Human Capital Investments or Norms of Role Transition? How Women’s Schooling and Career Affect the Process of Family Formation

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Proponents of the “new home economics” hypothesize that women’s growing economic independence largely accounts for the rise in delayed marriage and motherhood in industrialized societies. This article assesses this hypothesis for the Federal Republic of Germany by estimating the dynamic effects of women’s educational and career investments on the timing of family events. Event-history analysis shows that the delaying effect on the timing of the first marriage across cohorts does not result from an increase in the quality of women’s human capital investments as posited by the new home economics. Rather, women’s extended participation in schooling delays their transition to adulthood, an effect aligned with normative expectations that young women in school are “not ready” for marriage and motherhood. Increasing career resources, however, do lead women to postpone or avoid having children.

INTRODUCTION

Recent labor-market studies in the Federal Republic of Germany show that women, more than men, profited from the educational expansion, the developing tertiary sector of the economy, and the expansion of the welfare state. Across cohorts, women have a bigger increase than men at all higher levels of educational attainment (Blossfeld 1985, 1989, 1990),

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and their shift from relatively unskilled production and service jobs to skilled service and administration occupations is more pronounced than that of men (Blossfeld 1987c). Today, young women not only stay longer in the educational system than did women of older generations (Blossfeld and Nuthmann 1989) but are able more than ever to turn higher education into better job and career opportunities (Blossfeld 1987c, 1989). This development is shown in figure 1, which displays the development of the average prestige scores of women of the birth cohorts 1929–31, 1939–41, and 1945–51 over time. For each successive birth cohort of women, the average prestige score starts at a higher level and has a greater slope.

The changing educational and career behavior of young women, and its consequences for women’s traditional roles as housewives and mothers, is increasingly discussed in demography and the sociology of the family. One hypothesis, proposed mainly by economists, is that women’s growing economic independence (as a result of better education and improved career opportunities) is one of the major factors in the rise in delayed marriage, increasing marital instability, and the decline in fertility (see, e.g., Becker 1973, 1981; Schultz 1973; Zimmermann 1985).

Support for this hypothesis has been claimed on the basis of several empirical analyses. A general account of these studies is given by Lehrer and Nerlove (1986) as well as by Zimmermann (1985). But there are also contradictory findings, for example, by Schwarz-Miller (1981), who does not find that the level of education has a negative influence on the number of children, and by Zimmermann (1985), who claims that the negative effect of gainful employment on fertility could be considered disproved for the Federal Republic of Germany. However, all these studies are based on cross-sectional or aggregated time-series data and therefore can provide neither sufficient nor necessary evidence for a relationship over time at the level of the individual (Keyfitz 1977; Tuma and Hannan 1984; Bracher 1988; Blossfeld, Hamerle, and Mayer 1989). What is needed to assess the hypothesis of the “new home economics” is detailed time-related data on life courses of individuals. These data allow the use of statistical concepts that relate women’s subsequent family decisions to their previous educational and career experiences.

First attempts to approach the relationship between education, labor-force participation, and family decisions using life-course data have been made by Rindfuss and St. John (1983), Rindfuss, Morgan, and Swicegood (1988), Bloom and Trussell (1984), Marini (1985), Diekmann (1987), Hotz and Miller (1988), Huinink (1987, 1988c), Papastefanou (1990), Bracher (1988), Bagozzi and van Loo (1988), Sprague (1988), and Santow (1989). But these authors have not been interested in analyzing how changing educational and career investments—as a lifetime process—influence family formation. Our purpose in this article is therefore to model educa-
Fig. 1.—Average occupational prestige, by time, of women born 1929–31, 1939–41, and 1949–51.

Tional and career investments of women as a continuously changing process over the life course and to estimate their effects on the rate of entry into first marriage and first motherhood, with other important influences controlled for.

Arguments in Support of the Hypothesis of a Decreasing Significance of Marriage and Children for Women

Especially in the older birth cohorts, women’s comparatively poor general and vocational education and their overrepresentation in the lower ranks of the occupational pyramid are closely connected with an orientation toward the traditional sex-specific roles that emphasize women’s responsibilities as housewives and mothers (see Handl 1988). In the past, sociologists have argued that this traditional sex-role differentiation is functional for the stability of the family and even for society itself. The most prominent exponent of this research was Talcott Parsons (1959), who argued that different roles for men and women provide an important mechanism for preventing disruptive competition between spouses. In modern societies men have therefore specialized in gainful employment, and women in work within the family and the home.

The importance of sex-specific roles has been also stressed in the economic approach to the family. Gary Becker (1973, 1981), its main proponent, views unmarried men and women as trading partners who decide
to marry if each partner has more to gain by marrying than by remaining single. As in all trading relationships, the gains from marriage are based on the fact that each partner has something different to offer. In most societies women traditionally rely on men for provision of food and shelter as well as protection; and men rely on women for the bearing and rearing of children as well as for the maintenance of the home. This means that the socialization process traditionally induces (1) a comparative advantage of women over men in the household because women invest mainly in the human capital that raises household efficiency, and (2) a comparative advantage of men over women in the labor market because men invest mainly in capital that raises market efficiency. Hence, according to the "new home economics," it is this sex-specific specialization of labor in our society and the mutual dependence it produces between the sexes that provide the major incentive for the partners to marry. On the basis of this argument Becker comes to the conclusion that "the gain from marriage is reduced by a rise in the earnings and labor force participation of women . . . because a sexual division of labor becomes less advantageous" (Becker 1981, p. 248). The effects are that women increasingly delay or even avoid marriage and that marital instability increases.

Becker (1981) has drawn conclusions from his economic approach to the family not only with respect to entry into marriage and its stability, but also in relation to the decision to have children. According to Becker (1981) the production and rearing of children is one of the main purposes of families. Families use market goods and services, as well as the time of parents, to achieve this goal. Because of the sex-specific differentiation of labor in the family, it is especially the mother's time that is the major part of the total cost of producing and rearing children. Increases in the value of women's time as a result of increases in investments in education and career opportunities will therefore immediately affect the relative costs of children. Thus Becker argues that "a growth in the earning power of women raises . . . the relative cost of children and thereby reduces the demand for children" (Becker 1981, pp. 245-47).

To sum up, the hypothesis proposed on the basis of the economic approach to the family is that the significance of marriage and children for women is decreased to the extent that they increase their investments in education and job careers. The higher the level of education of women and the better their job perspectives, the more they will try to postpone or even to avoid marriage and motherhood.

However, there may be other reasons for changes in the timing of family formation (Hoem 1986; Eitzler 1987) stemming from educational expansion. Participation in the educational system takes time and affects women's ability to marry and to have a first child. When a woman is
attending school, a university, or vocational training programs in the Federal Republic of Germany, she is economically highly dependent on her parents. Further, there exist normative expectations in society that young people who attend school are “not at risk” of entering marriage and parenthood. Moreover, the roles of students and mothers are sufficiently demanding that most women delay fertility until they have left school (Rindfuss et al. 1988). Finishing one's education therefore counts as one of the important prerequisites for entering into marriage and parenthood (Featherman, Hogan, and Sørensen 1984). This is also true for women as, over the past four decades, their schooling has become more important and their opportunity costs of dropping out of school before completion have risen sharply (Oppenheimer 1988). Apart from the quantity of human capital investments, we therefore expect that there is also an effect of the simple fact that women are participating in the educational system.

A MODEL OF EDUCATIONAL AND CAREER INVESTMENTS AS A LIFETIME PROCESS

For the purpose of empirically assessing the hypothesis of a negative effect of educational and career investments on family formation in a longitudinal model, we must first solve the problem of how to measure the continuously changing educational and career investments of women. Accumulation of human capital is a lifetime process and must be modeled dynamically as such over the life course. In the Federal Republic of Germany this accumulation takes place in the general educational and the vocational training systems and, after the person enters the labor market, in on-the-job training. This means that it is necessary to differentiate between the accumulation of general and vocational qualifications within the educational system on the one hand, and the accumulation of workplace-related labor-force experience on the other.

Accumulation of General and Vocational Qualifications in the Educational System

In order to model the accumulation of general and vocational qualifications in the general school system, the vocational training system, and the university system of the Federal Republic of Germany, we use the average number of years required to obtain them: lower-school qualification without vocational training = 9 years; lower-secondary-school qualification with vocational training = 11 years; intermediate-school qualification without vocational training = 10 years; intermediate-school qualification with vocational training = 12 years; upper-secondary-
school qualification (*Abitur*) = 13 years; professional college qualification = 17 years; university degree = 19 years. To model changes in the accumulation of these qualifications over the life course, we have updated for each woman the level of education at the age when she obtained a particular educational rank in this hierarchy. For example, for a woman who attains a lower-school qualification at age 14, reaches the intermediate-school qualification at age 16, leaves school with an *Abitur* at age 19, and finally finishes her studies at the university at age 25, we would obtain a picture of changing levels of education over the life course as shown in figure 2. The explanation of the new home economics is that such increasing levels of education raise a woman's labor-market attachment, thereby leading to greater delays in marriage and childbirth.

However, as we discussed above, we also expect an effect of the fact that women are participating in the educational system. In order to include this influence in our model, we generated a time-dependent dummy variable indicating whether or not a woman is attending the educational system at a specific age (see the lower part of fig. 2).

**Accumulation of Labor-Force Experience by On-the-Job Training**

After leaving the educational system and entering into employment, women accumulate labor-force experience at their workplaces (Becker 1975). Economists (Mincer 1974; Becker 1975) and sociologists (Sørensen 1977; Sørensen and Tuma 1981) have often used time in the labor force as a proxy for the accumulation of labor-force experience. But this procedure can be criticized on the basis of research on labor-market segmentation. First, there is a so-called secondary labor market in the economy, offering relatively low-paying, unstable employment with poor chances of accumulating any labor-force experience at all (see, e.g., Doeringer and Piore 1971). Second, in some positions within so-called internal labor markets the opportunities to accumulate labor-force experience are very unequally distributed (e.g., Doeringer 1967; Piore 1968). Likewise, differences in the opportunity to acquire labor-force experience may also exist among the self-employed and people working in different kinds of professions. This means that the speed and levels of the accumulation of labor-force experience must be modeled as dependent on the type of positions. For the dynamic modeling of job-specific investments in human capital over the life course, we therefore made the three conjectures described below.

1. *Development of career resources after entry into first employment.*—Women who have left the educational system and entered their first job accumulate labor-force experience with decreasing increments. Because on-the-job training is concentrated mainly in the earlier
phases of employment, increases are large at the beginning and level off with increasing time in the job. This means that increments and final levels of labor-force experience should be modeled with dependence on a measure of the "goodness" of the job, for example, the prestige score, $P$, of jobs. The mathematical model of the growth rate $r(P, t)$ of career resources at age $t$, assuming that the first job was entered at age $t_0$, is then ($t \leq t_0$):

$$r(P, t) = \exp(-\alpha \times (t - t_0)),$$

where

$$\alpha = (P_{\text{max}} - P_{\text{min}}/2)/P = 83.4/P.$$  

Here $P$ is Wegener's (1985) prestige score, which is used as a proxy measure for the "goodness" of jobs and for the opportunity to accumulate labor-force experience within a job. Given this model, the level of career resources $K(P, t)$ within a job episode at age $t$ is then defined as:

$$K(P, t) = \exp\left[\int_{u=t_0}^{t} r(P, u) \, du\right] - 1.$$
Until entry into the first job, the level of career resources \( K(P, t) \) is equal to zero. The maximum level of career resources, \( \max[K(P, t)] \), within a job with the lowest prestige score (a helper with a prestige score of 20.0 on the Wegener scale), for example, is reached after nine months and has the value 0.27. For a job with the highest prestige score on the Wegener scale (a medical doctor) the maximum level of career resources is reached after about 9–10 years and has a value of 8.15.

2. Change of jobs.—If a woman changes from a job with prestige level \( P_0 \) to a job with prestige level \( P_h > P_0 \) at time \( t_1 \), which is an upward move, here career resources will increase until the maximum career level of the new job is reached. In this case the career function for \( t > t_1 \) is:

\[
K(P_h, t) = \min\{K(P_0, t_1) + K(P_h, (t - t_1)), \max[K(P_h, t)]\}
\]

If a woman changes from a job with prestige level \( P_0 \) to a job with a prestige level \( P_n < P_0 \) at time \( t_2 \) (a downward move), the career resources of the preceding job are linearly decreased over time and the career resources of the successive job are increased over time. However, the maximum career level of the preceding job is considered to be the upper limit. Thus, with increasing time, the level of career resources is decreasing and will approach the maximum career level of the successive job. For \( t > t_2 \) the level of career resources is obtained as follows:

\[
K(P_n, t) = \begin{cases} 
\min\{[1 - (1.5/P_0) \times (t - t_2)] \times K(P_0, t_2) \\
+ K(P_n, (t - t_2)), K(P_0, t_2)\}, & \text{if } t - t_2 < P_0/1.5, \\
K(P_n, (t - t_2)), & \text{otherwise}.
\end{cases}
\]

Figure 3 shows an example for the accumulation of career resources if a woman at first moves upward (from job 1 to job 2).

3. Discontinuity of work experience.—Besides continuous changes of the level of career resources as a result of upward and downward moves, we also recognize that women tend to have several entries into and exits from the labor force after leaving school because of family events (marriage, birth of children, etc.) (Mincer and Polachek 1974; Tölke 1989; Handl 1988). Given this discontinuity of work experience, the assumption that career resources monotonically increase with decreasing increments over the work life that is normally made for the career process of men in labor-market research (Sørensen 1977) is no longer valid. If women interrupt their work careers, then they will lose career resources that must be reaccumulated when they reenter the labor force. To model the path of labor-force experience of women we therefore assume that career

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2 In the following formula \( \max[K(P_h, t)] \) is the highest value a woman can reach in job \( h \). The formula \( K(P_h, t) \) then says that her resources equal a value that increases with time, until the maximum level—\( \max[K(P_h, t)] \)—is reached.
resources decline when women experience an interruption \((I)\) in their work career at age \(t\) as long as women’s career resources are still positive. The speed of the decrease is thereby dependent on the prestige level \((P_0)\) of the job held immediately before the interruption of the career. For \(t > t_3\) we get:

\[
K(I, t) = \max[0, 1 - \{(1.5/P_0) \times (t - t_3) \times K(P_0, t_3)\}].
\]

Figure 3 shows an example for a trajectory of career resources including a work interruption, and a reentry into job 3.

DATA, HAZARD RATE MODELS, AND VARIABLES

Data

The hypotheses derived from the new home economics are empirically assessed against life histories of 2,171 German respondents from cohorts born 1929–31, 1939–41, and 1949–51, collected between October 1981 and May 1983 by Karl Ulrich Mayer (1979). His objective was to record the life histories of the respondents over sociologically relevant domains (social background, education, job career, family, fertility, housing, etc.). The data were collected retrospectively by asking respondents to reconstruct, with exact dates, their life histories within these domains (Blossfeld et al. 1989; Carroll and Mayer 1986). A detailed description of the study is given by Mayer and Brückner (1989). Lengthy and extensive data editing, data checks, and cross-comparisons vouch for the quality
of the collected information. Several empirical studies assessing the quality of retrospective data and their representativeness show that the German Life History Study satisfies high standards (Blossfeld 1987b; Huinink 1988a).

Because the data not only cover educational and occupational trajectories but also provide family-history information, we are able to study in a dynamic way how time-related changes in the educational and job career affect the rate of entry into marriage and motherhood. Furthermore, we can at the same time control for other important sources of influence, for example, nonmonotonic age dependencies of rates of entry into marriage and motherhood, influences of social origin, characteristics of the husband, and measures indicating aspects of the development of historical and economic structures.

Methods
A wide range of statistical tools is available for the analysis of time-related life-course data. A comprehensive overview of these methods of event-history analysis is given, for example, by Blossfeld et al. (1989) and by Tuma and Hannan (1984). We specify as the dependent variable the instantaneous rate of entry into marriage or motherhood, defined as

\[ r(t) = \lim_{\Delta t \to 0} \frac{P(t \leq T \leq t + \Delta t | T \geq t)}{\Delta t}, \]

\[ \Delta t > 0, \]

where \( P(\cdot) \) is the transition probability of entering into marriage or motherhood in the interval \((t, t + \Delta t)\), respectively, provided that such an entry has not occurred before the beginning of this interval. Our goal is to specify the rates of entry into marriage and motherhood \([r(t)]\) as a function of time-constant \((X_1)\) and time-dependent covariates \([X_2(t)]\) in an exponential model:

\[ r(t) = \exp[\beta_1X_1 + \beta_2X_2(t)]. \]

Observation begins at age 15 and ends with the event of first marriage or the birth of the first child or, for right-censored cases, with the date of the interview or age 45, whichever is earlier.

To introduce the time-dependent effects into the rate equation, we use the method of episode splitting (Blossfeld et al. 1989). A separate data record was created at each month. For each record four different pieces of information were provided: (i) time at the beginning and end of the interval to which the record pertains; (ii) the values of the time-dependent covariates at the beginning of these intervals; (iii) whether the interval
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ended with an event or not; and (iv) the values of the other covariates relevant for the analysis.

Rate-function coefficients and their t-ratios are helpful in ascertaining how educational and career investments of women influence first motherhood and first birth, in what direction, and at what level of significance. However, the magnitude of the effects and their substantive significance are more easily assessed by examining survivor functions. Therefore on the basis of the model we estimated survivor functions for different educational and occupational careers that show the probability of a woman’s remaining unmarried or childless until age \( t \):

\[
\hat{S}(t) = \exp \left[ - \int_{u=0}^{t} \dot{\hat{r}}(u) \, du \right].
\]

Variables

We used a combination of two variables to control for the well-known nonmonotonic age dependence of the marriage rate and the rate of the first birth (Coale 1971; Bloom 1982). This approach assumes that women are at risk of entering first marriage and of having a first child between the ages 15 and 45 (\( i \) is an index for the \( i \)th one-month interval):

\[
\log(D_i) = : \log(\text{current age} - 15),
\]

\[
\log(R_i) = : \log(45 - \text{current age}).
\]

Including these variables in the exponential model as time-dependent covariates,

\[
\exp[\log(D_i) \times \beta' + \log(R_i) \times \beta''] = D_i^{\beta'} \times R_i^{\beta''},
\]

models the typical bell-shaped curve of the rates of entry into first marriage and first motherhood. This curve is symmetric around the age 30 for \( \beta' = \beta'' \), left skewed for \( \beta' < \beta'' \), and right skewed for \( \beta' > \beta'' \).

As time-constant background variables we include father's social class, residence at age 15 (town vs. country where country is the reference category), number of siblings, and the educational level of the partner. Father's social class was measured as social class 1 = lower working class, social class 2 = upper working class, social class 3 = lower middle class, and social class 4 = upper middle class (Blossfeld 1988). Class 1 is used here as the reference category.

To control for cohort and period effects of general historical and economic developments on family decisions, we introduced two different types of variables. First, we used two dummy variables for the three birth cohorts (reference group = cohort 1929–31) to measure differences
between cohorts. Second, we employed a variable that reflects the continuous development of labor-market conditions. This variable is the result of a factor analysis of 14 different time series indicating a range of aspects of the development of social and economic structures in the Federal Republic of Germany (Blossfeld 1987a). This variable has already proved to be useful in several empirical labor-market studies and can be interpreted here as measuring period effects of the business cycle (see fig. 4). Marriage and childbirth are connected processes. Premarital conception increases the readiness of women to enter into marriage and marriage increases the risk of childbirth. Therefore we also included a time-dependent indicator for pregnancy in the marriage model and a time-dependent indicator for being married in the first-birth model.

RESULTS

Effects on the Rate of Entry into First Marriage

Let us begin the analysis with the question of how the improvement of educational and career opportunities of women has affected their entry into first marriage. We find it most useful to control in a stepwise manner for other important influences before we focus on the variables of interest here, namely, the dynamic level of education and the dynamic level of career resources.

All coefficients in the models are metric coefficients, but we will not compare the relative magnitudes of the effects of different variables within models because they depend on the scale by which variables are measured. Instead, we rely on the significance level of variables to determine whether there is an important influence of a variable or not. In evaluating a model's performance, we also use a likelihood-ratio test comparing the model to a baseline. The baseline for all models is model 1, the model of a constant rate. This test gives chi-square values that are reported in tables 1 and 2.

Model 2 in table 1 includes, in a first step, two independent variables—log(current age – 15) and log(45 – current age)—as discussed earlier. Both coefficients are significant, which means that there is indeed a nonmonotonic pattern of the marriage rate in the data. Because the β coefficient of log(45 – current age) is greater than the β coefficient of log(current age – 15), we have a left-skewed bell-shaped path of the rate. This type of structure of the age dependence of the marriage rate remains the same across all models.

Model 3 in table 1 introduces, in a third step, several social background variables: father's social class, number of siblings, and type of residence at age 15. These variables are considered important for family formation
in the demographic and sociological literature (e.g., Rindfuss and St. John 1983). The number of siblings has no significant effect on the rate of entry into marriage.

More interesting from a sociological point of view are the effects of the dummy variables of father's social class in model 3 of table 1. These estimates show that women from lower social classes marry earlier than women from higher social classes. Theory would suggest that this reflects differences in class-specific resources determining social opportunities for children. These resources constitute not only income positions, properties, consumption styles, and economic strategies of families, but also their social orientations, values, and beliefs, which influence educational and career decisions of children (e.g., Blossfeld 1989; Huinink 1987). In later steps of this analysis we will see to what extent these effects of social origin have been transformed over the life course into prolonged schooling and improved career opportunities and which effect of social class on family formation remains after these influences are controlled for.

In model 3 of table 1 we also observe that entry into first marriage is not dependent on regional differences. Women who grew up in urban residences do not marry either earlier or later than women who grew up in the country.

Model 4 in table 1 incorporates measures of changes of the historical background such as cohort membership (modeled as a cohort effect) and economic development (modeled as a period effect). We find no significant cohort effect, but we observe a significant positive effect of the state of the economy (model 4 in table 1). This is to say that women enter into
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* $p < .05$. 

### Table 2

**Estimates for Models of the Rate of Entry into Motherhood of Women of Cohorts 1929–31, 1939–41, and 1949–51**

<table>
<thead>
<tr>
<th>Variables</th>
<th>Model 1</th>
<th>Model 2</th>
<th>Model 3</th>
<th>Model 4</th>
<th>Model 5</th>
<th>Model 6</th>
<th>Model 7</th>
<th>Model 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>−4.97*</td>
<td>−19.33*</td>
<td>−18.82*</td>
<td>−18.59*</td>
<td>−17.64*</td>
<td>−16.03*</td>
<td>−16.72*</td>
<td>−14.21*</td>
</tr>
<tr>
<td>Log(current age − 15)</td>
<td>2.17*</td>
<td>2.19*</td>
<td>2.08*</td>
<td>2.11*</td>
<td>1.68*</td>
<td>1.76*</td>
<td>.08</td>
<td>.08</td>
</tr>
<tr>
<td>Log(45 − current age)</td>
<td>3.36*</td>
<td>3.30*</td>
<td>3.33*</td>
<td>3.28*</td>
<td>2.84*</td>
<td>2.95*</td>
<td>2.24*</td>
<td></td>
</tr>
<tr>
<td>Number of siblings</td>
<td>.04*</td>
<td>.05*</td>
<td>.04*</td>
<td>.04*</td>
<td>.04*</td>
<td>.09*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father's social class 2</td>
<td>−.10</td>
<td>−.10</td>
<td>−.03</td>
<td>−.04</td>
<td>−.01</td>
<td>.12</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father's social class 3</td>
<td>−.34*</td>
<td>−.34*</td>
<td>−.21</td>
<td>−.19</td>
<td>−.18</td>
<td>−.03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Father's social class 4</td>
<td>−.45*</td>
<td>−.46*</td>
<td>−.13</td>
<td>−.08</td>
<td>−.05</td>
<td>.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Urban residence at age 15</td>
<td>−.23*</td>
<td>−.47*</td>
<td>−.18*</td>
<td>−.17*</td>
<td>−.18*</td>
<td>−.23*</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohort 1939–41</td>
<td>−.11</td>
<td>−.03</td>
<td>−.07</td>
<td>−.03</td>
<td>−.22</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Cohort 1949–51</td>
<td>−.16</td>
<td>−.02</td>
<td>−.05</td>
<td>.03</td>
<td>−.57*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Economic development</td>
<td>.20*</td>
<td>.19*</td>
<td>.20*</td>
<td>.20*</td>
<td>.20*</td>
<td>.07</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Partner's education</td>
<td></td>
<td>−.09*</td>
<td>−.07*</td>
<td>−.07*</td>
<td>−.04</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>In training (dynamic measure)</td>
<td></td>
<td>−1.98*</td>
<td>−2.24*</td>
<td>−1.32*</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of education (dynamic measure)</td>
<td></td>
<td>.05</td>
<td>.08*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Level of career resources (dynamic measure)</td>
<td></td>
<td>−.39*</td>
<td>−.18*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Married (dynamic measure)</td>
<td>3.82*</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>( \chi^2 )</td>
<td>480.04*</td>
<td>518.86*</td>
<td>547.14*</td>
<td>579.51*</td>
<td>674.56*</td>
<td>695.86*</td>
<td>1744.10*</td>
<td></td>
</tr>
<tr>
<td>( df )</td>
<td>2</td>
<td>7</td>
<td>10</td>
<td>11</td>
<td>13</td>
<td>14</td>
<td>15</td>
<td></td>
</tr>
</tbody>
</table>

* \( P < .05 \).
marriage earlier when the economic situation is favorable. In a period of economic expansion, the life-cycle prospects of young people are more predictable, and it is therefore easier for women to make such long-term decisions as entering into marriage (Oppenheimer 1988).

After having controlled for these theoretically important social and economic factors for women's age of marriage, we can now try to answer the question of how important improvements in educational and career opportunities have been for women's timing of marriage.

We look first at the dynamic effects of education. As discussed above, the theoretical importance of education may be viewed from two different perspectives. First, from the perspective of the new home economists, the accumulation of human capital as reflected by an increasing level of education increases women's labor-market attachment and thereby leads to greater marriage delays (Mincer 1974; Becker 1975). Second, from a sociological point of view, there exist normative expectations in the society that young people who attend school are not "at risk" of entering marriage. Finishing education, and thus ending the period of economic dependence on parents, should therefore count as one of the important events for entering into the adulthood status, and thereby becoming at risk of marriage (Oppenheimer 1988; Blossfeld and Nuthmann 1989). We have constructed dynamic, time-dependent measures for both aspects of the effects of education and included them in model 6 of table 1. This model shows that attending school, vocational training programs, or a university has indeed a strong negative effect on the rate of entry into marriage. However, and this is very interesting, the effect of the level of education is not significant. Women's timing of marriage is therefore independent of the quantity of human capital investments. In assessing the consequences of educational expansion on family formation, we can therefore conclude that marriage is postponed because women postpone their transition from youth to adulthood and not because women acquire greater quantities of human capital, thereby increasing their labor-force attachment.

Once we have controlled for educational histories of women, the effects of father's social class prove to be much smaller. In other words, different resources of social origin have been completely transformed over the life course not only in class-structured marriage patterns but also in differential times of school attendance. Parents of higher social classes provide their children with better opportunities to attain higher levels of education and to stay in the educational system longer, thereby delaying their entry into marriage.

Now, we need to assess the role of the improvement of career opportunities in the timing of women's marriage. To do this, we included women's continuous changes of the level of career resources over the life
course in model 7 of table 1. Again, and of great interest, this variable proves to be not significant. Women’s entry into marriage is therefore apparently independent of their career opportunities.

In model 7 of table 1 a time-dependent pregnancy indicator is included. It does not change the substantive findings above, but its effect is positive and very strong. This indicates that, for women experiencing premarital pregnancy, the marriage rate increases sharply.\(^3\)

To consider changes in the meaning and importance of education and job career across cohorts of women (as a consequence of the educational expansion and the changing occupational structure), we finally included interaction effects of cohort membership with level of education and level of career resources. No interaction effect was significant, and they are therefore not reported in table 1.

Effects on the Rate of Entry into First Motherhood

Let us now consider changes in the age at which women have their first child (table 2). We observe very similar effects for *age dependence* and *social class* in the first four models of table 2 to those in table 1. Because their interpretation is analogous, we do not repeat the substantive explanation. However, different findings emerge for the number of siblings and the variable “urban residence at age 15.” The *number of siblings* has a positive effect on the rate of entry into motherhood. The higher the number of siblings, the earlier women have their first child. This is in accordance with findings of earlier studies (Huinink 1987; Huinink and Tuma 1988). Women who grew up in larger families are not only systematically disadvantaged in their educational career but are also more strongly socialized toward a career as a housewife and mother. They are therefore more inclined to have children earlier and to have more children (Huinink 1988b).

The effect of *type of residence at age 15* is significant and negative. Women from rural areas bear their first child earlier than women from urban regions. This is also a well-known finding from other studies (e.g., Huinink 1987; Huinink and Wagner 1989).

Because the *partner’s current and future socioeconomic characteristics* are important for the process of family formation, we have also to control for these influences in our model. From a theoretical point of view, level of education, income position, and occupational position of the partner are important. However, longitudinal labor-market studies show that

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\(^3\) We know that about one-third of the women in our sample get pregnant the first time before their first marriages. However, only about 7% of all women had an illegitimate child before the interview date (Huinink 1988b).
there is a strong positive correlation between a person’s level of qualification and his first job (Blossfeld 1987b), his income trajectory (Blossfeld, Hannan, and Schömann 1988), and his career opportunities (Blossfeld 1989). In order to control for the economic position of the partner in the analysis of entry into motherhood it seems therefore to be sufficient to use only one of these characteristics: the educational level (Zimmermann 1985). Model 5 in table 2 shows that the effect of this indicator on the rate of entry into motherhood is negative. This means the higher the level of education—and, thereby, the better the job, income, and career perspectives of the partner—the later women enter into motherhood. We will come back to this effect when we discuss model 8 of table 2.

After having controlled for several important influences in table 2, we include in model 6 women’s continuously changing level of education and an indicator for their participation in the educational system to explain the rate of entry into motherhood. However, as in the marriage model, the level of education, which measures women’s general human capital investments, has no significant influence on the timing of the first birth. Instead, once again, attending an educational institution negatively affects women’s rate of having a first child. This means that there exist conflicting time commitments between women’s roles as students and mothers (Rindfuss et al. 1988) as well as normative expectations that young women who attend school are not at risk of entering into parenthood. Finishing education, as one of the important steps for entering into the adulthood status (see, e.g., Blossfeld and Nuthmann 1989), thus leads to a steep rise in the rate of entering into parenthood.

If changes in career resources of women over the life course are introduced in model 7 of table 2, in contrast to the expectations of the economic approach to the family, the effect of the level of education proves to be even significant and positive. This means that the process of attaining successively higher levels of qualification has an augmenting, rather than diminishing, effect on the rate of having a first child. The reason is that the attainment of increasing levels of education takes time and is connected with an increasing age of women (fig. 2). Women who remain in the educational system longer and attain high qualifications are subject to pressure not only from the potential increase of medical problems with lateness of first births, but from societal age norms as well (i.e., “Women should have their first child at least by 30” [Menken 1985]). Thus, not human capital investments, as claimed by the new home economics, but this increasing pressure might be in force, if the level of education has an effect on the timing of the first birth.

This is also illustrated in figure 5. In this figure we report estimates of the age-specific cumulative proportion childless (survivor function) for
different levels of education. The longer women are in the educational system, the longer they delay their first birth; therefore these women show a high proportion of childlessness. After leaving the educational system, those women who have delayed having children catch up with their contemporaries who have less education and who got an earlier start. However, they not only catch up. The positive effect of the educational level pushes the proportion of childless women with upper-secondary-school qualifications (at about age 20) and even those with university degrees (at about age 27) under the proportion of childless women with lower-school qualifications.

A confirmation of the economic approach to the family, however, may be seen in the negative effect of the level of career resources on the rate of entry into motherhood (model 7 of table 2). The accumulation of women's career resources conflicts with societal expectations that are connected with a woman's role as mother. Women still take primary responsibility for child care. And women are still disadvantaged in their careers when they must interrupt their work life because of the birth of a child (Ott and Rolf 1987). Women who have accumulated a high stock of career resources, therefore, try to postpone or even to avoid the birth of the first child.

Figure 6 displays examples of age-specific, cumulated proportions childless (survivor function) for ideal-typical career lines. This exercise

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4 These estimates were obtained from model 7 of table 2 by holding constant all other variables at the mean and assuming the women were not employed.

5 Again these estimates are obtained from model 7 of table 2 by holding constant all other variables at the mean.
shows that there is a conflict between career and motherhood. An increase in career opportunities augments the proportion childless at any age.

In model 8 of table 2 we introduced a time-dependent dummy variable that changes its value at marriage and thus shows whether or not a woman was married before the birth of the first child. This variable increases the rate of entry into motherhood remarkably. When this variable is introduced, one can observe that the negative effects of "in training" and "level of career resources" become weaker. Part of their influence is therefore mediated by the marriage process. This is even more pronounced for the effects of "partner's education" and "economic development," which both lose their significance. The higher the educational level of the partner, the later women marry and, mediated by the time of marriage, the later women have their first child. One reason for this fact is that there is a high degree of socioeconomic endogamy in the Federal Republic of Germany (Mayer 1977; Haller 1982; Ziegler 1985; Handl 1988). This means that there are important mechanisms of social inequality guiding the process of assortative mating, namely, social networks and differential opportunities to meet prospective spouses in selective social institutions such as schools and universities. Another reason is that better-educated men with good jobs, incomes, and career perspectives need more time to arrive at an age that makes it easier to estimate what long-run socioeconomic position accompanies any potential marriage (Oppenheimer 1988).

The fact that "economic development" also loses its significance after marriage is controlled for means that the more favorable the economic
Schooling, Career, and Family Formation

situation, the earlier women marry, and, mediated by entry into marriage, the earlier they will have their first child.

When marriage is introduced as a time-dependent variable, the effect of cohort 1949–50 becomes significantly negative. This reflects two things. First, young adults of the 1949–51 cohort could leave the parental home earlier and had to marry if they wanted to live together (see table 1). But second, these young adults had better access to contraceptive methods, especially the use of oral contraceptives, that allowed them to control fertility better and to postpone the birth of the first child. This means that there is an increased gap between the time of marriage and the time of the first birth, which also partly explains the sharply increased gainful employment rate of married women.

Finally, we have considered how changes in the meaning and importance of education and job career across cohorts of women (as a consequence of the educational expansion and the changing occupational structure) have affected the rate of entry into motherhood. But again, the interaction effects of cohort membership with level of education and level of career resources are not significant. We therefore do not report these effects in table 2.

SUMMARY AND CONCLUSIONS

Our purpose in this article has been to assess empirically the hypothesis of the new home economics that women's growing economic independence, resulting from better education and improved career opportunities, is one of the major factors in the rise in delayed marriage and motherhood in the Federal Republic of Germany. Using life-history data, we modeled educational and career investments of women as a continuously changing process over the life course and estimated their effects on the rate of entry into first marriage and birth of first child.

First, in analyzing the process of first marriage, we showed that, across cohorts, educational expansion has a delaying effect on the timing of the first marriage. But this effect is not the result of an increase in the quantity of human capital investments of women, as posited by the new home economics. Rather, women's longer participation in the educational system affects their ability to marry. There exist normative expectations in the society that young women who attend school are not at risk of entering marriage. The delaying effect of education on the timing of first marriage is therefore a result of the fact that, across cohorts, educational expansion has increased the time of educational participation and has delayed the transition from youth to adulthood. Accumulation of qualifications takes time and delays these transitions (Blossfeld and Nuthmann 1989).

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Women's housewife role in the family and their labor-market attachment proved not to be in conflict. The economic theory of the family, assuming that after marriage women immediately interrupt their market work and invest mainly in qualifications that raise their household efficiency, is therefore in some sense too traditional to describe today's empirical reality. The timing of family decisions of women is influenced neither by their level of education nor by their level of career resources. Support for the hypotheses of the new home economics, claimed on the basis of cross-sectional and aggregated time-series data, is thus probably the result of the methods and type of data used. These are not able to differentiate between the effect of accumulation of human capital over the life course and the effect of participation in the educational system in keeping women out of the marriage market.

Legal marriages were accepted as the only legitimate societal institution of living together during the period between 1940 and the early 1970s. This norm was not affected by the improvement of women's educational attainment and women's job opportunities. Instead of immediately interrupting their work after marriage, women increasingly remained in the labor force (Tölke 1989). And this is exactly what has turned out to be one of the major changes in women's employment after World War II in the Federal Republic of Germany (Müller, Wittms, and Handl 1983; Handl 1988). While the labor-force participation of unmarried women has declined over the past 40 years, the labor-force participation of married women has increased remarkably (see also Bracher 1988). In Germany, income-tax regulations (the so-called splitting table or Splittingtabelle) even provide an incentive for entry into marriage.

The analysis of the effect of educational and career investments on the rate of entry into motherhood has also provided interesting results. Again, prolonged participation in the educational system leads to a delay in women's transition to adulthood and thereby to a delay in their having a first child. Thus, across cohorts, educational expansion retards women's decisions to have children. However, the effect of the level of education on the rate of entrance into motherhood completely contradicts predictions based on the economic approach to the family. Instead of observing a negative sign of women's educational investments, we found a positive coefficient: the process of attaining successively higher levels of qualification increases the rate of having a first child and, as it turns out, decreases the cumulative proportion childless. This is because attainment of increasing levels of education takes time and is connected with woman's increasing age (see fig. 2). More highly qualified women, because they leave the educational system later, come increasingly under pressure from the greater medical problems of late first births as well as
from societal age norms (Menken 1985). Women who stay longer in the educational system and attain higher educational resources catch up with their contemporaries with lower levels of education.

A confirmation of the new home economics, however, may be seen in the negative effect of the level of career resources on the rate of entry into motherhood. In German society there still exists an economically based conflict between women’s accumulation of career resources and societal expectations connected with a woman’s role as mother. The economic approach to the family is therefore right insofar as women are still primarily responsible for the rearing of children. Thus, women with increasing career resources are faced increasingly with a conflict and try to postpone or even to avoid the birth of the first child. With further improvement of career opportunities of younger cohorts of women, resolving this conflict will turn out to be increasingly important for the society.

REFERENCES


