

Urbanization, Migration and Fertility in Contemporary Japan

*Naohiro Ogawa
Robert W. Hodge*

NUPRI Research Paper Series No.28

March 1986

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

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

C O N T E N T S

Tables	iv
Abstract	vi
I. Introduction	1
II. Place of Residence, Urban Background, and Cumulative Fertility	3
III. Family Formation and Reproductive Behavior of Rural to Urban Migration	6
IV. Room Crowding, Urban Experience, and Future Fertility	11
V. Urbanization and Fertility: Some Cohort Evidence	17
VI. Summary and Conclusions	20
References	22

T A B L E S

1. Mean Number of Children Ever Born by Type of Place of Current Residence and Urban/Rural Background, Adjusted and Unadjusted for Control Factors, for Married Japanese Women of Childbearing Age, 1984 3

2. Gross and Adjusted Deviations of Urbanites, Ruralites, and Migrants from Grand Means of Selected Social and Demographic Variables in a Causal Model of Family Formation and Reproductive Behavior, for Married Japanese Women of Childbearing Age, 1984 10

3. Mean Number of Additional Children Wanted by Urban Experience and Room Crowding, for Currently Married Japanese Women of Childbearing Age, 1981 14

4. Mean Number of Additional Children Wanted by Urban Experience and Room Crowding, Adjusted and Unadjusted for Control Factors, for Currently Married Japanese Women of Childbearing Age, 1981 16

5. Cumulative Number of Children Ever Born at Five Year Intervals by Urban Experience, for Selected Cohorts of Currently Married Japanese Women of Childbearing Age 19

ABSTRACT

The ultimate consequences of internal migration upon urban-rural differentials in fertility vary considerably from place to place, depending upon the nature and composition of migration streams and the presence or absence of reverse flows from larger to smaller places. In the present paper, first, we draw heavily upon the 17th Mainichi Survey of Fertility and Family Planning conducted in 1984, to examine urban-rural fertility differentials as observed in contemporary Japan. Second, the fertility behavior of migrants is analyzed. Third, based upon birth history records, we examine the development of urban-rural fertility differentials in recent cohorts.

The present study shows that as Japan moves through the final stages of her demographic transition, a small urban-rural differential in fertility still continues to persist, and this differential is intertwined with migration status. Moreover, cohort data reconstructed from birth histories reveal that the urban-rural differential in fertility varies over the life cycle of a cohort.

I. Introduction

In most nations, urban-rural differentials in fertility can be observed, although they vary in magnitude from one country to another. Such differentials can be found in countries which have barely entered the demographic transition, in which case both mortality and fertility remain high; in countries which are well into their demographic transition and mortality is already substantially reduced while fertility is falling; and in countries like Japan which have essentially completed their demographic transitions whereas mortality and fertility have fallen to levels consistent or nearly consistent with zero population growth. The persistence of urban-rural differentials in fertility is predicated upon a number of factors, which operate selectively at various phases in the demographic transition.

In the pre-transition phase, the value of children remains somewhat greater in rural areas than in cities, since the economic contributions of children to agricultural enterprises is well recognized. One should not, however, overestimate the differential value of children in urban and rural areas. In the traditional sectors of primate cities, children retain considerable economic value for the contribution they can make to household industries, such as the production of handicrafts and even small scale agrarian enterprises within city boundaries. Small children peddling flowers, cigarettes, and newspapers in traffic jams are still common sights in modern Bangkok and Manila.

Development typically proceeds from the city to the hinterland. Urban-rural differentials in fertility may expand with cities' industrialization and change as new ideas are introduced through expanded trade and commerce. But even after the demographic transition is well underway and entering its final stages, urban-rural differentials in fertility may well persist. However, in these final stages, one can reasonably entertain the hypothesis that gross urban-rural differentials in fertility are largely predicated upon such correlated factors as education, age at first marriage, and female employment opportunities in the modern sector. These factors continue to be differentiated between urban and rural areas. Rising urban income, particularly when coupled with the lowered fertility in rural areas due to contraceptive use, family planning activities, rural develop-

ment, and/or simple Malthusian pressures of population on land and resources, may actually lead to a reversal of urban-rural fertility differentials in the course of a demographic transition. For example, the net urban-rural differential in cumulative fertility, after controlling for duration of marriage, education, husband's occupation and region, now appears to be positive in Thailand.

Urban-rural differentials in fertility are intertwined with patterns of migration. Migration is selective almost everywhere with respect to age and education. Furthermore, in many developed and developing societies, the net flows of migrants are from the countryside to the cities. The direct impact of migration upon urban-rural fertility differences is, however, difficult to specify and may, in fact, vary from society to society or even within the same society at different stages of a demographic transition. Young migrants to the city may experience difficulties in finding stable employment as well as adjusting to urban mores. For this reason, they may marry and start building families somewhat later than native urbanites. In this way, migration reinforces the generally inverse relationship between urbanization and fertility. An equally plausible case can be made, however, for the opposite conclusion. Migrants, excepting young children, are primarily socialized in their places of origin. Thus, rural to urban migrants typically bring rural norms and values for fertility and family with them and act them out in their new urban setting. In this view, migration, far from augmenting the urban-rural fertility differential, actually serves to reduce it. There may, of course, be an element of truth in both hypotheses, in which case the effects cancel each other and leave the urban-rural fertility differential unaffected by migration.

The exact consequences of migration for urban-rural differentials in fertility have doubtless varied from place to place, depending upon the nature and composition of migration streams and the presence or absence of reverse flows from larger to smaller places. In the present paper, we first examine urban-rural fertility differentials as observed in contemporary Japan. Then, we turn to an analysis of the fertility behavior of migrants. Finally, using birth histories, we examine the development of urban-rural fertility differentials in recent cohorts.

II. Place of Residence, Urban Background, and Cumulative Fertility

The gross relationships between children ever born and current place of residence, residence at marriage, and residence while attending primary school are shown in the second column of Table 1. These data come from the 17th Mainichi Survey of Fertility and Family Planning which was conducted in the spring of 1984. Cities, towns, and

Table 1. Mean Number of Children Ever Born by Type of Place of Current Residence and Urban/Rural Background, Adjusted and Unadjusted for Control Factors, for Married Japanese Women of Childbearing Age, 1984

Classification of Current Place of Residence and Urban/Rural Background	Number of Cases	Actual	Adjusted for Urban Experience	Adjusted for Urban Experience and Controls
Means				
<u>Current Place of Residence</u>				
High Rise Apartment Building	187	1.909*	1.922*	1.974*
Built Up Residential Area	1419	1.956*	1.971*	1.987*
Industrial or Commercial Area	234	2.081	2.071	1.980*
Rural	543	2.173	2.132	2.112
<u>Residence during Primary School</u>				
Urban	1143	1.900*	1.915*	1.948*
Rural	1240	2.119	2.105	2.075
<u>Residence at Marriage</u>				
Urban	1653	1.967*	2.007	2.045*
Rural	730	2.121	2.028	1.942

*Significantly different from rural category of classification at .05 level.

villages throughout Japan were first stratified on the basis of population and local characteristics. Using Basic Resident Registers, respondents were 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). The target population was married women of childbearing age; there are 2759 respondents in the present sample, representing a response rate of 81.1 percent. In the present investigation, sample cases are deleted when data are missing on any of the variables utilized in a particular set of analyses. Also, the sample was restricted to women having certain characteristics in some of the analyses reported herein. These restrictions are noted as the data are introduced. The analysis reported in Table 1 is based on 2383 women for which data were available on each of three measures of urban exposure--current, at marriage, and during primary school--as well as on all of the control factors introduced below.

As can be seen by inspection of Table 1, gross differences in cumulative fertility are observed between women who are currently living in urban areas and those in rural areas; between women who grew up in urban and those who grew up in rural areas; and between women who were living in urban areas and those living in rural areas at the time of their marriage. These gross differentials are not large, though they are statistically significant ones. The largest differential is between women now living in high rise apartment buildings and those who are currently rural residents. This differential amounts to just over one-quarter of a child. The differential between women who attended primary school in urban areas and those who attended in rural areas is nearly as large, being just over one-fifth of a child. Women who were living in urban areas at the time of their marriage also have fewer children than those living in rural areas at the time of marriage, but these two groups are separated by less than two-tenths of a child on the average. There are also some slight disparities in fertility among the women currently residing in different types of urban areas. Indeed, those residing in industrial or commercial districts have a level of cumulative fertility which is not significantly lower than that of current rural residents.

The measure of current residence and the indicators of urban

experience at earlier points in the life cycle are, of course, associated. In Japan, a large part migration is from rural to urban areas, so the indicators basically have the structure of a three item Guttman scale, with some of those in rural environments during primary school moving to urban areas by marriage and some of those in rural settings at marriage subsequently moving into the cities. In the third column of Table 1, we show the impacts of these three urban variables when they have been simultaneously adjusted for one another. As expected, the adjustment reduces the gross differentials observed for each of the three measures of urban-rural exposure. The differential between current dwellers in high rise apartments and rural residents is reduced by about 20 percent, while that between those attending primary school in rural rather than urban areas is cut by a little less than 15 percent. However, just adjusting the urban variables for each, almost entirely eliminates the gross differential between those residing in urban rather than rural areas at the time of marriage. The unadjusted difference of about three-twentieths of a child between those living in urban rather than rural areas at marriage is reduced by over 85 percent after adjusting for the other urban variables.

Fertility is, of course, related to numerous factors other than urbanization, such as age and education. We need, therefore, to assess the net urban-rural differentials in fertility which remain after controlling for the known correlates of reproductive behavior. In earlier work based on the 16th Mainichi Survey, we developed a relatively elaborate causal model of cumulative fertility, cumulative abortions, and attitudes about abortion. We have drawn on that work (Ogawa and Hodge, 1983) to identify variables to control for purposes of assessing net urban-rural differences in fertility. In the present exercise, we have controlled for marital duration in years, number of children desired, wife's education and husband's education, as well as three dummy variables reflecting wife's work experience before marriage, whether or not the marriage was arranged by a go-between, and patrilocalty of residence at marriage. Earlier work had shown all of these variables to be implicated, directly or indirectly, in the determination of cumulative fertility. The net urban-rural fertility differentials which remain after adjusting for all of these control variables via ordinary least squares regression, as well as for the several indicators of urban experience, are shown in the last

column of Table 1.

As expected, the gross differentials observed in the second column of Table 1 are further altered by the introduction of the control factors. The gross differential between the mean number of children ever born to those currently living in high rise apartments and in rural settings is reduced by almost 50 percent once allowance is made for both the controls and the other urban variables. The reduction in the gross difference between those who went to primary school in urban rather than rural areas comes to just over 40 percent. Adjustment for the control factors also produces a modest surprise. Once the controls are introduced, the urban-rural difference observed at the time of marriage is reversed, so that those in urban areas at marriage wind up having more rather than fewer children than their rural counterparts. The difference is not large--about one-tenth of a child, but it is significant. This reversal seems to be attributable to the behavior of those who migrated from rural to urban areas between the period of early socialization in primary schools and marriage. That is the topic to which we now turn.

III. Family Formation and Reproductive Behavior of Rural to Urban Migration

There is a fundamental causal ambiguity in the analysis of fertility differentials by current place of residence. The analyst can never be sure whether the differentials observed are the result of the forces of urbanism acting on the behavior patterns of persons established in different milieus for long periods of time or the result of differential migration. Migrants could be selected for low fertility and simply augment or perhaps even create an apparent, but unreal urban-rural differential. Alternatively, migrants could bring high rural fertility norms with them and act them out in an urban setting, thus clouding urban-rural differences in fertility patterns. Indeed, it is not inconceivable that migrants may actually bring completed or partially completed families with them.

The upshot of the foregoing observation is threefold. First, it is readily apparent that one cannot understand urban-rural fertility differentials unless the behavior of migrants is isolated so that their contribution to the observed differential can be assessed.

Second, and in addition to the isolation of migrants, it is definitely preferable to measure residence prior to family formation, so that urban-rural differences in childbearing which unfold over the reproductive life cycle can be linked clearly to past experience rather than to some unknown mix of past and current residence. Third, these causal considerations definitely imply that many exercises in dealing with urban-rural differentials in fertility are best regarded as descriptive ones, capturing an unknown mix of residential experiences. That is clearly the case with the materials presented for descriptive purposes in the opening sections of this paper; it is also the case with analyses which can be conducted on any data set which does not couple partial or complete residential histories with pregnancy or birth histories.

Fortunately, the Mainichi data set contains partial residential histories, so we can isolate those persons who both went to school and were married in urban areas, persons who did the same activities in rural settings, and those who migrated from rural to urban areas between these events. There is, of course, a logical fourth group of respondents who moved from urban to rural areas, but in Japan their numbers are fairly small and we have consequently excluded this handful of migrants from the analyses which follow. Another and more sizeable group of respondents is also excluded from the analysis which follows. In examining the reproductive behavior and family formation of urbanites, ruralites, and rural to urban migrants, we wished to include the interval from marriage to first birth as one of the variables in the underlying model which informs the analysis. Consequently, we also restricted the sample to women who have had at least one child.

Our analysis of the relationship of migration to family formation and reproductive behavior is informed by basically the same model upon which our earlier work was based (Ogawa and Hodge, 1983). However, for present purposes the model has been somewhat modified to allow for the incorporation of some additional variables which were not considered (or were not available) in the analysis of the 1981 data set. The revised model, like the earlier one, is recursive and has the following structure:

Exogenous Variables

Family Education
Wife's Age
Wife's Work Experience Before Marriage
Migration Status

Endogenous Variables (listed in causal sequence)

Arranged Marriage
Age at First Marriage
Patrilocality of Residence at Marriage
Room Crowding at Marriage
Desired Number of Children
Contraceptive Use Prior to First Birth
Interval from Marriage to First Birth
Number of Pregnancies
Number of Abortions
Current Contraceptive Use

In the analyses which follow, we show the gross differences among urbanites (those schooled and married in urban areas), ruralites (those schooled and married in rural areas), and migrants (those educated in rural areas, but married in urban ones). We also show the net differentials among these same three groups. The net differentials are those which remain after the unadjusted differentials among urbanites, ruralites, and migrants on the endogenous variables have been adjusted for all of the exogenous variables as well as the endogenous variables which are causally prior to the variable under consideration. The analysis also includes number of children ever born, but this variable is, for all practical purposes, determined by number of pregnancies and number of abortions, so the net differentials between urbanites, ruralites, and migrants in number of children ever born have been adjusted only for the exogenous variables plus all of the endogenous variables up through and including the interval from marriage to first birth.

The definitions of the variables included in the analysis are, for the most part, self explanatory. Wife's age is measured in years and family education is the sum of husband's and wife's education, each measured on a four step scale ranging from primary schooling (or less) through university graduation. Wife's work experience is a dummy variable which takes on the value 1 if the wife worked prior to her marriage and the value 0 otherwise. Arranged marriage, patrilocality of residence at marriage, contraceptive use prior to first birth, and current contraceptive use are likewise dummy variables,

with the value 1 being assigned to the category described by the variable and the value 0 being assigned to the remaining cases. The interval from marriage to first birth is measured in months. Room crowding at marriage is defined by dividing the number of rooms in the dwelling occupied at marriage by household size. Unfortunately, household size was not ascertained directly and had to be approximated in the following way; if the respondent was living with both her own and her husband's parents, household size was set equal to five (on the assumption that it was very unlikely for both sets of parents to be occupying the same household unless one parent in one set was deceased); if the respondent was living with either her own or her husband's parents, household size was set equal to four; otherwise, household size at marriage was assumed to be two. The remaining variables--desired children, pregnancies, and abortions--are integer valued, according to the frequencies reported by the respondent.

The results of the analysis are displayed in Table 2, which shows the mean for each variable as well as the gross or net deviations from the grand mean of urbanites, ruralites and migrants. All of the results were obtained by multiple regressions in which migrants were the omitted category; thus, the statistical tests indicate whether migrants differ from urbanites, ruralites, or both. The net deviations from the grand mean are equivalent to MCA coefficients and were obtained by a well known transformation of dummy variable coefficients observed in the regression equations (Ogawa, 1980 and 1982).

Although there are some statistically significant differences between migrants and their non-migrant counterparts in both rural and urban areas, the three groups exhibit rather striking similarities in most aspects of their family formation and reproductive behavior. Within the context of these gross similarities between migrants and non-migrants, there are some modest differences. In general, the migrants tend to resemble urbanites more closely than rural residents as far as family formation behavior is concerned, but they depart from both groups in their reproductive behavior. Thus, we find, for example, that migrants are less likely than ruralites to have arranged marriages or to assume patrilocality of residence at marriage. They also marry slightly later than rural residents and have somewhat less living space when they do marry. These differences are sustained after adjustment for the control factors. In keeping with the general

Table 2. Gross and Adjusted Deviations of Urbanites, Ruralites, and Migrants from Grand Means of Selected Social and Demographic Variables in a Causal Model of Family Formation and Reproductive Behavior, for Married Japanese Women of Childbearing Age, 1984

Dependent Variables	Migrant Status			
	Total Mean	Urbanites	Migrants	Ruralites
	Gross Deviations from Mean			
Arranged Marriage (%)	42.5	-4.8	-6.9	12.7*
Age at First Marriage	23.8	0.3 ⁺	0.1	-0.4*
Patrilocality of Residence at Marriage	31.9	-5.6	-5.3	12.6*
Room Crowding at Marriage	1.47	-0.03*	-0.13	0.13*
Desired Number of Children	2.61	-0.03	0.00	0.04
Contraceptive Use Prior to First Birth	16.7	1.8	1.9	-4.0*
Interval from Marriage to First Birth	18.0	1.0	0.2	-1.6 ⁺
Number of Pregnancies	2.92	-0.16*	0.19	0.12
Number of Abortions	0.71	-0.10*	0.14	0.05
Children Ever Born	2.13	-0.10*	0.09	0.08
Current Contraceptive Use	64.7	0.7	-0.9	-0.4
	Adjusted Deviations from Mean			
Arranged Marriage	42.5	-3.5	-6.3	10.4*
Age at First Marriage	23.8	0.2	0.1	-0.4*
Patrilocality of Residence at Marriage	31.9	-4.1	-4.3	9.6*
Room Crowding at Marriage	1.47	-0.05 ⁺	-0.11	0.16*
Desired Number of Children	2.61	-0.03	0.00	0.05
Contraceptive Use Prior to First Birth	16.7	-0.1	1.3	-0.9
Interval from Marriage to First Birth	18.0	0.8	-0.2	-1.1
Number of Pregnancies	2.92	-0.06*	0.15	-0.02*
Number of Abortions	0.71	-0.02	0.02	0.02
Children Ever Born	2.13	-0.03*	0.08	-0.01*
Current Contraceptive Use	64.7	-0.6	-2.0	2.5
	Number of Cases			
Sample Frequencies	1953	926	436	591

*Significantly different from migrants at .05 level with a two-tailed test.

+Significantly different from migrants at .10 level with a two-tailed test.

homogenization of fertility values, we find, however, no differences between migrants and either rural or urban non-migrants in desired number of children. Furthermore, once the control factors are introduced, there are no significant differences between the groups in their use of contraceptive prior to first birth, in their current contraceptive use, in the length of the interval between marriage and first birth, and in abortion experiences.

The results in Table 2 also reveal that migrants overall have more pregnancies and more children than who both attended primary school and were married in urban areas. Although the differential diminishes with the introduction of the control variables, it remains significant. Furthermore, the introduction of the control variables brings the fertility behavior of urbanites more nearly in agreement with that of ruralites, so that the adjusted differentials reveal that migrants have slightly more pregnancies and children than either urbanites or ruralites. These data are, then, consistent with the view that migrants are partially responsible for the relatively modest fertility differentials observed in contemporary Japan between urban and rural residents.

IV. Room Crowding, Urban Experience, and Future Fertility

Among developed countries, Japan has one of the highest population densities. The pressures of urbanization upon agricultural holdings and the pressures of population upon the housing stock leave little room for population growth. Indeed, the pressures are so severe that land is being reclaimed from the sea in Kobe harbor to provide space for further industrial growth. One can reasonably speculate that these Malthusian pressures are operative factors in Japanese fertility behavior, particularly in an era when the Japanese have experienced a rising standard of living which could be eroded only by unchecked population growth.

Obviously, it makes little sense to relate density to past fertility or the crowding of individual households to past reproductive behavior since the observed density or crowding is more appropriately viewed as the outcome of those fertility decisions. What one needs, if one desires to relate contemporary crowding or density to fertility, is a measure of prospective fertility. Here we examine the

relationship of urban experience and room crowding to number of additional children wanted. The data, however, are taken from the 16th Mainichi survey, conducted in May of 1981, rather than from the more recent 1984 inquiry. The reason for this is that the number of rooms in the current dwelling was not obtained in the 1984 survey (which included only the number of rooms in the household occupied at marriage).

The measure of living space used herein is derived from the ratio of household size to number of rooms. This continuous variable was clustered into three categories reflecting the situations in which (1) household size is greater than the number of rooms, (2) household size and number of rooms are equal, and (3) the number of rooms is greater than household size. Although the definition of this measure of living space or room crowding within households is straightforward, some approximations were necessary in obtaining its values. The reason for this is that the 16th Mainichi Survey, while obtaining the number of rooms in the household, did not include household size as a variable. Consequently, we had to approximate household size in the following way; if the respondent was living with both her own and her husband's parents, household size was set equal to six plus the respondent's number of living children; if the respondent was living with either her own or her husband's parents, household size was set equal to four plus the respondent's number of living children; otherwise, household size was set equal to two plus the respondent's number of living children. Obviously, household size measured in this way is only an approximation of actual household size. Cases in which the couple is living with one or both sets of parents cannot be adjusted in the case that one or more of the parents is deceased. Furthermore, no adjustment is possible in the case that some living children may have already left home. And, of course, no adjustment is possible for those cases in which multiple sons and daughters are living together as one extended, multigenerational household with their parents. Despite these sources of error, it seems unlikely that the indicator of room crowding is severely distorted, though some cases are doubtless misclassified from one extreme to the other.

The measure of urbanization employed in the following analysis of additional children desired makes use of items in the 16th Mainichi Survey which parallel those used above in the analyses based on the

17th Survey. Here, since the measure of fertility is a prospective one, we include respondent's current place of residence, as well as whether the respondent was living in an urban area at the time of graduation from primary school and at the time first marriage. The measure of urban experience thus has four categories, depending upon whether the respondent was in an urban location on three, two, one, or none of these occasions. As noted above, a majority of the migration in Japan is from rural to urban areas, so the items used to construct the measure of urban experience form an almost perfect Guttman scale. Thus, the vast majority of respondents with largely, but not completely urban experiences are those who are currently living in urban areas and were living in an urban area at first marriage, but not at the time of graduation from primary school. Similarly, those with mainly, but not completely rural backgrounds are largely comprised of those currently living in an urban place, but who were neither living in an urban area at first marriage nor while in primary school.

The relationship between room crowding, urban experience, and number of additional children wanted is displayed in Table 3. Women who are unable to have any additional children, or at least who reported themselves as being unable to, have been excluded from the table. As can be seen from Table 3, crowding is related to future fertility desires. Women living in relatively crowded quarters want fewer additional children than do those with rooms to spare. The table also reveals that women with urban backgrounds want more additional children than do those with predominantly rural experiences.

As can be seen by inspecting the upper panel of Table 3, the gross differential in number of additional children wanted by urban exposure is replicated with only some modest noise within groups of women differentiated by the relative crowding of their homes. Similarly, the differential in number of additional children wanted as viewed in terms of room crowding holds up within groups of women differing in their exposure to urban environments. These patterns suggest that the impacts of urban experience and room crowding upon number of additional children desired are quite likely additive, rather than interactive. The relationship between number of additional children wanted ($=A$) and the dummy variables reflecting the classifications of women by urban exposure and rooms relative to

Table 3. Mean Number of Additional Children Wanted by Urban Experience and Room Crowding, for Currently Married Japanese Women of Childbearing Age, 1981

Rooms Relative to Household Size	Total	Urban Experience			
		All Urban	Largely Urban	Largely Rural	All Rural
Actual Mean Number of Additional Children Wanted					
Total	0.342	0.386	0.375	0.273	0.276
More Persons	0.210	0.214	0.228	0.212	0.132
Equal	0.338	0.366	0.394	0.274	0.227
More Rooms	0.400	0.481	0.447	0.297	0.318
Expected Mean Number of Additional Children Wanted from Additive Model					
Total	--	--	--	--	--
More Persons	--	0.249	0.243	0.127	0.111
Equal	--	0.380	0.374	0.258	0.242
More Rooms	--	0.456	0.450	0.334	0.318
Actual Less Expected Number of Additional Children Wanted					
Total	--	--	--	--	--
More Persons	--	-0.035	-0.015	0.085	0.021
Equal	--	-0.014	0.020	0.016	-0.015
More Rooms	--	0.025	-0.003	-0.037	0.000
Frequencies					
Total	2498	1028	544	534	392
More Persons	568	252	145	118	53
Equal	585	262	142	106	75
More Rooms	1345	514	257	310	264

persons is given by

$$\hat{A} = 0.380 - 0.130(R_1) + 0.077(R_3) - 0.138(U_1) - 0.122(U_2) - 0.006(U_3),$$

(0.032) (0.040)
(0.034)
(0.040)
(0.036)
2
3

where the standard errors of the coefficients are shown in parentheses beneath their estimated values. All of the coefficients, except that for U_3 , are more than twice as large in absolute value as their standard errors. Thus, one may conclude that women living in households with more persons than rooms want fewer additional children than those living in households where there is a room per person. Conversely, women living in households with more rooms than persons want more additional children than those with a room for each household member. There is no significant difference between the number of additional children wanted by women with only urban and largely urban backgrounds, but women with only rural and largely rural backgrounds desire significantly fewer additional children than those with only urban backgrounds.

The second panel of Table 3 shows the mean number of additional children expected under the additive model for women varying in the living space available in their homes and in their urban experience. The third panel of the table displays the discrepancies between the actual and expected mean number of additional children desired. These discrepancies are, indeed, modest; only one approaches as much as one-tenth of an additional child and the next largest discrepancy amounts to less than one-twentieth of a child. A more formal test is required, but the evidence in the second and third panels of Table 3 is consistent with the view that the impact of room crowding and urban exposure upon number of additional children wanted are additive.

The total sum of squares in number of additional children desired comes to 1156.36. The between mean sum of squares in the upper panel of Table 3 is just 25.89 and is based on 11 degrees of freedom. The within group sum of squares for the same panel is just the difference between the total and the between mean sum of squares, or 1130.47, which is based on 2486 degrees of freedom. The sum of squares explained by the additive model is 23.79, with five degrees of freedom. A test for interaction in the effects of room crowding and urban experience on number of additional children wanted is, then, given by

$$F = [(25.89 - 23.79)/(11 - 5)]/[(1130.47)/(2486)] = 0.77,$$

which is plainly not significant by any criterion since it implies that the mean square due to interaction is less than the mean square

error. Thus, we are unable to reject the hypothesis that the effects of room crowding and urban exposure upon future fertility desires are additive ones.

Although the results to this point reveal that there are differentials in future fertility desires by both room crowding and by urban exposure, these differentials are not large to begin with and might well be explained away by correlated factors. Consequently, we have adjusted the differentials in number of additional children wanted by urban exposure and room crowding for all of the controls introduced above in the analysis of number of children ever born. In addition, we have included number of children ever born as a control variable, since it has a substantial inverse association with number of additional children wanted. The results of the adjustments, which were derived by re-estimating the additive model studied above after introducing the controls as predictors, are shown in Table 4.

Table 4. Mean Number of Additional Children Wanted by Urban Experience and Room Crowding, Adjusted and Unadjusted for Control Factors, for Currently Married Japanese Women of Childbearing Age, 1981

Urban Experience and Crowding	Frequencies	Number of Additional Children Wanted			
		Gross Means	Adjusted for Room Crowding or Urban Experience	Adjusted for Controls as well Dummy Variable Coefficients	Adjusted Means
Urban Experience					
All Urban	1028	0.386	0.391	--	0.324
Largely Urban	544	0.375	0.385	.0142	0.338
Largely Rural	534	0.273	0.269	.0382	0.362
All Rural	392	0.276	0.253	.0450	0.369
Rooms Relative to Persons					
More Persons	568	0.210	0.200	-.0043	0.298
Equal	585	0.338	0.330	--	0.302
More Rooms	1345	0.400	0.277	.0755*	0.378

*Coefficient more than twice as large as its standard error in absolute value.

As can be seen by comparing the first and last columns of Table 4, the relationship between urban experience and number of additional children wanted is reversed once the controls are introduced. The unadjusted means show that women with rural backgrounds desire fewer additional children than do women with urban backgrounds. The adjusted means, taking into account all of the control factors, move in a contrary fashion. However, the very small differences observed in the adjusted means do not reach statistical significance. Consequently, the present data are consistent with the hypothesis that there is no net differential in the number of additional children desired by women differing in their exposure to urban life.

While the introduction of the control factors washes out the gross differential in number of additional children wanted by women with varying exposures to city life, the control factors only diminish, but do not completely explain the differential observed in number of additional children wanted among women living in more and less crowded quarters. The gross or unadjusted difference in the mean number of additional children wanted by women in housing with a surplus of persons relative to rooms and by women in dwellings with a surplus of rooms relative to persons comes to .400 - .210 or about .2 of an additional child. The introduction of the control variables leaves an adjusted difference between these two groups of .378 - .298 or about .1 of an additional child. Thus, the control variables explain about $(100)(.190 - .080)/(.190) = 57.9$ percent of the gross differential in number of additional children wanted by women living in relatively crowded and relatively uncrowded quarters. The residual difference which remains, though small, is nonetheless statistically significant by conventional criteria. Thus, if women act out their wishes for additional children, the pressure of persons on living space prove to be an impediment to fertility. Although the relationship is small, these data are consistent with the view that dwelling unit density has been a factor in the formation of contemporary Japanese fertility.

V. Urbanization and Fertility: Some Cohort Evidence

The cross-sectional evidence surveyed above provides no clue to the time path of the urban-rural fertility differential in Japan. Evidence from earlier Mainichi surveys conducted in 1967, 1969, and

1975 was compiled by Kobayashi (1977) and suggests that there may have been a modest decline in the urban-rural differential during this period. Using birth histories collected in the 16th Mainichi Survey of 1981, we have reconstructed the cumulative number of children ever born at five year intervals for selected cohorts of women differentiated by their urban experience. In this analysis, it is no longer possible to distinguish women according to their current type of place of residence, since some women would have moved from rural to urban areas during the course of their marriage. We distinguish, instead, only between three groups of women varying in their urban experiences prior to marriage. The groups contrasted are (1) those completing primary school in urban areas and residing in urban areas at the time of their marriage, (2) those in rural areas on both of these occasions, and (3) a mixed group which was in a rural area at one of these times (at completion of primary school or at marriage) and an urban area at the other. (The latter group is comprised almost entirely of those residing in a rural area on completion of primary school and living in an urban area at marriage, since the two items being used to define the groups form an almost perfect, two-item Guttman scale.)

The basic data are displayed in Table 5, which shows the mean number of children ever born at five year intervals for the cohorts of women with urban, rural, and mixed backgrounds who were aged 30-34, 35-39, 40-44, and 45-49 in 1981. It is readily apparent from inspection of the table that the cumulative fertility of women with urban and partially urban backgrounds is virtually undifferentiated. Indeed, excepting the cohort aged 35-39 in 1981, women with only partial urban backgrounds have marginally fewer children ever born than do women who both attended primary school in urban areas and were living in urban areas at marriage.

Although there is barely a difference at all the cumulative fertility of women with urban and mixed urban-rural experiences prior to marriage, there is a clear differential between those with urban and those with rural backgrounds. This differential is established by the time the cohorts of urban and rural women have reached ages 25-29 and it persists throughout their life cycle. The magnitude of the urban-rural differential in fertility changes, however, over the life cycle of cohorts. It peaks when comparable groups of urban and rural women

Table 5. Cumulative Number of Children Ever Born at Five Year Intervals by Urban Experience, for Selected Cohorts of Currently Married Japanese Women of Childbearing Age

Age in 1981 and Urban Experience	Cumulative Fertility at Ages				
	25-29	30-34	35-39	40-44	45-49
Mean Number of Children Ever Born					
30-34					
Urban	1.220	1.953	--	--	--
Mixed	1.142	1.940	--	--	--
Rural	1.398	2.174	--	--	--
35-39					
Urban	1.051	1.792	2.010	--	--
Mixed	1.319	2.000	2.181	--	--
Rural	1.568	2.252	2.374	--	--
40-44					
Urban	1.079	1.882	2.136	2.158	--
Mixed	1.014	1.858	2.050	2.064	--
Rural	1.310	2.151	2.314	2.335	--
45-49					
Urban	0.990	1.805	2.071	2.152	2.152
Mixed	0.889	1.556	1.829	1.906	1.915
Rural	1.560	2.296	2.456	2.488	2.488
Frequencies					
30-34					
Urban	359	359	--	--	--
Mixed	134	134	--	--	--
Rural	201	201	--	--	--
35-39					
Urban	293	293	293	--	--
Mixed	138	138	138	--	--
Rural	155	155	155	--	--
40-44					
Urban	228	228	228	228	--
Mixed	141	141	141	141	--
Rural	245	245	245	245	--
45-49					
Urban	210	210	210	210	210
Mixed	117	117	117	117	117
Rural	250	250	250	250	250

reach ages 25-29 or 30-34 and then dwindles as the groups mature into the close of their reproductive periods. This pattern is doubtless attributable to a combination of factors, including the later age at first marriage of urban cohorts and differential spacing of children among urban and rural women.

The present data shed little light on the question of secular change in the urban-rural fertility differential. Making comparisons only when cohorts of urban and rural women reached comparable stages in their life cycles, the differential is widest between the oldest cohorts of urban and rural women, i.e., those aged 45-49 in 1981. It is also the smallest in the youngest cohorts of women with rural and urban background, i.e., those aged 30-34 in 1981. Taken at face value, this suggests a declining urban-rural differential in cumulative fertility. The picture obtained by comparing the differential in the oldest and youngest cohorts is muddled, however, by considering the differential observed in the intervening cohorts, i.e., those aged 35-39 and 40-44 in 1981. The differential observed between the cohorts of urban and rural women aged 40-44 in 1981 is nearly as small as that observed between the youngest cohorts of urban and rural women, while the differential observed between urban and rural women aged 35-39 in 1981 is nearly as large as the differential observed between the oldest groups. Overall, if anything, the urban-rural differential in fertility has probably declined. The evidence at hand, however, suggests that such a change, if it has occurred at all, has not been caused by a monotonic decline in each successive cohort.

VI. Summary and Conclusions

In this chapter, we have shown that the gross differential in cumulative fertility observed between women differing in their urban experiences cannot be wholly explained by a wide variety of factors known to affect fertility, including education of both husband and wife, desired number of children, wife's premarital work experience, and duration of marriage. Thus, as Japan moves through the final stages of her demographic transition, a small urban-rural differential in fertility continues to persist. This differential is, however, intertwined with migration status. For women with one child, migrants actually have an adjusted number of children which exceeds that

observed for urbanites and ruralites. We have also found that there is no net relationship between urban experience and the number of additional children a woman desires. Room crowding, however, continues to pose an impediment to future fertility desires, even after the control variables are introduced.

Cohort data reconstructed from birth histories reveal that the urban-rural differential in fertility itself varies over the life cycle of a cohort. It peaks during the prime ages of childbearing, but then dwindles as cohorts of women with urban background make up for births forgone at earlier ages. The same cohort data provide little evidence of any monotonic trend across successive cohorts in the magnitude of the urban-rural differential in fertility. Although the differential is least in the youngest cohorts of urban and rural women and greatest in the oldest groups, the intermediate cohorts do not fall into an orderly pattern of change.

Finally, the cohort analysis reveals that the differential in fertility with respect to urban experience is between those with rural backgrounds and those with some urban exposure. The fertility of women who attended primary school in urban areas and who were living in urban areas at first marriage does not differ in any appreciable way from the fertility of those whose urban exposure is limited to just one of these conditions.

References

- Kobayashi, Kazumasa. 1977. "Family Size," in Fertility and Family Planning in Japan, edited by the Population Problems Research Council, Tokyo: the Mainichi Newspapers, and the Japanese Organization for International Cooperation in Family Planning, pp. 157-201.
- 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.
- _____. 1982. "Differential Fertility in Indonesia and the Philippines: A Multivariate Analysis," Southeast Asian Studies, Vol. 20, No. 2, September, pp. 179-205.
- _____ and Robert William Hodge. 1983. "Fertility and the Locus of Family Control in Contemporary Japan," Population Research Leads, No. 14, Thailand: United Nations ESCAP.
- Population Problems Research Council, Mainichi Newspapers. 1978. Summary of Fourteenth National Survey on Family Planning, Tokyo.