Contraceptive Use and Childbearing in Contemporary Japan

Robert W. Hodge
Naohiro Ogawa
Kazumasa Kobayashi

Robert W. Hodge
Professor
Department of Sociology
  and Anthropology
University of Southern California

Naohiro Ogawa
Professor
College of Economics
Nihon University
and
Deputy Director
Nihon University
Population Research Institute

Kazumasa Kobayashi
Professor
and
Deputy Director
Nihon University
Population Research Institute

C O N T E N T S

T A B L E S

F I G U R E S

A B S T R A C T ——————————————————

The present paper attempts to examine the relationship between contraceptive and reproductive behavior at the micro-level, utilizing the 16th round of a series of studies on fertility and family planning conducted by the Mainichi Newspapers the first round of which was conducted in 1950.

One of the principal findings of the present study is that current contraceptive use and cumulative fertility are positively related, owing to the conjunction of relatively late marriages, small family size goals, entry into marriage only when prepared to begin family formation, and the acceptance of contraceptives primarily after family size goals are complete.

The other important finding is that while about three-fifths of married Japanese women of childbearing age are currently using contraceptives, the experience of younger cohorts strongly suggests that probably ninety percent or more of the cohorts presently in the prime ages of reproduction will use contraceptives at some point in their life cycle.

Another important point emerging from the present study is that tastes, as measured by family size goals, are generally more potent determinants of reproductive behavior than are the social positions of respondents.

I. Introduction

At the close of World War II, Japan's demographic situation was not appreciably different from the circumstances which some commentators (Thompson, 1929) felt had precipitated her entry into that conflict. In 1947, the crude death rate was 14.7 and slowly declining. By way of contrast, the crude birth rate was 34.5 and set on no identifiable course, particularly since the modest prewar declines in fertility were in large measure attributable to changes in marital pattern rather than to changes in fertility within marriage (Tsubouchi, 1970; Ohbuchi, 1976). More refined indicators of aggregate fertility were equally high in 1947; the total fertility rate was 4.54, the gross reproduction rate, 2.21, and the net reproduction rate, 1.72. A mere decade later, Japan's demographic transition was virtually complete; the crude death rate had dwindled to 8.3 by 1957, but the crude birth rate had plummeted to 17.3. Even the gross reproduction rate was below replacement levels, standing at 0.99. The net reproduction rate was 0.92. Since 1957, the level of mortality has crept downward, and fertility has fluctuated around a replacement level while likewise drifting downward. In 1980, the crude death rate was 6.2; the crude birth rate stood at 13.6, and the levels of gross and net reproduction were 0.85 and 0.83, respectively.

While Japan's demographic miracle was transpiring, numerous social and economic changes were underway. The best known of these, of course, was Japan's quick economic recovery and subsequent prosperity. In addition, educational opportunities were expanding rapidly and the mean age at first marriage was slowly rising, especially for women. More proximate determinants of fertility (Bongaarts, 1980) were also changing and are mirrored quite closely by the aggregate shifts in fertility.

Abortion was effectively legalized in Japan with the passage of the Eugenics Protection Law in 1948, which was further liberalized in 1949 to allow for abortions for financial reasons (Muramatsu, 1967, p.3). Official statistics reveal there were 91 abortions per 1,000 live births in 1949, a figure which had doubled to 209 by the following year and continued to rise rapidly to a peak of 716 per 1,000 live births in 1957. Subsequently, the incidence of abortion relative to live births tailed off, the estimated ratio being 379 in 1980.

Although the figures cited here surely understate the true level of abortions (Muramatsu, 1960, 1967), the temporal pattern observed in these official statistics probably tracks the actual incidence rates quite closely since there is no evidence to suggest changes in the completeness of reporting of induced abortions (see Muramatsu, 1967). Consequently, though there is little doubt that abortion played a major role in the reduction of Japanese fertility to replacement levels, it played a less substantial role in holding fertility at low levels once the demographic transition was essentially completed in the late 1950s.

Coincidental with the legalization and adoption of abortion was an equally precipitous rise in the use of contraceptives as a vehicle for controlling family size. Data from the Mainichi surveys--a series of KAP type inquiries sponsored by the Mainichi Newspapers and conducted at regular intervals since 1950--reveal two trends no less remarkable than that of abortion. In 1950, about one-third of Japanese married women of childbearing age had at some time practiced contraception and about one-fifth were currently practicing contraception. By 1957, when abortions relative to births peaked, about three-fifths of married Japanese women of childbearing age had at some time practiced contraception and about two in every five were current users. However, as the use of abortion declined in subsequent years, the practice of contraception continued its dramatic rise. By 1984, over four in five married Japanese women of childbearing age had practiced contraception at some point and about three in five were current users.

Not only has the use of contraception expanded during the past three and one-half decades, but the type of contraception used has shifted as well. Condoms and rhythm have always been the most popular methods of contraception in Japan. In 1950, among couples who had ever used contraception, about thirty percent had used rhythm, and forty percent had used condoms. By 1957, these percentages had risen to about fifty for rhythm and sixty percent for condoms. (Note that the percentages can add to over 100 percent because women can use multiple methods.) These figures had been relatively stable since 1952, with only a slight increase in the relative numbers of rhythm users being detectable in the Mainichi data. However, 1957 marks the beginning of a significant and continuing change in the choice of

contraceptive methods by married couples. Just as the use of abortions was beginning to decline, the relative popularity of rhythm began to fall while that of condoms began to rise. By 1984, almost four out of every five couples practicing contraception were using condoms, while only about one in five was using rhythm. Thus, although neither rhythm nor condoms are particularly reliable methods of birth control, there was a shift to what is generally regarded as the more reliable of these two methods--condoms--just at the time when abortion was being used less frequently as a method of controlling family size.

There is little doubt that the aggregate movement in these proximate determinants of fertility track the actual movement in aggregate fertility quite well. Japan was propelled through her transition by widespread abortion and the large scale adoption of contraceptive methods, which, while ineffective for couples, can nonetheless have substantial aggregate impacts. Once through the transition, fertility has been held in check by the continuing diffusion of contraceptive use and a shift away from rhythm to condoms (and to a lesser extent pills and the IUD) as the contraceptive of choice. Although the covariation between the course of fertility and the time paths of the proximate and not-so-proximate determinants of fertility provide a clear portrait of the factors operative in Japan's postwar demographic history, such macro-level movements provide no clear and certain knowledge of the micro-level processes which affect family formation at the individual level. Indeed, there has been relatively little micro-level work on fertility related behavior in Japan which goes beyond simple crosstabulations to thoroughly multivariate analyses. Some of the best known papers (see, e.g., Mosk, 1979; Ohbuchi, 1976; Tsubouchi, 1970) deal entirely with macro-level data. Using micro-level data, Ogawa and Hodge (1983) have recently postulated and estimated an elaborate causal model of childbearing, abortion, and attitudes toward abortion in contemporary Japan. In that paper, no reference is made to contraceptive practices and the only measure of fertility behavior utilized is a cumulative one. In the present paper, we examine the relationship between contraceptive and reproductive behavior at the micro-level, thus providing evidence on an important variable omitted in the previous study by Ogawa and Hodge. As the analysis unfolds, it becomes abundantly clear that the micro-

level relationship between contraceptive use and reproductive behavior cannot be unraveled by utilization of a cumulative measure of fertility. Although the earlier work of Ogawa and Hodge provides a useful conceptualization and organization of a variety of social and demographic factors implicated in Japanese reproductive behavior, the present inquiry reveals that a satisfactory account of fertility in contemporary Japan will require a model considerably more detailed than the one presently available.

II. Data Base

The present essay draws upon the same data set employed by Ogawa and Hodge in the analysis cited above. The data comprise the 16th round of a series of studies of fertility and family planning conducted by the Mainichi Newspapers since 1950. The present data were collected in the spring of 1981 using a stratified, multi-stage sampling procedure. Cities, towns and villages throughout Japan were first stratified on the basis of population and local characteristics. Using Basic Resident Registers, respondents were then randomly chosen from each primary sampling unit. Details of the sampling procedure are available elsewhere and will not, therefore, be repeated here; they are similar to those employed in previous surveys in this series (e.g., Population Problems Research Council, 1978).

In the present inquiry, questionnaires were distributed to the target sample by the field staff, a member of which returned several days later to retrieve the completed schedules. In all, 3078 questionnaires were completed, representing a quite respectable completion rate of 83 percent. In the present analyses, however, we make use only of the 2598 cases for which complete data are available on all of the variables of interest in the present report. Still further, many of the analyses are imposed upon subsets of these respondents who meet various criteria detailed below. There appears, on the basis of comparisons with census data and the examination of relationships observed in pairwise and listwise deleted data sets, no reason to believe that either the initial losses of non-respondents or the subsequent losses incurred by use of listwise deletion of sample cases with missing data incur any appreciable distortion in the results presented herein.

III. Pregnancies and Contraceptive Use

In the aggregate, there is little dispute that contraceptive use
is a proximate determinant of fertility in the short run. A popula-
tion that judiciously shields, sheaths, or otherwise protects itself
from the consequences of sexual intercourse will quite simply exhibit
a lower level of fertility than one which indulges in sexual delights
without such precautionary measures. A contracepted population is one
with contained or constrained growth. But what is true of popula-
tions in the aggregate is often contradicted by what characterizes
relationships at the individual level.

Among individuals, overall or cumulative fertility is as plau-
sible a cause of contraceptive use as vice versa. To see this point,
one need only consider the situation of a high fertility population
into which modern means of contraception have only recently been
introduced. The early adopters of contraception in such a population
are likely to be older, but still fecund women who already have as
many mouths as they can feed. Such an adoption pattern, prompted by
Malthusian conditions at the household level, will set up a positive
correlation between cumulative fertility and contraceptive use. Such
a situation is by no means hypothetical; it can be observed, for
example, in many contemporary Third World countries (Ogawa, 1980).

What is characteristic of the relationship between cumulative
fertility and contraceptive adoption in less developed nations can
also be observed in developed ones. A positive association would,
for example, be observed between contraceptive use and cumulative
fertility if women entered marriage to fulfill their family size goals
and initiated contraceptive use only when those goals were at, or near
completion. This is precisely the situation in contemporary Japan.
Over the past thirty years or so, a two or three child family size
norm has gradually emerged. The mean age at first marriage is, how-
ever, relatively old. The mean ages of men and women contracting
first marriages in 1981 were 27.9 and 25.3, respectively. With
relatively late marriages, couples are typically ready to undertake
the process of family formation. The interval from marriage to first
pregnancy is typically short and quickly followed by second and
successive pregnancies until the couple's desired family size is
reached. Contraception may, of course, be used for purposes of child

- 5 -

spacing during the early stages of family formation, but is finally
and permanently adopted only after family size goals are achieved.
This sets up a positive association between cumulative fertility and
contraceptive use. This positive association, brought on by social
practices, is, of course, further reinforced by instances of infecund
or subfecund brides, who, unaware of their condition, never adopt
contraception and contribute little or nothing to cohort fertility.

If there is any doubt that the situation described above charac-
terizes the relationship between cumulative fertility and contracep-
tive use in contemporary Japan, it should be thoroughly dispelled by
inspection of the results presented in Table 1 and graphically dis-
played in Figure 1. It is readily apparent from these data that
current contraceptive users have experienced more pregnancies than
those who have never used contraceptives. The gap is already estab-
lished among those aged 25-29, widens in those aged 30-34 to just
over a whole pregnancy, and remains relatively fixed at this level
among the older age groups. There is also a differential in the two
youngest age groups of about half a pregnancy between those who are
currently using and those who have used contraception in the past.
This is the pattern one would expect if contraception were used for
purposes of child spacing among younger women. The differential
between present and past contraceptors disappears among the groups
aged 35-39 and 40-44. It reappears at a reduced level in the oldest
age cohort.

The overall pattern is quite clear: in contemporary Japan both
present and past contraceptive use is associated with more, not fewer
pregnancies. What is true of cumulative pregnancies is also true of
children ever born, though the differentials are somewhat smaller.
The data bearing on number of children ever born are not, however,
displayed here because they exhibit a pattern parallel to that ob-
served for number of pregnancies.

We have adjusted the differentials in number of pregnancies
observed among current, past, and non-contraceptors for a variety of
social and demographic variables known to affect fertility. These
include marital duration in years (= M), number of children desired
(= D), a measure of urban experience (= U), and an indicator of family
education (= E). The measure of urban experience was formed from two
questions, which ascertained whether a woman was brought up in an

Table 1. Mean Number of Pregnancies by Age and Contraceptive Use, for
Married Japanese Women of Childbearing Age, 1981

| Age of Women | Contraceptive Use | | | |
	Total[1]	Current	Before	Never
	Mean Number of Pregnancies			
Total[1]				
<25	1.143	1.122+	1.882*	0.526
25-29	1.831	2.056*	1.476	1.367
30-34	2.639	2.815*	2.462*	1.576
35-39	2.877	3.058*	3.012*	1.962
40-44	3.250	3.444*	3.426*	2.262
45-49	3.202	3.573*	3.402*	2.435
	Adjusted Mean Number of Pregnancies			
Total[1]				
<25	1.143	1.135+	1.755*	0.613
25-29	1.831	1.986*	1.544	1.581
30-34	2.639	2.798*	2.454*	1.728
35-39	2.877	3.040*	2.951*	2.107
40-44	3.250	3.450*	3.397*	2.294
45-49	3.202	3.604*	3.334*	2.516
	Number of Cases			
Total				
<25	77	41	17	19
25-29	450	287	103	60
30-34	623	460	104	59
35-39	503	342	81	80
40-44	500	279	141	80
45-49	445	131	199	115

1/Weighted averages of subgroup means.
*Statistically different from those never practicing contraception at
 the .01 level with a two-tailed test.
+Statistically different from those never practicing contraception at
 .05 level with a two-tailed test.

urban area while attending primary school and whether she was resid-
ing in an urban area at the time of her marriage. The urban variable
is coded as follows: 0, if the respondent was living in a rural area
both at the time of marriage and while attending primary school; 1, if

Figure 1. Mean Number of Pregnancies, Adjusted and Unadjusted for Social and Demographic Factors, by Age and Contraceptive Use, for Married Japanese Women of Childbearing Age, 1981
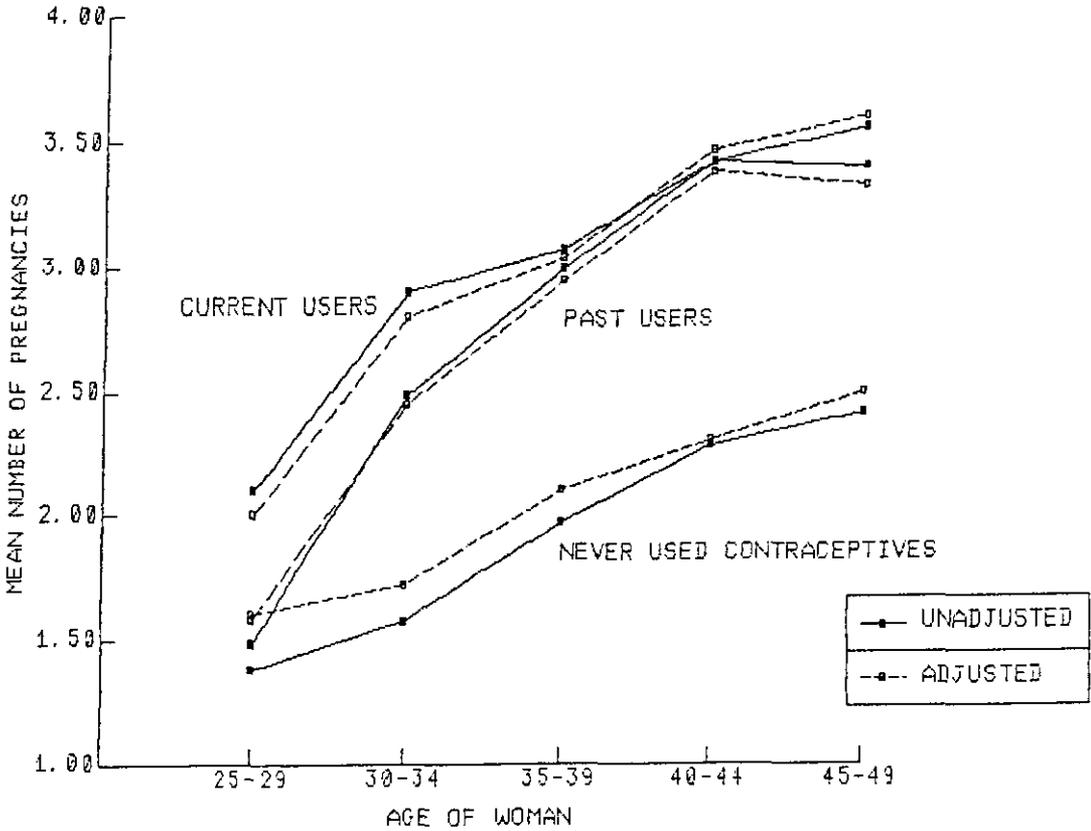
the respondent was living either in an urban area while attending primary school or living in an urban area at the time of her marriage, and 2, if the respondent was in an urban area during both of these phases of her life cycle. A predominant portion of migration in Japan is from rural areas to urban areas, so the two items combined into the index of urban experience form a near perfect, two item Guttman scale. The vast majority of respondents receiving a score of 1 on the index are persons who were in rural areas while attending primary school and in urban areas at the time of marriage. The measure of family education was formed by combining husband's and wife's education (= E_H and E_W, respectively.) Both the education variables were scored as follows: 0, if husband or wife attended only an old primary school or a new primary and junior high school; 1, if an old junior high school or a new senior high school was attended; 2, if husband or wife attended a junior college or a new or old system technical or commercial college, and 3, if a new or old system university was attended. The measure of family education used here is given by $E = E_H + E_W$, the simple sum of husband's and wife's education. We used this combined index in the present paper because previous work (Hodge and Ogawa, 1985) has shown that the impacts of husband's and wife's education on cumulative fertility are virtually identical.

The adjustment procedure was carried out via a generalization of multiple classification analysis to include continuous variables. We defined three dummy variables reflecting contraceptive use: $C_1 = 1$, if a woman is currently using contraception and 0, otherwise; $C_2 = 1$, if a woman used contraception in the past, but is not currently doing so, and 0, otherwise; and $C_3 = 1$, if a woman has never used contraception and 0, otherwise. Evidently, $C_1 + C_2 + C_3 = 1$. With P standing for number of pregnancies, we considered the following model:

$$P_i = \bar{P} + \sum_{j=1}^{3} \alpha_j C_{ji} + \beta_1 (M_i - \bar{M}) + \beta_2 (D_i - \bar{D})$$
$$+ \beta_3 (U_i - \bar{U}) + \beta_4 (E_i - \bar{E}) + e_i,$$

where P is the total number of pregnancies; the control variables have been deviated from their respective means--$\bar{M}$, $\bar{D}$, $\bar{U}$, and $\bar{E}$; e_i is a disturbance term; $\sum_{j=1}^{3} C_{ji} = 1$, and $\sum_{j=1}^{3} \alpha_j \bar{C}_j = 0$, with the $\bar{C}_j$'s being the proportions of women who are current, previous, or non-users

of contraceptives. The model cannot be estimated directly in its present form, but it is readily transformed so that it can be. Deleting the redundant dummy variable and multiplying out the means of the control variables leaves

$$P_i = k + \sum_{j=1}^{2} a_j C_{ji} + \beta_1 M_i + \beta_2 D_i + \beta_3 U_i + \beta_4 E_i + e_i,$$

where $k = \overline{P} - \beta_1\overline{M} - \beta_2\overline{D} - \beta_3\overline{U} - \beta_4\overline{E}$ and $a_j = \alpha_j - \alpha_3$, for $j = 1, 2$. In this modified form, the equation can be estimated via ordinary least squares. A little algebra shows that the unknown value of α_3 can be obtained from the numerical estimates of the a_j's by

$$\alpha_3 = - \sum_{j=1}^{2} a_j \overline{C}_j,$$

which enables us to find α_1 and α_2 by

$$\alpha_j = a_j + \alpha_3, \text{ for } j = 1, 2.$$

Once the a_j's are derived, the mean number of pregnancies for current, past, and non-contraceptors, adjusted for the control variables are obtained by $\overline{P} + \alpha_j$, $j = 1, 2, 3$. The adjustments were carried out separately in each of six age groups. The resulting adjusted means are reported in the second panel of Table 1 and plotted in Figure 1 along with the unadjusted means.

As can be seen by inspection of Figure 1, the adjustment for the control variables has only a very modest impact upon differentials in *number of pregnancies experienced by past, present, and non-contracep-tors.* Thus, in contemporary Japan, contraceptive use is primarily associated with the reaching of family size goals. Over 85 percent of Japanese women desire two or three children; contraceptors are drawn primarily from the pool of women who have reached those goals and a smaller pool of women who wish to space those children out according to some specified plan. With so many women desiring two or three children and marrying relatively late, there is little room in contemporary Japan for contraceptive use to exhibit a negative association with cumulative fertility. The kind of society in which one might encounter a negative association *between cumulative fertility and con-traceptive use* would be one in which there was a greater diversity of

family size goals, with relatively large fractions of women desiring
one child or no children and still others desiring four or five or
even more children to bring overall fertility up to replacement
levels. In such a society, cumulative fertility might well exhibit a
negative association with contraceptive use, since the users would be
concentrated among those desiring only one child or none at all. But
that is not the situation in contemporary Japan where family size
norms are quite homogeneous. In these societies, current contra-
ceptive use is an implausible determinant of cumulative fertility.
A more plausible view would be to regard cumulative fertility or,
preferably, the completion of family size goals as the proximate
cause of contraceptive use.

In line with the foregoing observations about the causal ordering
of current contraceptive use and cumulative fertility, we now turn to
an examination of the factors associated with contraceptive adoption.
Before turning to multivariate analyses, we first examine the rela-
tionship between contraceptive use and age. One of the implications
of the forgoing discussion is that, in a country like Japan where
family size goals are quite modest overall and quite homogeneous as
well, the age specific demand for contraception is nearly constant.
The reason for this is that with small families as the norm and little
variation about the norm, women can achieve their family size goals
in the first few years of marriage. This sets up a near zero associa-
tion between age and contraceptive use, particularly if one allows for
the fact that some young women who have yet to achieve their family
size goals will nonetheless practice contraception.

The relevant data on age and contraceptive use, as displayed in
Figure 2, simultaneously show three relationships. First, the height
of the bars reflects the proportion of women of different ages who
have ever used contraception. Second, the bars are further divided
into two segments. The lower portion of each is darkly shaded and
reflects the relative numbers of women who have used contraception in
the past, but are not currently doing so. Finally, the upper segment
of each bar is lightly shaded and reflects the relative number of
current contraceptive users in each age group. Reading the last rela-
tionship from the figure, i.e., the relationship between age and
current contraceptive use, requires one to displace visually the
lightly shaded portions of each bar so that they rest on the horizon-

Figure 2. Relationship between Age and Contraceptive Use, for
Married Japanese Women of Childbearing Age, 1981
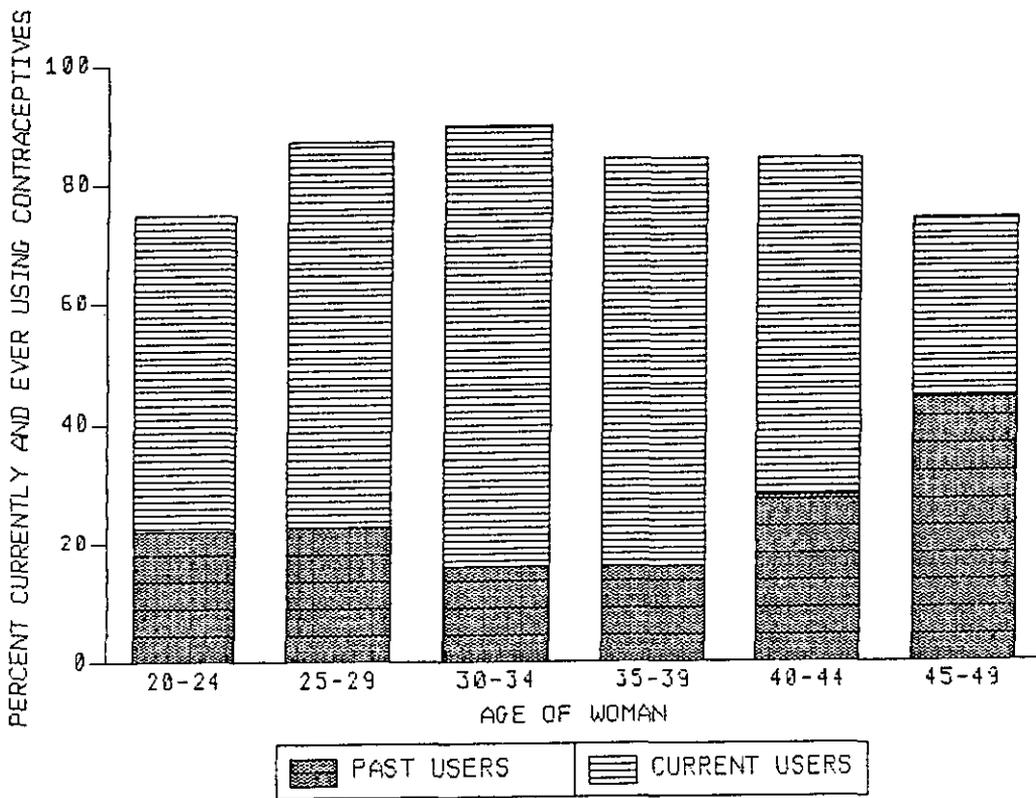
tal axis of the figure.

Each of the three relationships displayed in Figure 2 is distinctly curvilinear. First, consider the relationship between age and contraceptive use in one's lifetime. As one can see from the overall heights of the bars in Figure 1, there is not a great deal of difference in the proportion of women of different ages who have ever used contraception. The range is between about 90 percent for women aged 30-34 and just under 75 percent for those aged 45-49. As one can see from the figure, the fraction of women who have ever practiced contraception rises from those aged 20-24 to those aged 30-34 and then drops off in the older cohorts to a level among those aged 45-49 which is just under that observed among the youngest group of women. This pattern is almost surely a reflection of both demographic history and contemporary, post-transition patterns of contraceptive use.

Let us consider first those aged 30-34 in 1981, who were only 20-24 in 1971 and largely still in or about to enter the marriage market. There is little doubt that the Japanese demographic transition was, for all practical purposes, complete by 1971 and quite likely, somewhat earlier. However, in 1971 the trend discussed above with respect to the use of abortion was just bottoming out. The number of reported abortions per 1,000 reported live births was 370 in 1971. In the next two years it fell to an all time reported low of 335. Five years earlier, in 1966, the ratio was 590, but 1966 was an exceptional year--the Year of the Fire Horse and not a precipitous one for birth. The previous year, 1965, is more representative of the trend at hand. In that year, abortions per 1,000 live births stood at 462, or about 25 percent higher than in 1971. By 1971, the trend discussed above, the shift in contraceptive of choice among users from rhythmic abstinence to condoms, was also close to peaking out. By 1971, 33 percent of contraceptive· users utilized rhythm and 74 percent had used condoms. These figures have continued to change, but the shifts in choice of contraceptives during the decade following 1971 are rather less dramatic than those in the decade prior to 1961, particularly with respect to the use of condoms as the contraceptive of choice.

The upshot of the foregoing observations is that women aged 30-34 in 1981 were, in many ways, the very first cohort of Japanese women to pass the entire length of their sexually active lives through what might be considered the modern era of Japanese reproductive behavior.

This period is characterized by (1) nearly universal use of contraception, (2) access to, but limited use of abortion, (3) late marriage, and (4) nearly universal acceptance of a 2-3 child family norm. For this reason, we regard the increase in the fraction of women who have ever used contraception between those aged 20-24 and those aged 30-34 in 1981 as mirroring real cohort experiences in the modern period of Japanese reproductive history. Such an increase is logical, since women will adopt contraception as soon as their family size goals are fulfilled. That the increase is slight also makes sense, since we are dealing here with married women and a two child family can be logically achieved within two years of marriage. Thus, we regard the overall increase in the proportion of women having ever used contraceptives from those aged 20-24 through those aged 30-34 as a reflection of current family formation processes.

What is observed about the contraceptive use patterns of women aged 35 and older requires, however, a different explanation. Their behavior cannot possibly reflect the operation of relatively stable processes of family formation, since the cohorts behind them are more likely, excluding 20-24 year olds, to have ever used contraceptives. What is at stake here is almost surely demographic history. Let us consider, for example, the oldest age group, those aged 45-49 in 1981. They have the lowest incidence of having ever used contraceptives, but in 1951, when they were aged 20-24 and largely still in or just entering the marriage market, the Japanese fertility transition had just begun, unless one chooses to count the prewar decline which can be largely traced to changes in marital pattern rather than to changes in marital fertility. In 1950, the first date for which data are available, only about one in every three Japanese women of childbearing age had ever used contraception. It is truly remarkable that nearly three of every four women in the cohort aged 45-49 in 1981 had ever used contraception. If the cohort aged 30-34 in 1981 was the first to live sexually active lives through the post transition phase of Japanese reproductive history, the cohort aged 45-49 in 1981 was the one whose own life cycle paralleled most closely the Japanese fertility transition. When they entered the marriage market, fertility was still relatively high and considerably uncontrolled; as they passed through their reproductive life span, fertility both declined and became increasingly subject to voluntary

control. Thus, we regard the decline in the relative numbers of women who have ever used contraception from the cohort aged 30-34 in 1981 through that aged 45-49 as primarily a cross-sectional reflection of demographic change.

The slightly convex relationship observed between contraceptive use in a lifetime and age is mirrored, as can be seen in Figure 2, by the slightly concave relationship between age and prior, but not present, contraceptive use. This relationship, like that between age and having ever used contraceptives, is most likely a blend between contemporary process and past history. If we exclude the non-contraceptors from the data, then the curvature is enhanced as can be seen from the following results:

Age in 1981	Conditional Odds Past Contraceptor Given Ever User
20-24	.415
25-29	.359
30-34	.226
35-39	.237
40-44	.505
45-49	1.519

The decline in the fraction of past users, among ever users, is almost surely a signal that younger women are using contraceptives inter-mittently for child spacing until their family size goals are achieved. The rise in the fraction of past users among older women is in part expected, owing to the cessation of menstruation and perhaps a decline in sexual activity. The incline, however, is too steep, and the actual fractions of women involved are too large for this to be a complete explanation. We surmise that the older cohorts include some sizeable fractions of women who tried contraception and abandoned it, quite possibly in favor of abortion. These older cohorts passed through their prime ages of reproduction at the very time when the use of abortion was in its heyday.

The third relationship displayed in Figure 2, that between age and current contraceptive use, requires no extended discussion, since it is necessarily derivative from the two already discussed and

simply reflects the difference between them. The curvature in this third relationship is, however, quite marked, as it must be, since it is the conjunction of two other non-linear relationships, one of which is concave and the other of which is convex. As can be seen in Figure 2, the relative number of current contraceptors rises between married women aged 20-24 and those aged 30-34 and then declines in the higher age groups. This pattern is expected and its explanation fairly closely coincides with that for the distribution of past users by age.

IV. Correlates of Contraceptive Use: Multivariate Analyses

We turn now to an examination of the correlates of contraceptive use. Owing to the pattern of contraceptive use by age, we have examined the impacts of social and demographic variables upon contraceptive use within age categories of women. The variables chosen for analysis include marital duration (= M), number of children desired (= D), the measure of urban experience (= U), and the indicator of family education (= E), which had been used and were described above in conjunction with the analysis of number of pregnancies. Three further variables were included in the analyses of current conceptive use: number of children ever born (= B), number of abortions (= A), and self-reported fecundity (= F). The first of these variables requires no further description and was included for the obvious reason that a woman with many children will be more likely, ceteris paribus, to practice contraception because she is more likely to have already achieved or even surpassed her family size goals. Number of abortions likewise requires no further description and was included because a woman who has undergone an abortion has already made a behavioral choice to constrain her family size to its current level and will more likely, therefore, be practicing contraception to avoid further abortion experiences. Obviously, infecund women have no need to practice contraception and subfecund women have a reduced likelihood of conceiving a child even if they are not practicing contraception. Evidently, fecundity is implicated in contraceptive need and, for that reason, it is desirable to include a measure of it. In the 16th Mainichi Survey, women were asked if they were still able to have a child if they wanted to do so. The measure of self-reported fecundity (= F) used here takes on the value 1 if a woman reported she

could have a child or if a woman reported she was uncertain she could have a child; it takes on the value 0 for those women who reported they could no longer have a child. There are, as it turns out, some difficulties with this variable and they must be exposed before continuing with the multivariate analyses.

The relationship of current contraceptive use to age and self reported fecundity is shown in Table 2. As can be seen in the bottom panel of the table, self-reported fecundity is a potent predictor of current contraceptive use in all groups aged thirty and over. In the two youngest groups, however, no significant relationship between contraceptive use and fecundity is observed, but virtually all of the women in these groups, as can be seen from the upper panel of the table, report themselves as fecund.

Table 2. Relationship Between Current Contraceptive Use, Age and Self-Reported Fecundity, Married Japanese Women of Child-bearing Age, 1981

	Current Contraceptive Use and Fecundity			
	Able to Have Children		Not Able to Have Children	
	Current user	Current Non-user	Current user	Current Non-user
	Frequencies			
Age of Woman				
20-24	38	32	2	1
25-29	264	149	19	8
30-34	394	128	62	33
35-39	249	78	91	75
40-44	159	72	116	144
45-49	63	63	62	235
	Odds Current Contraceptive User			
Age of Woman				
20-24	1.188		2.000	
25-29	1.772		2.375	
30-34	3.078		1.878	
35-39	3.192		1.213	
40-44	2.208		0.806	
45-49	1.000		0.264	

The results displayed in the bottom panel of Table 2 make clear why one would want to include self reported fecundity as a predictor of contraceptive use. The difficulty with the measure, however, is revealed by the underlying frequencies in the upper panel of the table. Pooling the frequencies for current users and non-users of contraceptives, we find the following relationship between age and self-reported fecundity:

Age of Women	Percent Fecund
20-24	95.9
25-29	93.9
30-34	84.6
35-39	69.1
40-44	47.0
45-49	26.4

As one expects, the level of self-reported fecundity falls with age, but it falls off much too precipitously to be realistic. It is utterly implausible that about thirty percent of married Japanese women aged 35-39 and over half of those aged 40 and over are infecund or sub-fecund. Evidently, self reported fecundity is subject to a quite substantial amount of reporting error. A very sizeable number of the women included in this survey, especially older women, have reported themselves as being unable to bear children; in fact, the opposite is the case. Some of these women may have misunderstood the stimulus question and reported themselves as infecund because they were practicing contraception or did not wish to have any further children. We could not devise any plausible scheme for correcting this variable. Consequently, we have gone ahead and used it as it was reported on the survey. One should, consequently, be careful when interpreting the results below and understand that the variable at hand is self reported or believed fecundity, not the real or bio-logical capacity to bear children.

The estimated linear probability functions linking current con-traceptive use to family education, marital duration, number of desired children, urban residency, number of children ever born, num-ber of abortions, and self-reported fecundity are reported in Table 3

Table 3. Age Specific Regression Analyses of Current Contraceptive Use, for Married Japanese Women of Childbearing Age, 1981

Independent Variables	Age of Woman					
	20-24	25-29	30-34	35-39	40-44	45-49
	Regression Coefficients in Raw Score Form					
Intercept	.68305+	.45653*	.17443	.34098*	.50513*	.35824*
Education of Husband and Wife	-.03627	.01007	.02879*	.00811	.03749*	-.01773
Desired Number of Children	-.12730	-.13281*	-.08852*	-.02850	-.04508	-.05877*
Marital Duration	-.04542	-.02507*	.00629	-.00529	-.02005*	-.01033+
Urban Experience	.04290	.01387	.00439	.02790	-.05573*	.05505*
Fecundity	.13828	.13227	.15072*	.20877*	.24146*	.28299*
Children Ever Born	.36075*	.29793*	.22428*	.10926*	.12556*	.09321*
Number of Abortions	-.11832	.06935*	.04566*	.07985*	.06820*	.04735*
	Other Statistics					
Coefficient of Determination	.2627	.1787	.1516	.1074	.1388	.1409
Number of Cases	73	440	617	493	491	423

*Coefficient more than twice its standard error.
+Coefficient at least 1.645 times, but less than twice its standard error.

for each of six age groups of women. The most consistent predictors of current contraceptive use prove to be number of children ever born, number of abortions, and self-reported fecundity. In each age group, the probability of practicing contraception rises and rises significantly with number of children ever born. Contraceptive use is also seen to increase with number of abortions in all but the youngest age group who have little experience. The impact of having a child, rather than experiencing an abortion, appears to be a considerably more potent stimulus to adopting contraceptives. The coefficient of number of children ever born is larger than that of number of abortions in all age groups and is often several times larger than that for number of abortions.

In the four oldest age groups, self-reported fecundity also has a significant impact on contraceptive use. No association could be expected in the youngest two groups, since all but a handful of these women reported themselves as able to have children. Perhaps the most striking feature of the results displayed in Table 3 is the general absence of any marked concentration of contraceptive use in particular social categories. As was to be expected, the coefficient of index of urban residency is generally positive, but it is statistically significant in only two groups and it has the wrong sign in one of those. Consequently, there is no consistent and marked tendency for women with urban backgrounds, as opposed to those with rural ones, to use contraception. The education of husbands and wives likewise has but a small impact upon contraceptive use. Its sign is positive, as expected, only in the four central age groups and its value is significant in two of these. For purposes of summary, we struck the weighted mean of the coefficient of family education observed among those aged 25-29, 30-34, 35-39, and 40-44. This comes out at .02185. The range of the education variable is from 0, for a couple neither of whom progressed beyond primary school, to 6, for a husband and wife who both attended university. At these extremes, the average difference in contraceptive use, adjusted for the other variables in the equations, is only about $(100)(6)(.02185) = 13$ percent. This is perhaps non-trivial, but it is certainly not large, particularly when one remembers that there are very few couples in which both husband and wife attended university.

The results pertaining to desired number of children are wholly

those expected. The coefficient of the variable is estimated to be negative in all of the age groups and is significantly so in three of them--the oldest and the two groups spanning ages 25 to 34. The coefficients of desired number of children imply, in all but the two youngest age groups, that desire for one additional child is associated with a drop in the fraction of women practicing contraception of less than 10 percent. The estimated coefficients are somewhat larger in the two youngest groups, but any reasonable confidence interval about them would still include the 10 percent figure. The impact of fertility desires on contraceptive use does not strike us as particularly great, especially in view of the fact that the primary source of variation in fertility desires is between wanting two rather than three children. Nonetheless, those women desiring small families are somewhat more likely to be practicing contraception than those with more expansive fertility goals.

The final variable included in the analysis is marital duration, which, in all but one of the age groups, exhibits a negative association with contraceptive use. In three of the groups, the coefficients, are significant at least at the .10 level. This relationship is puzzling at first, since one would expect that women married longer are more likely to have fulfilled their family size goals and ought to be more, rather than less likely, to be practicing contraception. Making sense out of the impact of marital duration requires one to recognize that age has been implicitly controlled in these regressions by performing the analyses within age groups. Within age groups, marital duration is virtually synonymous with age at first marriage, with those married the longest being those who married the earliest. The results for marital duration, therefore, may be interpreted as indicating that age at first marriage is positively associated with contraceptive use, net of the other factors studied herein. That is surely to be expected, since those marrying at younger ages are more likely to aspire to higher fertility goals and are almost surely highly motivated to launch into the process of family formation.

With only modest exceptions, the results presented herein on the use of contraception are orderly and predictable. Although there are differences between social groups in the use of contraceptives, these differences are not great and indicate the widespread availability and general social acceptance of contraceptives. The main variables

associated with current contraceptive use directly can also be used to explain past fertility experiences. In a society with relatively homogeneous family size norms, it is perhaps not surprising that the main forces inducing contraceptive adoption are such causally proximate experiences as perceived fecundity, number of children, and number of abortions.

V. Causal Efficacy of Contraception

We have already seen that in contemporary Japan, current contraceptive use is positively, rather than negatively, associated with cumulative pregnancies. The explanation for this relationship hinges upon the fact that Japanese women marry relatively late and generally enter marriage only when they are ready to start building families. They then typically proceed to achieve their family size goals, turning to contraception only after those goals are fulfilled, thus, setting up the observed positive association between current contraceptive use and cumulative fertility. If one wants to observe the effectiveness of contraceptive practice in a society like Japan, one must construct analyses so that contraceptive use is temporary and, therefore, causally prior to an indicator of fertility.

A wholly adequate design to evaluate the efficacy of family planning practices would require us to have, at the least, both pregnancy and contraceptive histories. The Mainichi data set for the 16th round includes the former, but not the latter. For women who had ever practiced contraception, however, we do know when they first used contraception. Thus, we can identify women who first used contraception at marriage and, hence, prior to their first birth. We can also identify women who first used contraception after their first birth and before their second, after their second and before their third, and so forth. The advantage of this data, unlike current contraceptive use, is that it enables us to pinpoint whether a woman had used contraceptives prior to any particular birth. This gets the temporal and, therefore, causal ordering of the variables straight. The disadvantage of these data, of course, is that we do not know how long a woman used contraceptives once she initiated their use. In addition, we do not know anything about the history of contraceptive use for women who used them in the early stages of family formation.

For example, we do not know if women who used contraceptives prior to their first birth used them after that birth and we do not know if women who first used contraceptives after their first birth continued to use them after the second and so forth.

To examine the impacts of past contraceptive use on subsequent fertility, we first constructed a series of four dummy variables, all taking on the value 1, for those initiating contraception at a particular phase in their life cycle, and the value 0 for all others, including both non-contraceptors and contraceptive adopters who first ued them at an alternative stage in the life cycle. These four variables reflect whether a woman first adopted contraceptives (if she adopted them at all, after marriage, after her first birth, after her second child, or after her third child. The variables pertain to live births, not to pregnancies (which could, of course, have been terminated through abortions and miscarriages or resulted in a still birth). In order to examine the impact of family planning on subsequent fertility, we utilize data in pregnancy histories available from the Mainichi data set to study number of pregnancies, number of children ever born, parity progressions, and birth intervals. We accomplish this by defining successively restricted groups of women, so that we can always be certain that contraceptive adoption predated the reproductive behavior under analysis.

Number of pregnancies. We begin with the analysis of the number of pregnancies among all women, including in the model only the single dummy variable for contraceptive use at marriage (or before first birth), plus a standard set of predictor variables--family education (= E), urban experience (= U), duration of marriage (= M), and number of children desired (= D)--which were defined above and will be used throughout the present analyses. The relevant regression is reported in the first column of Table 4, where it can be seen that all of the predictors except urban exposure are both significant and have the expected signs. The coefficient of the dummy variable for contraceptive use at marriage is negative and rather substantial, indicating that women who adopted contraception at marriage had, on the average, about one-quarter less of a pregnancy than women who did not begin contraception with marriage. The second regression in the set pertaining to number of pregnancies is restricted to women with at least one child, so that it becomes sensible to include the dummy variable

Table 4. Regression Analyses of Number of Pregnancies, Restricted by Parity, For Married Japanese Women of Childbearing Age, 1981

Independent Variables	Parity Restrictions			
	All Women	One or More Children	Two or More Children	Three or More Children

Regression Coefficients in Raw Score Form

Independent Variables	All Women	One or More Children	Two or More Children	Three or More Children
Intercept	0.67593*	1.03272*	1.67814*	2.22583*
Education of Husband and Wife	-0.05226*	-0.04119*	-0.04330*	-0.00546
Urban Experience	0.01521	0.01490	0.04617	0.04643
Marital Duration	0.07245*	0.06126*	0.04394*	0.03989*
Number of Children Desired	0.52825*	0.49528*	0.41552*	0.34719*
Contraception at Marriage	-0.24136*	-0.23529*	-0.17751[+]	0.13223
Contraception after 1st Birth	--	-0.23443*	-0.11624	-0.06763
Contraception after 2nd Birth	--	--	-0.18987*	0.10951
Contraception after 3rd Birth	--	--	--	0.14411

Other Statistics

Independent Variables	All Women	One or More Children	Two or More Children	Three or More Children
Coefficient of Determination	.2396	.2066	.1250	.0722
Number of Cases	2641	460	1999	629

*Coefficient more than twice its standard error.
+Coefficient at least 1.645 times, but less than twice its standard error.

reflecting the adoption of contraception after first birth as well as that reflecting adoption at marriage. As can be seen from Table 4, this regression is virtually identical to the one for all women. The intercept is higher of course, since all of these women have had at least one child, but the coefficients of the predictor variables are virtually identical to those in the regression for all women. The coefficients of the dummy variable for initiation of contraceptive practice at marriage and for initiation after birth of first child are nearly identical in value. Thus, although we cannot be certain that those who initiated contraceptive practice at marriage continued to practice it after their first birth, they were as successful as those who launched contraceptive practice after their first births in reducing their total pregnancies. Both groups have about one-quarter less of a pregnancy than those who never practiced contraception or began using it later in their family life cycles.

The last two regressions pertaining to number of pregnancies are reported in the third and fourth columns of Table 4. In these regressions, women with at least two children are first examined. In this regression, it becomes possible to introduce the dummy variable for initiating contraceptive use after birth of the second child, as well as those reflecting adoption of family planning methods at marriage and after birth of the first child. The final regression is restricted to those with at least three children and in it all of the dummy variables for the timing of contraceptive adoption--at marriage, after first birth, after second birth, and after third birth--can be introduced. The regression for those with two or more children is generally similar to those for all women and for women with at least one child. The coefficients of the variables are a little less and the dummy variable for the adoption of contraception after first birth is not significant, even though it is negative. The final regression refers only to women with at least three child- ren, less than one quarter of the initial sample. This regression is markedly different from the remaining ones. Only marital duration and number of desired children are associated with the total pregnancies of women at parities three and above. In particular, none of the contraceptive variables are significant and three of the four have the wrong sign. Thus, among higher parity women, contraceptive use, regardless of when it was adopted, appears to have

little impact upon total pregnancies. It seems likely that these women are using abortion as the primary means of fertility control, especially in view of the positive association between number of children ever born and number of abortions (Ogawa and Hodge, 1983, Table 3, p.7).

Number of Children Ever Born. The proof of contraceptive effectiveness is more nearly in births, rather than in pregnancies, since the latter can always be terminated by recourse to abortion. In Table 5, we examine the same pattern of regressions studied above for number of pregnancies, save that now the dependent variable is number of children ever born. The results are quite striking. First, all of the coefficients are significant, with the exceptions of those for family education and urban experience in the final equation for women with three or more children. Second, the coefficients of the main predictor variables--family education, urban experience, marital duration, and desired number of children--always have the proper sign, but decrease in their magnitudes as one restricts the sample to women with higher and higher parities. Finally, the contraceptive variables are significant throughout. The impact of adopting contraception at marriage carries over into the equations for women with at least one, two or three children. Its impact is quite stable across these equations. The same holds for the adoption of contraception after first birth, which carries over into the equations for women with at least two and three children and retains in these equations a coefficient not detectably different from that achieved in the equation for women with one or more children. Indeed, all of the coefficients for the contraceptive variables are quite homogeneous. Thus, among women who have reached a particular level of parity, those who have adopted contraception, whether before reaching that parity or immediately after it, have around two to three tenths fewer children on the average than those who did not adopt contraception. These results leave little doubt that Japanese women's use of contraception, on the whole, has been efficacious, even though the vast majority of them have utilized rhythm and condoms, not the most reliable contraceptive methods.

Parity Progression Ratios. The analysis is extended in Table 6 to the examination of parity progression ratios for the same groups of women. For all women, the first equation examines the transition from

- 26 -

Table 5. Regression Analyses of Number of Children Ever Born, Restricted by Parity, For Married Japanese Women of Childbearing Age, 1981

Independent Variables	Parity Restrictions			
	All Women	One or More Children	Two or More Children	Three or More Children
	Regression Coefficients in Raw Score Form			
Intercept	0.52353*	0.90128*	1.61275*	2.52212*
Education of Husband and Wife	-0.02582*	-0.01770*	-0.01600*	-0.01520
Urban Experience	-0.05589*	-0.05008*	-0.03693*	-0.01371
Marital Duration	0.04368*	0.03116*	0.01516*	0.01401*
Number of Children Desired	0.42936*	0.40165*	0.32772*	0.23262*
Contraception at Marriage	-0.24820*	-0.23730*	-0.28027*	-0.201017*
Contraception after 1st Birth	--	-0.33516*	-0.31225*	-0.32291*
Contraception after 2nd Birth	--	--	-0.41728*	-0.18302*
Contraception after 3rd Birth	--	--	--	-0.33677*
	Other Statistics			
Coefficient of Determination	.3257	.3339	.3143	.2078
Number of Cases	2641	2460	1999	629

*Coefficient more than twice its standard error.
+Coefficient at least 1.645 times, but less than twice its standard error.

Table 6. Regression Analyses of Parity Progressions, for Married
          Japanese Women of Childbearing Age, 1981

Independent Variables	Parity Progression			
	None to One	One to Two	Two to Three	Three to Four
Regression Coefficients in Raw Score Form				
Intercept	0.77012*	0.47189*	-0.172527*	-0.32140*
Education of Husband and Wife	-0.00177	-0.00264	-0.00996[+]	-0.001135
Urban Experience	-0.00363	-0.01574[+]	-0.02843*	-0.01314
Marital Duration	0.00631*	0.01503*	0.00961*	0.01031*
Number of Children Desired	0.04115*	0.092149*	0.22688*	0.16989*
Contraception at Marriage	-0.08851*	-0.15764*	-0.22873*	-0.15825*
Contraception after 1st Birth	--	-0.21943*	-0.22727*	-0.24829*
Contraception after 2nd Birth	--	--	-0.35184*	-0.14432*
Contraception after 3rd Birth	--	--	--	-0.26542*
Other Statistics				
Coefficient of Determination	.0847	.2199	.3072	.2327
Number of Cases	2641	2460	1999	629

*Coefficient more than twice its standard error.
+Coefficient at least 1.645 times, but less than twice its standard
 error.

zero parity to first parity; in the second equation, the transition from first to second parity is examined for women with at least one child; in the third equation, for women who have reached second parity, the transition to a third child is examined and, finally, in the last equation, the passage from a three to four child family is examined for women with three children. The results of this analysis are generally similar to those presented above for number of children ever born, but there are some noteworthy exceptions.

First, family education plays no particularly significant role in any of the parity progressions, achieving a coefficient which is moderately significant in only one of the regressions. Second, urban experience enters into the equations only for the transition from first to second and from second to third births, but even in these equations, its coefficient is small and reflects a modest difference in the parity progression probabilities of those with urban and rural backgrounds. Third, number of desired children enters all of the equations, but its coefficient is substantially larger in the equations reflecting the transition from second to third and from third to fourth children than it is in the equations for the lower order transitions. This is perhaps to be expected, since family planning goals divide basically into two camps: those who want two and those who want three children. Desired children become particularly prominent just when that progression is at stake.

All of the contraceptive variables are significant in all of the parity progression equations. With a single exception, the coefficients of the contraceptive variables are quite homogeneous, as was the case in the equations for children ever born. Thus, roughly speaking, among women who have reached a given parity level, about 20 percent fewer of those who have adopted contraception than those who have not adopted contraception advance to the next higher parity. Whether the adoption of contraception was prior or immediately after reaching the parity level in question has little bearing on this outcome. The main exception concerns the transition to first parity, where the coefficient of the dummy variable indicating contraceptive adoption at marriage is somewhat lower than either its own or the coefficients of the other contraceptive variables in the remaining equations. This is not surprising, since very few women desire no children and the use of contraception at marriage is almost surely for

purposes of delaying, rather than totally averting first births.

   Childspacing. In the final set of analyses, we examine the length of birth intervals. For these analyses a different set of restrictions are imposed. Nulliparous women are excluded altogether. The first equation in Table 7 refers to the length of the interval (in months) from marriage to first birth among women with at least one child. The second equation examines the length of the interval between first and second births for women with at least two children, while the third concerns the interval between second and third births among women with at least three children. The final equation pertains to the handful of women with four or more children and examines variation in the interval from third to fourth births among them.

   As can be seen from Table 7, family education is associated only with the interval from marriage to first birth and urban experience only with the intervals from marriage to first birth and from first to second births. Like urban experience, number of desired children is related only to the interval from marriage to first birth and that from first to second births. Such association as can be observed between social variables and childspacing is, therefore, restricted to the early stages of the family formation process.

   There is also some evidence in Table 7 that birth intervals between all parities may be shortening. Marital duration is positively associated with the length of all the birth intervals. Conceptually, marital duration is identically equal to the difference between current age and age at first marriage. However, the variance in current age (in a group of women in their childbearing years) is considerably larger than the variance in age at first marriage, so the variance in marital duration is dominated by the variance in current age and, in fact, the correlation between age and marital duration is on the order of .9. Thus, we have no difficulty in interpreting the results as referring to age as much as marital duration. They are certainly consistent with the view that birth intervals are contracting, a perspective which is also consistent with the general picture that, in contemporary Japan, marriage is increasingly delayed until couples are ready to begin the process of family formation.

   There is, however, another methodological problem which prevents one from drawing a firm conclusion. These data are _censored_; there are women who have yet to complete the birth intervals studied here,

Table 7. Regression Analyses of Length of Birth Intervals, for
Married Japanese Women of Childbearing Age, 1981

Independent Variables	Birth Interval			
	Marriage to First	First to Second	Second to Third	Third to Fourth
Regression Coefficients in Raw Score Form				
Intercept	5.32445*	31.67184*	27.35860*	21.17748[+]
Education of Husband and Wife	1.13512*	-0.41924	0.84950	0.02096
Urban Experience	1.07350*	1.21559*	-0.57919	-1.38527
Marital Duration	0.69818*	0.55053*	0.53539*	0.72303*
Number of Children Desired	-1.32902*	-2.63867*	-0.98050	-0.69540
Contraception at Marriage	7.98670*	5.45998*	3.50244	23.02135*
Contraception after 1st Birth	--	6.71680*	7.46416*	7.63986
Contraception after 2nd Birth	--	--	9.88583*	9.04613
Contraception after 3rd Birth	--	--	--	19.30966*
Other Statistics				
Coefficient of Determination	.0736	.0726	.0535	.1922
Number of Cases	2411	1948	601	90

*Coefficient more than twice its standard error.
+Coefficient at least 1.645 times, but less than twice its standard
  error.

especially from first to second and from second to third births. As the cohorts of women covered by the data set pass through their childbearing period, these women, whose family formation lies ahead will be mixed in with those who presently can be analyzed. When the mix is complete, the picture may be different. It is virtually impossible to decipher a contraction of birth intervals until the process of family formation is complete for all of the women re-presented by the present data set.

As expected and as can be seen from Table 7, the contraceptive variables are associated with birth intervals between successive parities which are generally around one-half to three-quarters of a year longer for contraceptors than for non-contraceptors. The coeffi-cients of the contraceptive variables are generally significant; two of the three instances in which they are not statistically significant occur in the very small group of women who already have four children, but even in these instances the parameter estimates are plausible ones. There are some differences in the birth intervals observed for those who adopted contraception at different stages in their life cycles. For example, the transition from first child to second child is about one month longer for those who adopted contraception after their first birth than for those who adopted contraception after marriage. Excepting the interval from third to fourth child for those first using contraceptives at marriage, this pattern is a general one, i.e., the more proximate the first adoption of contraception is to the birth interval in question, the longer is the birth interval. These differences between birth intervals for women who adopted contracep-tives at different times in their life cycle are, of course, to be expected, since some of those who adopted contraceptives at an early stage will abandon them in later stages. In any event, these rela-tively small differences between the length of birth intervals ob-served for women who first adopted contraception at different stages of the family formation process are completely swamped by the differ-ences between users and non-users. Those who have adopted contracep-tives have substantially longer birth intervals, regardless of when they first adopted contraceptives, than do those who remain in the group of non-users.

A variety of observations are supported by the present study of childbearing and contraceptive use in contemporary Japan. First, current contraceptive use and cumulative fertility are positively related, owing to the conjunction of relatively late marriages, small (and homogeneous) family size goals, entry into marriage only when prepared to begin family formation, and the acceptance of contraceptives primarily after family size goals are complete.

Second, contraceptive use is very widespread. While about three-fifths of married Japanese women of childbearing age are currently using contraceptives, the experience of younger cohorts strongly suggests that probably ninety percent or more of the cohorts presently in the prime ages of reproduction will use contraceptives at some point in their life cycle.

Third, although the main methods of contraception are not noteworthy for their reliability, Japanese women obviously use them effectively in the aggregate. This is clearly revealed in evidence bearing upon the timing of contraceptive adoption and pregnancies, births, parity progression ratios, and childspacing.

Fourth, there is no pronounced tendency for contraceptive use or family formation practices to be concentrated in different social strata. Although the predictable educational and urban/rural differences are typically found, they are by no means uniformly significant ones. When they are significant, they are by no means uniformly significant ones. When they are significant, they are quite modest in magnitude. Japanese women are quite homogeneous in their family size goals and quite homogeneous in their family size achievement. However, not only are the goals and accomplishments quite homogeneous in the aggregate, there is very little differentiation in them from group to group.

Finally, another important point emerging from the present study is that tastes, as measured by family size goals, are generally more potent determinants of reproductive behavior than are the social positions of respondents. The range of tastes to be sure appears quite limited, with two or three children being the overwhelming choice of family size. That tastes prove so closely connected with actual reproductive behavior is almost certainly attributable to the

wide-aggregate, if not couple by couple, with the means to fulfill their quite restricted family size goals.

References

Bongaarts, John. 1980. "A Framework for Analyzing the Proximate Determinants of Fertility," Population and Development Review, 4 (March), pp. 105-132.

Hodge, Robert W., and Naohiro Ogawa. 1985. "Education and Fertility in Contemporary Japan." Tokyo: Nihon University Population Research Institute Paper Series, Japan, No. 22 (March), 26 pp.

Mosk, Carl. 1979. "The Decline of Marital Fertility in Japan," Population Studies, 33 (March), pp. 19-38.

Muramatsu, Minoru. 1960. "Effect of Induced Abortion on the Reduction of Births in Japan," Milbank Memorial Fund Quarterly, 38 (April), pp. 153-166.

_____. 1967. "Medical Aspects of the Practice of Fertility Regulation," in Minoru Muramatsu, ed., Japan's Experience in Family Planning--Past and Present. Tokyo: Family Planning Federation of Japan, Inc. pp. 57-82.

_____. 1976. "Family Planning in Japan," in Chojiro Kunii and Tameyoshi Katagiri, eds., Basic Readings on Population and Family Planning in Japan. Tokyo: Japanese Organization for International Cooperation in Family Planning. pp. 1-24.

Ogawa, Naohiro. 1980. "Multiple Classification Analysis and Its Application to the 1974 Fiji Fertility Survey." World Fertility Survey Occasional Papers, No. 22, pp. 111-147.

_____ and Robert W. Hodge. 1983. "Towards a Causal Model of Childbearing and Abortion Attitudes in Contemporary Japan," Population Research Leads, No. 15. Bangkok, Thailand: ESCAP, Population Division. 32 pp.

Ohbuchi, Hiroshi. 1976. "Demographic Transition in the Process of Japanese Industrialization," in Japanese Industrialization and its Social Consequences, edited by Hugh Patrick with the assistance of Larry Meissner. Berkeley: University of California Press. pp. 329-361.

Population Problems Research Council, Mainichi Newspapers. 1978. Summary of Fourteenth National Survey on Family Planning. Tokyo, Japan.

Thompson, Warren S. 1929. Danger Spots in World Population. New York: Knopf.

Tsubouchi, Yoshihiro. 1970. "Changes in Fertility in Japan by Region: 1920-1965," Demography, 7 (May), pp. 121-134.