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The Emergence of A New Pattern of Childbearing : Fertility in Korea During The 1980s

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Ⅰ. Introduction

A new pattern of childbearing is rapid, fertility decline, and below replacement fertility in Korea during the 1980s. This paper presents on the trend and parity distribution of fertility in Korea during the 1980s. It is based on the 1988 Fertility and Family Health Survey.

We begin by comparing the period parity progression ratio TFRs with conventional TFRs calculated from age-specific birth rates. The comparison is complicated by the absence of any. Because, birth registration remains incomplete, available age-specific birth rates are either estimates from census data or based on fertility surveys and subject to sampling fluctuation.

Ⅱ. Materials and method

The 1988 Korean Fertility and Family Health Survey was a nationally representative sample survey carried out by the Korean Institute for Population and Health (KIPH) from May 9 and June 30, 1988. It was the eighth in a series of

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fertility surveys carried out since 1971 by what is now the Korean Institute for Health and Social Affairs. Field work for a ninth survey is completed and processing is underway at this writing.

The 1988 survey provides information on 11,864 households and complete pregnancy histories for 7,792 ever married women aged 15 to 44 (Moon et al. 1989 : 20-21). Survey findings have been reported in two volumes, a general report by Moon et al.
(1989) and a series of detailed analyses edited by Hong et al. (1989). Both of these reports are in Korean, though Hong et al. provides tables with English text. No other analyses of the survey data have been published, so far as we know.

Conventional measurements of human fertility focus the level of reproduction and ignore its distribution among women(Feeney & Lutz, 1991). Satisfactory characterization of the distribution of childbearing among women requires the introduction of life table methods and may be accomplished in various ways. The simplest approach looks at life tables for the distribution of intervals between successive childbearing events. We consider the cohort of women who have a first birth during a given year, for example, follow this cohort over time, and compute a life table representing the intervals between first and second births. Life tables may also be calculated for the intervals between birth and first marriage of woman and for the intervals between first marriage and first subsequent birth. All of these life tables may of course be calculated on period as well as on a cohort basis.

Let $q_i(y, x)$ denote the number of parity i women reaching x years duration in parity i exactly during calender year y divided into the number of $(i+1)$st births these women have before reaching $x+1$ years duration in parity i. This statistic is analogous to a life table q_x value, with the occurrence of an i-th birth corresponding to birth, during in parity i corresponding to age, and the occurrence of $(i+1)$st birth corresponding to death.

The numerators of these $q_i(y, x)$ values are obtained by cross-classifying all survey women who have $(i+1)$ or more births by year of i-th birth and interval between i-th and $(i+1)$st birth classified by single years of duration in parity i. The denominators are obtained by classifying all women who have i or more births by year of i-th birth and subtracting the appropriate number of women having $(i+1)$st births. The statistics $q_i(y, x)$ may be referred to either as duration-specific parity progression rates or as duration-specific birth probabilities.

The period parity progression ratio (PPPR) for progression from i-th to $(i+1)$st birth for the years y and $y+1$ is calculated as

$$p_{i\to i+1} = 1 - \prod_{x=0}^{9} [1 - p_i(y, x)] \qquad (1)$$

The truncation at ten years duration in parity i allows for all but exceptionally long birth intervals and is necessary to obtain comparability of values over time when working with survey data. The PPPR refers to years y and $y+1$, rather than to year y only, because parity i women reaching any given duration x during year y have their $(i+1)$st births in year $y+1$ as well as in year y.

Period parity progression ratios for progression

from first marriage to first subsequents birth are calculated analogously, first marriage playing the role of i-th birth, first subsequent birth the role of (i+1)st birth. Period progression ratios for progression from birth of woman to first marriage are also calculated analogously. The latter are proportions of women ultimately marrying, in the absence of mortality, in a period nuptiality table.

Given any set of parity progression ratios, the corresponding total fertility rate(TFR) is calculated as

$$TFR(y) = p_0 + p_0p_1 + p_0p_1p_2 + \cdots + p_0p_1p_2\cdots p_n/(1-p_n) \quad (2)$$

where p_0 denotes the parity progression ratio for progression from birth of woman to first birth and p_i denotes the ratio for progression from i-th to (i+1)st birth. The quotient $p_n/(1-p_n)$ in the last term represents a geometric series approximation that allows for truncation of the PPR series. The approximation is acceptable so long as p_n is not too large.

The terms in (2) represent the proportions of women having at least one child (p_0), at least two children (p_0p_1), and so on, from which we may calcuate a completed pariy distribution by differencing. Thus $1-p_0$ gives the proportion of childless women, $p_0-p_0p_1$ the proportion of women with exactly one child, and so on.

We use (2) to calculate TFRs from period progression ratios with n=4 and with p_0 calculated as the product of the PPPRs for progression from birth of woman to first marriage and first marriage to first subsequent birth. These TFRs are similar in to conventional TFRs in that they represent the mean number of children born per woman in an hypothetical cohort which experiences fertility rates observed during a given time period. They differ from conventional TFRS in being based on period parity progression ratios rather than on period age-specific birth rates.

The parity progression ratio TFR is numerically identical to the conventional TFR if suitably defined fertility rates have been constant for a long period of time. General relationships under non-equilibrium conditions have not been developed. A formal analysis of corresponding statistics for progression to first birth suggests that they are complex (Feeney & Yu, 1987). Empirical studies to date indicate that the two TFRs show similar broad trends but may differ in local detail (Feeney, 1986; Feeney & Yu, 1987; Feeney, 1991).

Changes in the parity progression ratio TFR over time may be decomposed in the following way. Given two TFRs, each computed from a set of period progression ratios for two successive years, we ask what change in fertility level would have been observed in only one of the progression ratios changed in the way that it did, with all the others remaining constant, using (2) to compute the result. Summing these changes over all progressions will not give the observed change, since (2) is not a linear relation, but prorating the calculated changes provides a useful indication of the contribution of each progression to the overall change.

Ⅲ. Results and discussion

Period parity progression ratios for the years 1980-1986 are shown in Table 1 together with the corresponding total fertility rates(TFRs).

Table 1. Period parity Progression Ratios (per 1000) for Korea : 1980-1986

Year	Progression						TFR
	B→M	M→1	1→2	2→3	3→4	4→5	
1986	923	980	853	179	158	148	1.84
1985	910	995	844	218	117	174	1.86
1984	936	993	830	227	144	235	1.91
1983	910	993	913	288	209	184	2.06
1982	936	988	914	366	259	261	2.20
1981	943	983	937	517	312	413	2.48
1980	918	997	948	606	492	468	2.80

Source : 1988 Korean Fertility and Family Health Survey.

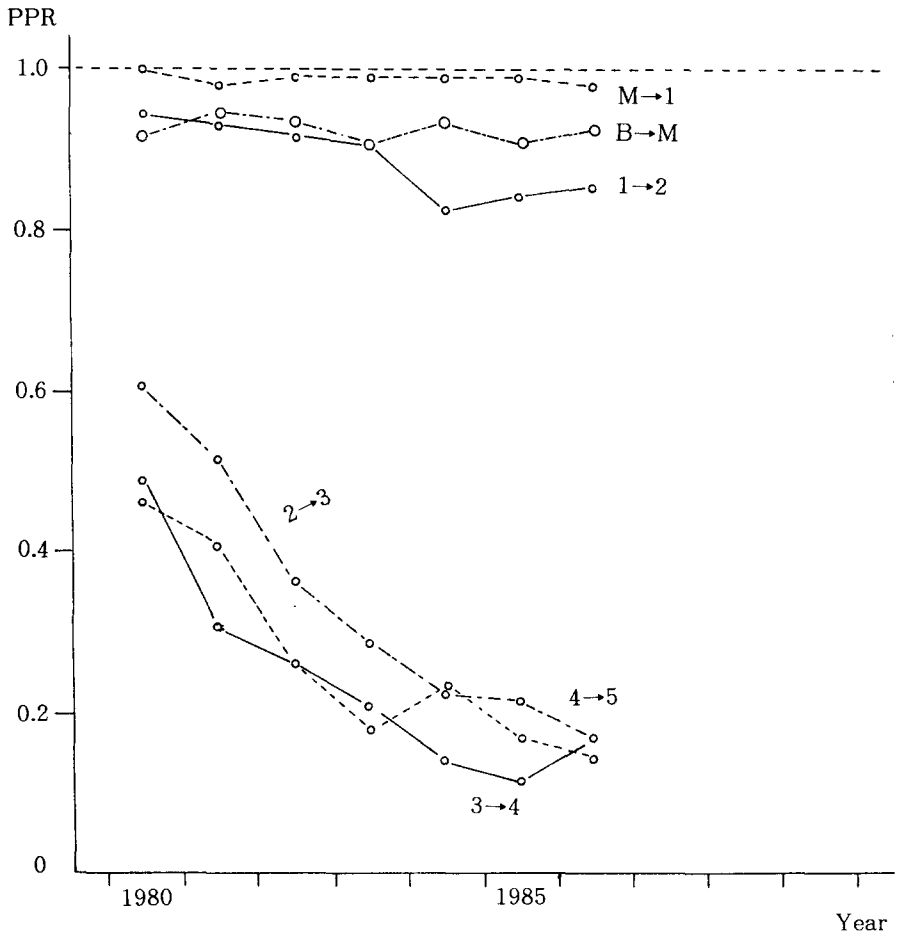

Figure 1. Period Progression Ratios : Korea, 1980-1986

The progression ratios are plotted in Figure 1. The most obvious pattern is the sharp division between the earlier and the later progression ratios, with high and relatively constant values for the earlier progression (B→M, M→1 and 1 →2) and low and declining values for the higher order progressions. Progression from birth of women to first marriage varies erratically with no overall trend. The median level for the period is 92.5 percent.

Progression from first marriage to first birth is extremely high and nearly level with a median value of 99.3 percent. Since some three percent of all women remain childless even among the high fertility Hutterites, these values are suspect. While we cannot present further evidence to support the point, it seems likely that a substantial proportion of adopted children, second and higher order births to their biological parents, were incorrectly reported as first bitrhs by their adoptive parents. Similarly high values are observed for china(Feeney and Yu 1987 : Table 1), and we hypothesize the same explanation in this case.

Progression from first to second birth shows a median value of 91.3 percent. Though there is a very slight decline over the period as a whole, the values for the recent years do not suggest any further decline.

Considering these earlier progressions together, we see that the substantial decline in the TFR from 2.8 children per woman in 1980 to 1. 8 children per woman in 1986 was due primarily to declines in progression to third and higher order births. Most importantly, progression from second to third birth declined extremely rapidly, from 61 percent in 1980 to 18 percent in 1986. The series for progression from third to fourth and especially from fourth to fifth birth are erratic on account of the small numbers of

Table 2. Decomposition of Change in Total Fertility Rate : Korea, 1980-1986

Prog.	1980	1986	TFR*	Diff	Percent
B→M	.918	.923	2.810	-.015	-1.1%
M→1	.997	.980	2.747	.048	3.6%
1→2	.948	.853	2.607	.088	6.5%
2→3	.606	.179	2.082	.713	52.9%
3→4	.492	.158	2.465	.330	24.5%
4→5	.468	.148	2.612	.183	13.6%
TFR	2.809	1.841	-	1.347	100%

Note : Parity progression ratios from Table 1. TFR. denotes the total fertility rate which would have been observed in 1986 if the progression ratio on this line had changed as it did change, but all other parity progression ratios retained their 1980 values. Diff denotes the difference between the 1980 TFR and 1986 TFR..

women reaching these higher parities, but it is clear that they also declined sharply.

The change in the TFR between 1980 and 1986 is decomposed into parity progression components in Table 2. We see that changes in progression to third and higher order births accounted for about 90% of the decline during these years, with over half of the decline accounted for by the decline in progression from second to third birth.

The "fanning out" pattern of the parity progression ratios with fertility decline appears to be universal. The overall decline in level of childbearing is effected by declines in progression to third and higher order births, with progression to lower order births declining relatively little or not at all. This pattern is observed in Japan (Feeney, 1986; Feeney, 1990), in China (Feeney & Yu, 1987; Luter, Feeney & Zhang, 1990), and in Taiwan (Feeney, 1991). It is also observed in France, the only European country for which these statistics are presently available, during the late eighteenth century (Weir 1983; see also the cover of the Spring 1983 issue of Population Index).

The pattern of the Korean parity progression ratios resembles that of the Japan in displaying a very sharp break between progression from first to second birth and progression from second to third births. This pattern, together with the high proportions progressing to second birth, represents and extreme concentration of two-child families. To see this we use the parity progression ratios to compute a completed distribution of fertility,as shown in Table 3. The concentration of two-child families is probably more pronounced in Korea than in any other county in the world. Figure 2 compares the completed parity distribution for Korea in 1986 with corresponding distributions for Japan in 1982 and the United States in 1984. The United States,with slightly over 30 percent of all women having two children,is broadly typical of Western countries(Feeney & Lutz,1991). Japan,with nearly 50% of all women having two children,shows unusual concentration at this family size. In Korea,some 64% of all women have two-child families.

Ⅳ. Conclusion

Fertility in Korea continued to decline rapidly during the 1980s,falling from nearly three children per woman at the beginning of the decade

Table 3. Completed Parity Distribution Implied by Period Parity Progression Ratios : Korea, 1986

	Number of Children					
	0	1	2	3	4	5+
Parity Progression ratio	.907	.853	.175	.176	.148	-
Birth order component	-	.907	.774	.135	.024	.004
Parity distribution	.093	.133	.639	.111	.020	.004

Note : Parity progression ratios from Table 1. Birth order components are terms of formula (2) in the text.

Table 4. Parity Progression Ratios for Selected Populations (Per 1,000)

Population	Progression									
	B→M	M→1	0→1	1→2	2→3	3→4	4→5	5→6	6→7	7→8
Korea 1986	925	980	918	853	175	176	148	-	-	-
Taiwan 1986	992	959	951	782	428	212	170	185	198	216
China 1965	990	982	972	979	964	929	886	845	786	720
China 1979	994	991	985	959	700	539	431	414	322	309
〃 Rural	997	992	989	978	759	572	448	422	328	310
〃 Urban	981	979	960	799	259	168	131	185	44	373
Japan 1982	925	916	847	856	320	137	221*	-	-	-
U.S. 1984	-	-	802	789	488	386	382	419	439	456*
〃 1960	-	-	923	922	746	645	619	650	682	689*
〃 1941	-	-	779	745	628	639	651	670	666	635*
Canada 1985	-	-	-	793	423	301	287	370	412	430*
Nether. 1985	-	-	-	835	382	298	363	483	555	562*
E Germany 1985	-	-	-	688	274	300	366	427	443	422*
Hungary 1984	-	-	-	750	242	249	377	414	470	458*
Yugoslavia 1982	-	-	-	815	318	416	518	567	547	464*
France 1976	891	939	837	645	325	267	277*	-	-	-
Italy 1978	926	861	797	739	345	280	287*	-	-	-
Eng & W	-	829	-	855	347	267	241*	-	-	-
Hutterites	-	971	-	988	972	968	967	953	929	905

Sources : Korea from Table 1. Taiwan from Feeney (1991 : 470).
China from Feeney and Yu (1987 : 81). Japan from Feeney (1986 : 20). U.S. from Feeney (1988 : Table 1). East Germany from Feeney and Lutz (1991). Values for Canada, the Netherlands, East Germany, Hungary and Yugoslavia estimated by the indirect procedure described in the text from time series of registered births by order from United Nations *Demographic Yearbooks*. Values for France, Italy and England and Wales from Penhale (1984 : Tables 12-14). Asterisked Values are aggregates for progression from i-th or higher order to (i+1)st or higher order births. Cohort statistics for Hutterites calculated from Eaton and Mayer (1954 : 20, Table 10). All other figures are period.

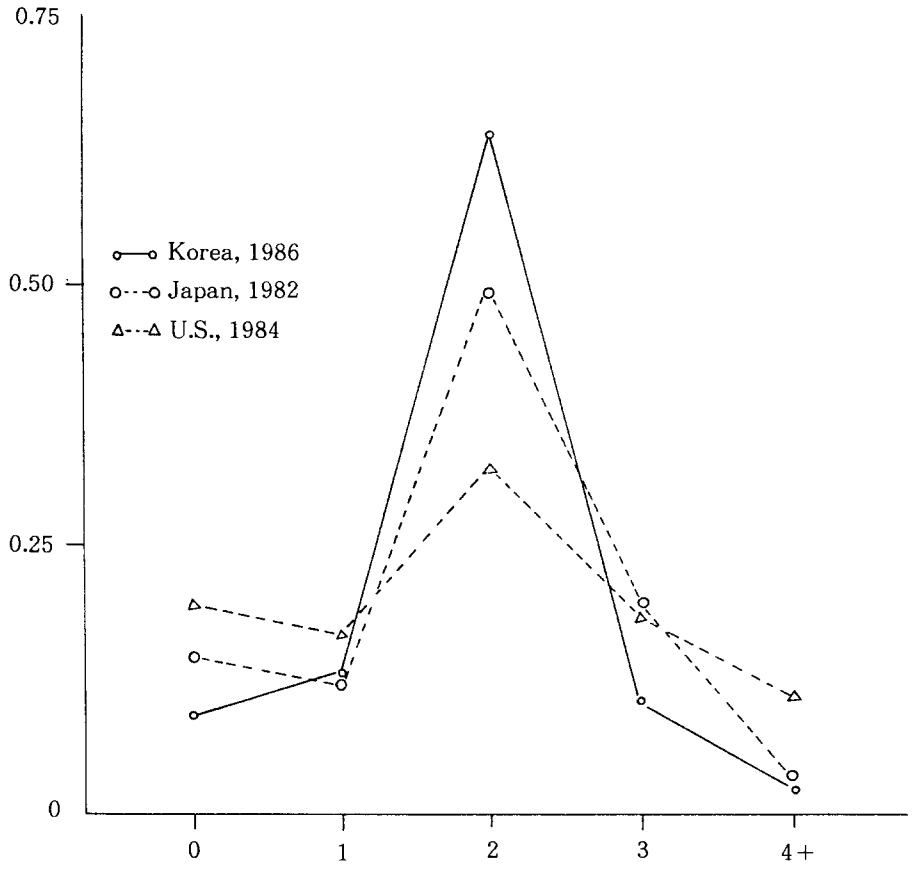

Figure 2. Completed Parity Distribution : Korea, Japan, and the Untied States.

to below replacement level in 1986. About 90% of this decline is accounted for by declines in third and higer order births, with declines in progression from second to third birth accounting for over half the decline. Because proportions of women marrying and becoming mothers have remained high,an extreme concentration of two-child families has resulted.

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<국민초록>

1980年代 韓國 出産力의 變動 推移에 관한 分析

韓聖鉉*

Griffith Feeney**

본 연구는 1980년대 우리나라 출산력의 급격한 변동을 설명하기 위하여 1988년 한국보건사회 연구원에서 실시한 전국규모의 출산력 및 가족보건조사자료를 기초로 출산순위진도 측정방법에 의하여 출산력을 분석한 것이다.

본 연구 결과에서는 년도별 출산력과 출산순위분포, 출산순위별 진도율 등을 측정하였고, 그 결과를 요약하면 다음과 같다.

1980년 초에는 출산력이 2.8에서 1986년 이후에 대체수준이하인 1.8로 계속적인 하향추세를 보였다.

출산순위별 진도율에서는 둘째에서 세재아이로 진도한 비율이 1980년초에서 1986년사이에 약 71%가 감소하였고, 세째순위에서 네째순위로 33%가 감소하였다. 세째이상으로 진도한 비율의 감소율이 90%를 상회하고 이중 둘째에서 세째사이의 변동율이 50%를 나타내었다.

출산순위분포에서는 둘째아이에 64%가 집중되어 있으며 출산진도율은 결혼에서 첫째아이로 진도되는 확률이 90%, 첫째에서 둘째로 85%, 둘째에서 세째로는 18%가 나타냈다.

이러한 현상은 최근 한국부인의 82%가 둘째아이에서 단산하는 경향을 보이고 한자녀만 갖는 확률은 15%로 풀이되고 있다.

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