

WORKING PAPER

**THE DIVISION OF LABOR FOR SOCIETY'S
REPRODUCTION:**

**On The Concentration of Childbearing
and Rearing in Austria**

Wolfgang Lutz

April 1986
WP-86-19

NOT FOR QUOTATION
WITHOUT THE PERMISSION
OF THE AUTHOR

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Abstract

Using data from the birth history of the German-Austrian census of 1939 and recent Austrian sample surveys, changes in the distribution and concentration of fertility are analyzed from the beginning of the century up to completed parity distributions implied by current period fertility. The extent of concentration is described by Lorenz curves and "havehalf" statistics as well as by the difference between mothers' and children's mean family sizes. Generally, declining fertility was accompanied by increasing concentration while the baby boom period saw unprecedented low concentration. The labor of rearing children is even more concentrated than fertility, especially when men's participation in childcare is taken into account.

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INTRODUCTION

Modern societies exhibit increasing specialization in almost every segment of production. The proportions of the population that produce our food supply, our clothing, our automobiles, etc., all diminish. This trend pertains to most material goods. But what do we know about the proportion of the population that produces new members of our population—a type of production that is usually called reproduction?

Contrary to other kinds of production that are highly concentrated in the hands of a few specialists, the bearing and rearing of children has always been an activity in which the majority of the population takes part. Having children is still part of the "normal" life cycle of every man and woman. And many of those who do not have children feel they are missing something important.

In Central Europe childlessness is even less frequent today than it was a century ago. It was least frequent—probably at an all-time low in history—during the time of the Baby Boom that followed World War II in all industrialized countries. In Austria only 10% of the women born in 1936-1940 remained childless. Recently the proportion of women without children has been increasing again. There are two major factors that determine these trends in the prevalence of childlessness: First, the marriage pattern has changed dramatically over the last century. In the 1880 census of Austria 25% of all women aged 50 remained unmarried; the most recent census of 1981 showed a proportion of only 8.7% unmarried. Between 1880 and 1971 the singulate mean age at marriage (i.e., the mean age calculated from age-specific proportions married in censuses) had declined from 27.7 to 21.9 for women and from 30.9 to 26.0 for men. Over the last 15 years both the mean age at marriage and the proportion of unmarried have been increasing again. Secondly, we

might suspect that the incidence of involuntary infertility is increasing. Although the general health status is improving delayed childbearing together with the ideal of very low weight—which possibly results in irregular menstrual functions (Rose 1974)—might reduce the probability of having a birth as wanted. Voluntary childlessness which was insignificant during the baby boom, has also become more prevalent. But still in 1981/1982 only 2.2% of young Austrian couples said that they did not want children (Gisser et al. 1985).

Having or not having children is only one aspect of the division of labor for reproduction. Fertility is also unequally distributed among mothers. In the birth cohort of 1936-1940 about 33% of the women had two children, which is 37% of all mothers. Completed parities one and three show approximately equal prevalence of 20% in this cohort. Still 10% have four children and 7% have five or more. Seen together, only 28% of all women of this birth cohort have given birth to half of the children borne by this cohort. The following analysis will show that the concentration of fertility in this particular cohort is even very low as compared to older and younger birth cohorts.

Part of this empirically observed concentration is due to involuntarily low fertility for some women and unintended high fertility for others. A recent fertility survey in Austria (Gisser et al. 1985) showed that desired family size distributions tend to be much less concentrated than actual distributions. More than half of young married women (50.9%) wanted two children, a quarter (24.5%) wanted three children; the last quarter includes women that wanted one (13.6%), four or more (9%), or no children (2.2%).

Only women can bear children but men can well participate in the rearing of them and share the inconveniences as well as the pleasure of having children. Hence, we should not only focus on the division of labor among women but within the total population. The male population is also heterogeneous, not only in respect to the number of children but also in respect to the extent of their participation in childcare and housework. Empirical studies show that the proportion of child-related work that a man does even declines for larger families. Men's modest participation in childcare is an additional reason for the concentration in the labor for society's reproduction.

HOW DOES ONE MEASURE THE CONCENTRATION OF REPRODUCTION?

For an economist concentration analysis is a very natural thing and one of his basic tools. Demographers take much less advantage of this very instructive approach to heterogeneity analysis. Concentration analysis asks what fraction of the population accounts for what fraction of a certain outcome: in economics this may be income or total production; in demography it might be births, marriages, or migrations. For non-repeatable events such as deaths this kind of analysis is not very informative. The number of births per woman, however, has a high potential for variation with significant consequences on family structures, living arrangements, female labor force participation, economic inequality, and social policy issues.

The usual way to depict inequality and concentration is the Lorenz curve. This concentration curve ranks individuals on the horizontal axis from lowest to highest fertility. On the vertical axis the proportion of all children born by the cumulated proportion of women is given. Hence, the curve falls below the 45-degree diagonal or equals it in the case of complete evenness (i.e., all women have the same number of children). The further the departure from the diagonal, the higher the degree of concentration.

Figure 1 plots such Lorenz curves for three fertility distributions that will be discussed in detail later: the completed parity distributions of wives of independent farmers in Germany and Austria that had married before 1905; the completed parity distribution implied by the period fertility of Austrian women in 1981; and the number of co-resident children under age 15 in relation to all women aged 20-55 in the Austrian census of 1981. This last concentration curve focuses on the current division of labor rather than on the question if women ever had children. Figure 1 indicates a clear increase in concentration from the first to the third curve.

Economists and statisticians have used a variety of coefficients to summarize the information given by the Lorenz curve. The Gini coefficient that describes the area between the curve and the diagonal is probably best known. In this study we will use even more intuitive measures: the so-called have-statistics. The have- γ statistics give the proportions of women (ordered from highest to lowest fertility) that have a certain proportion (γ) of all children. They may also be referred to as fractiles or percentiles. In this study we will mainly use the havehalf which is a consistent measure sensitive to changes in any of the values of the underlying frequency distribution (Goodwin and Vaupel 1985).¹ If the distribution is perfectly

¹Empirical studies by Goodwin et al. (1986) showed that correlation coefficients between the havehalf, the Gini coefficient, and the coefficient of variation are very high (in all cases above .9).

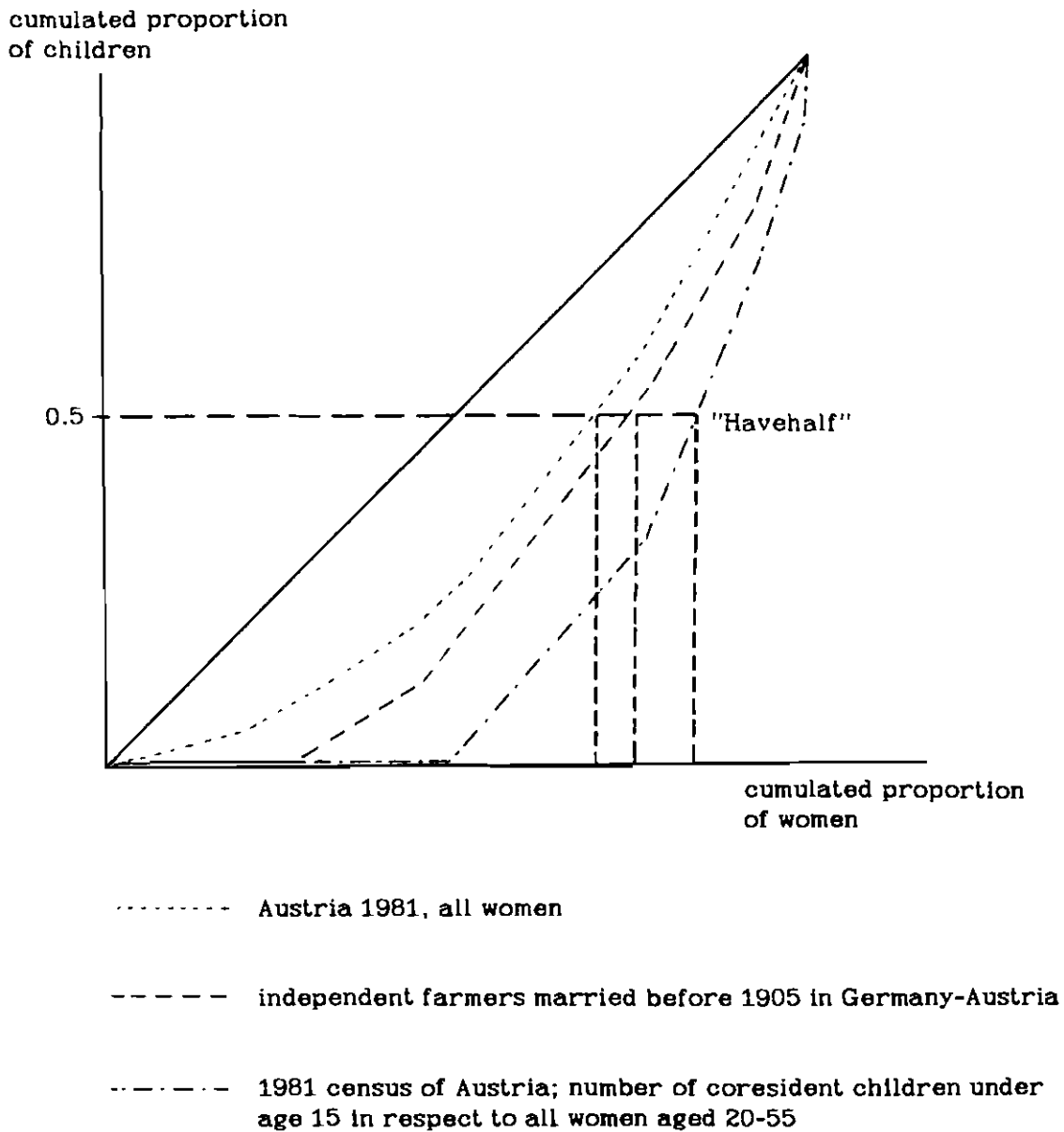


Figure 1. Lorenz curves to illustrate the concentration of fertility in three selected Austrian populations.

even the havehalf is equal to 0.50 since half the women will have half the children. In all other cases the havehalf will be below 0.50: the higher the concentration, the lower the fraction of women that has half the children.

Another consequence of the concentration of reproduction is that the mean family size per woman is not equal to the mean size of the family children come from. An intuitive explanation for this discrepancy is that in the population of children a family of six children will be represented six times whereas a one-child family only once; childless couples get no weight at all. Preston (1976) formalized this relationship in the following way: Let $f(x)$ be the proportion of women with completed parity x . Then the mean family size for women is

$$\bar{x} = \sum_{x=1}^n f(x)x$$

where n is the maximum parity considered. The average family size for children then is:

$$\bar{c} = \frac{\sum_{x=1}^n \frac{f(x)x}{\sum_{x=1}^n f(x)x} x}{\bar{x}} = \frac{\sum_{x=1}^n f(x)x^2}{\bar{x}}$$

where the weight in the summation represents the proportion of children from families of size x .

It can be shown that the difference between mothers' mean family size (\bar{x}) and children's mean family size (\bar{c}) is a function of the variance of the distribution. Hence, a higher concentration of reproduction will result in a greater difference between the two family size measures. In the following empirical study we will see that trends in mothers' and children's family sizes are not parallel unless the extent of concentration remains unchanged.

MARITAL FERTILITY FROM THE LATE 1800's TO 1939

The German census of 1939 ("Reichsfamilienstatistik 1939"), which includes the Austrian territories, provides a unique source of information for the distribution of reproduction during and shortly after the great fertility transition. In 1939 all married women living together with their husbands were asked for the number of children ever born. These women can be grouped into cohorts according to the year of marriage. The statistics also provide 64 occupational categories for husbands, thus allowing the analysis of socio-economic differentials (see Spree

1984).

Table 1 gives measures of fertility and reproductive concentration for three marriage cohorts (married before 1905, 1905-1909, and 1920-1924) and fourteen selected occupational groups. The mean number of children ever born declined significantly in all social groups. For those who married before 1905 agricultural workers and miners had, on the average, more than 5.5 children. The lowest fertility was found in self-employed physicians and university professors — social elites that had anticipated the fertility decline — and with army officers who showed the highest concentration of fertility: 28% of the officers remained childless (although married) and 19% had five or more children. This extreme concentration implies that 14% of all married army officers had half of the children born to this occupational group. In all other social groups concentration was much lower. For workers in agriculture or construction 30 or more percent of all families had half the children. Generally, the highest fertility groups reveal the lowest concentration of reproduction.

This pattern of lower concentration in high fertility groups results in a more even picture of mean family sizes from the children's perspective than from the mothers' perspective. Children of miners had, on the average, 6.6 brothers and sisters, children of church officials 4.8, children of innkeepers 5.3, and children of army officers even 5.5. Only families of physicians and professors lie outside this pattern with both fertility and concentration rather low. Consequently, the child of a physician who had married before 1905 had only 2.6 brothers and sisters on the average.

Couples who had married between 1905 and 1909 had, on the average, more than one fewer children than those who married before 1905. The concentration of reproduction also increased in most occupational groups. This implies that some members of the groups moved faster towards the new fertility regime than others, thus increasing the relative variance. Only for army officers and church officials and ministers did the completed parity distributions become more even.

The same trend continued between 1905-1909 and 1920-1924. For several occupational categories the mean number of children per couple had fallen to 2.0 or below. With 1.4 children per couple, independent artists and actors were even well below the fertility of physicians and professors, and showed extremely high concentration, due to childlessness among 35% of the couples. At the upper end of the spectrum agricultural laborers still had 3.5 children on the average. Concentration also continued to increase in most occupational groups. It is interesting to no-

Table 1. Concentration of fertility among marriage cohorts by occupational groups for Germany and Austria (German census of 1939).

Occupation of husband	Year of marriage	Mean number of children; Mothers' point of view	Mean number of children; Children's point of view	Havehalf
Laborers in agriculture	before 1905	6.0	7.6	0.31
	1905-1910	5.2	6.7	0.30
	1920-1924	3.5	4.9	0.26
Independent farmers	before 1905	5.6	7.5	0.29
	1905-1910	4.7	6.7	0.27
	1920-1924	3.1	4.6	0.25
Miners	before 1905	5.7	7.7	0.29
	1905-1910	4.9	6.8	0.28
	1920-1924	2.9	4.4	0.25
Construction workers	before 1905	5.2	6.7	0.30
	1905-1910	4.4	5.8	0.28
	1920-1924	2.9	4.5	0.24
Self-employed craftsmen	before 1905	4.4	5.7	0.28
	1905-1910	3.5	5.3	0.24
	1920-1924	2.2	4.0	0.22
Self-employed in transportation	before 1905	4.4	6.4	0.26
	1905-1910	3.3	5.1	0.23
	1920-1924	2.0	3.5	0.22
Workers in iron and metal industry	before 1905	4.3	5.8	0.28
	1905-1910	3.4	5.3	0.24
	1920-1924	2.1	3.4	0.23
Self-employed innkeepers	before 1905	4.0	6.3	0.24
	1905-1910	3.0	4.5	0.25
	1920-1924	1.8	3.1	0.23
Church officials, ministers	before 1905	3.9	5.8	0.26
	1905-1910	3.4	4.5	0.29
	1920-1924	2.7	3.8	0.27
Civil servants with railroad and postal service	before 1905	3.5	5.2	0.25
	1905-1910	2.9	4.4	0.25
	1920-1924	1.9	3.5	0.22
Independent artists, actors, etc.	before 1905	3.1	5.1	0.22
	1905-1910	2.3	4.3	0.20
	1920-1924	1.4	3.7	0.15
Army officers	before 1905	2.7	7.5	0.14
	1905-1910	2.4	3.8	0.24
	1920-1924	1.9	3.1	0.24
University professors and deans	before 1905	2.7	3.8	0.28
	1905-1910	2.6	3.7	0.28
	1920-1924	1.9	3.1	0.24
Self-employed physicians	before 1905	2.6	3.6	0.28
	1905-1910	2.5	3.9	0.26
	1920-1924	2.0	2.3	0.30
All 64 occupational categories	before 1905	4.7	6.5	0.27
	1905-1910	3.6	5.3	0.24
	1920-1924	2.3	4.0	0.21

Source of data: Spree (1984).

tice that the concentration within the aggregate of all 64 occupational groups in the pre-1905 marriage cohort was about the mean of the havehalf figures of the individual groups. For the marriage cohort of 1920-1924, however, the aggregate is clearly higher concentrated than the majority of the occupational groups taken separately. This indicates that variation between the various occupational groups had increased even stronger than the variation within those groups.

Another interesting finding is that the fertility transition was much less significant from the children's perspective than from the couple's point of view: while the mean number of children per couple declined by more than half between the pre-1905 and the 1920-1924 marriage cohorts, the mean family size for children declined by only 38% on the average.

THE POST-WAR BABY BOOM

More recent data can be obtained from two micro-censuses (1% samples of the Austrian population) in 1976 and 1981 that asked for complete birth histories. In 1976 all ever-married women under age 60 were interviewed. Women can be grouped into marriage cohorts which then may be broken down by age at first marriage. For the earlier marriage cohorts only women who married at younger ages are included in the sample because the others were already above age 60 in 1976 (the figures refer to the number of births after 20 years of marriage). The time span of period fertility covered by those cohorts ranges from the late 1930s to the early 1960s. It includes World War II, the post-war period, and the onset of the baby boom, which in Austria peaked in 1962-1963.

For the marriage cohorts of 1936-1940 and 1941-1945 (the war generation) completed fertility is lowest for those who married under age 20 (see Table 2). This pattern is reversed for the post-war marriage cohorts where a younger age at marriage means a higher average number of children after 20 years of marriage. The reason for this discrepancy lies in the fact that in the war generation the proportion of childless couples was especially large for those who had married at young ages. But after the war couples who married at young ages showed the strongest decline in proportions childless (from 13.4% in the 1941-1945 marriage cohort to 6.7% in the 1946-1950 cohort). Consequently the concentration of fertility for women who had married before age 25 was highest for the war generation and declined sharply thereafter.

Table 2. Mean numbers of children and concentration of fertility for selected Austrian marriage cohorts 1936-1940 to 1956-1960 by age at marriage (micro-census 1976) after 20 years of marriage.

Year of marriage	Female age at marriage	Mean/woman	Mean/child	Havehalf
1936-1940	under 20	2.19	3.66	0.22
	20-24	2.29	4.01	0.23
1941-1945	under 20	2.06	3.20	0.24
	20-24	2.15	3.26	0.25
	25-29	2.29	3.58	0.23
1946-1950	under 20	2.56	3.64	0.25
	20-24	2.35	3.85	0.23
	25-29	2.22	3.39	0.25
	30-44*	2.00	3.16	0.24
1951-1955	under 20	2.55	3.90	0.24
	20-24	2.51	3.51	0.27
	25-29	2.22	3.49	0.24
	30-44*	1.99	3.68	0.20
1956-1960	under 20	2.37	3.28	0.28
	20-24	2.55	3.59	0.27
	25-29	2.27	3.63	0.23
	30-44*	1.74	3.18	0.21

*after 15 years of marriage

Source of data: Haslinger and Feichtinger (1978).

Women who married after age 25 consistently reveal higher concentration than those who married at younger ages. In all marriage cohorts less than 25% of all women that had married at ages above 25 had half the children of those cohorts. Again, one of the reasons for higher diversity lies in higher proportions of childless women.

Comparing all cohorts, the mean number of children per woman after 20 years of marriage was highest for those married under age 20 in 1946-1950 (2.56 children) and 1951-1955 as well as those married between ages 20 and 24 in 1956-1960 (both 2.55 children). The trend over time was that of a slight decline from the early war generations (married 1936-1940) to the late war generation (1941-1945) and a continued increase thereafter. The concentration of fertility as measured by the havehalf decreased over the whole period from 1936 to 1960. Consequently, the

mean family size from the children's perspective increased less than could be expected from the increase of children per woman.

The 1981 survey (see Table 3) allows us to follow the baby boom for five more years. With 2.41 children per woman the 1961-1965 marriage cohort had probably the highest fertility of all women born in this century. However, from the children's perspective, the peak in family size was earlier. Those children whose mothers married between 1956 and 1960 have the highest number of brothers and sisters in recent Austrian history (2.36 on the average).

Table 3. Mean numbers of children and concentration of fertility for selected Austrian birth and marriage cohorts (micro-census 1981).

Year of marriage	Mean/woman	Mean/child	Havehalf
	[after 20 years of marriage]		
1951-1955	2.29	3.32	0.27
1956-1960	2.37	3.36	0.27
1961-1965	2.41	3.17	0.30
Year of birth	includes married and unmarried women		
	[births up to age 35]		
1921-1925	1.65	2.93	0.21
1926-1930	1.82	3.07	0.23
1931-1935	2.01	3.07	0.26
1936-1940	2.15	3.09	0.28
1941-1945	2.03	2.90	0.27

Source of data: Haslinger (1985).

Decreasing concentration made the mean family size from the children's perspective increase less than the number of children per married mother. This pattern becomes even more prominent once we look at birth cohorts of all women including unmarried (see Table 3).² From the birth cohort of 1921-1925 to that of 1936-1940 the mean number of children per woman increased by more than 30% from 1.65 to 2.15, while the mean family size from the children's perspective increased by only 5% over that period.

²The cutoff at age 35 is necessary in order to get information on the 1941-1945 birth cohort. In case of a strong delay of births this could bias the comparisons. A strong bias is not very likely, however.

We may conclude that the baby boom in Austria was accompanied by a very strong decrease in the concentration of reproduction. The percentage of all women of a birth cohort who had half the children born in that cohort increased from 21% to 28%. This may be attributed to an increase in proportions married, a decrease of childless couples, and a general convergence towards the two-child family. This roughly corresponds to the American pattern—although the Austrian level of fertility was significantly lower—where Preston (1976) found that the post-war baby boom was not accompanied by larger family sizes for children.

ESTIMATES BASED ON 1981 PERIOD FERTILITY

So far the measurement of the distribution and concentration of reproduction focused exclusively on the quantum aspect of fertility. The timing aspect, i.e., at what age women have a given number of children should not matter. For this reason we had to consider completed parity distributions, a restriction that does not allow the analysis of more recent reproductive performance unless we make certain assumptions on future fertility.

There are several methods to estimate the completed parity distribution that is implied by current period fertility. In all cases parity-specific period fertility rates must be available to estimate parity progression ratios. The method that will be applied here is a recent application of the life table concept to parity progression (Chiang and van der Berg 1982; Lutz and Feichtinger 1985; Lutz 1985). This fertility table based on parity has parity instead of age as the indexing variable. The empirical input data are parity-specific fertility rates (r_i) and mean ages at births of certain orders (x_i). As in the normal life table, a combination of the rates (including timing and quantum aspects) with the length of birth intervals (timing only) yields survival probabilities which in our case are the parity progression ratios (quantum aspect only).³ Applying those parity progression ratios (p_i) to a radix (l_0) of 100,000 childless women at age 15 yields the proportions of women still in the reproductive process at each parity (l_i column). Finally, dividing the

³The transition formula suggested by Chiang and van den Berg (1982) is

$$p_i = \frac{(x_w - x_i)r_i}{1 + (x_w - x_{i+1})r_i}$$

where x_w is the end of the process, assumed to be 45.00 in our case. x_0 was set to 15.00. To remove the effect of age distributional distortions the data were weighted in a way that produces an even age distribution (see Lutz and Feichtinger, 1985).

number of women leaving the process of reproduction at each parity (d_i), i.e., having completed parity i , by the radix results in the completed parity distribution implied by observed parity-specific period fertility under the assumption of stability.

Table 4 gives the parity table for Austria in 1981 with the completed parity distribution implied by current observed parity-specific fertility rates and mean ages at births. With the exception of parities one and five the parity progression ratios are declining with parity. This means that the chance of having a birth is higher for women with one child already than for childless women or those with two or more children. Under the assumption of stable parity-specific fertility, and mean ages at birth almost one third of all Austrian women who were 15-45 years of age in 1981 will end up with two children. The second largest group is that of childless women (28%) followed by mothers with only one child (17%); 15% will end up with three children, the rest with four or more children. This distribution implies that 23% of all women will have half the children.

Table 4. Parity table for Austria, 1981.

Parity	Mean age at birth of order i	Parity-specific fertility rate	Parity progression ratio	"Survivors"	Completed parity distribution
i	x_i	r_i	p_i	l_i	$\frac{d_i}{l_0}$
0	15.00	0.05040	0.72115	100000	27.9%
1	23.24	0.10229	0.76846	72115	16.7%
2	26.46	0.03404	0.41219	55418	32.6%
3	29.40	0.03282	0.35154	22842	14.8%
4	31.11	0.02945	0.30886	8030	5.5%
5	33.97	0.03694	0.30896	2480	1.7%
6+	36.35				.8%
Average number of children 1.62					

Source: Lutz (1985).

A breakdown by province and women's education (see Table 5) reveals significant differences in the expected concentration of fertility. The province showing the highest degree of concentration is Vorarlberg (in the very west of Austria) with 32% of women remaining children but also 14% of all women having four or

more children. Less than 9% of the women will have only one child under the given assumptions. A similar bipolarity can be observed for several other provinces (Carinthia, Upper Austria, Tyrol), resulting in high concentration measures. Styria reveals the most even distribution and a havehalf of 26%. With a total fertility rate of only 1.25 fertility is by far the lowest in Vienna but the concentration is relatively weak since 93% of all women will have two or fewer children (30% zero, 29% one, 34% two). In contrast to all other provinces, the one-child family seems to have become very common in Vienna.

Table 5. Mean numbers of children and concentration of reproduction in Austrian provinces and different educational groups as implied by the fertility pattern of 1981.

Province	Mean/woman	Mean/child	Havehalf
Burgenland	1.91	3.12	0.23
Carinthia	1.55	2.67	0.24
Lower Austria	1.57	2.68	0.24
Upper Austria	1.76	3.23	0.23
Salzburg	1.80	2.95	0.25
Styria	1.81	2.76	0.26
Tyrol	1.87	3.12	0.25
Vorarlberg	1.78	3.26	0.22
Vienna	1.25	2.20	0.25
Total Austria	1.62	2.78	0.23
Women's education			
Primary school	1.62	3.07	0.22
Vocational school	1.62	2.55	0.27
Secondary school	1.56	2.92	0.22
University	1.95	4.01	0.19

Source of data: Lutz (1985).

Concerning educational differentials, women with vocational training exhibit by far the lowest concentration (27%), and women with a university degree by far the highest concentration (19%). University-trained women seem to be a case of extreme bipolarity where women either stay childless (34%) or have a family size well above average (38% will have three or more children).⁴ The comparison of

⁴Because of the small number of women in this category, we must be cautious with generalizations.

women with vocational training and those with only primary school is a good illustration of the fact that identical levels of fertility (1.62 children per woman) can be the result of significantly different distributions resulting in divergent family sizes from the children's perspective (2.55 versus 3.07).

CURRENT INVOLVEMENT IN CHILD CARE

Only a certain period in the life cycle of any mother is devoted to childraising. Even women with very high fertility do not spend more than half of their life (assuming average life expectancy) raising their children. For this reason, an analysis of the division of labor for reproduction should also look at the time concentration of fertility: how many years of a woman's life are spent for caring about children? Obviously this does not only depend on the number of children born but also on the spacing between births.

Table 6. Concentration of childcare in the Austrian census of 1981 as measured by the number of co-resident children under age 15.

Total	Haveall	Havehalf	Mean number of children per unit of total
1. All women			
2. All women aged 15-60	0.383	0.123	0.64
3. All women aged 20-55	0.510	0.165	0.86
4. All women with children	1.000	0.321	1.67
5. All men and women*	0.220	0.073	—

*The numerator includes all men and women with children (weighted by their number), the denominator all men and women.

Source of data: Osterreichisches Statistisches Zentralamt (1985).

In the Austrian census of 1981, 22.4% of all women lived together with at least one child under age 15 (see Table 6). Only 7.2% of all women had half the co-resident children under age 15. If we restrict our analysis to women of working age (15-60), 38.3% of them have all children but only 12.3% have half the children. This amounts to a very high concentration of child care. The next total considered is that of all women that could potentially have a child under age 15 given an average age at first birth of 20 and at last birth of 40. The concentration of child care

among those women is plotted as curve 3 in Figure 1. More than half of these women have children but still only 16.5% have half the children under age 15.

As mentioned earlier, the labor of childrearing is by no means restricted to women. Assuming that fathers and mothers should be given equal weight in respect to the labor of childrearing, we can look at both sexes together and find that 22.0% of all men and women have children under age 15 and only 7.3% have half the children. Because of single-parent families, child care for men and women taken together is slightly higher concentrated than for women only.

MEN'S SHARE IN REARING CHILDREN

Table 7 shows that the assumption of equal weights for men and women with respect to child care is extremely unrealistic. In the early 1980s in Austria the majority of fathers did less than a quarter of the work involved in rearing children. There is even reason to assume that this information provided by the women is biased towards higher male participation to make the couple look more "modern". We find significant differences in the amount of male participation by the type of activity. Only 16% of fathers do half or more in feeding and cleaning the child, whereas 34% do half or more in playing with the child or conducting other leisure activities; only 2% of co-resident fathers do not do this at all.

A rather disturbing finding is revealed by the breakdown of men's participation in inside housework by the number of children: the higher the number of children, the lower the proportion of housework done by the father. The percentage of men not participating in housework at all is "only" 26% for childless couples and increases monotonically with the number of children; 58% of fathers of four or more children do not work in the household at all. This increase in inequality between the sexes with greater family size seems to be inevitable: the more children there are, the more the father has to work in order to maintain the family's standard of living and the less he has time to be with his family and help with the housework. But even if the amount of housework done by the father remained constant, an increase in the total work load results in a diminishing proportion of his work. We may, however, assume that decisions about family size and participation in housework are not made independently but that traditional attitudes and mentalities are a common determinant of both high fertility and low participation in housework whereas "modern" fathers have less children and help more. Hence, in this respect, the transition to a more "modern" pattern would mean a decrease in the concentration of labor for society's reproduction.

Table 7. The participation of husbands in childcare (percentage distribution): sample of young couples who married in 1974 or 1977.

Type of work	Amount of participation			
	Half or more	Quarter to half	Less	None
Feeding, washing, etc.	16	34	29	21
Accompany to school or kindergarten	17	18	22	39
Playing, reading	34	48	16	2
Cleaning up toys	28	44	21	7
Helping with school work	18	18	32	30
Participation in inside housework by number of children				
No children	4	34	35	26
1 child	1	21	47	31
2 children	1	14	49	41
3 children	1	18	35	47
4 or more children	-	10	30	58

Source: Findel et al. (1985)

CHILD CARE IN THE DAILY TIME BUDGET

Austrian women (including also grandmothers and others) who take nonprofessional care about children spend on the average 2 hours and 20 minutes per day with explicit childcare (not including housework). Men who participate in childcare do so for 1 hour and 50 minutes on the average. These are findings from an Austrian time budget survey of 1981. However, only 19% of all women and 7% of all men above age 19 are involved in childcare. This brings the average time spent on childcare in the total population above age 19 down to 27 minutes for women and 8 minutes for men. For women the time used to watch television is four times greater (97 minutes) than that spent on child care. For men the time spent in front of a television set is even thirteen times longer (102 minutes).

Men above age 19 spend only 1.8% of their available time (excluding sleep, basic needs, and economic activities) for child care. For women this figure is 4.9%. If we also exclude housework from the amount of available time, 6 hours and 8

Table 8. Childcare in the daily time budget of the total Austrian population above age 19.

Available time on the average	Proportion of available time per person used for child care (includes also grandparents looking after children)			
	Basis	Men	Women	Men
All day and night	24 hours	24 hours	0.5%	1.9%
Time excluding basic needs like sleeping, eating, etc.	12 hours, 40 min.	12 hours, 40 min.	1.1%	3.5%
Time excluding basic needs and economic activity (incl. way to work)	7 hours, 32 min.	9 hours, 8 min.	1.8%	4.9%
Time excluding basic needs, economic activity and household and garden work	6 hours 8 min.	4 hours 18 min.	2.2%	10.5%

Source of data: Osterreichisches Statistisches Zentralamt (1984).

minutes of daily free time remain for men and 4 hours and 18 minutes for women. Women use more than 10% of this time for child care, men slightly over 2%. Because women have less free time the proportion of this time spent to watch television is greater for women (38%) than for men (28%).

Of course these average figures do not say much about the reality of the everyday life of mothers but they can provide a rough picture of how much time our society allocates to child care. Breakdowns of these time budget figures show that 35% of all housewives, 17% of currently-working women, and 6% of retired women are involved in child care. The child care done by men is even more concentrated and restricted to 7% of all men. For those caring for children, other leisure activities are significantly reduced.

OUTLOOK

Will the future bring an increasing division of labor for society's reproduction or will the bearing and rearing of children spread more evenly over broad segments of the population?

Trends in both directions are visible. We saw that decreasing fertility was generally accompanied by increasing concentration. Since the beginning of the century, some families joined the trend toward lower fertility faster than others, making the population more heterogeneous. After World War II this increase in concentration was followed by an unprecedented decline. The concentration of reproduction within the birth cohort of 1936-1940 (married and unmarried) was even lower than that of the marriage cohort of 1905 and before, although the mean number of children had been twice as high for the marriage cohort of 1905 and earlier. Estimates of completed parity distributions implied by current period fertility indicate a new increase in concentration at present and in the near future. On the other hand, long-term trends indicate a decline in the number of high fertility families, and also an increasing feeling among childless women can be registered that they are missing something if they do not have children of their own. If both expectations materialize this would bring about a substantial decrease in the concentration of fertility.

If the bearing and rearing of children were considered only as a pain necessary for society's replacement, this disutility which seems to decrease for higher parity births, could probably be minimized by having a few mothers that had all the children and received in return for their work high social and economic recognition. But this is obviously not the case. Having children is also considered to be one of the most rewarding things in life and a great source of personal fulfillment. If the rewards of childrearing were perceived equally through the population, then the maximum level of societal rewards would be obtained if every man and woman had the same number of children. Reality shows a mixture of these two aspects—the first having been strongest in pre-modern alpine communities, the second during the post-war baby boom. Recently, however, both patterns have weakened. The social and economic advantages of having many children have been diminishing rapidly and, on the other hand, personal circumstances such as career options, partnership problems, etc., have often outweighed the desire for own children. As a consequence, the national fertility level has been continuously declining since the baby boom.

In the future, the high fertility option will probably become less and less attractive to young couples unless great changes occur in social policy or cultural values. On the other hand, the desire to have at least one or two own children seems as pronounced as ever before, despite increasing childlessness. If circumstances become more favorable for young families (more flexible working ar-

rangements for men and women, higher subsidies, etc.), this might lead to an increasing number of families with one, two, or three children. This would result in a lower concentration of fertility as is also implied by desired family size distributions stated in surveys. Hesitantly, but still visibly, men's participation in child care is increasing and bringing into the distribution of labor between men and women more equality, thus further reducing the concentration of child rearing in society.

REFERENCES

- Chiang, C.L., B. van den Berg (1982) A Fertility Table for the Analysis of Human Reproduction. *Mathematical Biosciences* 62:237-251.
- Findl, I., A. Laburda, and R. Münz (1985) Frauenalltag und familiäre Arbeitsteilung. Pages 129-158 in *Leben mit Kindern*, edited by R. Münz. Vienna.
- Frisch, R. (1974) *Demographic Implications of the Biological Determinants of Female Fecundity*. Research Paper No. 6. Center for Population Studies, Harvard University.
- Gisser, R., W. Lutz, and R. Münz (1985) Kinderwunsch und Kinderzahl. Pages 33-94 in *Leben mit Kindern*, edited by R. Münz. Vienna.
- Goodwin, D. and J. Vaupel (1985) *Concentration Curves and Hare-Statistics for Ecological Analysis of Diversity: Part III: Comparison of Measures of Diversity*. WP-85-91. Laxenburg, Austria: International Institute for Applied Systems Analysis.
- Goodwin, D., W. Lutz, and J. Vaupel (1986) Concentration of Reproduction and National Fertility Levels. Forthcoming Working Paper. Laxenburg, Austria: International Institute for Applied Systems Analysis.
- Haslinger, A. and G. Feichtinger (1978) *Analyse der Fertilitätsentwicklung in Österreich nach Heiratsjahrgängen*. Vienna: Institut für Demographie.
- Haslinger, A. (1985) Fruchtbarkeitentwicklung nach Heiratsjahrgängen: Ein Vergleich des Mikrozensus Juni 1981 mit der Longitudinalerhebung. Pages 227-291 in *Leben mit Kindern*, edited by R. Münz. Vienna.
- Lutz, W. (1985) Heiraten, Scheidungen und Kinderzahl: Demographische Tafeln zum Familien-Lebenszyklus in Österreich. *Demographische Informationen*, pp. 3-20.
- Lutz, W. and G. Feichtinger (1985) A Life Table Approach to Parity Progression and Marital Status Transitions. Paper presented at the IUSSP General Conference in Florence, 1985.
- Osterreichisches Statistisches Zentralamt (1984) *Ergebnisse des Mikrozensus September 1981*. Vienna.
- Osterreichisches Statistisches Zentralamt (1985) *Volkszählung 1981*. Hauptergebnisse Österreich. Vienna.

Preston, S. (1976) Family sizes of children and family sizes of women. *Demography* 13(1):105-114.

Spree, R. (1984) Geburtenrückgang in Deutschland for 1939. Verlauf und schichtspezifische Ausprägung. *Demographische Informationen*, pp. 49-68.