the variables t1 and t2:

$$r(t) = \exp(c_i + \beta_1 t_1 + \beta_2 t_2)$$

with t_1 = duration of marriage, $t_2 = \ln(\text{duration of marriage}^2)$, $c_i = (\exp(\beta_i) - 1) * 100$. [23].

5. RESULTS AND DISCUSSION

Let us have a look at the results of the multivariate analyses for West Germany and East Germany in Table 3 and Table 4. The outcome for couples with only legitimate children is given in normal font, whereas the results of couples with children without a further differentiation among the child-parent relations are displayed in italics. This visualization was chosen to show how a non-exact differentiation of child-parent relations can influence the results. For instance, couples with only legitimate children throughout have a lower divorce risk than couples, who also have non-legitimate children. This confirms the supposition that an exact differentiation of child-parent relations – in this case legitimate children – is necessary to get definite results.

Due to the coefficients in this table, statements can only be made about which gender combination of children offers the highest marital stability.

But this is only of secondary interest because the paper's investigation deals with whether gender-specific divorces exist. For this reason, the results are only sketched out – this investigation would not be useful anyway because parents cannot control the child's gender.

In West Germany, parents with a daughter-son-son combination have the lowest divorce risk (see Table 3 Model 2: the model with multiple variables is chosen), followed by those with three or two sons. In East Germany, parents in the same model with a daughter-son-daughter combination have the lowest divorce risk, followed by those with two sons and a son-daughter combination (see Table 4 Model 2),. The comparison of cohorts (see Table 5 and 6 is not interpreted at this point, because it will be presented in detail in the discussion of gender-specific divorce rates.

The gender-specific divorce rates that are of interest here can again be explained by the parents' preference for a certain gender in their children. Therefore, the results of the analysis are shown in a modified way in Table 7. This enables a clearer interpretation of the outcome and a better verification of the hypotheses. Given a theoretical basis, contrary as well as

contentious congruent hypotheses have been studied. According to the 'basic assumptions' of the hypotheses, it is presumed that gender preferences are common among parents. No preference for a certain gender in children is also considered to be a preference: it's called "no gender preference". If a child of the preferred gender is born during marriage, the divorce risk is lowered. Therefore, marital stability is indirectly affected by gender preference. Hence, gender preference structure can be deduced from gender-specific divorce rates.

Hereinafter, effects between gender and number of children will have to be eliminated during the interpretation of the multivariate results. This is because the effects between gender and number of children have an impact on each other and they were found during the calculation of other models. In order to exclude this effect and to simplify the verification of the hypotheses, gender-specific divorce rates are considered separately for one, two and three children and ranked according to the coefficients. Moreover, all five possible preference patterns are compared to the data from the analyses. The first column shows the number of children (1–3), followed by five columns with anticipated rankings from the lowest to the highest divorce risk in relation to possible gender preferences. For example, if the hypothesis states that sons are preferred to daughters, sons should decrease the divorce risk more than daughters. According to the expected ranking (Column 2, Table 7.) the divorce risk should be lower with a son (S) than with a daughter (D) at the birth of the first child. With two children, the divorce risk should be lowest with two sons (SS), followed by a combination of son and daughter (SD or DS), since two daughters (DD) would show the highest divorce risk compared to all other combinations. Accordingly, the anticipated rankings of all further preference structures are displayed.

At this point, the last possible gender preference – no preference to a certain gender in children – structure should be mentioned briefly. If this is the case, no distinct pattern should exist. The outcome of a comparison of the observed rankings with regard to divorce risk as well as a number of children and the expected rankings with regard to underlying gender preference (see "evaluation of results") are illustrated in the lower part of Table 7. For a comparison of the individual effects (α -effects), the outcome in Table 3 to Table 6 should be taken into account.

The following columns indicate the results of the extended models with regard to the lowest divorce risk in ascending order for each number of children (1–3). For example, in Table 3, Model 2 (T3, M2), the divorce risk is higher with the birth of a daughter (D) than with the birth of a son (S). Note that the analyses always refer to the reference category of childless marriages. However, it would also be possible to correlate the analyses to another reference category, e.g. sons. This was not done here, as this is not only an investigation of whether a son preference exists, but of various hypotheses that are even contrary in some cases. The comparison of the coefficients among themselves allows statements on the differences between both groups. For a daughter (D), the factor is 0.619 and 0.538 for a son. In the case of two children, it is lowest if they are both sons (SS), followed by a son-daughter combination (SD) and then by two daughters (DD), whereas the highest divorce risk can be found with a daughter-son combination (DS). Here, the factorial values are in accordance with the enumeration: 0.220, 0.282, 0.298 and 0.307. The rankings of gender combinations of three children are generated analogously. In the modified table, the following outcome can be seen:

If one or two children are born in West or East Germany, a slight preference for sons is visible. For one son, this amounts to 12.7 %. Here the difference between both coefficients was calculated ($e^{(-0.48 - -0.60)} = e^{0.12} = 1.127$). Note: these are the original β -values; for the Tables

the antilogarithm $\exp(\beta) = \alpha$ - also called α -effect is generated. For two children, the effects in comparison to two sons are ($e^{(-1,266--1,514)} = e^{0,275} = 1.282$). for a son-daughter combination, ($e^{(-1,211--1,514)} = e^{0,303} = 1.354$). for a daughter-daughter combination and ($e^{(-1,181--1,514)} = e^{0,333} = 1,395$) for a daughter-son combination.

For three children, no preference pattern is apparent in West Germany, but a slight preference for daughters exists in East Germany. The following six columns illustrate the results of the cohort comparison, which serves as the means for checking the "attenuation hypothesis." This hypothesis states that the impact of a son preference decreases in more recent cohorts, and therefore the children's gender does not affect the marital stability in these cohorts.

In West Germany, a son preference is visible for the marriage cohort 1961–1970 with one child, but there is no preference for further children. For a son, this effect amounts to 0.712 in comparison to childless marriages, and for a daughter the effect comes to 0.852. However, it is not significant. Therefore, calculating the effect is not useful in order to compare son and daughter. However, a daughter preference for couples with one child becomes obvious in the marriage cohort 1971–1980. For two children, there is no preference pattern and for three children a slight son preference can be observed. In the context of the marriage cohort 1981–2000, a son preference can be found among couples with one child, no preference pattern is visible for two children, and a slight son preference exists for three children. If a son was born, the parents' divorce risk is lower than after the birth of a daughter. When comparing daughter and son, the effect amounts to ($e^{(-1,298--1,501)} = e^{0,203} = 1.225 = 22,5\%$). The outcome of the cohort comparison in East Germany is very different from that in West Germany. With respect to the marriage cohorts 1961–1970 and 1971–1980, no preference patterns can be found for one to two children. The results for one child are not significant. For the marriage cohort, only the daughter-son combination with the factor 2.270 is significant at a 10%-significance level. If couples of the marriage cohort 1981–2000 give birth to a child, they prefer a son a little more than a daughter, but a strong daughter preference becomes obvious with two children. For two children, the effect of a daughter-son combination is 1.575, that of a son-daughter combination is 2.138 and for a son-son combination it is 2.373, with all these combinations being compared to two daughters. The results of the combinations of three children are not significant for almost all gender combinations, probably, caused by the low number of cases and are therefore not displayed here.

In the next step, the results are compared to all five deduced hypotheses, followed by verification (see Table 7). The first assumption (Hypothesis 1) that the birth of sons increases the marital stability was deduced by the Fathers Involvement Hypothesis. The outcome of the multivariate analysis shows that a lower divorce risk exists for couples with a son – except for the second cohort in West Germany in a cohort comparison and for the first two marriage cohorts in East Germany – than for couples with a daughter. With two children, a slight son preference exists in West and East Germany, except in cohort comparison. If three children were born, different gender preferences are visible and some results are not even significant. Hence, Hypothesis 1 can be confirmed only with respect to one child, if the cohort comparison is not considered. For two children, it can be confirmed only partially, and it has to be ruled out for three children.

Additionally, Morgan and Pollard [2] hypothesize (2) that the effect of a son preference decreases in more recent cohorts. The marriage cohorts from 1961–2000 cannot confirm this hypothesis. On the other hand, results show that the series of marriage cohorts in West Germany at the birth of the first child is first a son preference (marriage cohort 1961–1970),

then a daughter preference (marriage cohort 1971–1980) and again a son preference in the context of marriage cohort 1981–2000.

In couples with two children, no preference patterns are visible for West Germany. With three children, the results are not even significant for both parts of Germany. In the context of East German marriage cohorts (1961–1970 and 1971–1980), the gender of one to two children do not have any impact on marital stability, whereas the marriage cohort 1981–2000 shows that a son reduces the divorce risk more than a daughter. But in couples with two children, a daughter preference can be observed. Thus, the Attenuation Hypothesis (2) has to be ruled out.

Family Economics and the Value of Children Approach formulate another hypothesis (3), which states that there is no visible gender preference in Germany, and consequently there is no correlation between a child's gender and marital stability. If a first and a second child are born, this supposition can neither be confirmed for West nor for East Germany because the results of the model show a preference for son. This applies to one child in West Germany in the comparison of cohorts and for the most recent cohort in East Germany as well, where either a preference for son or a daughter can be found depending on the cohort. In a cohort comparison, however, there is no apparent preference pattern for East German couples with one child among the marriage cohorts 1961–1970 and 1971–1980. It cannot be resolved whether this is due to the insignificant outcome or if there are indeed no preference patterns. At the birth of a second child, there is no gender preference for all the cohorts in West Germany as well as for the first two cohorts in East Germany. However, the third cohort for East German couples shows a daughter preference. For three children only, small values are significant in order to interpret them. This is probably due to the low number of cases. Hence, both hypotheses can only be confirmed in the cohort comparison of the second child in West Germany and in the cohort of 1971–1980 for the birth of the second child in East Germany.

Finally, the Complementary-costs Hypothesis (4) is investigated. This hypothesis assumes that children of the same gender increase marital stability the most. It refers to only two or more children. The divorce risk for couples with two children is lowest, if they have two sons, for West as well as for East Germany. This is followed by a son-daughter combination and then by two daughters. For three children the results are significant in too little cases, in order to interpret them. The cohort comparison does not show compliance either except for the second cohort. Therefore, these results cannot confirm the hypothesis.

With regard to our initial question, whether a child's gender has an impact on the divorce risk, this can be fully confirmed for couples with only one child, and partially for couples with two children. The results lead to the conclusion that sons are preferred to daughters in one-child families, and hence a son preference is predominant.

Table 3. Risk of divorce for couples in West Germany after the gender of the children (weighted)

	West Germany							
	Model 1		Model 1		Model 2		Model 2	
Duration of marriage ^b	0.932	***	0.961	***	0.932	***	0.961	***
In (duration of marriage)	1.661	***	1.656	***	1.661	***	1.656	***
One Child: son ^{ab}	0.549	**	0.699	**	0.538	**	0.640	**
One child: Daughter ^{ab}	0.619	*	0.853	*	0.619	*	0.853	**
Two children: Son-Son ^{ab}	0.242	***	0.299	***	0.220	***	0.289	***
Two children: Son-Daughter ^{ab}	0.298	***	0.377	***	0.282	***	0.370	***
Two children: Daughter-Son ^{ab}	0.301	***	0.391	***	0.307	***	0.399	***
Two children: Daughter-Daughter ^{ab}	0.289	***	0.367	***	0.298	***	0.350	***
Three children: Son-Son-Son ^{ab}	0.229	**	0.298	***	0.218	**	0.289	***
Three children: Son-Son-Daughter ^{ab}	0.221	*	0.292	***	0.252	*	0.313	***
Three children: Son-Daughter-Son ^{ab}	0.391	*	0.449	***	0.387	*	0.432	***
Three children: Daughter-Son-Son ^{ab}	0.184	**	0.258	***	0.189	*	0.282	***
Three children: Son-Daughter-Daughter ^{ab}	1.051		0.995		1.174		0.997	***
Three children: Daughter-Son-Daughter ^{ab}	1.616	*	0.861		1.840	*	0.915	***
Three children: Daughter-Daughter-Son ^{ab}	0.698	+	0.981	+	0.613	+	1.054	***
Three children: Daughter-Daughter-Daughter ^{ab}	0.618	*	0.698	*	0.638	*	0.710	***
Four or more children ^{ab}	0.333	***	0.383	***	0.340	***	0.398	***
Length of cohabitation	0.923	*	0.951	*	0.896	*	0.932	**
Duration until household formation	0.940	+	0.940	*	0.960	+	0.940	+
Age at marriage of wife	1.000		1.000		1.000		1.010	
Age at marriage of husband	0.990		0.990		0.990		0.990	
Home ownership ^a	0.377	***	0.375	***	0.373	***	0.361	***
Church attendance ^a	0.638	**	0.670	***	0.741	*	0.779	***
Religious ceremony ^a	0.644	**	0.795	***	0.698	*	0.844	*
Marriage cohort 1971-80 ^a	1.632	***	1.682	***	1.616	**	1.707	***
Marriage cohort 1981-90 ^a	2.943	***	2.956	***	2.715	***	2.804	***
Marriage cohort 1991-2000 ^a	3.675	**	3.674	***	3.649	***	3.658	***
Education homogamy ^a	0.886	**	0.979	***	0.888	**	0.980	**
Both catholic ^a	0.869	+	1.030		0.869		1.020	
Fathers education (years)	0.905	*	0.896	*	0.878	*	0.861	***
Education of wife (years)	1.041		1.020		1.051		1.020	

	West Germany							
	Model 1		Model 1		Model 2		Model 2	
Education of husband (years)	0.990	***	1.000		0.970		0.980	
Getting to know I ^c	0.819	**	0.798	***	0.787	+	0.733	***
Getting to know II ^c	0.878	**	0.875	***	0.861		0.803	***
Married several times ^a	2.344	***	2.335	***	2.351	***	2.335	***
Family-oriented partnership					0.960	**	0.968	***
Attitude to work and family life					0.742	+	0.741	+
Attitude to role of mother					0.817	***	0.844	***
Child-orientated couples					0.458	**	0.677	+
Economic benefit of children					0.771	*	0.972	*
Key statistics								
Number of splits	30578		30578		29806		29806	
Not censored data	329		329		321		321	
Log-Likelihood	-2391.780		-1265.122		-2329.983		-1233.192	

^a Dummy variable (0/1); ^b Time dependent; Reference category; ^c Reference category: Getting to know III, + P = .1 * P = .05; P** = .01, *** P = .001

Table 4. Risk of divorce for couples in East Germany after the gender of the children (weighted)

	East Germany							
	Model 1		Model 1		Model 2		Model 2	
Duration of marriage ^b	0.844	***	0.914	***	0.852	***	0.923	***
ln (duration of marriage)	1.665	***	1.657	***	1.664	***	1.657	***
One Child: son ^{ab}	0.571	+	0.794	+	0.600	+	0.777	***
One child: Daughter ^{ab}	0.935		1.094		0.887		1.271	+
Two children: Son-Son ^{ab}	0.311	**	0.427	**	0.313	**	0.389	
Two children: Son-Daughter ^{ab}	0.326	**	0.432	**	0.324	*	0.425	*
Two children: Daughter-Son ^{ab}	0.497	*	0.600	**	0.554	*	0.644	
Two children: Daughter-Daughter ^{ab}	0.543	*	0.617	*	0.477	*	0.582	
Three children: Son-Son-Son ^{ab}	1.005		0.851		1.008		0.807	*
Three children: Son-Son-Daughter ^{ab}	0.339	*	0.428	**	0.341	*	0.452	*
Three children: Son-Daughter-Son ^{ab}	1.032		0.964		1.117		0.974	***
Three children: Daughter-Son-Son ^{ab}	0.786		0.819		0.997		1.011	***
Three children: Son-Daughter-Daughter ^{ab}	0.402	+	0.474	+	0.396	+	0.572	
Three children: Daughter-Son-Daughter ^{ab}	0.285	+	0.320	+	0.281	+	0.304	

	East Germany			
	Model 1	Model 1	Model 2	Model 2
Three children: Daughter-Daughter-Son ^{ab}	0.398 +	0.469 +	0.388 +	0.462 ***
Three children: Daughter-Daughter-Daughter ^{ab}	0.493 +	0.599	0.497 +	0.592 *
Four or more children ^{ab}	0.122 ***	0.284 ***	0.121 ***	0.267 *
Length of cohabitation	1.051 *	1.041	1.020 *	1.044 ***
Duration until household formation	1.000	0.980	1.010	0.990 **
Age at marriage of wife	0.923 *	0.951 **	0.932 *	0.961 **
Age at marriage of husband	0.951 +	0.961 *	0.961	0.961 *
Home ownership ^a	0.332 ***	0.357 ***	0.359 ***	0.391 +
Church attendance ^a	1.018 *	1.016 ***	1.021 *	1.019
Religious ceremony ^a	0.698	0.742	0.763	1.010 ***
Marriage cohort 1971-80 ^a	1.234	1.209	1.116	1.139 ***
Marriage cohort 1981-90 ^a	2.434 ***	2.829 ***	2.111 ***	2.638 ***
Marriage cohort 1991-2000 ^a	1.840 *	1.682 +	1.715 +	1.568 ***
Education homogamy ^a	1.052 +	1.029 *	1.060 *	1.034 ***
Both catholic ^a	0.680 **	0.723 **	0.668 ***	0.715 +
Fathers education (years)	0.951 *	0.961	0.932 *	0.923
Education of wife (years)	1.070 *	0.923 *	1.092 *	0.923 *
Education of husband (years)	1.030	1.000	1.073	1.030
Getting to know I ^c	0.926	1.020	0.912	1.041
Getting to know II ^c	1.027 *	1.031 **	1.031 *	1.035
Married several times ^a	2.861 ***	2.886 ***	2.832 ***	2.779 ***
Family-oriented partnership			0.989 *	1.017
Attitude to work and family life			0.919	0.733 *
Attitude to role of mother			0.837 **	0.820 *
Child-orientated couples			0.857 **	0.890 ***
Economic benefit of children			1.520 *	1.042 ***
Key statistics				
Number of splits	8834	8834	8659	8659
Not censored data	144	144	138	138
Log-Likelihood	-740.876	-492.051	-726.460	-483.803

^a Dummy variable (0/1); ^b Time dependent; Reference category; ^c Reference category: Getting to know III, + P = .1 * P = .05; P** = .01, *** P = .001.

Table 5. Risk of divorce for couples in West Germany by sex of child and cohort (weighted)

	West Germany					
	Cohort 1961-1970		Cohort 1971-1980		Cohort 1981-2000	
	Model 1		Model 2		Model 3	
Duration of marriage ^b	0.980		0.980		0.827	***
ln (duration of marriage)	1.655	***	1.657	***	1.671	***
One Child: son ^{ab}	0.712	+	0.819		0.223	***
One child: Daughter ^{ab}	0.852		0.779	*	0.273	***
Two children: Son-Son ^{ab}	0.373	**	0.317	***	0.108	***
Two children: Son-Daughter ^{ab}	0.330	*	0.589	*+	0.077	***
Two children: Daughter-Son ^{ab}	0.684		0.403	***	0.106	***
Two children: Daughter-Daughter ^{ab}	0.463	*	0.353	***	0.167	***
Three children: Son-Son-Son ^{ab}	0.625		0.212	***	0.062	***
Three children: Son-Son-Daughter ^{ab}	0.307	*	0.631		0.092	**
Three children: Son-Daughter-Son ^{ab}	0.698		0.527	+	0.069	***
Three children: Daughter-Son-Son ^{ab}	0.336	*	0.295	*	0.063	***
Three children: Son-Daughter-Daughter ^{ab}	2.974		0.741		1.010	
Three children: Daughter-Son-Daughter ^{ab}	1.477		2.287	***	0.600	
Three children: Daughter-Daughter-Son ^{ab}	0.361	+	0.763		0.492	+
Three children: Daughter-Daughter-Daughter ^{ab}	0.328	+	0.726		0.595	
Four or more children ^{ab}	0.811		0.340	***	0.287	***
Length of cohabitation	1.716	*	1.271	**	0.869	***
Duration until household formation	1.060		1.040	*	0.941	*
Age at marriage of wife	1.073	*	1.040	*	1.000	
Age at marriage of husband	0.990		1.030		0.998	
Home ownership ^a	0.502	**	0.384	***	0.266	***
Church attendance ^a	0.623	+	0.998		0.723	**
Religious ceremony ^a	0.699	*	0.605	*	0.931	
Education homogamy ^a	0.891		0.662	**	0.981	
Both catholic ^a	1.171	+	1.070		0.661	**
Fathers education (years)	0.873	*	0.809	**	0.909	**
Education of wife (years)	0.932		1.000		0.928	
Education of husband (years)	1.105		0.914		1.030	

	West Germany					
	Cohort 1961-1970		Cohort 1971-1980		Cohort 1981-2000	
	Model 1		Model 2		Model 3	
Getting to know I ^c	0.623	*	0.520	**	0.868	
Getting to know II ^c	0.842	*	0.874	*	0.749	
Married several times ^a	1.668	***	2.251	***	3.380	***
Family-oriented partnership	0.942	*	1.006		0.949	**
Attitude to work and family life	0.328	*	0.499	**	1.031	
Attitude to role of mother	0.773	**	0.876	**	0.858	**
Child-orientated couples	1.224	*	0.728		0.103	***
Economic benefit of children	1.900	+	0.873		0.451	**
Key statistics						
Number of splits	12748		10458		19718	
Not censored data	56		104		161	
Log-Likelihood	-605.689		-837.921		-886.270	

^a Dummy variable (0/1); ^b Time dependent; Reference category; ^c Reference category: Getting to know III, + P = .1 * P = .05; P**=.01, *** P=.001

Table 6. Risk of divorce for couples in East Germany by sex of child and cohort (weighted)

	East Germany					
	Cohort 1961-1970		Cohort 1971-1980		Cohort 1981-2000	
	Model 1		Model 2		Model 3	
Duration of marriage ^b	0.835	**	0.811	***	0.771	**
ln (duration of marriage)	1.670	**	1.668	***	1.670	***
One Child: son ^{ab}	0.691		0.726		0.463	**
One child: Daughter ^{ab}	1.310		0.835		1.537	*
Two children: Son-Son ^{ab}	0.932		0.323	***	0.206	***
Two children: Son-Daughter ^{ab}	1.185		0.230	***	0.186	***
Two children: Daughter-Son ^{ab}	2.270	+	0.543	*	0.137	***
Two children: Daughter-Daughter ^{ab}	1.616		0.763		0.087	***
Three children: Son-Son-Son ^{ab}	1.000		0.186	**	3.633	
Three children: Son-Son-Daughter ^{ab}	0.795		0.375	*	1.000	
Three children: Son-Daughter-Son ^{ab}	1.000		1.209		1.000	
Three children: Daughter-Son-Son ^{ab}	1.020		0.827		1.399	***

	East Germany				
	Cohort	Cohort	Cohort		
	1961-1970	1971-1980	1981-2000		
	Model 1	Model 2	Model 3		
Three children: Son-Daughter-Daughter ^{ab}	0.756	1.000	0.040	***	
Three children: Daughter-Son-Daughter ^{ab}	0.395	1.000	0.887		
Three children: Daughter-Daughter-Son ^{ab}	0.307	0.157	0.942		
Three children: Daughter-Daughter-Daughter ^{ab}	1.000	1.363	0.139		
Four or more children ^{ab}	0.482	0.119	0.125	***	
Length of cohabitation	1.122	1.294	0.983	*	
Duration until household formation	0.896	1.020	0.960	+	
Age at marriage of wife	0.572	0.891	0.952	*	
Age at marriage of husband	1.584	0.990	0.878	*	
Home ownership ^a	0.497	0.397	0.265	***	
Church attendance ^a	1.079	1.012	1.023	*	
Religious ceremony ^a	1.114	0.454	0.452	*	
Education homogamy ^a	0.464	1.026	1.060		
Both catholic ^a	0.442	1.000	0.747	**	
Fathers education (years)	0.473	0.846	0.90	*	
Education of wife (years)	1.234	1.051	0.755	**	
Education of husband (years)	0.733	1.197	0.878	*	
Getting to know I ^c	0.442	1.104	1.320	*	
Getting to know II ^c	0.932	1.610	1.272		
Married several times ^a	2.972	2.369	4.402	***	
Family-oriented partnership	1.113	1.004	0.945	*	
Attitude to work and family life	0.972	1.289	0.277		
Attitude to role of mother	0.742	0.702	0.799	**	
Child-orientated couples	1.159	0.632	0.815	**	
Economic benefit of children	1.034	1.019	1.201	*	
Key statistics					
Number of splits	1803	3877	2979		
Not censored data	18	54	66		
Log-Likelihood	-155.111	-328.326	-242.948		

^aDummy variable (0/1); ^bTime dependent; Reference category; ^cReference category: Getting to know III, + P = .1 * P = .05; P**=.01, *** P=.001

Table 7. Expected and observed ranking of divorce risk by sex of child

No of children	Expected Ranking					Observed ranking of divorce risk by sex of child								
	Son-preference	Daughter-preference	M-G ^a -preference	Same sex	No preference	T 3 M 2 W	T 4 M 2 E	T 5 M 1 C1 W	T 5 M 2 C2 W	T 5 M 3 C3 W	T 6 M 1 C1 E	T 6 M 2 C2 E	T 6 M 3 C3 E	
1	S	D	S, D	-	Similarly high values	S	S	S	D	S	ns	ns	S	
	D	S	D;S	-		D	D ^{ns}	D ^{ns}	S ^{ns}	D	ns	ns	D	
2	SS	DD	<u>SD~DS</u>	<u>DD or SS</u>	No clear pattern	SS	SS	SD	SS	SD	ns	SD	DD	
	DS or SD	SD or DS				SD	SD	SS	DD	DD	ns	SS	DS	
3	DD	SS	SS or DD	SD or DS	No clear pattern	DD	DD	DD ^{ns}	DS	SS	ns	DS	SD	
	SSS	DDD				DS	DS	DS	SD	DD	DS	DD ^{ns}	SS	
			SSD, SDS, DSS ≈ SDD, DSD, DDS	<u>DDD or SSS</u>		DDD	DSD	SSD	SSS	SSS	SSS	ns	SSS	SDD
						SSS	SSD	SSS	DSS	DSS	ns	SSD	DSS	
						SSD	SDD	DSS	SDS	SDS	ns	ns	ns	
						SDS	DDD	DDS	DSD	SSD	ns	ns	ns	
	SSD or SDS or DSS	SDD or DSD or DDS			DDD	ns	ns	ns	ns	ns	ns	ns		
			DDD or SSS	DDS or DSD or SSD or SDS or DSS	DSD	ns	ns	ns	ns	ns	ns	ns		
	DDD	SSS			ns	ns	ns	ns	ns	ns	ns	ns		

1	Evaluation of the outcomes	S-Pref.	S-Pref	S-Pref	D-Pref.	S-Pref	No/ns	No/ns	S-Pref
2		Low S-Pref	Low S-Pref.	No	No	No	No/ns	No	D-Pref.
3	Note. ^a Mixed-Gender; ^b The results should show no clear pattern; ^c T= Table number, M= Model number; W= West Germany; E= East Germany; C1= Cohort 1961-1970; C2= Cohort 1971-1980; C3= Cohort 1981-2000; The observed order shows in which sex or gender combination, for one, two and three children, the divorce risk is lowest; ns = not significant with P=0.10 In column 3: <u>underlined bold</u> : lowest divorce risk, fat: low risk of divorce, <i>light</i> : the highest risk of divorce; In column 4: <u>underlined bold</u> : lowest divorce risk, <i>light</i> : higher risk of divorce than for <u>underlinedbold</u> .	No	Low D-Pref./ns	No/ns	Low S-Pref./ns	Low S-Pref./ns	Low S-Pref./ns	ns	ns

6. CONCLUSION

Parents of daughters have a higher divorce risk – this is the title of a study by Morgan et al. [1]. In this way, the authors lay the foundation of further investigations, which examine the influence of a child's gender on marital stability. The analysis of the theoretical basis of these studies, however, reveals that the divorce risk is indirectly affected by the preference of parents for a certain gender and not the gender of children itself. Probably, the divorce rate varies depending on whether the preferred gender was born or not. Following Morgan and Pollard [2] and Diekmann and Schmidheiny [4], the hypothesis that marriages with daughters have a higher divorce risk than marriages with sons, is investigated.

Moreover, research on fertility makes it possible to deduce different gender preference patterns whose assumptions reflect further hypotheses. To verify the hypotheses, it was necessary to show gender-specific divorce rates. The following analysis of one to three child combinations by means of multivariate models was aimed at determining gender-specific divorce patterns. The patterns found were then compared with the assumptions of the hypotheses, and afterwards evaluated. Altogether, no hypothesis can be confirmed fully. The hypothesis, that the divorce risk is higher among couples with daughters than with sons, could only be confirmed for couples with one child. With regard to two children, a slight preference for a son is visible, whereas for three children, most of the results are insignificant, and hence do not allow an interpretation. Whether the results do indeed reflect preference patterns should be evaluated by means of higher data sets and suitable questions on the preference of the child's gender, etc., which unfortunately are not available at this point.

COMPETING INTERESTS

Author has declared that no competing interests exist.

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