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"Inter-Prefectural Differences of Fertility and Marriage Behavior in Japan"

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Inter-Prefectural Differences of Fertility and Marriage Behavior in Japan

Since the onset of the so-called Second Fertility Transition, numerous analyses have been conducted addressing differences in fertility levels or speed of change between various nations including Japan. Intra-national differences, however, have not received that much attention yet. This is regrettable since studies on a regional scale not only give answers to the question of whether a specific fertility level or trend is typical for a whole country or not, but can also give clues to determinants of fertility specific to a region which would go unnoticed in national surveys. In this presentation, I will thus address the following two sets of questions (see also PowerPoint slide 2):

(1) How has the Second Fertility Transition spread across Japan? Where did it start? Was it a diffusion-like process, similar to the spread of the first fertility decline several decades ago, or did the changes commence almost at once in many locations? Are there regions that still do not correspond to the new fertility regime? Do older regional fertility patterns still show through, or did the changes lead to the creation of totally new patterns?

(2) What are the main factors that can be associated with the current geography of fertility in Japan? Do local cultural factors or values play a decisive role, or are regional differences merely reflecting varying socio-economic characteristics of prefectural populations? And what about the impact of infrastructural factors such as the diffusion rate of childcare facilities on regional fertility patterns?

Regarding Japan, there are a few studies relating the inter-prefectural pattern of the Total Fertility Rate (TFR) either to general socio-economic indicators or the influence of unspecified cultural factors. However, since it has been constantly stressed that the recent fertility decline has been caused by drastic changes in marriage behavior and not by

declining numbers of children ever born to married women, an analysis exclusively based on an overall fertility measure such as the TFR might give an incomplete picture of recent changes. Therefore, the following analysis will split regional fertility patterns into the components of "marital fertility" and "marriage proportions". In the first part, inter-prefectural fertility patterns will be described, covering the period from the early 1970s, when the second fertility decline set in, until 2005. In the second part, some factors that are significantly associated with the regional patterns of 2005 are identified by employing multiple regression analysis (重回帰分析). Since Japanese prefectures are extremely heterogeneous in their internal composition, the results of the regression analyses should only be regarded as first clues to possible causes that have to be either confirmed or falsified by subsequent micro-level studies.

In order to decompose overall fertility levels and trends into effects from marriage behavior and marital fertility at the prefectural level, I used the so-called Hutterite Indices (ハテライト指標) developed by Ansley Coale in the late 1960s. These indices can be regarded as sum fertility or marriage measures derived by the method of indirect standardization (間接標準化法). This means that the distorting influence of age structure is smoothed by applying a standard schedule of age-specific fertility rates. In the original, the age-specific fertility rates (年齢別出生率) of the Canadian Hutterite sect (ハテライト宗派) who showed the highest marital fertility ever recorded were used. In the following analysis, however, the Hutterite rates were replaced by the Japanese age-specific fertility rates of 1990, midway between 1975 and 2005. The level of overall fertility (総出生力), or "I_f", can be expressed as the product of marital fertility (摘出出生力), or "I_g", and the proportion married (結婚性向), or "I_m".

Turning to the regional pattern of overall fertility, or "I_f", first (PowerPoint slide 3), it becomes evident that rates are generally lower in highly urbanized areas such as Southern Kantō or Kansai and higher in remote rural regions like Okinawa, Southern Kyūshū, San'in, Nagano or Southern Tōhoku, although some rural areas are exceptions. The overall impression of a marked contrast between urban and rural regions is confirmed by a highly

significant correlation coefficient (相関係数) of -0,631 between I_f and the percentage of population living in so-called densely inhabited districts (人口集中地区). A clear urban-rural gradient is also showing through the regional pattern of I_m (PowerPoint slide 4). Low proportions of married women are found in the urban agglomerations of Tōkyō, Ōsaka, and Fukuoka, but also on the island of Hokkaidō with its regional metropolis of Sapporo. While high celibacy rates (生涯未婚率) in urbanized regions could be expected, it is more surprising to see that there are significant differences inside rural Japan. Generally speaking, a northeast-southwest pattern emerges, with higher rates in northeastern and central Japan. Even more marked by regional rather than urban-rural differences is the pattern of marital fertility, or I_g. The correlation with the percentage of population living in densely inhabited districts is negative but not significant. In clear contrast to the pattern of marriage proportions, rates are generally higher in southwestern than in northeastern Japan. Kyūshū and Okinawa stand out in particular. In sum, it becomes clear that marital fertility and the proportion of married women show completely different regional patterns, proving that it is justified to treat the two components separately.

Next, I will concentrate on the temporal changes in the regional pattern of fertility since the resumption of birth rate decline in the 1970s. Before doing this I would like to sum up shortly some major trends that can be observed on the national scale.

First, it is important to note that during the First Fertility Transition that happened around the beginning of the 20th century in most of Europe and shortly after the Second World War in Japan, marital fertility decline as a result of family planning was the single most important factor, whereas marriage behavior did not change much or even went into the direction of earlier and more universal marriage. Japan was no exception to this rule.

By contrast, recent Japanese fertility decline has been caused almost exclusively by changing marriage patterns. During the 1990s, not only later marriage (晩婚化), but less marriage (非婚化) as well started to become significant for fertility change in Japan. Marital fertility, however, has remained almost constant so far. It declined somewhat during the period following the oil crisis in the latter 1970s when higher order births were postponed

only to recover since the 1980s. The next figure (PowerPoint slide 5) which shows the temporal change of the Hutterite indices for all Japan, gives a good illustration of these trends.

Turning back to the inter-prefectural scale, it can be said that regional patterns changed as well during this period. In slide 6 (PowerPoint), correlation coefficients showing the strength of association between overall fertility and its two components are given. Note that during the 1970s the pattern of overall fertility was still solely determined by the pattern of marital fertility. In the late 1980s, however – that is, the time when marriage behavior started to change –, regional differences in marriage proportions became suddenly more important. Obviously, until the 1970s marriage was not only universal throughout Japan but happened nowhere that late as to have an effect on the number of children that were eventually born. While the 1980s were a period of transition, with the phenomenon of less marriage not yet firmly established, in the 1990s the proportion of married women became so low in some areas as to affect a reduction in overall fertility levels there.

It is thus evident that recent changes in the distribution pattern of overall fertility were mainly the result of changes in marriage behavior. I will now examine these changes in greater detail. In particular, it would be interesting to see whether the decline in the proportion of married women spread in a diffusion-like manner from the center to the periphery, that is, whether it followed the way lower rates of marital fertility spread during the First Fertility Transition.

In order to analyze the temporal change of the regional I_m pattern, percentage changes in I_m for the six quinquennia starting with 1975 to 1980 were calculated for each prefecture. Based on the resulting six variables, cluster analysis (クラスター分析) was adopted to classify the prefectures according to the temporal change pattern in the proportions of married women. Four distinctive groups of prefectures could be identified (PowerPoint slide 7). From the results, it becomes apparent that indeed a diffusion process had taken place. It started in the urban agglomerations around Tōkyō, Nagoya, and Ōsaka (cluster 1) during the period from 1975 to 1980, then spread to neighboring prefectures, almost

covering the whole metropolitan belt stretching from Sendai to northern Kyūshū (cluster 2). Around the same time, but not with the same vigor during the crucial period from 1985 to 1995, marriage behavior change also set in in more remote or rural places like Hokkaidō, Aomori, or parts of Shikoku Island (cluster 3). By the beginning of the 1990s, finally, the new marriage pattern had started to cover all of Japan (cluster 4). In the most recent period from 2000 to 2005, the transition of marriage behavior has slowed down in all areas, but even in the urbanized prefectures change has not yet come to a stand-still.

This result comes not as a surprise, for it seems plausible that participation rates of women in university education or gainful employment increased first in metropolitan areas around Tōkyō or Ōsaka, factors that are said to have a significant effect both on the timing and the frequency of marriage. Likewise, certain new attitudes towards marriage might have been evolved in urbanized regions before they spread to other prefectures.

To test these hypotheses, multiple regression analysis was adopted. Socio-economic variables were included in addition to variables, taken from an NHK regional survey, that measure family- or gender-related values and attitudes. As a result, the regression model with the highest explanatory power is presented in slide 8 (PowerPoint). It confirms the overall finding by Retherford, Ogawa and Matsukura (2001) that rising employment opportunities for women and a weakening of familistic attitudes are responsible for changing marriage behavior in Japan, the former being more important than the latter. Since media coverage is all-pervasive in Japan, changing marriage behavior predominantly or exclusively caused by changed values and attitudes would most likely have transformed the whole country from one moment to the other rather than spread gradually. A variance explained of only 53.8% (従属変数の分散のうち何%を独立変数が説明しているか) signifies, however, that there might be additional determinants still undetected or for which no data are available on the regional scale.

For the rest of this presentation, I would like to focus on factors which show strong correspondences to the current inter-prefectural patterns of fertility. Again, I used the statistical method of multiple regression analysis. As can be seen from slide 9 (PowerPoint),

a high percentage of respondents expressing the view that marriage is a matter of course is contributing also to the 2005 pattern of women being married. In contrast to the model shown in slide 8 (PowerPoint), however, this time a high proportion of employed persons occupied as production or construction workers has the highest explanatory power.

This correspondence remains strong even after controlling for factors such as educational attainment or employment participation rates of women. Provided that the association is not spurious, there are some possible explanations for this surprising finding. First, periods of education are generally shorter and first marriage happening earlier in life among blue-collar than white-collar employees. But this explanation does not seem sufficient since the regional distribution of high blue-collar proportions is also strongly associated with low rates of women staying single during their lifetime. It has often been found in stratification analyses that, compared with white-collar workers, blue-collar workers in Japan do not tend to view their work as a means of fulfillment. Therefore, it might further be speculated that, due to low expectations or interest in social advancement or occupational career, life paths of both men and women embedded in blue-collar culture are fixed quite early, giving no reason to postpone and eventually abandon marriage plans. It might be worthwhile to conduct individual-level studies to inquire further into this correspondence.

It has to be added that the regional pattern of the "I_m"-index in 2005 is still somewhat resembling the reconstructed I_m pattern of the late 1870s (correlation coefficient of 0.484). According to the historical demographers Hayami Akira and Kurosu Satomi (2001), the regional pattern of marriage rates during the late Tokugawa and early Meiji periods was determined by factors such as family structure, status of women and employment opportunities. Regions in the central and southwestern parts of Japan, where the strict norms of the stem family were not all-pervasive and cities offered many employment opportunities for young men and women, marriage proportions were generally lower than in the northeastern part. It is not my argument here that this old pattern is directly related to the current regional differences in the proportion of married women, since the causal factors then at work have mostly vanished. It is however probable that marriage behavior

prevalent during the latter part of the 19th century has been solidified into social norms completely detached from its former context of justification. Now people might just think that to marry is natural, an attitude which is indeed significantly more prevalent in northeastern regions which showed high marriage proportions during the late 1870s.

The results of the regression model for the inter-prefectural pattern of marital fertility are reproduced in slide 10 (PowerPoint). I have already pointed to the fact that marital fertility does not seem much affected by urbanization levels. The model results confirm this impression, since it is for the most part variables representing socio-cultural factors which were included in the model. First of all, the high significance of the Okinawa variable highlights the fact that marital fertility levels in this southernmost prefecture are much above the national average. Kumagai Fumie in her recent book on "Families in Japan" (2008) as well as other researchers have indicated a link between high numbers of children per couple and the family system of Okinawa. Contrary to the rather flexible *ie*-system dominant in the rest of Japan, and similar to the Chinese family, the continuation of the Okinawan family requires a male heir of the body, thus urging a couple to repeat having a baby until a male heir – and a spare – is born.

Apart from this regional peculiarity, attitudes stressing the importance of the family line and its continuation are also corresponding significantly with marital fertility levels in other parts of Japan, as the inclusion of the second variable in the model shows. It should be added that high percentages of people claiming that they feel a "strong attachment to family ancestors" are especially typical for Kyūshū, generally known for the conservatism of its inhabitants, what might be the major reason for the high marital fertility rates recorded there.

Next, the variable "High school graduates going on to university education" has also to be interpreted as a cultural rather than socio-economic indicator. The highest rates can be found along the Inland Sea and in central Japan even outside the metropolitan areas. In this old cultural heartland of Japan more than elsewhere, great importance is attached traditionally to the merits of higher learning. Since education costs such as school and

university fees are substantial in Japan, it is not surprising that this variable has a significantly negative effect on the number of children per couple.

The only structural factor that seems to have an impact on the regional pattern of marital fertility is the proportion of pre-school children in day nurseries. This finding might delight policy-makers who recently have repeatedly stressed the need to improve the supply of day nurseries across the nation in order to raise the birth rate. The effect is only small, though, and becomes significant only after controlling for the effects of the other variables included in the model.

In conclusion, I would like to emphasize the following results (see also PowerPoint slides 11 and 12):

1) Changes in the regional pattern of overall fertility since the resumption of fertility decline in the mid-1970s were almost exclusively associated with a decline in the propensity of women to marry. This decline started in the major metropolitan areas due to gradual improvements in employment opportunities for women as well as changing attitudes towards marriage. It then spread diffusion-like towards the periphery of Japan. At present this process has slowed down but not yet come to a close.

2) This diffusion process notwithstanding, a marked contrast between higher proportions of married women in most of northeastern and central Japan and lower proportions in Hokkaidō, the Tōkyō Metropolitan Area, and southwestern Japan has still remained. In part, this dichotomous pattern dates back as far as the late Tokugawa Period. More important, however, are differences in the occupational composition of the work force, with marriage rates still comparatively high in regions which are dominated by blue-collar workers.

3) The regional pattern of marital fertility, by contrast, is marked by high rates in Okinawa and Kyūshū and average to low rates elsewhere. The influence of differing levels of urbanization is negligible. Instead, socio-cultural factors such as differences in family

norms or the importance attributed to education do seem to play the leading role in effecting this pattern. In addition, there is a minor correlation with high proportions of children in day nurseries.

In sum, although the impact on fertility of frequently discussed socio-economic or structural indicators such as educational attainment and employment participation rates of women, or childcare infrastructure can indeed be felt at the regional level, Japanese inter-prefectural fertility patterns do seem to be no less affected by historical and socio-cultural factors. A better consideration of cultural and historical factors might also be an important key to improve our understanding of *national* fertility levels and trends.