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Foreword

Any demographic event such as birth, death, marriage, and divorce may be registered and studied with respect to various demographic dimensions; these are most prominently age and time but also duration of marriage, time since last birth, etc. Fertility, mortality, and nuptiality are all considered to depend primarily on age. Divorce has traditionally been studied with respect to marital duration.

This paper uses a multi-dimensional perspective to study the phenomenon of divorce. It is made possible by the availability of a unique data set from the Finnish Population Register that provides cross-classified information on several demographic dimensions of divorce. The study yields intriguing results that give a quite different picture than conventional one- and two-dimensional perspectives.

Wolfgang Lutz
Deputy Leader
Population Program

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THE DEMOGRAPHIC DIMENSIONS OF DIVORCE: THE CASE OF FINLAND

Wolfgang Lutz, Babette Wils*, Mauri Nieminen***

1. INTRODUCTION

It is a rather recent phenomenon for European societies that a sizable proportion of marriages does not break up involuntarily by the death of one spouse but voluntarily by divorce. This is a consequence of changes in the value system, the socio-economic structure of the society and changing legislation. In turn, increasing divorce rates also have an impact on society, on family and household structures, and probably most important and critically on the children experiencing a divorce of their parents. The causes and consequences of divorce are an extremely difficult and complex subject challenging analysis in disciplines as different as statistics, law, child psychology, etc.

The following analysis will be restricted to a demographic perspective. The demographic view is primarily concerned with measurement and with the variation of divorce along some basic demographic variables such as time, age, duration of marriage, number of children born, and time since last birth. Like any other demographic event a divorce can be perceived and registered as a point in the multi-dimensional space built by the demographic dimensions mentioned above. In other words, every divorce takes place at a certain time, marital duration, parity of the wife etc. In the following we want to study the variation of divorce rates and probabilities along these demographic dimensions separately and within sets of several dimensions in the hope to gain a better understanding of the phenomenon of divorce.

Indeed, the results from the multi-dimensional models are in part unexpected and challenging. They suggest that the conventional one-dimensional perspective on divorce might be misleading especially what concerns the effects of marital duration and age at marriage on divorce risks.

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Finland was selected as a case study because the available data is of excellent quality and demographic detail. We use data from the Finnish population registration. Also, the Finnish divorce trends are similar in direction and magnitude to many other industrialized nations.

Historically divorce was legalized in Finland on the grounds of adultery and wilful desertion in the 16th century (see Pitkänen 1984). Marital discord was not grounds for divorce, although from the 18th century, there existed an exemption procedure. From the beginning of this century, as Finland changed to an industrial society, more and more use was made of this procedure. The divorce rates had already climbed considerably in the 1920's by the time divorce on the grounds of marital discord was legalized in 1930, indicating legislation followed, not caused, the divorce trend. The onset of World War II brought an abrupt increase in divorce rates, which peaked in 1945 at a crude divorce rate of 1.48. It then fell again, but not to the low pre-war levels.

A brief international comparison of divorce rates in Europe and North America since the late 1940s places the Finnish experience in perspective. For such comparisons, however, it is difficult to find an appropriate demographic indicator. The one most readily available over time is the crude divorce rate which simply gives the number of divorces per 1000 persons in the population. But this rate may be grossly misleading because the denominator includes all persons and not just those exposed to the risk of divorce; it is strongly affected by trends in the marriage pattern. Other more sophisticated rates that consider the age or marital status composition of the population are no longer difficult to obtain but also anticipate choices about the relevance of certain demographic dimensions. As a compromise the "crude divorce rate for married women" combines a closeness to raw data—which is desired at this point—with a correct denominator. But even for this crude rate the denominators must be interpolated in certain cases where the complete data series was not available.

Figure 1 depicts trends in this crude divorce rate for married women in Finland and four selected industrialized countries for the period 1949 to 1986. We find that since the 1960s all countries show increasing levels of divorce. Divorce trends have been highest in the USA where the number of women that divorced per year doubled from around 10 per thousand in 1960 to over 22 per thousand in 1979. After that the rates stabilized or even declined somewhat. A similar stabilization though at a lower level of divorce probabilities can be seen in Sweden, where after a peak in the early 1970s has remained almost constant at about 10 divorces annually per 1000 married women. The Finnish experience closely resembles the Swedish with the exception that the increase in the early 1970s was weaker and the current stable level lower (at about 8 per 1000) than in Sweden. Hungary

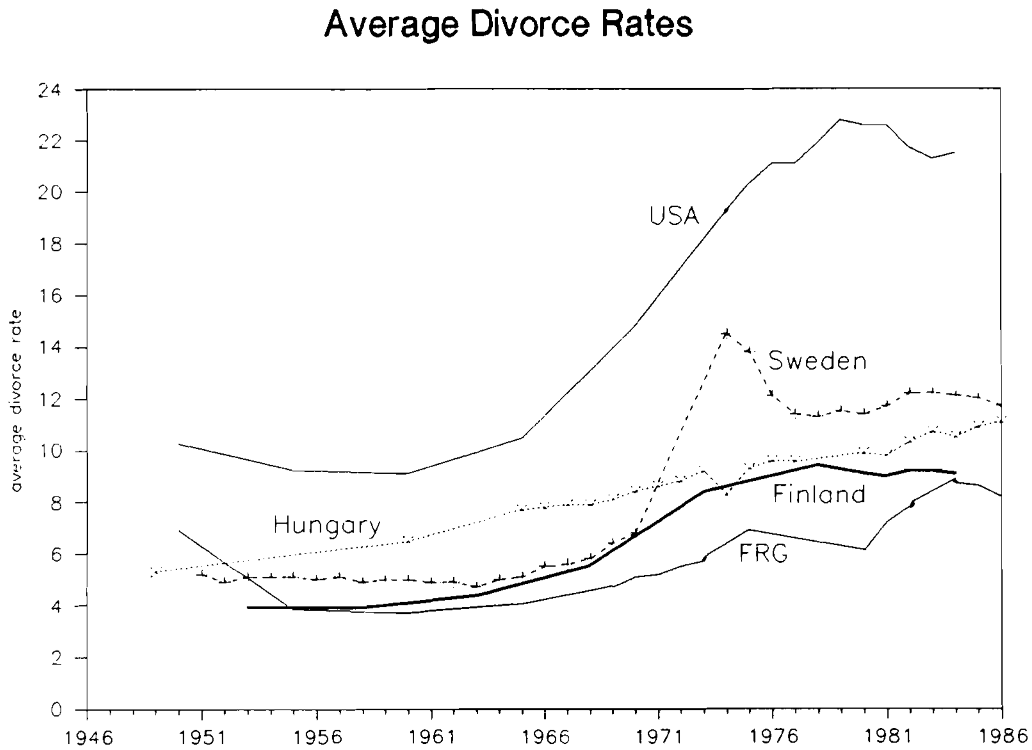

Figure 1. Crude divorce rates for married women for five selected countries, 1949–1986.

reveals a rather linear increase in divorce rates while the Federal Republic of Germany also shows the acceleration in the early 1970s, although to a lesser extent than Finland, Sweden, and the USA.

The trends described above are strictly period trends. It remains unclear whether the observed increase in divorce probabilities is a cohort phenomenon or whether period influences affect all cohorts. This interesting question can only be studied by models that simultaneously consider period and cohort effects. The following section will attempt such an analysis on Finnish time series. Since the available data are structured only with respect to marital duration it will be a marital duration-period-cohort analysis in analogy to the age-period-cohort approach mostly applied to fertility analysis. The further sections of this paper will then investigate the demographic dimensions of period divorce rates in Finland in 1984. Special attention will be given to the relative effects of age and marital duration and their interaction, age at marriage, on divorce. The effects of parity and the ge of the youngest child on divorce will also be studied.

2. MARITAL DURATION-PERIOD-COHORT

The Finnish system of population registration provides us with the numbers of divorce by duration of marriage for all marriage cohorts since 1949. Given the original sizes of the marriage cohorts, we can calculate the duration-specific divorce probabilities ($q(x)$ in life table notation) that are conditional to the continuation of a marriage up to duration x. The divorce tables constructed by chaining these probabilities like in an ordinary life table are net of mortality, i.e. give the pattern of marital breakups in a situation without mortality. The available data can be used to construct series of duration-dependent divorce tables for cohorts and periods. Due to the structure of the given data, in the period divorce table higher durations are truncated in earlier years. Similarly, in the cohort table higher durations are truncated in more recent cohorts.

Table 1 summarizes the period and cohort divorce tables by giving the number of surviving marriages out of an initial radix of 1000 marriages for selected durations in selected cohorts or periods. This reflects the survival values, $l(x)$, of the mortality life table. The table does not include marriage dissolution through mortality. For example, the $l(20)$ for the cohort married in 1960 is 847. This means that after 20 years of marriage 15.3% of this cohort have been divorced. We find that at almost every duration the proportion of couples still married diminishes for more recent cohorts and periods. Given this trend of increasing divorce rates over time it is evident that the proportions still married at any given duration must be lower in the period tables than in the corresponding cohort tables because in the cohort tables the marriage intensities at lower durations reflect earlier behavior. The most recent period table indicates that in 1984, after 30 years of marriage 28% of marriages will have ended in divorce. For the cohort married in 1954 the corresponding figure is 18%. After 10 years of marriage the period table for 1975, for example, shows 12.5% divorces whereas the marriage cohort of 1965 that was married 10 years in 1975 had only 10.5% divorces.

Another interesting question that can be answered by the life table approach is, how long a marriage that ended in divorce lasted on average. This quantity is isomorphic to the life expectancy in the ordinary life table with the difference that not every marriage ends in divorce. Hence, the summation of person years lived in marriage must be restricted to those marriages that ultimately end in divorce. Technically this can be resolved by calculating a column $l_l(x)$ with the radix $l_l(0)$ being equal to the sum of all life table divorces ($d(x)$) up to a fixed duration m. Hence $l_l(0)$ equals also $l(0) - l(m)$. These mean durations of marriage for marriages that end in divorce by duration m are given in Table 4 for selected values of m.

Table 1. Numbers of "surviving marriages" ($l(x)$) at selected marital durations for selected marriage cohorts and periods in Finland.

A: $l(x)$ for marriage cohorts

	Marriage Cohort					
Duration	1950	1955	1960	1965	1970	1975
1	1000	1000	1000	1000	1000	1000
5	975	977	973	965	953	946
10	939	941	929	895	872	
15	914	912	888	842		
20	891	880	847			
25	868	848				

B: $l(x)$ for marriage by period

	Period						
Duration	1984	1979	1974	1969	1964	1959	1954
1	993	999	1000	1000	1000	1000	1000
5	944	950	948	962	971	976	974
10	866	870	866	912	930	940	
15	816	816	814	879	902		
20	774	775	776	855			
25	741	742	748				
30	720	722					

Generally the pattern of mean durations of marriage at divorce is relatively stable over periods and cohorts. For marriages breaking up by durations 5 and 10 the mean durations are more than half of the potential durations for both the period and cohort tables, indicating that divorce in the very first years is less frequent than at durations 3–10. For m's of 15 to 30 the period and cohort patterns diverge somewhat. For period tables the mean durations are less than half of m in all cases and the values are relatively invariant over time. For cohorts, however, the mean durations at divorce tend to be greater than $m/2$ and show some increase over time, especially from the marriage cohort of 1950 to that of 1955. This indicates that independent from the general level of divorce in a cohort the duration-specific cohort pattern of divorce seems to have changed at higher durations. One way of investigating this change in the cohort pattern, and also the difference in mean durations between period and cohort tables is to graphically represent all cohorts in one comprehensive picture.

Figure 2 gives a three-dimensional view of the duration-specific divorce probabilities for the marriage cohorts 1949 to 1980. In front is the duration-specific pattern (with duration running from right to left) for the cohort of 1949. The lines behind this initial curve

Table 2. Mean durations of marriage for marriages that end in divorce by duration m; selected marriage cohorts and periods in Finland.

A: By cohort

	Marriage Cohort						
m	1950	1955	1960	1965	1970	1975	1980
5	3.42	3.37	3.48	3.48	3.51	3.42	3.41
10	5.73	5.80	5.95	6.16	5.95	5.74	
15	7.71	7.97	8.43	8.25	7.80		
20	9.71	10.57	10.84	10.16			
25	11.96	13.07	12.94				
30	13.95	15.03					
35	15.44						

B: By period

	Period						
m	1984	1979	1974	1969	1964	1959	1954
5	3.40	3.46	3.42	3.37	3.40	3.26	3.39
10	5.69	5.79	5.82	5.60	5.69	5.69	
15	7.54	7.69	7.63	7.44	7.62		
20	9.36	9.48	9.30	9.05			
25	11.01	11.09	10.77				
30	12.24	12.27					
35	13.05						

refer to the subsequent marriage cohorts. To give a clearer picture, period lines are not drawn on this graph but they would run along the diagonals from the lower left to the upper right. As expected, we see that divorce probabilities were strongly increasing over time. This appears along cohort and along period lines. The duration-specific pattern (visible in Figure 3) for cohorts shows an initially steep increase in the risk of divorce peaking at durations four and five followed by a slow decline. For the earlier cohorts—for the front cohort of 1949—this pattern seems, however much less pronounced than for the later cohorts. Compared to the later cohorts the early cohorts have very high risks at high durations relative to the risk in the peak durations 4–5. This deviation from the average duration-specific pattern might be due to strong period effects that tend to increase the divorce probabilities for couples already married many years and being members of marriage cohorts that initially had experienced only moderate divorce rates. A visual indication for such a period effect is also the ridge in the back of the graph that crosses all cohorts at different durations and corresponds to the period of the mid 1970s. Such strong period effects could also explain the greater mean durations at divorce in the cohort table as compared to the period table: The inflated divorce probabilities at higher

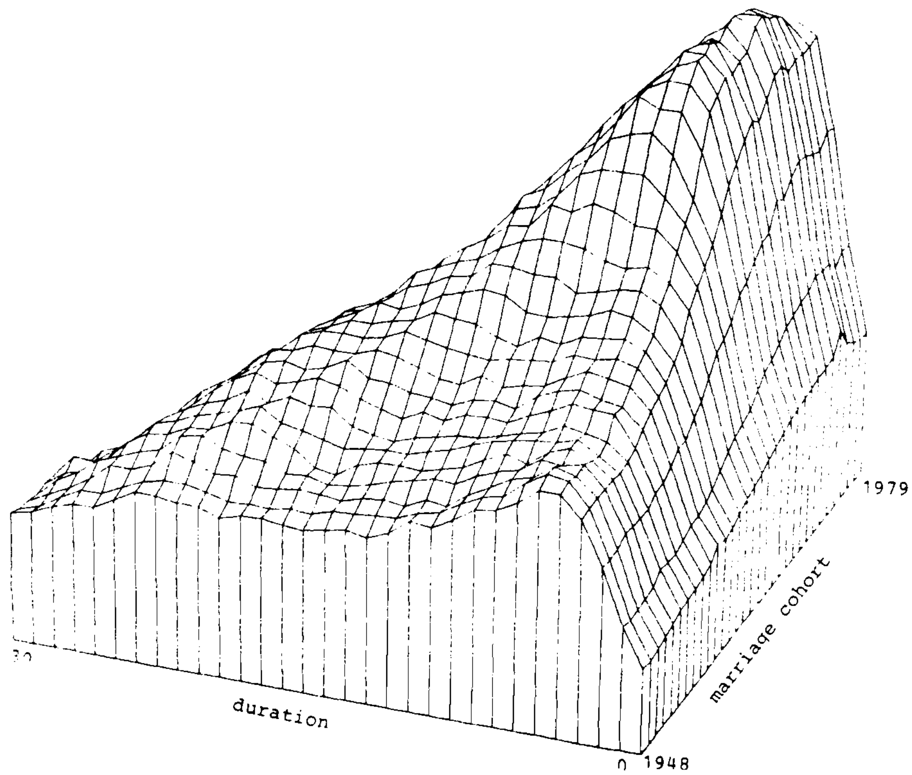

Figure 2. 3-D plot of cohort divorce probabilities in Finland by duration and marriage cohort.

durations described in Figure 2 tend to increase the cohort mean duration sat divorce as compared to the period ones.

Aside from our visual intuition the only way to prove and quantify such period effects is a duration-period-cohort (DPC) model that isolates the separate effects of those three demographic dimensions of divorce. To estimate the relative effects we decided to use GLIM (General Linear Interactive Modelling, release 3.77) with a logistic link function[1] and dummy variables for each duration, period, and all cohorts, except for the most recent ones that only have a few data points. Through this we could also avoid the problem of over identification typical for age-period-cohort models. Our input data were the duration-specific divorce probabilities by marriage cohort as described above. In a way, this procedure may be viewed as a descriptive tool that calculates an average duration pattern over all periods and cohorts, an average period pattern over all durations and cohorts, etc. Always the third dimension may be viewed as the interaction between the two others. The results may also be used to reconstruct a smoothed form of the original

[1] A binomial error structure taking the exposure as an offset and using a maximum-likelihood approach known as iterative weighted least squares. Because the deviations of the data points from those predicted by the model must be weighted according to both the size of the denominators and the values fitted by the model, several cycles are required using old estimates to obtain better ones.

pattern. Figure 4 plots the resulting divorce probabilities after reconverting the estimated coefficients (that are still on the logit scale) into probabilities by taking the year 1984 as reference period for duration and duration 5 as reference duration for period and cohort effects.

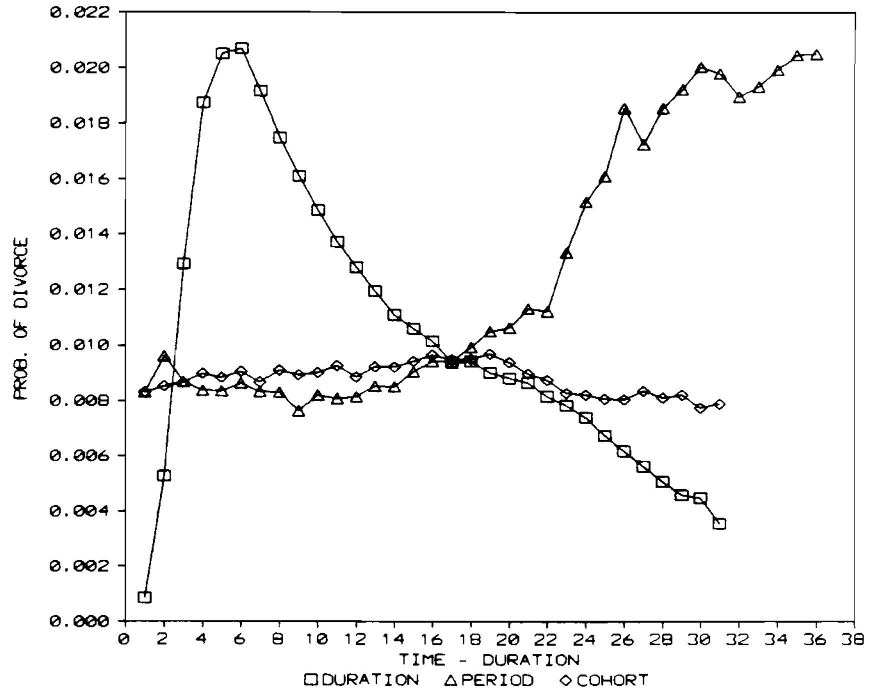

Figure 3. GLIM results for duration, period, and cohort effects on divorce probabilities in Finland.

Figure 3 shows that the DPC-model results in a very clear duration-specific divorce pattern. The divorce risk increases very fast from duration 0 to durations 4 and 5 and declines thereafter at a somewhat slower rate until around duration 17 when the decline slows down even further. Period and cohort effects seem to be at approximately the same magnitude and quite constant over about half of our period of observation (1949–1965). In the late 1960's, however, period effects start to increase and between 1970 and 1974 they just seem to explode, bringing the divorce probability to more than twice of its 1965 level. In the late 1970's and 1980's the increase in period effects then seems to level off. It is quite unexpected to find that we cannot observe a parallel increase in the cohort effects on divorce. As a matter of fact the cohort effects even slightly decrease after the marriage cohort of 1968.

In summary, our duration-period-cohort model strongly confirms our visual impression from Figure 2 that the boom in divorce rates has mainly been a period phenomenon. To actually interpret period and cohort effects in a meaningful way is more difficult than estimating them. Given the duration patterns that reflects an average for all periods and cohorts, a period effect might be understood as a change in average behavior in reaction to the changing environment, changing fashions, mentalities, or economic conditions which affects all individual independent of the year of marriage. A cohort effect, in contrast, means that the mentality relating to the probability of divorce is specific for the year of marriage and constant thereafter. The period effect means, for example, that a marriage cohort that starts out with low divorce rates does not necessarily continue on this level with variations only along the average duration pattern if the environment changes or vice versa. The marriage cohort of 1953 is an extreme example for this phenomenon, where divorce risks were initially rather low, peaking somewhat around .008 at durations 3–6, but then during the divorce boom of the mid-seventies members of this cohort again reached a divorce probability of above .008, this time at durations 20–21. A possible interpretation for this is that couples that originally could not think of divorce, changed their attitudes and increasingly saw divorce as a real possibility in a society where divorce was acceptable.

Hence we may conclude that the recent increase in divorce rates is clearly a consequence of changing environments (periods) that affects couples of all marriage cohorts.

3. AGE-DURATION

Above, marriage cohorts were treated as homogeneous groups with each couple being exposed to the same duration-specific pattern of divorce risks. One might, however, speculate that the pattern appearing on the aggregate does not reflect individual risk patterns but is only the average of different groups that are heterogeneous with respect to divorce. If, for example, a marriage cohort consisted of two different groups—one with a low and constant probability of divorce and the other with a steadily rising risk—then the aggregate population could show a pattern of first increasing probabilities (due to the rising risk group) followed by decreasing risks (selection effect, i.e. high risk group diminishes) that resembles the typical duration-specific pattern described above (Keyfitz 1985).

We cannot do much do study hidden or unobserved heterogeneity but we can study the phenomenon according to demographic factors that are known to have some impact on the risk of divorce in addition to duration, namely age at marriage, number of children, and age of youngest child. Other non-demographic sources of variation must be disregarded in this study.

A cross-classification of the complete Finnish population on 1 January 1984 by sex, age, marital status, marital duration, parity, and duration in parity together with the information on how many divorces happened in each cell during the year 1984, is the basis for the following period analysis of divorce. The data were derived from the Finnish population register.

Initially, we made a number of computer runs each time plotting the population along two demographic dimensions: age and marital duration; parity and duration; birth interval and duration. The results of this exercise—which will not be described in more detail here—indicate independent influences of each dimension. Also, the results showed that in cases when there were children before the marriage (seen when birth interval is longer than marriage duration and when parities are high while marriage duration is short) the divorce rates are particularly high. We will return to this in the discussion of risk groups at the end of the paper.

To calculate the relative effect of each demographic dimension we use GLIM as above. The parameters are given in the Appendix. Although some patterns can be detected from the given set of parameters a meaningful interpretation requires a combination and transformation of parameters. To calculate the probability of divorce e.g. for women aged 25 at marital duration three one takes the constant and adds the parameters of age 25 and duration 3 to it. This is still the logarithm of the odds ratio, and a simple algebraic transformation is needed to get the probability. Below, we will discuss the probabilities of divorce along one dimension while controlling for another. For comparisons we will also give the one-dimensional pattern that appears if no control for other dimensions is made.

This method is useful to disentangle some interactions between dimensions—say, between duration and age, or parity and duration—and to isolate the single effect of a dimension. Because of limited space, we can only present some of the models. We will concentrate on the models of women; the male models have similar results.

Most of the past studies on the effects of age, marital duration, and age at marriage have not arrived at a general consensus concerning the relative strength of the effect of each of these dimensions. Most results, however, agree that there is an inverse relationship between divorce rates and duration, age and age at marriage.[2] Many of these studies considered only one, sometimes two, of these dimensions simultaneously, or in combination with some other factors such as parity or marriage cohort.

[2]For duration: e.g. Ross and Sawhill (1975): Cherlin (1977); Monnesland, Brunborg and Selmer (1982); Kellerhals (1985); Morgan (1986); Morgan and Rindfuss (1985). For age: e.g. Thornton and Rodgers (1987); Glich and Lin (1986). For age at marriage: Lindgren (1986); Booth and Edwards (1985); Bumpass and Sweet (1972); Moore and Waite (1981).

The disadvantage of considering only one or two of the three factors: age, duration, and age at marriage, at one time is that the effect of their interaction cannot be studied. For example, any result found by looking at age only, — high divorce rates at age 20 —, could also be the effect of age at marriage — those divorcing at 20 married very young. Thus, it is difficult to say which dimension is decisive.

In our study, we found very different results depending on whether we considered one, two, or three dimensions in the model, where the third dimension is the interaction between the two others that is assumed to have a separate effect. The one- and two-dimensional exercises reflect the general concensus, but the results are ambiguous. The results of the three-dimensional exercise point in quite different directions.

In summary, the provocative and unexpected though not implausible results of the analysis considering age, duration and age at marriage effects simultaneously are:

1) Divorce risks tend to increase almost monotonically with duration at least up to duration 20.

2) Young age is the major divorce risk factor, rather than young age at marriage or certain marital durations.

3) A higher age at marriage tends to increase the risk of subsequent divorce.

To arrive at this result we will study the pattern in several steps going from the "raw" empirically observed data, to one- and two-dimensional logit models and finally to the three-dimensional model looking critically whether the appearing patterns contradict the above stated results that might be seen as a working hypothesis.

To gain an initial impression of the age/duration/age-at-marriage pattern that will concern us, we look at a three-dimensional diagram of empirically observed divorce probabilities of women in Finland, 1984, up to duration 20 and for ages 15–50, along the dimensions age and duration.

Figure 4 is structurally similar to the duration-period diagram of the previous section, where here, age replaces year of marriage. It is obvious that the effects of age and age at marriage interact in much the same way as cohort versus period effects. Theoretically, the effect of age at marriage is similar to a cohort effect: a couple has certain characteristics at marriage that accompany it all through married life. The effect of age is more similar to a period effect: as time passes, new characteristics shift in to replace the old.

From conventional wisdom and the literature cited above, we expect a diagram showing high divorce rates at young ages, and with a peaked ridge at durations 3–7— combined, this indicates highest divorce rates where young age and durations 3–7 cross—

declining gradually with increasing age and duration. Also, we expect a high ridge for very young age at marriages.

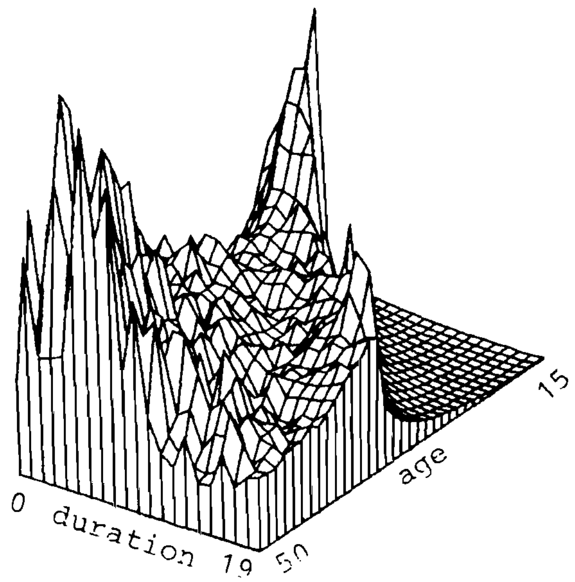

Figure 4. 3-D chart of age- and duration-specific divorce rates for married Finnish women, 1984.

Unlike the duration/period three-dimensional diagram in Figure 4, this diagram is neither smooth due to small cell sizes in some parts, nor does it allow very clear visual interpretation. What is visible is partly expected, partly unexpected. As expected, there is a high peak in divorce rates at young ages and/or ages at marriage. Also, divorce rates are lowest at highest age and duration. Unexpected is the high accumulation of divorces in the left quarter of the diagram: these are late marriages, contracted beyond age 30–35. The effect looks quite strong.

Also, the effect of duration is not nearly as strong as we might expect. To gain a visual impression, follow one line along the duration-axis, from the back-left to the front-right. At age 50, we see the expected hump at duration 3–10, decreasing afterwards. But at earlier ages, from 30 to 40, these lines do not show the expected decrease at all, and even increase in a few cases.

Next we will use the above described logit models to study the fitted patterns of coefficients when considering only two dimensions at once. As in the previous section the coefficients have been converted into probabilities for the graphs.

Figure 5 plots the pattern for age-specific divorce probabilities along marital duration for ages 20, 25, 30 and 40. The dark line shows the duration-curve, including all ages which can be interpreted as a weighted average of all age-specific curves with the weights changing over duration. The figure reveals a surprisingly strong effect of age between 20 and 25. The peak in divorce rates is very pronounced. With respect to marital duration, it is surprising that, after controlling for age, the duration curves look rather different from the typical duration specific pattern described in the previous section and usually found in the literature. Only the peak at duration 4 remains, but after duration 10 the divorce probabilities do not decline further, and even increase in some intervals.

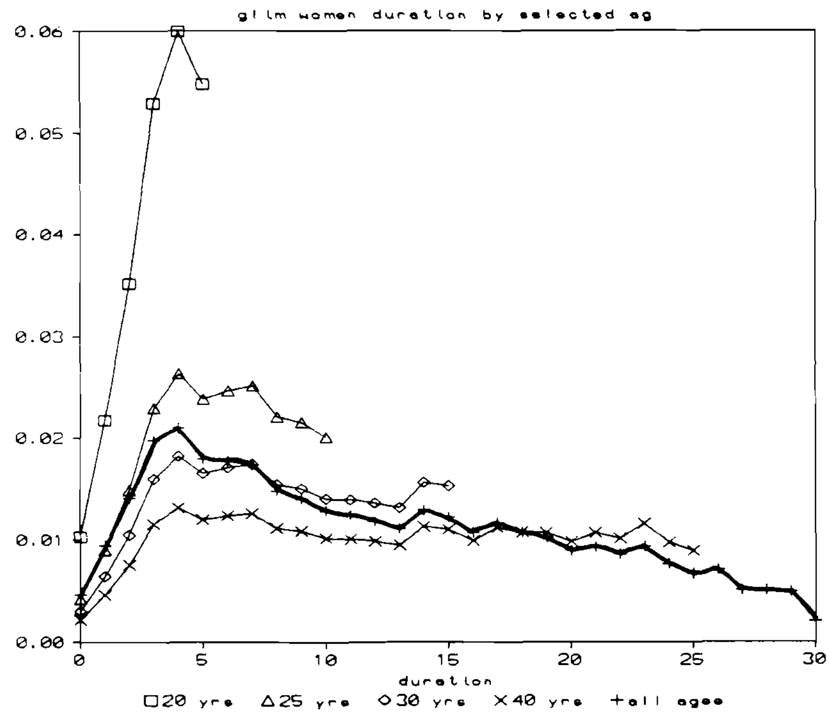

Figure 5. GLIM results for age and duration effects; Finland 1984.

Figure 5 figure can be interpreted in various ways. One can take it at face value to indicate that age is the main factor influencing divorce rates and duration loses influence after the first decade of marriage. The contradiction between the level age- and duration-specific curves found here and the continuing decline after duration 3–5 usually observed and also found in the dark line referring to all ages would lie in the changing weights of age groups at differing durations. At higher durations, there are relatively more older women. The lower risk of their higher age would tend to pull the duration curve increasingly down to produce the usual "crude" curve.

Alternatively, one can consider the effect of age at marriage, which is hidden in this figure. High divorce rates at young ages could be attributed to the implicit younger ages at marriage. In many studies, young age at marriage was fund a risk factor. In Finland, Lindgren (1986) showed that for most marriage cohorts since 1950, those who were married below age 20 have the highest divorce probabilities. This pattern has recently become even more pronounced. But is this pattern due to young age at marriage or young age during marriage?

As a case in point, we can take the same estimates as we used to make Figure 5, but assume that the estimated age-effect is an age-at-marriage effect. A slight rearrangement of the estimates produces Figure 6: duration effect at varying ages of marriage. In this figure, younger age at marriage seems to have a strong effect especially for very young marriages until after the first decade of marriage and then the curves converge.

Figure 6 looks as plausible as Figure 5. But we need to choose between them since we used the same data resulting in the same pattern of parameters twice, first as an age effect, then, as an age-at-marriage effect.

Unless age and age at marriage are considered simultaneously, it is not possible to understand which factor is responsible for the peaking divorce probabilities.

The three-dimensional model used here is virtually identical with the DPC model in the previous section: age replaces period; age at marriage replaces cohort; duration remains duration.

It is the results of this model that are so surprising. They are shown in Figure 7. The age curve maintains its original shape: high risks at young ages, decreasing monotonically after a peak around 20. The age at marriage curve shows the increase for high marriage ages that was indicated by our visual impression of the raw data. A peak at young ages is missing.

The duration curve however, so well-established in one-dimensional perspective with a peak between duration 3–7 and a subsequent decline, is completely new. As with the traditional curve, divorce risks increase until duration 5. After that, the similarity stops: the curve in Figure 7 increases until duration 19. It is low again for durations 20+, indicating the beginning of a gradual decline in divorce risks after a peak in the beginning of the third decade of marriage.

To further test the validity of these new findings extensive sensitivity tests were performed.[3] The levels of the effects turn out to be relatively unstable but the basic pattern

[3] Three-dimensional models were calculated separately for one-year, two-year, and five-year age groups; for men and women; and for groups with a maximum age of 50–70. The levels of the effects are unstable, the

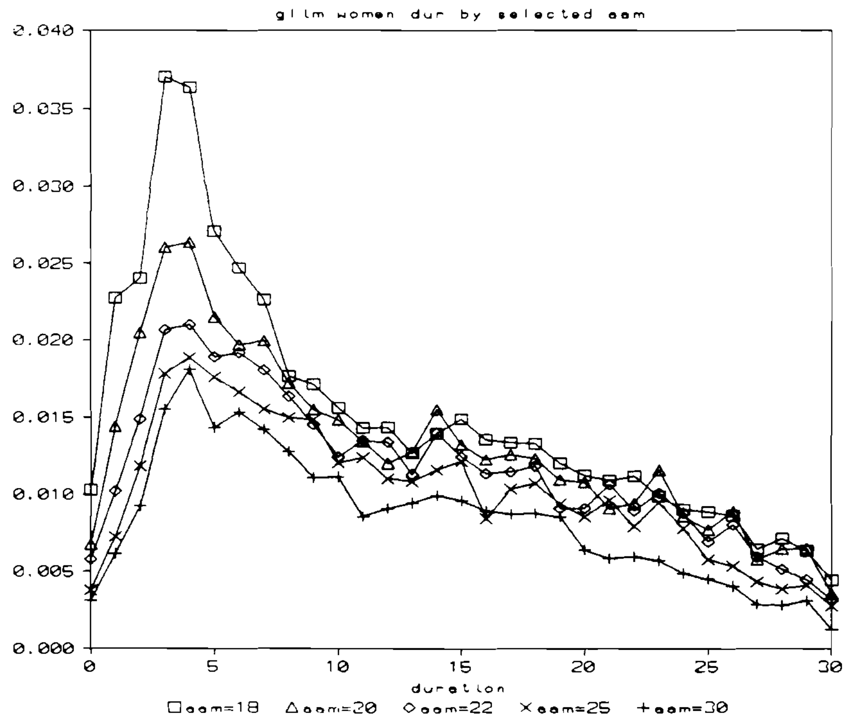

Figure 6. GLIM results rearranged for age at marriage and duration by selected ages at marriage, Finland 1984.

described above holds for all modifications of the model.

If this finding turns out to be of general validity in other populations it would have significant implications ranging from the measurement of divorce by statistical offices that usually classify only according to duration to the sociological and even psychological literature that tend to assert without qualifications that young marriage is the major risk factors in divorce. One must be extremely cautious, however, to interpret these patterns at face value and to generalize them. First of all, these are *ceteris paribus* effects and secondly, the estimates are based on period data. Some of the appearing patterns such as the increasing duration effect might result from differential divorce patterns for subsequent cohorts. For these reasons it is problematic to compare the appearing patterns directly to those in other fields such as psychology or anthropology.

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effects of age are considerably more extreme when durations 20+ are not included—maximum 0.018 at age 20—than when they are—maximum 0.008 at ages 20. Also, the patterns shift slightly. A two-year grouping disregarding durations 20+ produces a small peak age-at-marriage effect for those married at 17-18, which disappears in all other models. In Figure 8 there is a sharp decline for duration 20 which is not apparent when durations 20+ are considered. Moreover, the age effect—for men under 24 is absurdly high. Nonetheless, the basic pattern—greatest effect of age until 30, and increasing effects for duration and age at marriage—remains in all models.

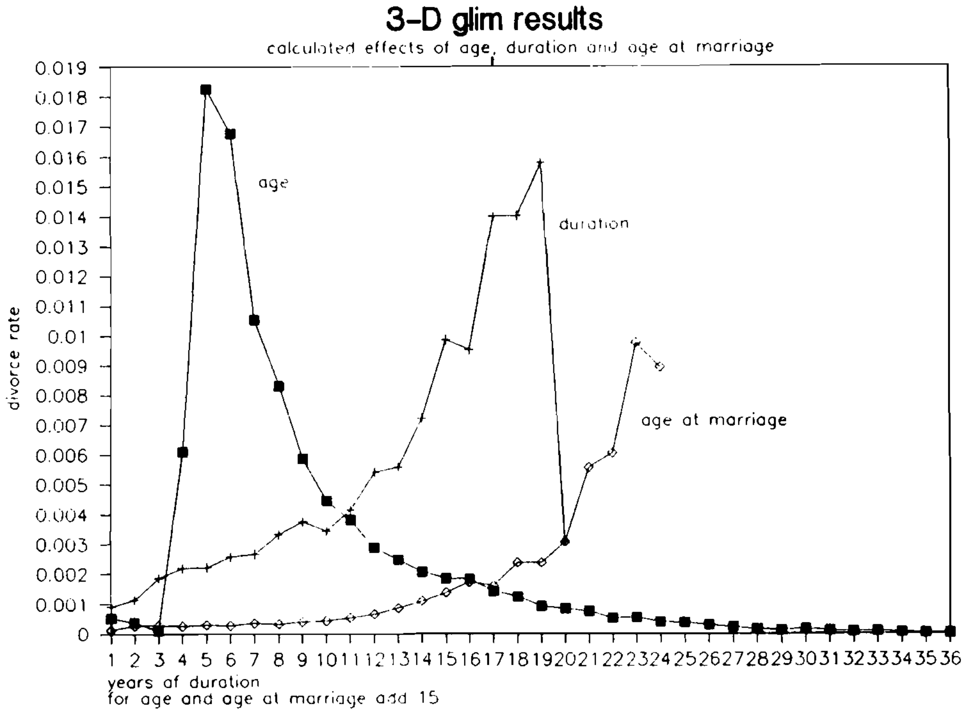

Figure 7. GLIM results of the three-dimensional model including age, age at marriage and duration effects, Finland 1984.

4. PARITY, AGE OF YOUNGEST CHILD AND DURATION

Effects of the number of children born to a woman (parity) and of the age of the youngest child become also evident in our study. Figure 7 shows the divorce probabilities for parities 0 to 5+ controlling for marital duration. The results are from the logit model including the two dimensions parity and duration. The solid line shows the aggregate divorce probabilities per parity (that is, not controlling for marital duration). The thin lines are parity-duration effects, showing the divorce probabilities for different parities controlling for selected durations. Generally, the effect of parity on divorce risks is smaller than the effect of duration and age discussed above, notably because there are no such extreme peaks. We use duration here rather than age to make our results comparable to those of other studies. Usually, parity effects are measured against duration.

When controlling for duration, the effect of parity is clearly U-shaped; divorce probabilities are highest for couples with no or many children, and lowest for those with 2 or 3 children. The overall level is lowest at duration 0, jumps at duration 5, and declines again. The effects of duration (changes in the level of the curves) are greater than those of parity (variation within one curve). Interestingly, the probability curve for parity across all durations is shaped differently: probabilities increase from parity 0 to parity 1, and then decrease monotonically to higher parities. The reason for this again lies in the

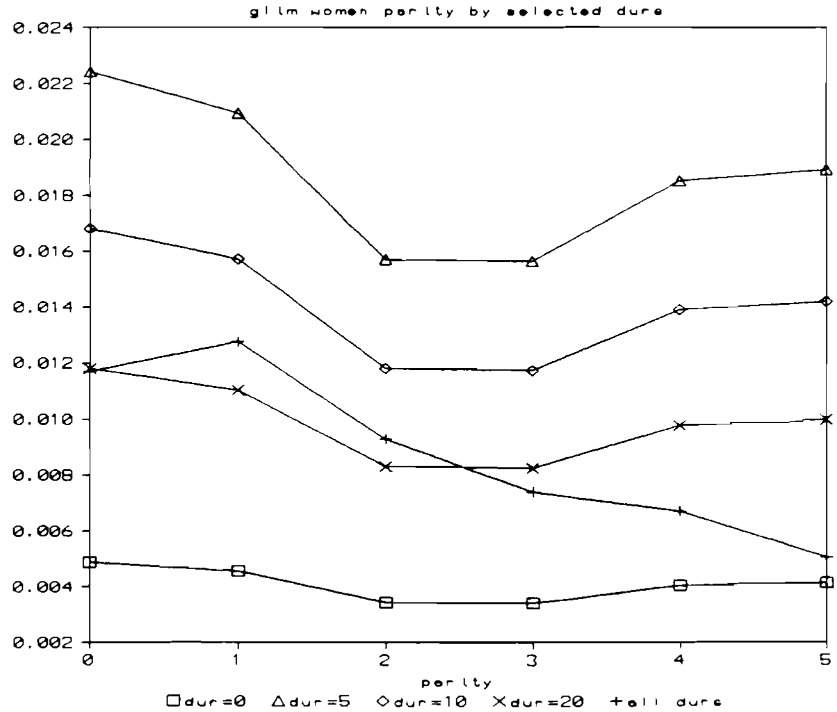

Figure 8. GLIM results for divorce probabilities by parity for selected marital duration, Finland 1984.

changing weights of various marital durations according to parity. At parity 0 there is a large group of newly-weds who pull the divorce probability down. At parity 1 the weight of the critical durations around 4 or 5 corresponding to the critical ages will be strong, inflating the divorce probability. At higher parities, the higher, more stable durations have increasing weight. It is for this reason that studies following a particular marriage cohort will find that those with one child divorce less than the childless couples (e.g. Waite, Haggstrom and Karouse, 1985; Becker et al., 1977), while period studies with mixed durations find higher divorce rates for couples with one child (leading to the—unlikely—conclusion that the first child causes a time of crisis in many marriages (Jutamäa-Jutamäa, 1984) – quoted in Lindgren (1986)).

A similar mechanism influences the effect of the age of the youngest child (open birth interval). The overall curve for birth interval and divorce probabilities increases from birth intervals 1 to 4, and decreases thereafter (see Figure 9). This looks very much like the marital duration curve and we are tempted to think that the shape of the birth interval curve is decisively influenced by the changing weights of marital durations: higher birth intervals indicating, on average, higher marital durations. In fact, when we control for marital duration to find the independent effect of birth interval the picture becomes quite different: high divorce probabilities at birth interval 0, lowest at birth interval 1

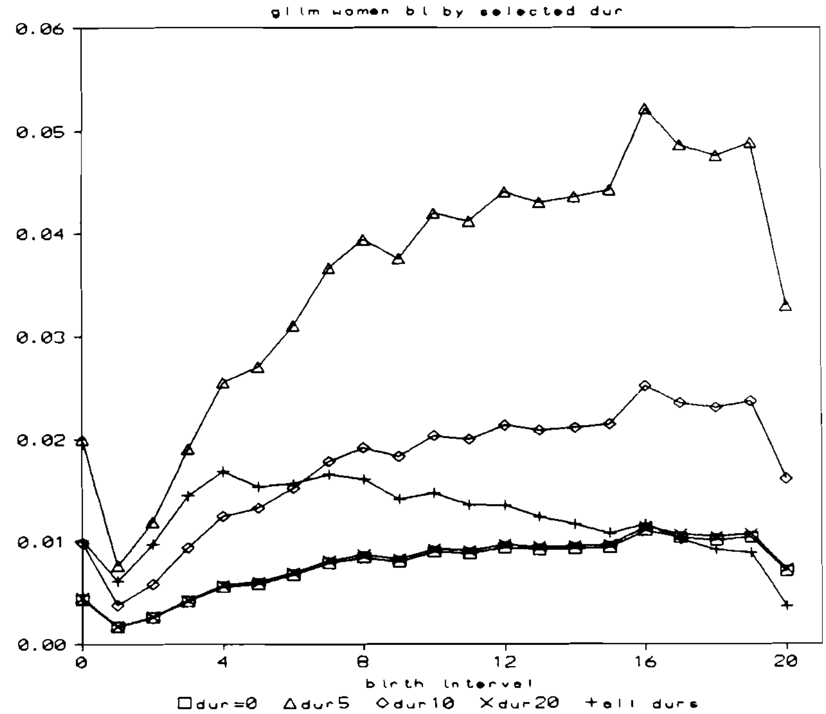

Figure 9. GLIM results for divorce probabilities by age of the youngest child for selected marital durations, Finland 1984.

and increasing for each birth interval until the youngest child is in his late teens. The high divorce probability at birth interval 0 reflects the childless couples in this group whose duration in parity had been set to zero in the creation of the data set. The later shape would indicate that older children at home are an extra strain on the marriage (adolescence and the associated turbulence), while young children tend to hold a couple together (intensive caring for the new child). It is not possible to tell what happens after the open birth interval reaches 20—which is presumably when all the children including the youngest have left the parental home—because the data aggregate these birth intervals into one 20+. Divorce probabilities for the aggregate 20+ are lower than for birth interval 20.

Another interesting finding, not shown in the graph, is that when duration since last birth is as long as duration of marriage, divorce rates tend to be higher than if the open birth is shorter. This category refers to couples that married because a birth was imminent. The data suggest that for such couples the divorce risks are higher. Firmer conclusions, however, would require a more vigorous analysis.

In summary, it appears that children, both their number and their age, have some effect on the stability of marriage.

5. SUMMARY AND DISCUSSION

This study looked at divorce probabilities in Finland from the perspective of various demographic dimensions. It is still quite uncommon in demographic analysis to speak of demographic dimensions. In a pioneering study Hobcraft and Casterline (1983) applied models somewhat similar to our models here to a group of high fertility countries participating in the World Fertility Survey. Lutz (1989) discusses the broader concept and the usefulness of speaking of demographic dimensions in the case of fertility. In the context of divorce we also found the concept of seeing demographic events as simultaneously influenced by several demographic events as a very helpful approach that led us to find some unexpected and even revolutionary conclusions.

The *main findings* of this study on the Finnish case are:

1) The period effect on divorce trends is very strong. The cohort effect is almost nil. This is important because it indicates e.g that recent marriage cohorts, with an extremely high divorce rate, are not necessarily doomed to continue this course throughout their marriage "lifetime" if period influences should become more disfavorable to divorce in the future. It means that people are flexible and open to social, moral etc. changes throughout their life as we showed above that e.g. the pro-marriage cohorts of the 50's reach fairly high divorce levels in the 70's.

2) The traditional thought on the effects of age, age at marriage, and duration on divorce are contradicted by our results. With the method we used, we obtained different results depending on how many and which of the demographic dimensions we included in the model. The three dimensional model can give us the least ambiguous results.

   These results indicate that age is the most important divorce risk factor until about age 30; higher age at marriage (above 35 or so) and high durations at least until duration 19 tend to increase divorce risk.

3) Both the number of children and the age of the children influence the probability of divorce. We found the U-shaped parity curve that has been shown in various previous studies[4] with lowest divorce probability for parents of 2 or 3 children. Childless couples have the highest divorce probabilities. If there is no correction for duration of marriage, the highest divorce probabilities are found for one-child parents because of the large concentration of young women at this parity. We found no support for the idea that a first child is a period of crisis in a marriage. Parity has relatively less

[4] E.g. Koo, Suchindran and Griffith (1984, p. 460).

influence than duration, or age. The age of the youngest child influences divorce probabilities independent of duration. As the youngest child gets older, divorce probabilities increase until youngest child age 16–20, after which they decrease.

The results of this study may also be used to identify demographically defined high risk groups for divorce. The first and most important such group consists of people who are under the age of 30. This group represents about 15% of the marriages (by age of wife) and almost 30% of divorces (Vital Statistics of Finland 1984). The second high-risk group, representing only 3% of the marriages in the group up to age 50 in 1984, but almost 8% of the divorces, are people with children from before the marriage. Up until duration 10, the divorce rate of this group is more than twice as high as that of the rest of the population peaking at duration 5. Not until after duration 15, does this children-from-before-current-marriage effect disappear completely—that is, probably after these children have left the parental home. A third, very small, high risk group is that of women which marry at a high age. While the last two groups are selective and effect only rather small proportions of all women, the first risk category affects everybody given that he is married at an age under 30. It is also plausible to assume that this instability is associated with young age.

It is not difficult to accept the influence of young age on divorce. In their twenties, people are still in a flux, ready to change, growing up. This may include changing career plans, setting up a home of your own after moving away from the parents, and finding out that your partner is not as you expected, or changing in a different direction from yourself. It is also plausible to assume that this instability associated with young age does also exist (and is probably even stronger) for non-marital relationships that could not be studied here because of lack of appropriate data.

The implications of this study on the heterogeneity of the population with respect to divorce risks is quite different from "conventional wisdom" that found its way even deeply into psychological literature and marriage counseling. There you are told that early marriage is the worst you can do to your marriage and that certain marital durations (for some strange reasons often the seventh year is stated) carry higher risks and that you just have to make it through these years in order to have it easier afterwards. None of these assertions find statistical support in this multi-dimensional study, that is however based on period data and not on true longitudinal observations.

If it were true that the results found here for the 1984 period divorce rates in Finland pointed at a general pattern valid in other populations at different points in time, then indeed much of the literature on divorce would need to be revised and even statistical data collection on divorce should change by giving less attention to marital duration and more to age. Before such assertions could be made with considerable certainty, however, more populations at different points in time (or ideally under a cohort perspective) need to be studied under a perspective that simultaneously considers several demographic dimensions of divorce.

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