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First marriage and first birth patterns by educational attainment in the transiting societies, the Netherlands, Japan and Karnataka (Southern India)

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Abstract

Starting from the debate on demographic convergence, the objective of this paper is to empirically assess whether demographic behavior is converging across different societies and whether the same determinants are driving demographic behavior in those countries. We assess this through a case study of first marriage and first birth behavior in three societies, focusing on the mean age at first birth, the mean age at first marriage, and the role of education in the Netherlands, Japan and Karnataka (Southern India). In this regard, it has to be noted from the outset that because of various data constraints it has not been possible to obtain fully comparable results for the three societies. However, some interesting observations can be made. We study continuity and change in demographic behavior across cohorts within each society, as well as similarities and differences in demographic behavior across societies. We apply single state life table techniques to micro-data from the Netherlands Family Fertility Survey 1998, the Japanese National Fertility Survey 1992, and the Karnataka section of the Indian National Family Health Survey 1998.

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1 Introduction

Different scholars provide different contributions to answer the question whether demographic behavior is likely to converge at the global level. Lesthaeghe (2000) for instance observes (the changes in) worldwide fertility patterns over the past few decades and writes about demographic heterogeneity and heteropraxis. Demographic heterogeneity refers to variations across covariates like age, education, marital status and socio-economic characteristics. Demographic heteropraxis refers to the fact that the process of social and cultural change proceeds at a different pace in different countries. Wilson (2003) on the other hand points to increasing social similarity and convergence of mortality and fertility rates at the global level. In a similar way van de Kaa (1997) suggests within the context of his research on partnership and family formation behavior in low fertility countries that Second Demographic Transition countries move through a key or standardized sequence (van de Kaa, 1997, p. 8).

This paper empirically assesses whether demographic behavior is converging across different societies and whether the same determinants are driving demographic behavior in those countries. Its focus is on first marriage and first birth behavior, specifically on the mean age at first birth and the mean age at first marriage. The reason for focusing on these events is that they constitute key events in a woman's life course, capturing the choices resulting from the complex interactions of women with the context they are situated in and the people surrounding them. The emphasis is on one particular determinant of the mean age at first birth and the mean age at first marriage, namely the level of educational attainment. The reason is that as will be explained below education is widely recognized as an important determinant of demographic behavior in general and first marriage and first birth behavior in particular (See a discussion on the particular role of education in India in footnote[i]). The above topic is studied in three different societies: the Netherlands, Japan and Karnataka (Southern India - See a discussion of why Karnataka is used in footnote[ii]). The above choices result in the following specific research questions: (1) Are Dutch, Japanese and Karnatakan first marriage and first birth behavior converging?; (2) Does education play a similar role in all three societies?; (3)

Does the Netherlands constitute a kind of demographic model that Japan and Karnataka will follow?

This paper argues that Dutch, Japanese and Karnatakan first marriage and first birth behavior are converging, that education plays a similar role in all three societies, and that the Netherlands constitutes a kind of demographic model that Japan and Karnataka will follow.

In accordance with Coleman's (1990) methodological individualism (which will be explained below) the analysis is based on vital statistics and micro-data from the Netherlands, Japan and Karnataka[iii]. Use is made of the Netherlands Family Fertility Survey 1998, the Japanese National Fertility Survey 1992, and the Karnataka section of Indian National Family Health Survey 1998. On this basis, continuity and change in demographic behavior across cohorts within each society as well as similarities and differences in demographic behavior across societies are studied. This is achieved through the application of single state life table techniques in a cohort approach in line with the life course approach and its concepts of 'location in time and place' and 'linked lives' (Giele and Elder, 1998).

This paper is structured as follows. In section 2, we present some theoretical remarks. In section 3, we take a macro-approach to first marriage and first birth behavior. A first sub-section explains for each society its position with regard to the first demographic transition. In a second sub-section, the Second Demographic Transition is discussed through a presentation of the observed indicators of mean age at first marriage and first birth. Next, a discussion is offered of the situation in each society with regard to historical changes in (average) educational attainment levels. In section 4, a micro-approach is taken, first to explain some technical aspects relating to the use of fertility surveys. In addition, the results of the single state life table analysis are presented. In section 5, a conclusion is presented.

2 Theoretical approach

In this section, we present theoretical remarks on two different issues: the position of education as an important determinant of first marriage and first birth behavior and the way in which education influences first marriage and first birth behavior.

Scholars widely agree that education is an important determinant of first marriage and first birth behavior. The higher educated a woman is the *later* and *less* she gets married and gives birth. This negative relation has been proposed most clearly by Becker (1981) who wrote that in the case of women the income effect of higher levels of educational attainment dominates the price effect (See also Liefbroer and Corijn, 1999). Empirical research has confirmed the existence of such a negative relation in traditional and modern societies like India, Japan and the Netherlands but not in liberal societies like the Scandinavian countries (Blossfeld, 1995; Jejeebhoy, 1995; Basu, 1996; Tsuya and Mason, 1995; Raymo, 2003).[iv] The reason is that the precise effect of education and labor force participation on first marriage and first birth behavior depends on the degree of incompatibility between on the one hand labor force participation and on the other hand marriage and motherhood as determined by a society's family system in its structural and cultural aspects (Blossfeld, 1995; Liefbroer and Corijn, 1999). Such a broader approach taking into account education as well as other factors is followed by Van de Kaa (1988, p. 14) in his Second Demographic Transition explanatory framework.

A limitation of the above studies is that while they identify education as an important determinant of first marriage and first birth behavior they do not explain how education influences that behavior. That is where Coleman's (1991) methodological individualism offers a possible way out by calling for a focus in empirical research on the micro-level of the individual. Such a micro-approach is proposed by Giele (1988) and Elder (1994). Their life course framework (Giele and Elder, 1998, p.11) allows for an understanding of how an individual's demographic behavior is determined by the context in which that individual is situated as well as that individual's personal history and an insight into the causal mechanisms behind observed demographic behavioral outcomes (For a similar approach see Hutter, 1994; de Bruijn, 1999). This framework clearly accommodates a variable like education. Two important concepts in the life course

framework are those of 'location in time and place' and 'linked lives' (Giele and Elder, 1998) which call attention to respectively the society specificity and the cohort specificity of demographic behavior. Each birth cohort experiences different historical events and carries these shared experiences with it which then account for differences across birth cohorts in behavior and attitudes (Becker, 1992). These two concepts are captured through 'time' (age, period and cohort) (for a further explanation see Giele and Elder, 1998 and Matsuo, 2003).

3 A macro-perspective on demographic behavior in the Netherlands, Japan and Karnataka

3.1 The first demographic transition

The past demographic development of these three societies appears to provide support for the convergence thesis. All three societies have experienced or are experiencing a first demographic transition in line with first demographic transition theory (Davis, 1945; Kirk, 1996). The Netherlands and Japan have already passed completely through the first demographic transition. India however is an intermediate fertility-level country finding itself in the middle to late stages of the first demographic transition.[v]

The Dutch demographic transition occurred during the period 1850-1900 (de Beer, 1991). A distinction can be made between 3 periods: (1) 1850-1900: population growth increased from below 1 percent to 1.4 percent; (2) 1900-mid-1960s: growth rate was stable around 1.4 percent, except for the periods surrounding the two World Wars; (3) since 1964: the sharp decline of population growth (0.5 percent). Between 1840 and 1880 the birth rate increased while the death rate remained stable. Thereafter the death rate started to decrease earlier than the birth rate. Once the birth rate also began to drop it did so to a smaller extent. The latter phenomenon was largely concentrated in the first half of the 20th century. After WWII while the death rate did not drop anymore the birth rate decreased sharply after 1964 (De Beer, 1991).

The Japanese first demographic transition runs from 1870 to 1960 (Kuroda 1970; Atoh, 2000). While it is largely consistent with demographic transition theory it started much later than in Europe (e.g. the Netherlands) and was more condensed. Atoh (2000, pp. 89-103) identifies two periods: (1) until 1870: high birth rates and high death rates; (2) 1870-1960: high birth rates and low death rates with a breakdown into 3 sub-periods: (1) 1870-1920: birth rates increase while death rates start to drop; (2) 1920-1945: both birth rates and death rates fall; (3) 1945-1960: both birth rates and death rates drop steeply.

In India – rapidly transforming into a modern economy – the first demographic transition is slowly but steadily running its course. Between 1901 and 2001 there has been a steep decline in mortality and a relatively less steep but sustained decline in fertility (Government of India, 1992).

3.2 The second demographic transition

So the Netherlands and Japan have already passed completely through the first demographic transition, while India is still making that transition. But have the Netherlands and Japan, as well as individual regions in India, already passed into the second demographic transition?

3.2.1 Demographic indicators of first marriage and first birth

According to Van de Kaa (1987, p. 18) an important indication of whether a country has entered into the second demographic transition is whether and to what extent the TFR has dropped below replacement level.[vi] In the Netherlands the TFR declines from an extended baby boom high of 3.04 in 1965 to 1.51 in 1985 stabilizing and rising again to 1.72 in 2000 (Table 1). According to Coleman and Garsson (2002) the Dutch fertility level is higher than the European average in the 1960s, below that average in the 1980s, and at that average in the 1990s. In Japan the TFR declines from 2.14 in 1965 to 1.36 in 2000 and 1.32 in 2002. The 'Year of Horse and Fire' (inauspicious year) 1966 is characterized by exceptionally low birth rates. Japan's 1960s TFR is already situated at a

lower level than the Dutch one reflecting the fact that Japan did not experience an extended baby-boom. Actual TFR decline also starts later in Japan than in the Netherlands, after 1975. And no stabilization and rise takes place after 1985 resulting in a final rate that is much lower than the Dutch one and more in line with that of Southern European Countries (Council of Europe, 2001). So while we can conclude that both the Netherlands and Japan have already entered the Second Demographic Transition both countries have followed somewhat different paths.[vii]

In Karnataka, the TFR has dropped from 3.1 in 1991 (Census 1991) to 2.13 in 1998-99 (NFHS-2). In 1998-99 it stood at 1.89 for women age 15-49 in the urban areas and 2.25 for such women in the rural areas (NFHS-2). So while India as a whole still finds itself in the first demographic transition, individual regions such as Karnataka (but also Kerala, Tamil Nadu and Andhra Pradesh) have already entered into the Second Demographic Transition with below replacement fertility levels.

3.2.2 Educational characteristics

In all three societies, levels of female educational attainment have increased over the past few decades, as presented in Table 2. In the Netherlands, the female gross enrolment rate for secondary education increased from 68.80 in 1970 to 126.39 in 2000, while the female gross enrolment rate for tertiary education increased from 11.10 in 1970 to 56.80 in 2000, and the average years of female schooling from 7.50 in 1970 to 9.12 in 2000 (World Bank, WDI).

In Japan, the female gross enrolment rate for secondary education increased from 86.30 in 1970 to 102.96 in 2000, while the female gross enrolment rate for tertiary education increased from 9.90 in 1970 to 43.88 in 2000, and the average years of female schooling from 7.10 in 1970 to 9.08 in 2000 (World Bank, WDI).[viii]

In India, the female gross enrolment rate for secondary education increased from 14.10 in 1970 to 40.07 in 1999, while the female gross enrolment rate for tertiary education increased from 2.20 in 1970 to 8.26 in 1999, and the average years of female schooling from 1.20 in 1970 to 3.74 in 2000. Over the same period, the illiteracy rate decreased from 81.49 percent to 54.61 percent (World Bank, WDI).[ix]

4 A micro-perspective on the second demographic transition in the Netherlands, Japan and Karnataka

4.1 Data, measurement of concepts and method

4.1.1 Data

This paper makes use of micro-data from three different fertility surveys. The data for the Netherlands are taken from the Netherlands Family Fertility Survey 1998 (OG 98), which records life history data for 5,450 women. The data for Japan are taken from the Japanese National Fertility Survey 1992, which collects data for 3,990 never-married women and 8,844 ever-married ones. The data for Karnataka are taken from the Karnataka section of the second Indian National Family Health Survey 1998 (NFHS-2)[x], which records data for 4,374 ever-married women.

4.1.2 Measurement of concepts

As far as levels of educational attainment are concerned a distinction is made between three levels: low, medium and high. In the Dutch and Japanese cases the OECD ISCED classification (OECD, 1999) has been applied (See Appendix, Table 3 and 4). In both cases, 'Low' equals ISCED 1 and 2, 'Medium' ISCED 3, and 'High' ISCED 4, 5 and 6. In the Karnatakan case the NFHS-2 classification has been converted into a 4-point scale (See Appendix, Table 5 and Note 1).[xi]

To operationalise the concept of ‘linked lives’ and study continuity and change in demographic behavior across cohorts within each society a cohort-approach is taken. In the Dutch and Japanese cases a simple distinction is made between a pre-1960 and a post-1960 birth cohort (For a justification see Appendix, Note 2). In the Karnatakan case a

distinction is made between a pre-1960, a 1961-1965, a 1966-1970 and a 1971-1976 cohort (For a justification see Appendix, Note 3).
In Appendix (Table 6, 7, 8 and 9, and Note 4), an overview is provided for each society of average levels of educational attainment by birth cohorts (A discussion on wanted and unwanted fertility can be found in Note 5).

4.1.3 Method

The core of the data analysis consists of applying single state life table techniques to first marriage and first birth behavior and calculating the mean and median ages at which these events take place for the first time (See Appendix, Note 6). The advantage of single state life table analysis is that it uses grouped data. Censoring is assumed to occur at the middle of the discrete time interval following Namboodiri and Suchindran (1987).

4.2 Results

4.2.1 First birth

The focus in this section is on the mean age at first birth. In the case of the Netherlands and Japan it is calculated on the basis of a life-table analysis based on those women who experienced first birth by age 30. In both the Netherlands and Japan, the mean age at first birth increases across birth cohorts. In the Netherlands, the mean age at first birth is 26.3 years in the pre-1960 birth cohort and 27.7 years in the post-1960 birth cohort. In Japan, the mean age at first birth is 26.6 years in the pre-1960 birth cohort and 28.0 years in the post-1960 birth cohort.

Netherlands

In the Netherlands, fewer women are giving birth in the later cohort than in the earlier one, but most of all they are giving birth later. The cumulative proportion of women in

first birth at age 25 decreases from 38.3 percent to 19.7 percent across birth cohorts, and that at age 30 decreases from 69.9 percent to 54.0 percent. But at age 35 it decreases (only) from 82.7 percent to 77.3 percent (Figure 1). So Dutch women clearly go on giving birth after age 30. As a result, the proportion of women ultimately remaining childless can be expected to remain quite low in the Dutch post-1960 birth cohort (14 percent).

Japan

In Japan, women are giving birth later in the later cohort than in the earlier one, but most of all they are giving birth less. Figure 2 shows that the cumulative proportion of women in first birth at age 25 decreases from 34.4 percent to 20.0 percent across birth cohorts, while that at age 30 decreases from 76.3 percent to 58.7 percent. In the second place, the fact that in both birth cohorts most of the increase in the cumulative proportion of women in first birth takes place around age 25 points to the presence of a certain age norm (For a more extensive discussion on age norms see Brinton, 1988; Shirahase, 2000). The latter also means that those Japanese women who have not given birth by the 'required' age are rather unlikely to do so thereafter. So compared to Dutch women there is much less scope for catch-up behavior after age 30. This means that the proportion of women ultimately remaining childless can be expected to remain quite high. For instance, the proportion of women childless in the earlier cohort is 17.4 percent at age 33 (full observation) and 14.1 percent at age 50 (incomplete observation), while in the later cohort the proportion is 33.9 percent at age 33.

Karnataka

Figure 3 shows that the first birth behavior of the 1971-76 cohort differs quite substantially from that of the other three cohorts. The cumulative proportion of women in first birth at age 16 is somewhat higher for the 1971-76 cohort than for the three other cohorts. But the cumulative proportion of women in first birth at later ages is decisively

lower for the 1971-76 cohort than for the three other cohorts. This indicates that postponement of first birth as well as a lower incidence can be expected.

4.2.2 First marriage

The focus in this section is on the mean age at first marriage. In the case of the Netherlands and Japan it is calculated on the basis of a life-table analysis based on those women who experienced first birth by age 30. In the Netherlands and Japan, the mean age at first marriage increases across birth cohorts. In the Netherlands, the mean age at first marriage increases from 23.4 years to 31.7 years across cohorts. In Japan, the mean age at first marriage increases from 24.9 years in the pre-1960 birth cohort to 26.6 years in the post-1960 birth cohort.

As far as the Netherlands and Japan are concerned, even though the mean ages at first marriage for these two countries are more or less in line with each other in the pre-1960 birth cohort, the extent of increase across birth cohorts is very different. It seems that, at least when comparing mean ages, marriage behavior differs more widely than first-birth behavior.

Netherlands

The changes across birth cohorts can be summarised in three points. First, the trend is towards less and later marriage, as reflected in the changes in the cumulative proportions of women in first marriage at certain ages. The cumulative proportion of women in first marriage at age 30, for instance, drops from 83.9 percent to 65.7 percent across cohorts, and that at age 35 from 88.5 percent to 78.1 percent (Figure 4). In the second place, and as reflected in the decline across birth cohorts of the rate of increase in the cumulative proportion of women in first marriage between age 25 and 30, while Dutch women adhere to a certain age norm in the earlier cohort they do not do so anymore in the later cohort. Lastly, cohabitation becomes increasingly important among Dutch women in the later cohort illustrating the fact that cohabitation kind of starts replacing marriage (Figure 4).

Japan

The trend across cohorts in Japan is also towards later and less marriage. This is illustrated by the change across cohorts in the cumulative proportion of women in first marriage at a certain age. The cumulative proportion of women in first marriage at age 25, for instance, drops from 58.0 percent to 25.4 percent across cohorts, while that at age 30 drops from 88.5 percent to 69.7 percent (Figure 5). As in the case of first birth a certain age norm appears to guide Japanese marriage behavior in both birth cohorts. And because of these age norms women who do not get married by age 35 are rather unlikely to do so thereafter resulting in a rather high proportion of never-married women. From these illustrations it is clear that both first marriage and first birth behavior change over time: fewer women experience these events across birth cohorts, and the ones who do experience them do so on average at a slightly higher age. But even in the recent cohort behavior is relatively standardized illustrating the strong connection between marriage and first birth.

Karnataka

It appears that also in the case of Karnataka fewer women are getting married across birth cohorts, and are getting married later. Figure 6 shows that the starkest of the changes in the timing of the first union can be observed in the 1971-76 cohort. Marriage behavior between age 12 and 15 in this cohort does not differ from that in other cohorts. But after age 15 first marriages are postponed much more in this cohort than in the other three. As the cumulative proportions take into account both married and unmarried women this change in the youngest cohort is rather interesting.

4.2.3 The impact of education on first marriage, first birth and duration between first marriage and first birth by birth cohort

Netherlands

As far as first marriage behavior is concerned, there is already variation by level of educational attainment in the Dutch earlier cohort. The mean ages at first marriage differ quite a lot between levels of educational attainment. Table 8 shows that for low-educated women the mean age (for those women who experience the event by age 30) is 22.9 years, compared to 24.0 years for medium-educated women and 26.4 years for high-educated ones, with the difference between low- and high-educated women amounting to 3.5 years. The cumulative proportions of women in first marriage at certain ages also show that high-educated women postpone first marriage much more than low- and medium-educated ones. High-educated Dutch women of the earlier cohort get married to a much smaller extent than low- and medium-educated ones (Figure 7).

A similar pattern is observed in the Dutch earlier cohort for first birth behavior. The mean ages at first birth differ substantially between levels of educational attainment (Table 8). The cumulative proportions of women in first birth also show that high-educated women postpone much more than their low- and medium-educated counterparts and that more high-educated women remain childless than low- and medium-educated ones (Figure 8). Duration between first marriage and first birth also clearly differ by level of educational attainment, with no convergence between them (Figure 9).

Women at all levels of educational attainment postpone first marriage across birth cohorts. The mean age at first marriage increases from 22.9 to 25.2 years for low-educated women, from 24.0 to 26.7 years for medium-educated ones, and from 26.4 to 29.0 years for high-educated ones (Table 8). In the later cohort, the difference in first marriage behavior between low- and high-educated women becomes even more pronounced (The difference between the mean ages at first birth for the low- and high-educated women increases across cohorts from 3.5 to 3.8 years). The differences by level of educational attainment are also clear from the cumulative proportions of women in first marriage at certain ages illustrating that high-educated women postpone more than

low- and medium-educated ones but also that high-educated women get married to a much smaller extent than low- and medium-educated ones (Figure 10).

The data show postponement of first birth across birth cohorts only for Dutch medium- and high-educated women. The mean age at first birth decreases across birth cohorts from 24.6 to 24.3 years for low-educated women, while it increases from 25.9 to 27.6 years for medium-educated ones, and from 28.7 to 30.0 years for high-educated ones. It is important to note that the mean age at first birth among high-educated women is affected by the high number of censoring cases. The difference in first birth behavior between low- and high-educated women becomes more pronounced in the later cohorts. The difference between the mean ages at first birth for low- and high-educated women increases from 4.1 years to 5.7 years across cohorts.

Finally, the duration between first marriage and first birth also clearly differs between highly educated women on the one hand and low and medium educated ones on the other hand (Figure 12).

Japan

There is not much variation by level of educational attainment as far as first marriage behavior is concerned in the Japanese earlier cohort. The mean ages at first marriage (based on those women who experience the event by age 30) do not differ that much across levels of educational attainment. They are 23.8 years for low-educated women, 24.6 years for medium-educated women, and 26.0 years for high-educated women, with the difference between low- and high-educated women amounting to 2.2 years (Table 9). The cumulative proportions of women in first marriage at certain ages show that both low- and medium-educated women display almost identical behavior. High-educated women become brides later than low- and medium-educated women, but only a little bit later, and ultimately they get married to the same extent as low- and medium-educated women (Figure 13). The absence of variation in first marriage behavior by level of educational attainment shows that the impact of educational attainment in the earlier cohort is limited. Such a result is also found in other studies (Raymo, 2003; Shirahase, 2000; Retherford, Ogawa, Matsukura, 2001).

Also in the case of first birth behavior there is not much variation by level of educational attainment in the Japanese earlier cohort. The mean ages at first birth do not differ that much across levels of educational attainment. They are 25.7 years for low-educated women, 26.3 years for medium-educated women, and 27.6 years for high-educated women, with the difference between low- and high-educated women amounting to 1.9 years (Table 9). The cumulative proportions of women in first birth at certain ages are almost identical to the cumulative proportions of women in first marriage at certain ages. Both low- and medium-educated women display almost identical behavior. However, high-educated women give birth later than their low- and medium-educated counterparts, but ultimately they give birth to the same extent as low- and medium-educated women (Figure 14).

The duration between first marriage and first birth (Figure 15) is also equal for women at all levels of educational attainment illustrating that once they get married they display identical behavior regardless of their level of educational attainment. It also shows that most women give birth from 9 months after their marriage onwards, suggesting that pre-marital conception is limited. These characteristics show that the impact of educational attainment in the earlier cohort is quite limited and that a very close relation exists between first marriage and first birth behavior.

Women in Japan postpone first marriage across birth cohorts, irrespective of their level of educational attainment. Table 9 shows that for low-educated women the mean age at first marriage increases across birth cohorts from 23.8 to 25.0 years, for medium-educated women from 24.6 to 25.9 years, and for high- educated women from 26.0 to 28.7 years. Levels of educational attainment differentiate first marriage behavior to a much larger extent in the more recent cohort. Table 9 shows that the difference in the mean age at first marriage between low- and high-educated women increases across cohorts from 2.2 to 3.7 years. The differences by level of educational attainment are also clear from the cumulative proportions of women in first marriage at certain ages (Figure 16). Low-educated women start getting married much earlier than medium- and high-educated women, and more of them get married at a younger age. Medium- and high-educated women start getting married later than low- educated ones, with the difference

between medium- and high-educated ones being quite large. Eventually, it is the medium- rather than the low-educated women who get married to the largest extent.

Women at all levels of educational attainment also postpone first birth. For low-educated women the mean age at first birth increases across birth cohorts from 25.7 to 26.4 years, for medium-educated women from 26.3 to 27.3 years, and for high-educated women from 27.6 to 28.8 years (Table 9). Levels of educational attainment affect first birth behavior to a much larger extent in the more recent cohort. As shown in Table 9, the difference in terms of first birth behavior between low- and high-educated women increases across birth cohorts from 1.9 to 2.4 years. These issues are also reflected in the cumulative proportions of women in first birth at certain ages (Figure 17).

Finally, the duration between first marriage and first birth differs by level of educational attainment. Women with low education have their children at a younger age than medium- and high-educated ones, and medium-educated women bear children earlier than high-educated ones. Eventually, however, the cumulative proportions of women in motherhood for all three levels of educational attainment converge.

Karnataka

In this section, we look at changes across different birth cohorts and levels of educational attainment in the timing of women's entry into first union/marriage and first birth. Tables 10 and 11 show the changes in the timing of entry into first marriage and first birth across birth cohorts and different educational level of women. These tables show for each birth cohort the proportion of woman unmarried and without children at certain ages. These tables are derived from life table estimates by level of educational attainment.

Table 10 (as well as Figure 18 to 21) shows that changes in the timing of entry into first marriage are observable both across birth cohorts and across different levels of educational attainment. We find that in all birth cohorts low educated women experience marriage much earlier than middle incomplete, middle complete and high-educated women. Most of the low educated women experience marriage before the age of 18. For instance, in the oldest birth cohort, namely that of 1949-1960, only 28 percent remains unmarried at the age of 18. Similar results are found for low educated women in the other

birth cohorts. Results already differ for middle incomplete educated women. In all birth cohorts, these women generally appear to postpone marriage and only get married to a substantial degree by age 20 instead of age 18. So this shows that the level of educational attainment does matter: the number of years of schooling has an effect on the timing of entry into an important event in a woman's life like her first marriage. Both the middle complete and the high educated women postpone to a larger extent still, but the differences between them are quite large. While in all birth cohorts, 65 to 72 percent of the middle complete educated women are unmarried at age 18, 40 to 52 percent of them are unmarried at age 20, and 17 to 41 percent unmarried at the age of 22. In the case of high educated women the proportion ranges are 88 to 90 percent, 67 to 80 percent and 37 to 55 percent respectively.

Table 11 shows that a relationship can be observed between the number of years spent in schooling and the delay in the birth of the first child. This relationship holds true across all birth cohorts and all levels of educational attainment. Some 50 percent of low educated women already have had their first child by the age of 18. Most of the remaining low educated women have their first child by age 22. As far as middle complete and high educated women are concerned, they do not give birth at ages 18 and 20. But while middle complete educated women start giving birth at age 22, that is not the case of high educated ones.

In the oldest cohort (1949-1960), most literate women are either low (34.4 percent) or middle incomplete educated (31.9 percent). Combining this with Table 11, this means that most women in this cohort have their first child before age 22.

In the birth cohort 1966-1970, the proportion of low educated women declines and that of middle complete and high educated ones increases. 23.2 percent of literate women are high educated, becoming somewhat more representative. By age 18, 96 percent of high-educated has not given birth, decreasing to 87 percent at age 20 and 70 percent at age 22. The situation is comparable for birth cohort 1971-1976. As it is the high educated women that are most likely to delay child bearing they are also most likely to engage in catch-up behavior later on, closer to and after age 30. Eventually a bare minimum remains childless.

From the duration analysis (Figure 22 to 25), we find that there are no variations by educational attainment until 24 months of first birth interval. However, after this duration of 24 months, there are variations, particularly amongst low educated women on one hand, and medium and high on other. But at longer duration's, these differences disappear. In the later cohort that is from the cohort 1966-1970 and 1971-1976, much more variations by educational attainment are observed compared to the early cohorts of women. As far as the first birth interval is concerned in this cohort of women, high-educated women since 0 month duration have been delaying their first birth than the low and medium educated women. This behavior of the high-educated women remains to be different than the low and middle incomplete and the middle complete ones.

5 Conclusion

Starting from the debate on demographic convergence, the objective of this paper was to empirically assess whether demographic behavior is converging across different societies and whether the same determinants are driving demographic behavior in those countries. We assessed this through a case study of first marriage and first birth behavior in three societies, focusing on the mean age at first birth, the mean age at first marriage, and the role of education in the Netherlands, Japan and Karnataka. We studied continuity and change in demographic behavior across cohorts within each society, as well as similarities and differences in demographic behavior across societies.

We demonstrated that in all three societies educational attainment plays a significant role in influencing the occurrence and timing of first marriage and first birth across birth cohorts. Some interesting similarities and differences can be noted. Probably the single state life table results for the Netherlands and Japan are the ones which are most comparable. The weakening link between marriage and motherhood in the Netherlands, the absence of concentration of behavior around certain ages, and the large impact of levels of educational attainment on marriage and motherhood point to the existence of individualised life courses in the Netherlands. On the other hand, the close connection between marriage and motherhood in Japan, the concentration of behavior around certain ages, and the limited impact of levels of educational attainment on marriage and

motherhood point to the continued importance of standard life courses in Japan. The above - as well as from the incidence of cohabitation and extramarital births in the Netherlands, and their absence in Japan - also means that it is unlikely that the Netherlands constitutes some kind of model to which Japan will evolve in the future, thus providing no support for the convergence thesis.

Even though the results for Karnataka are not fully comparable to those for the Netherlands and Japan nevertheless some interesting observations can be made. Perhaps the most important one is that already from the oldest birth cohort onwards the impact of educational attainment on the timing of first marriage (delay) and the duration between first marriage and first birth (lenghtening) is rather clear. This is interesting because even though Karnatakan fertility levels have only recently dropped below replacement level, nevertheless the Karnatakan case seems to be aligned much more with the Dutch one, where also already in the earlier cohort the role of education is obvious, than with the Japanese one, where the women in the earlier cohort display identical first marriage and first birth behavior regardless of their level of educational attainment. It is probably too early to draw firm conclusions from the analysis carried out for this paper but the results indicate that a case-study such as the Karnatakan one has great potential to provide valuable contributions to the debate on demographic convergence and the second demographic transition in both developed and developing western and non-western societies.

6 References

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7 Appendix

Table 1 Selective indicators on fertility, 1965-2000, Netherlands, Japan, India and Karnataka

Indicator	Country	1965	1970	1975	1980	1985	1990	1995	2000
TFR	NL	3.04	2.57	1.66	1.60	1.51	1.62	1.53	1.72
	JPN	2.14	2.14	1.90	1.75	1.76	1.54	1.42	1.36
	IND	6.2	5.8	5.3	4.9	4.4 (4.3)	3.8	3.4 (3.5)	3.0 (2.85)
	KAR					3.6	3.2	2.7	2.13
MAFB	NL	25.2	24.8	25.2	25.7	26.6	27.6	28.4	28.6
	JPN	25.9	25.8	25.7	26.1	26.5	27.2	27.8	28.0
	IND								
	KAR								
TFMR	NL	1.13	1.06	0.83	0.68	0.57	0.66	0.53	0.59
	JPN		0.80		0.67		0.48		0.47
	IND								
	KAR								
MAFM	NL	23.6	22.9	22.6	23.2	24.4	25.9	27.1	27.8
	JPN	24.5	24.2	24.7	25.2	25.5	25.9	26.3	27.0
	IND								
	KAR								

Source: Netherlands: Council of Europe, 2001; Japan: National Institute of Social Security and Demographic Research, 2003b.

Table 2 Macro-indicators on female educational attainment, 1970-2000, Netherlands, Japan and India

		1970	1975	1980	1985	1990	1995	2000
NL	Gross enrolment rate (sec.)	68.80	85.0	90.40	114.50	124.10	141.10	126.39
	Gross enrolment (ter.)	11.10	17.0	23.80	26.60	36.10	46.30	56.80
	Average years of schooling	7.50	7.73	7.99	8.25	8.51	8.89	9.12
JPN	Enrolment rate (sec.)	86.30	92.50	94.30	96.50	98.0	104.20	102.96
	Enrolment (ter.)	9.90	17.20	20.30	19.80	23.30	-	43.88
	Average years of schooling	7.10	7.40	8.16	8.38	9.0	8.86	9.08
IND	Enrolment	14.10	16.0	19.80	26.40	32.90	38.0	40.07(1999)

	rate (sec.)							
	Enrolment (ter.)	2.20	2.50	2.90	3.80	4.20	5.0	8.26(1999)
	Average years of schooling	1.20	1.56	1.89	2.29	2.74	3.18	3.74(2000)
	Illiterate rate (%of females 15+)	81.49	77.79	73.46	68.80	64.08	59.43	54.61

EdStats - the World Bank's comprehensive Database of education statistics
http://www1.worldbank.org/education/edstats/

Table 3 Conversion of survey educational classification into ISCED, Netherlands (OG98)

OG98			
Variable label	Old	Applying ISCED	New
2	PrimaryLower secondary	1	low
3	Higher secondary	2	low
4	First stage higher education	3	medium
5	Second stage higher education	4	high
6	Third stage higher education	5	high
7		6	high

Source: OECD (1999) and OG98

Table 4 Conversion of survey educational classification into ISCED, Japan (JNFS92)

OG98			
Variable label	Old	Applying ISCED	New
2	Primary	1	low
3	Lower secondary	2	low
4	Higher secondary	3	medium
5	First stage higher education	4	high
6	Second stage higher education	5	high
7	Third stage higher education	6	high

Source: OECD (1999) and JNFS92

Note 1 Conversion of survey educational classification into 4-point scale, Karnataka

It is observed that across birth cohorts of women in Karnataka, illiteracy or those women with no education has declined from 53.4 percent in the cohort born 1960 and before to 46.1 percent in the cohort 1971-1976. NFHS-2, Karnataka also reports a decline in the level of illiteracy from 62 percent as found in NFHS-1, to

55 percent at the time of NFHS-2 (IIPS, 2001). However among women who are literate across all birth cohorts, the largest proportions are those that have incomplete secondary school education. Thus while illiteracy has seen a decline of 7.3 percent from the oldest to the youngest cohort, those attaining completed secondary education has increased by 3.3 percent for the same birth cohorts. In the youngest birth cohort ie born 1971-1976, not only has illiteracy declined, but it is also observed that there has been an increase in the proportion of women with incomplete secondary, complete secondary and higher education when compared with the cohort of women born 1966-1970. From this we can say that women in the cohort 1971-1976 have been attending increased number of years of schooling when compared to the other cohorts of women in Karnataka.

With each birth cohort we can observe that apart from a substantial proportion of women who have no education, the distribution of women in the other educational categories have shifted from lower levels of education in the older cohorts to higher levels of education in the youngest cohort. The inter cohort observation also reveals that there is a clear shift in the educational attainment of women from lower levels to higher levels. If illiterate women are left out, we can find that of the women who are literate whilst in the cohort born 1960 and before incomplete primary ie 4 years of schooling and incomplete secondary ie 6-9 years of schooling were clear markers, in the cohort born 1971-1976, the markers are either incomplete secondary education ie 6-9 years of schooling or complete secondary ie 10 years of schooling and higher ie 11 to 19 years of schooling. Thus with this shift in educational markers we can also say that women in the cohort 1971-1976 have been attending more number of years of schooling which could have an influence on the timing of their marriage and first birth.

Table 5 Proportion of women by birth cohort and level of educational attainment, Karnataka

Educational categories	1960 and before	1961-1965	1966-1970	1971-1976	Total
Illiterate	53.4	52.6	48.9	46.1	50.2
Incomplete primary (4 years of schooling)	11.5	8.2	8.4	8.1	9.3
Complete primary (5 years of schooling)	4.5	4.8	4.5	4.2	4.5
Incomplete secondary (6-9 years of schooling)	14.9	16.4	16.0	17.9	16.3
Complete secondary (10 years of schooling)	8.2	9.0	10.4	11.5	9.7
Higher (11-19 years of schooling)	7.5	9.0	11.9	12.2	10.0
Number of women	1128	669	751	1019	3567*

**907 cases missing (as women born after 1976 are not included)*

Note 2 Selection of 1960 birth cohort cut-off point in the Netherlands and Japan

For the data set for the Netherlands and Japan, a distinction is made between two birth cohorts on the basis of the year and month of birth. In each datasheet, people born at the latest in December 1959 belong to the earlier birth cohort while people born at the earliest in January 1960 belong to the later birth cohort. Two reasons are given for this cut-off point. In the first place, it leaves a sufficiently large window of observation for the later birth cohort: 32 years for the Japanese sample, and 38 years for the Dutch sample, as well as a sufficient number of observations. Secondly, in the Netherlands as well as in Japan, these cohorts allow us to capture the value change and innovative demographic behavior.

Note 3 Reason for opting for 4 cohorts in the case of Karnataka

The birth cohorts have been categorised for Karnataka as those born 1960 and before, 1961-1965, 1966-1970 and 1971-1976. Each birth cohort has a uniform five-year period distribution. This is with the exception of the upper range for the oldest cohort, which is in accordance with the year of birth of the oldest women in the NFHS survey. The oldest cohort includes women who are born between 1949-1960. Unlike the Dutch and the Japanese case, the birth cohorts for the Karnataka context are not divided into broad categories. This is because of the fact that by dividing into two broad categories changes can hardly be observed. It was thus decided to distinguish the birth cohorts into 4 distinct categories. After we have the birth cohorts of women we can now specify the age categories of women in the different birth cohorts. The year of interview as stated in the NFHS-2, datasheet for Karnataka is the year 1999. Thus the age ranges of the women included in this study for the Karnataka context were broadly 22-49 years of age at the time of survey.

Table 6 Levels of educational attainment by birth cohort, the Netherlands (OG98)

	Frequency Total (<60/60<)	%
Low	1,417 (740/677)	26.0 (32.0/21.5)
Medium	2,438 (922/1,516)	44.7 (40.0/48.2)
High	1,352 (474/878)	24.8 (20.5/27.9)
Not known /Missing	243 (170/73)	4.5 (7.3/2.3)
Total	5,450 (2,306/3144)	100.0

Note: Total (<60/60<) means those who are born before 1960 and those who are born in 1960 and after.

Table 7 Levels of educational attainment by birth cohort, Japan (JNFS92)

	Frequency Total (<60/60<)	%
Low	1,370 (1,123/247)	10.7(16.0/4.29)
Medium	6,355 (3,698/2,657)	49.7(52.7/46.2)
High	4,912 (2,081/2,831)	38.5 (29.6/49.2)
Not known /Missing	138 (117/21)	1.1 (1.7/0)
Total	12,775 (7,019/5,756)	100.0

Note: Total (<60/60<) means those who are born before 1960 and those who are born in 1960 and after.

Note 4 On levels of educational attainment by birth cohort, Karnataka

Results from NFHS-2 suggest that in 1998-1999 the rate of illiteracy among ever-married women age 15-49 stands at 55 percent in Karnataka (compared to 58 percent in the whole of India). This constitutes a decline compared to the 62 percent observed overall in NFHS-1 (1992-93). The decline over time is also reflected in the different rates of illiteracy found for different age groups in NFHS-2. The rate for women age 45-49 reaches 61 percent while that for women age 15-29 reaches only 53 percent.

Literacy is clearly connected to the years of education completed. Most of the literate women have completed primary school (5-7 years of education). From NFHS-1 (1992-93) to NFHS-2 (1998-99) there has been an increase in the percentage of women having completed high school (10-11 years of education) from 14 to 20 percent. As for NFHS-2 (1998-99), among ever-married women age 25-29 at the time of survey, 12 percent of them had completed as their highest level of educational attainment higher secondary education and above. These women are from the birth cohort 1970-1976.

Literacy rates, 1981-2001, Karnataka

	Census 1981	**Census 1991**	**NSS 53rd round 1997**	**Census 2001**
Person	46.20	56.04	58	67.04
Male	58.72	67.26	66	76.29
Female	33.16	44.34	50	57.45

Source: 1981, 1991 and 2001 Census of India; Office of the Registrar General of India 1997; National Sample Survey Organization 53rd Round

Note 5 On wanted and unwanted fertility, Karnataka

It is conventional to think that educational attainment of women has its impact on the fertility scenario of a country. Research and many of the empirical evidence proves this point (Cochrane 1979, Caldwell 1982, Jejeebhoy 1995, Jeffery and Basu 1996, United Nations 1987). Fertility is found to be higher amongst uneducated women than amongst better-educated women (United Nations 1987) which has a direct bearing on the average number of children a woman in her reproductive years would eventually produce. The level of total fertility rate that a country helps us in understanding the stage of demographic transition the country is situated in. Thus on one hand we can perceive the link between education and fertility and the on the other is the link between education and the transition stage of the country.

If adoption of contraception is looked at as the principal proximate cause leading to the ongoing fertility decline, there is a need to understand how along with the total fertility rates, the wanted and the unwanted fertility rates are influenced. We look at all the three by the literacy levels of women in Karnataka and for the whole of India.

NFHS-2, Karnataka

Literacy levels	TFR	WTFR	UNWTFR
Illiterate	2.57	1.82	0.75
Literate<Middle	2.09	1.47	0.62
Middle complete	2.06	1.55	0.51
High school and above	1.89	1.59	0.30

NFHS survey has asked women questions for each child born in the three years prior to the survey and the currently pregnant women during the survey whether the pregnancy was wanted at that time (planned), wanted at a later time (mistimed) or not wanted at all. Wanted total fertility in NFHS is calculated in the same way as the total fertility rate but with the exception that all births that have occurred after the mother has reached her desired family size are excluded. The wanted total fertility rate thus gives us a picture of what the fertility would be like if the unwanted births was prevented. The unwanted total fertility rate is the difference between the total fertility rate and the wanted total fertility rate.

As can be observed from the table above, there are wide differences in the TFR and WTFR by levels of education of women in Karnataka. The overall level of TFR and WTFR is 2.13 and 1.56

respectively in the year 1998-99 (NFHS-2) when compared to the TFR of 2.85 and WTFR of 2.18 respectively in the year 1992-93 (NFHS-1). Hence the overall UNWTFR has declined from 0.67 in the year 1992-93 to 0.57 in the year 1998-99 (NFHS results). Bongaarts (2003) states that fertility differentials of TFR, WTFR and UNWTFR are different at different stages of the transition process of a country. According to the ranges of total fertility rates assigned to the different transition stages Karnataka with a TFR of 2.13 falls in the phase of late transition stage. Similar is the criterion as regards the UNWTFR. The overall UNWTFR at the present level of 0.57 in the year 1998-99, categories Karnataka in the late transition stage. As can be observed from the table 2 above, women with educational level high school and above have lower wanted and unwanted fertility than women with middle complete educational level. The above table shows exactly the way in which TFR, WTFR and UNWTFR behave for the context of Karnataka.

Note 6 On the timing of the first union in Karnataka

Initiation of first union in the Karnataka context can be distinguished into the timing of first marriage and the timing of living together with the husband. NFHS datasheet makes a clear distinction between the two variables. Indian society is largely patrilocal wherein the girl after her marriage leaves her parents home to reside with her husband. This is popularly known as *'gauna'* or *'vadhu-vara griha pravesh'* in the Karnataka context (NFHS-1, 1992-93 p 52). In some cases the timing of marriage and living together along with the husband takes place at the same time, while in some cases the formal ceremony of marriage is conducted when the girl is very young and hence she goes to reside with her husband only after attaining menarche. The timing of first union is taken directly from the NFHS-2, dataset stated by the variable 'Age at first union (calculated)'. This variable gives us the age at which the first union i.e. living together with the husband has taken place. NFHS-2 (2001 p.40) states that *' the difference between the median age at first marriage and the median age at first cohabitation is negligible in both rural and urban areas. This suggests that 'gauna' or similar practices that introduce a lag between marriage and cohabitation are not important in Karnataka or they usually take place at the same time as the marriage'.*

Figure 1 Cumulative proportion of women at age at first birth by birth cohorts, the Netherlands

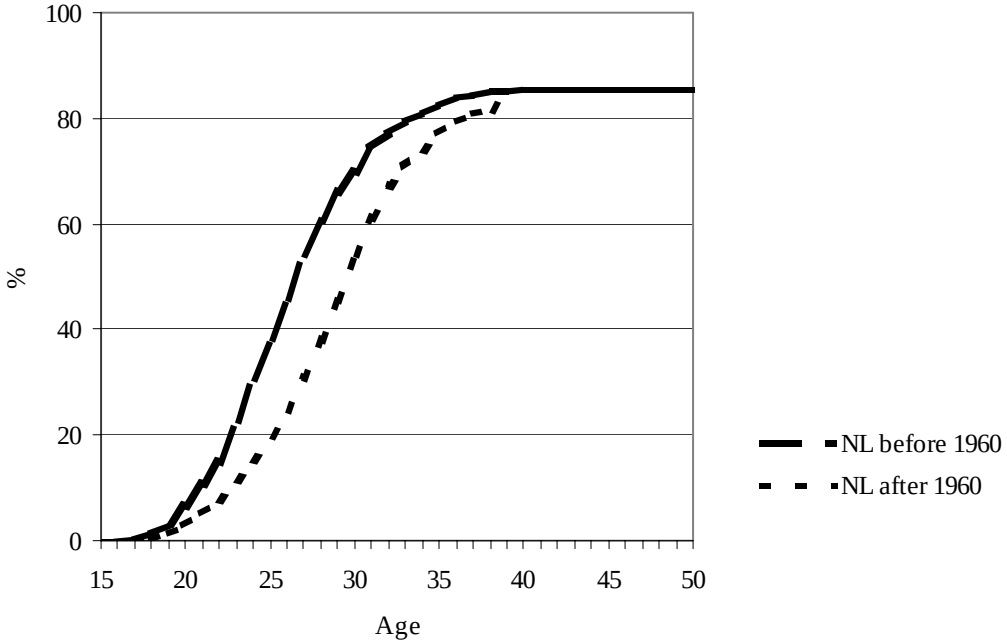


Figure 2 Cumulative proportion of women at age at first birth by birth cohorts, Japan

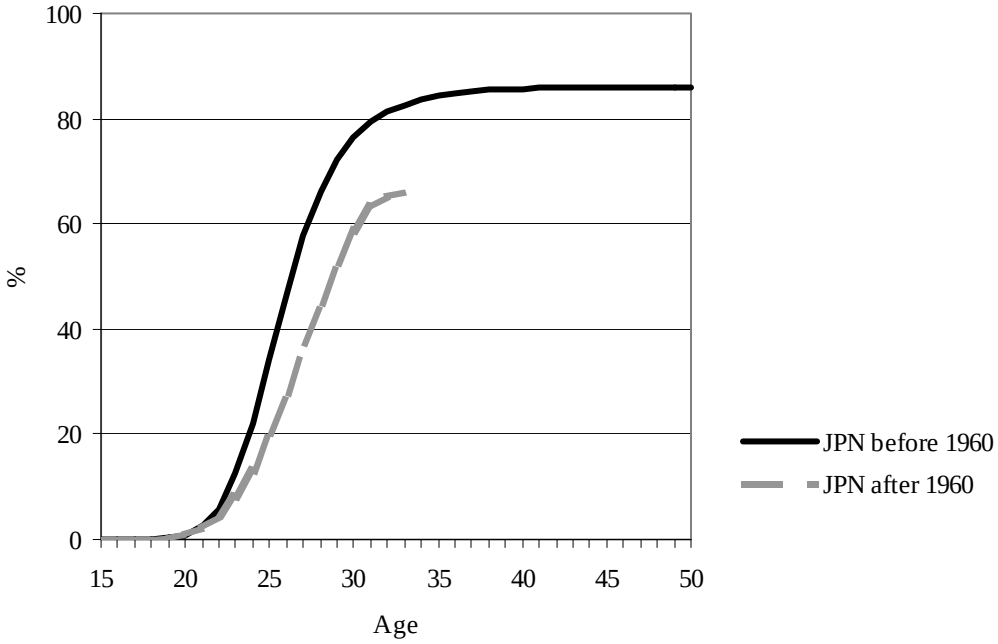


Figure 3 Cumulative proportion of women at age at first birth by birth cohorts, Karnataka

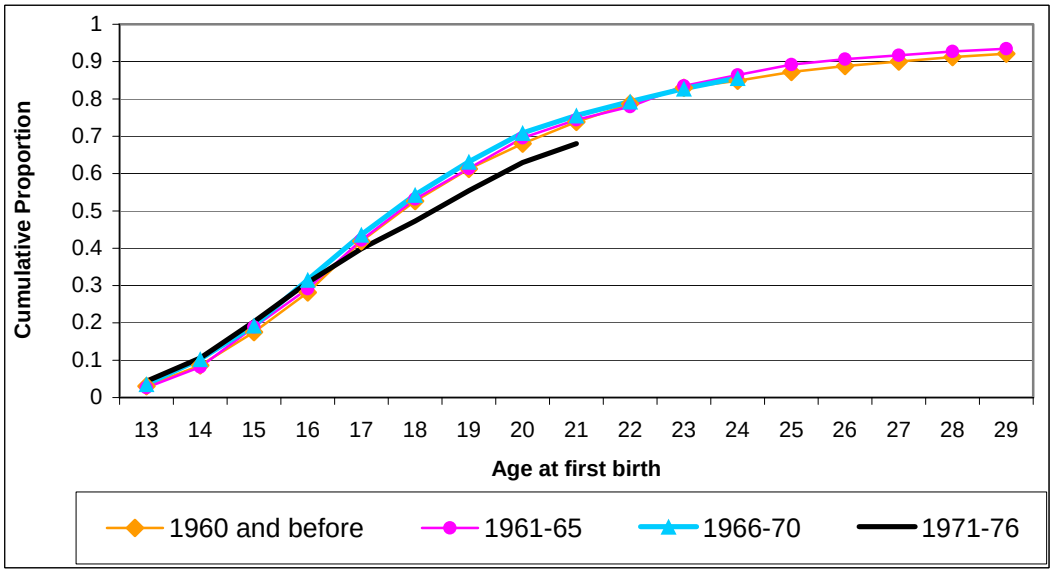


Figure 4 Cumulative proportion of women at age at first marriage by birth cohorts, Netherlands

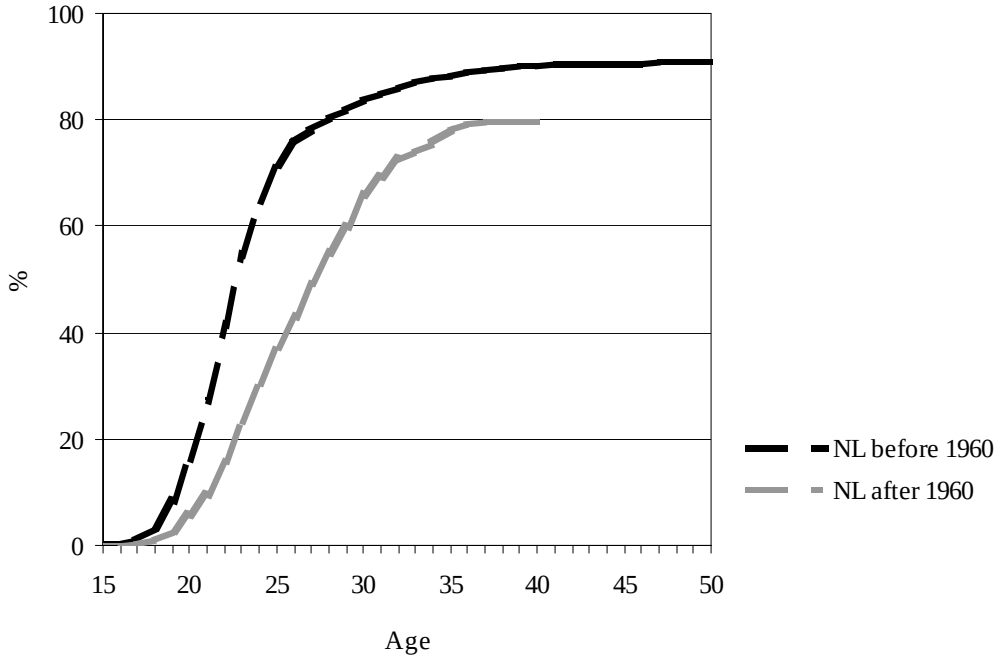


Figure 5 Cumulative proportion of women at age at first marriage by birth cohorts, Japan

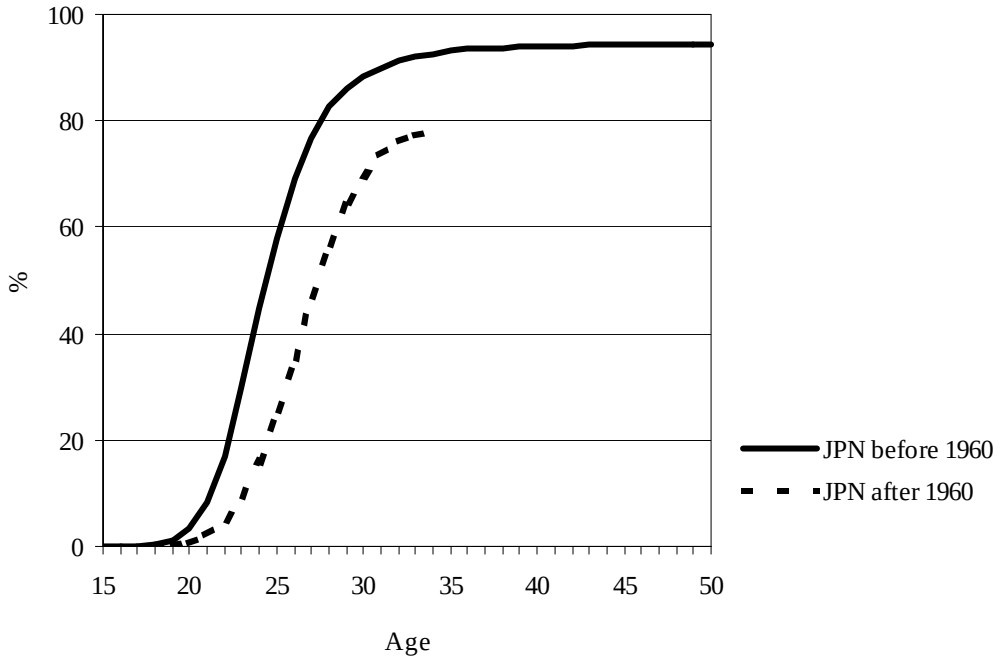


Figure 6 Cumulative proportion of all women at age at first union by birth cohorts, Karnataka

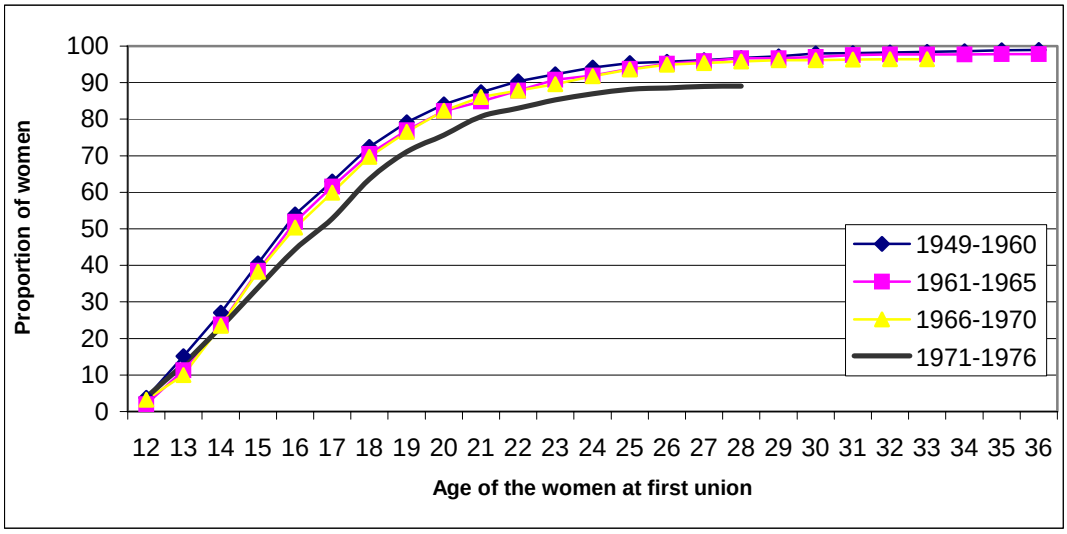


Table 8 Mean age at first marriage and first birth by birth cohort and level of educational attainment, the Netherlands

	Born before 1960		Born after 1960	
Level of ed. att.	First marriage	First birth	First marriage	First birth
Low	22.9	24.6	25.2	24.3
Medium	24.0	25.9	26.7	27.6
High	26.4	28.7	29.0	30.0

Figure 7 Cumulative proportion of women in first marriage in early cohort by age and level of educational attainment, the Netherlands

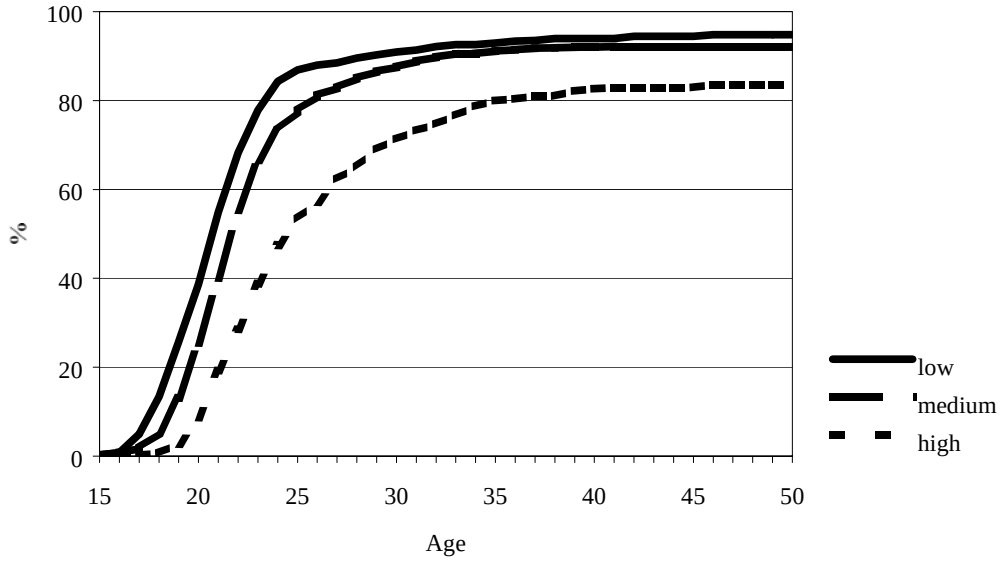


Figure 8 Cumulative proportion of women at first birth in early cohort by age and level of educational attainment, the Netherlands

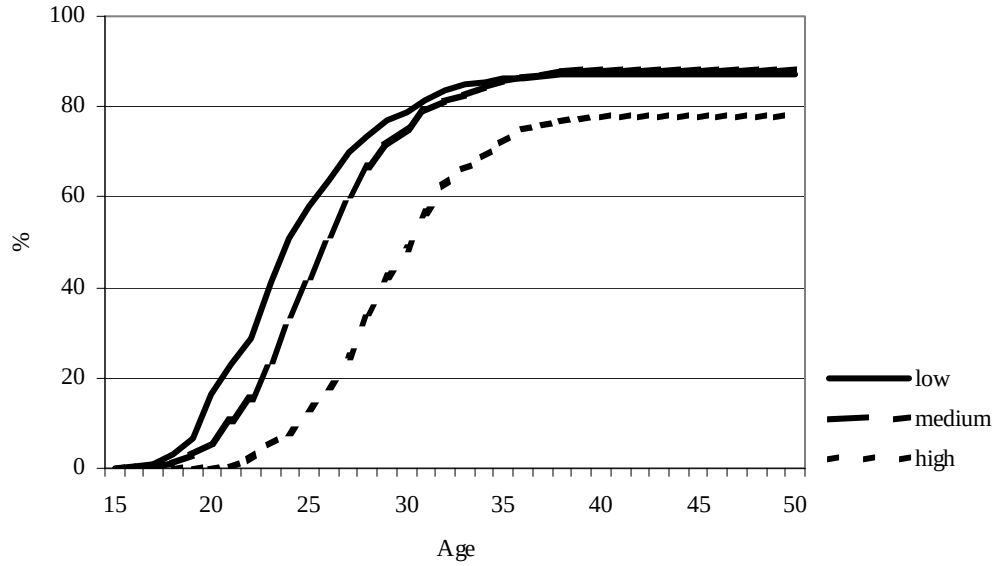


Figure 9 Cumulative proportion of women at first birth in early cohort by duration of marriage (months) and level of educational attainment, the Netherlands

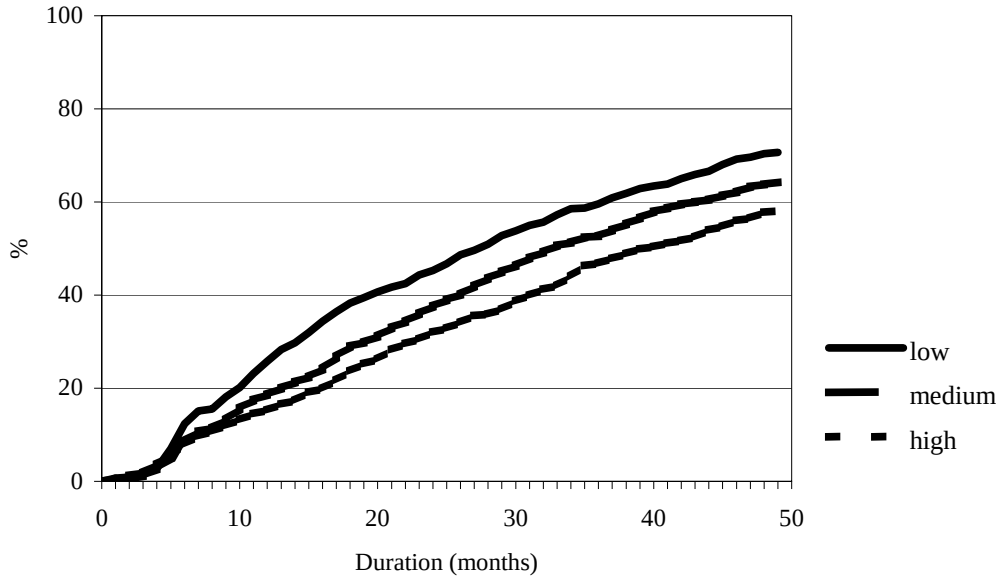


Figure 10 Cumulative proportion of women in first marriage in later cohort by age and level of educational attainment, the Netherlands

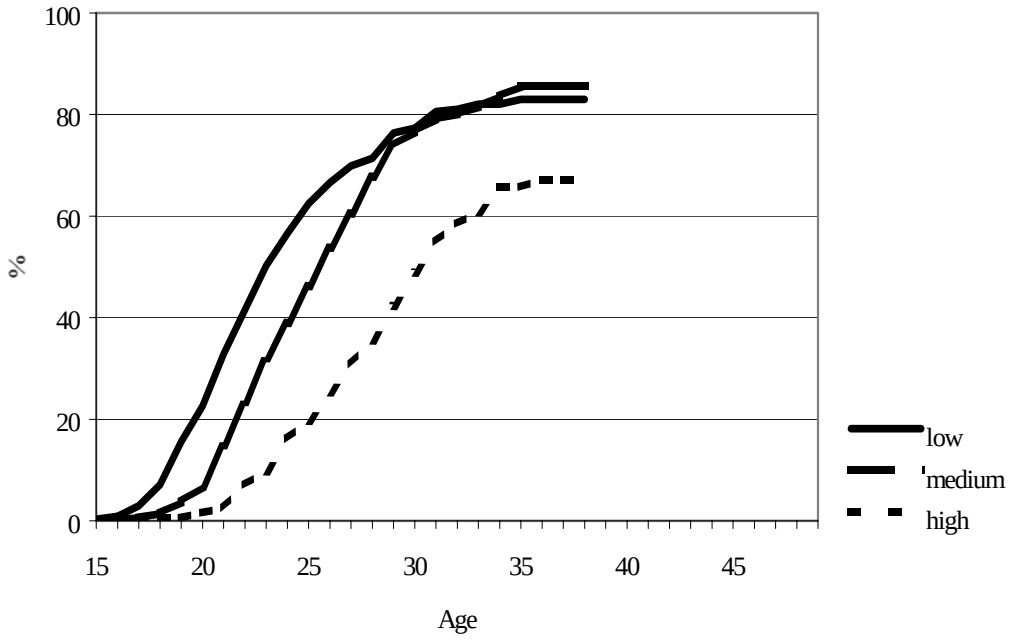


Figure 11 Cumulative proportion of women at first birth in later cohort by age and level of educational attainment, the Netherlands

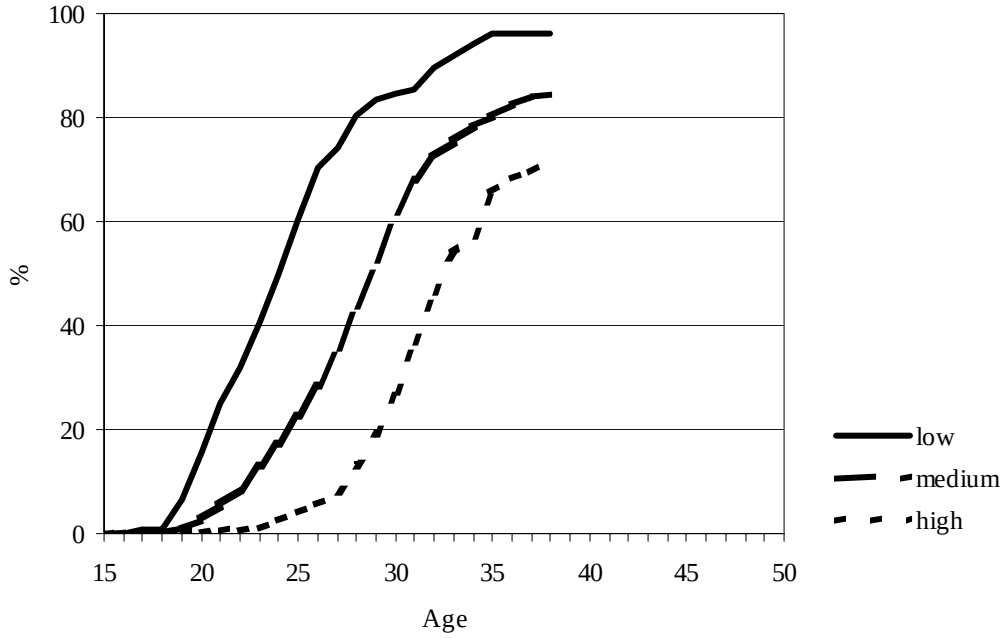


Figure 12 Cumulative proportion of women at first birth in later cohort by duration of marriage (months) and level of educational attainment, the Netherlands

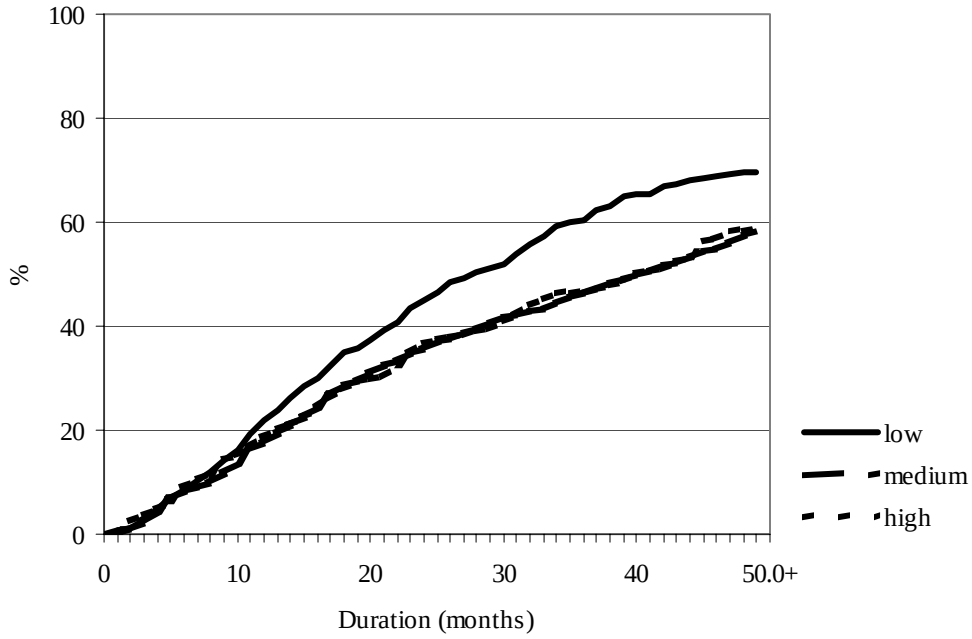


Table 9 Mean age at first marriage and first birth by birth cohort and level of educational attainment, Japan

	Born before 1960		Born in and after 1960	
Level of ed. att.	First marriage	First birth	First marriage	First birth
Low	23.8	25.7	25.0	26.4
Medium	24.6	26.3	25.9	27.3
High	26.0	27.6	28.7	28.8

Figure 13 Cumulative proportion of women in first marriage in early cohort by age and level of educational attainment, Japan

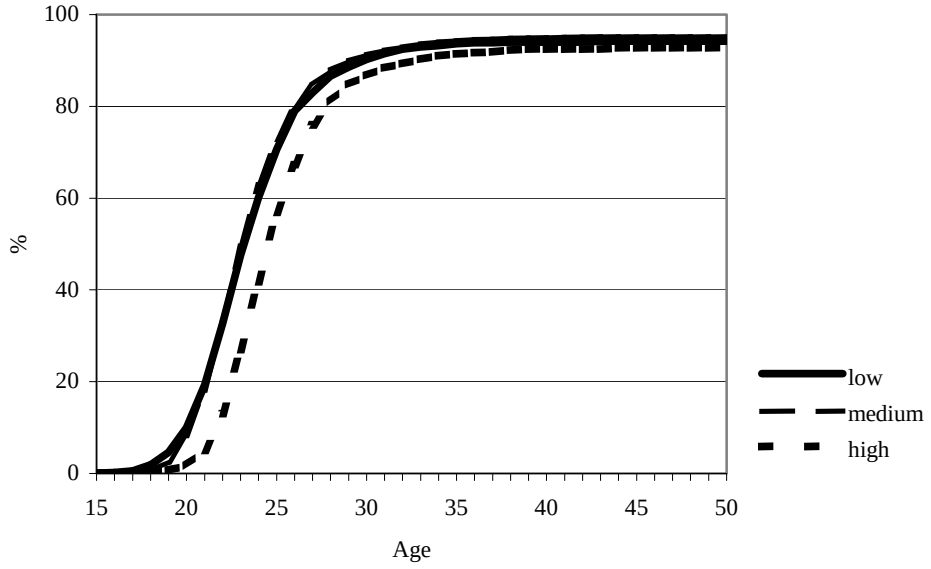


Figure 14 Cumulative proportion of women at first birth in early cohort by age and level of educational attainment, Japan

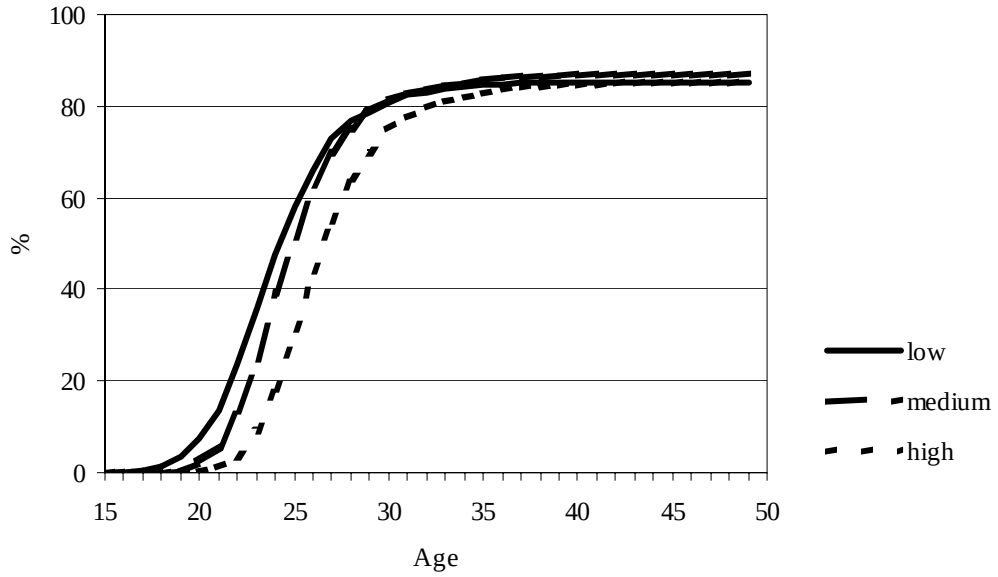


Figure 15 Cumulative proportion of women at first birth in early cohort by duration of marriage (months) and level of educational attainment, Japan

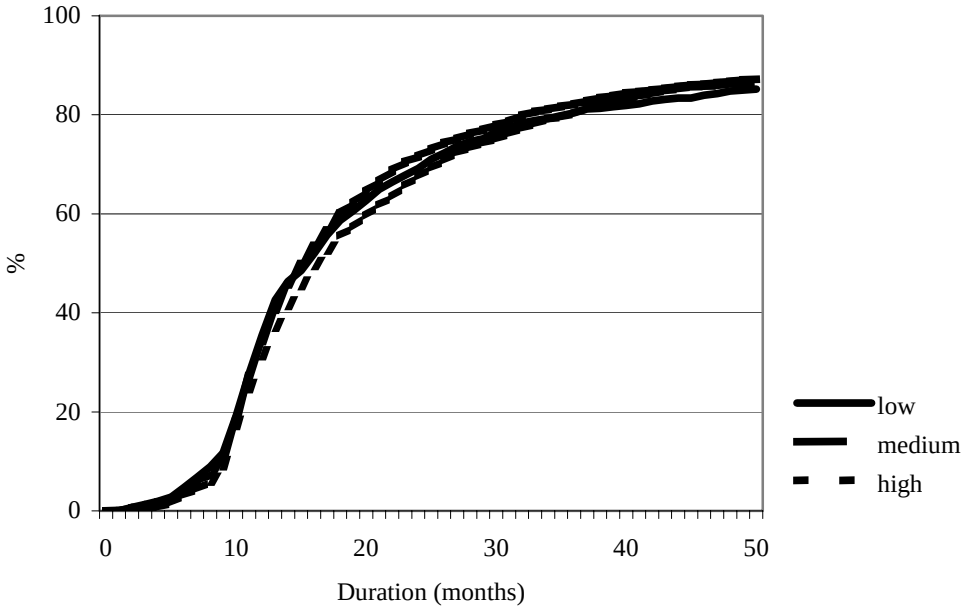


Figure 16 Cumulative proportion of women at first birth in later cohort by age and level of educational attainment, Japan

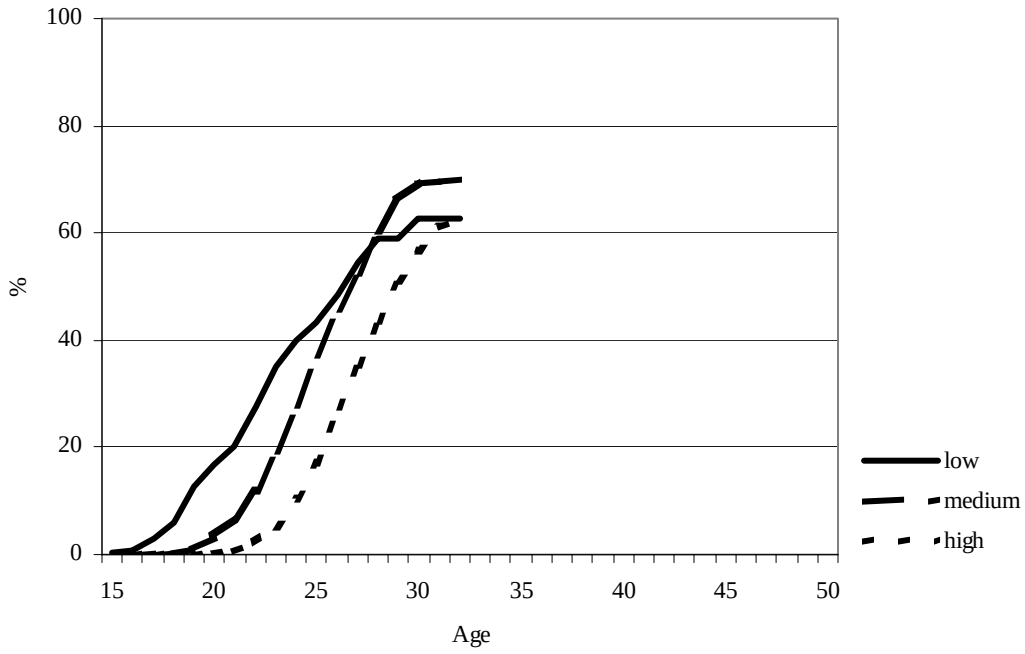


Figure 17 Cumulative proportion of women at first birth in later cohort by duration of marriage (months) and level of educational attainment, Japan

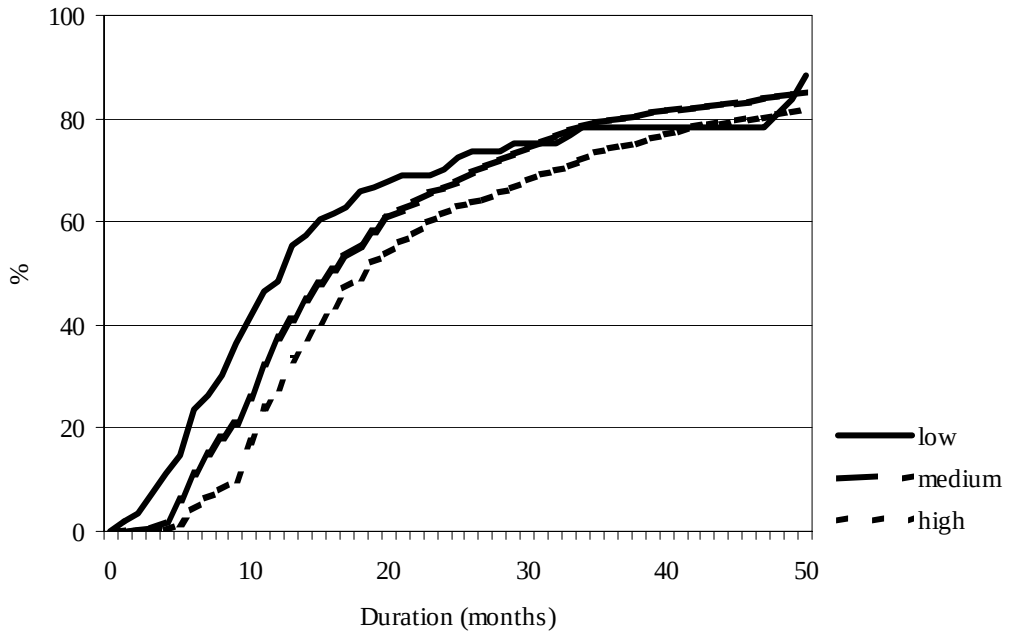


Table 10 Changes in the timing of entry into first marriage as measured by proportion without their first marriage at specific ages (percentages) Karnataka

Birth Cohort	Proportion of women without their first marriage at age		
Low educated	18	20	22
1949-1960	28	11	6
1961-1965	25	14	10
1966-1970	21	10	2
1971-1976	24	7	3
Middle incomplete	18	20	22
1949-1960	42	23	11
1961-1965	44	19	11
1966-1970	37	17	8
1971-1976	49	22	9
Middle complete	18	20	22
1949-1960	67	41	31
1961-1965	72	52	41
1966-1970	72	45	25
1971-1976	65	40	17
High educated	18	20	22
1949-1960	88	71	52
1961-1965	88	80	55
1966-1970	89	70	47
1971-1976	90	67	37

Table 11 Changes in the timing of entry into first birth as measured by proportion without their first child at specific ages (percentages) Karnataka

Birth Cohort	Proportion of women without their first child at age		
Low educated	18	20	22
1949-1960	51	31	20
1961-1965	50	28	18
1966-1970	48	22	12
1971-1976	41	26	13
Middle incomplete	18	20	22
1949-1960	62	35	21
1961-1965	66	40	23
1966-1970	58	35	16
1971-1976	67	40	12
Middle complete	18	20	22
1949-1960	73	64	41
1961-1965	83	70	56
1966-1970	85	60	40
1971-1976	86	62	48
High educated	18	20	22
1949-1960	95	80	64
1961-1965	96	92	74
1966-1970	96	87	70
1971-1976	97	83	60

Figure 18 Women in cohort 1949-1960, Karnataka

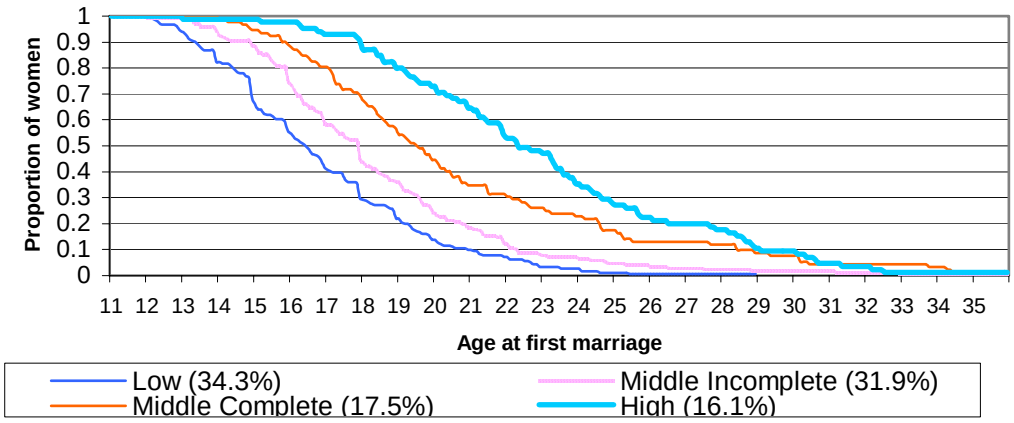


Figure 19 Women in cohort 1961-1965, Karnataka

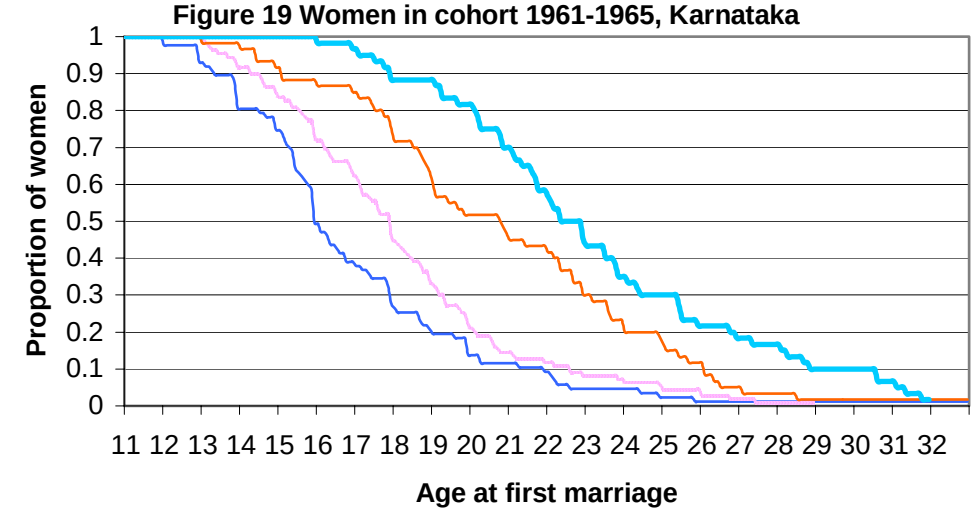


Figure 20 Women in cohort 1966-1970, Karnataka

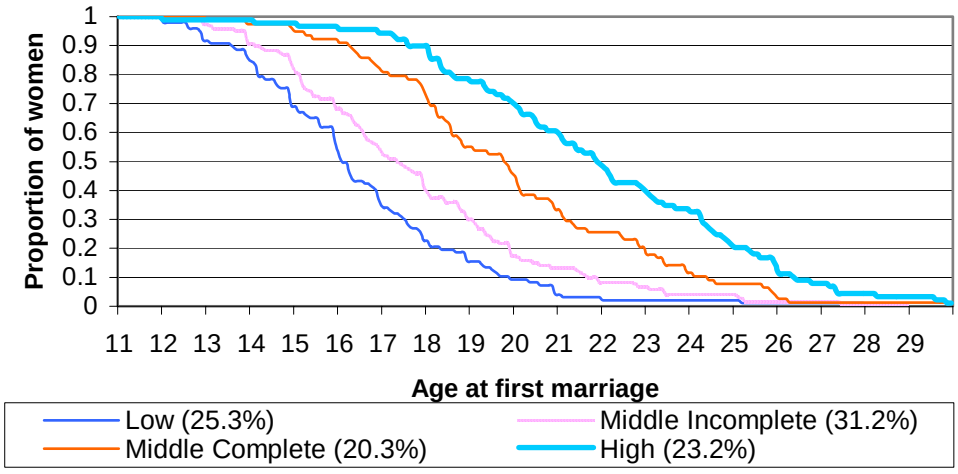


Figure 21 Women in cohort 1971-1976, Karnataka

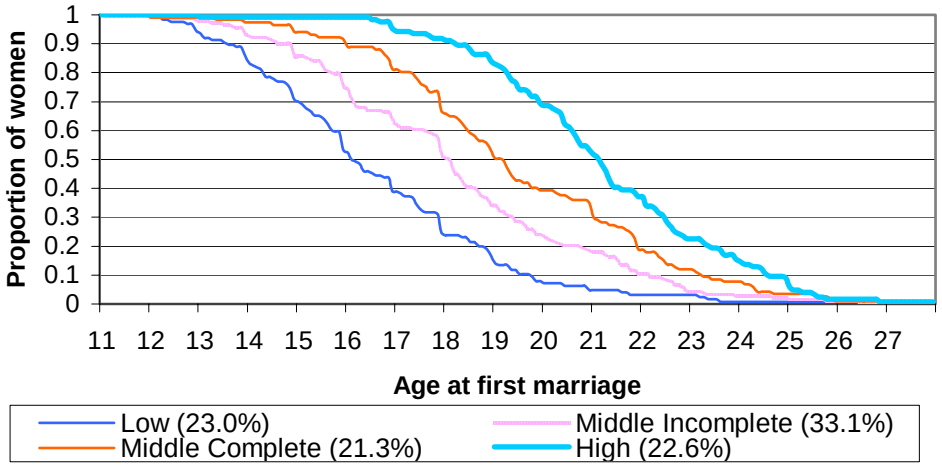


Figure 22 Birth cohort 1949-1960, Karnataka

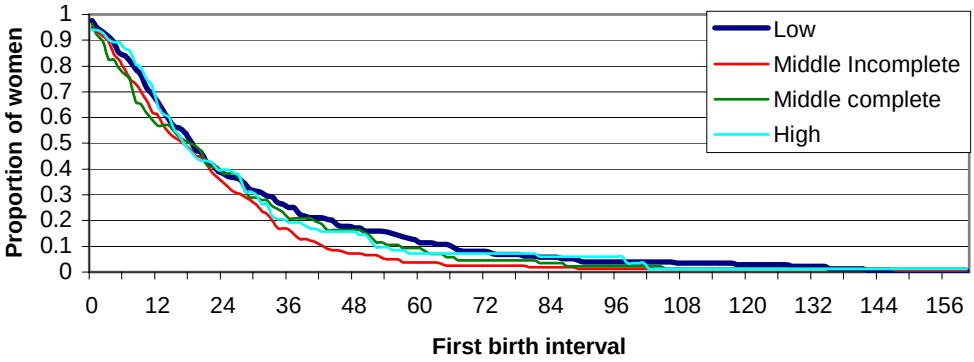


Figure 23 Birth cohort 1961-1965, Karnataka

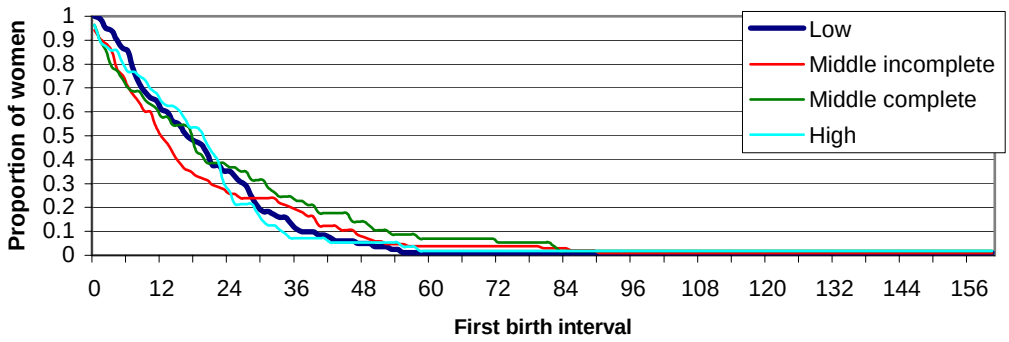


Figure 24 Birth cohort 1966-1970, Karnataka

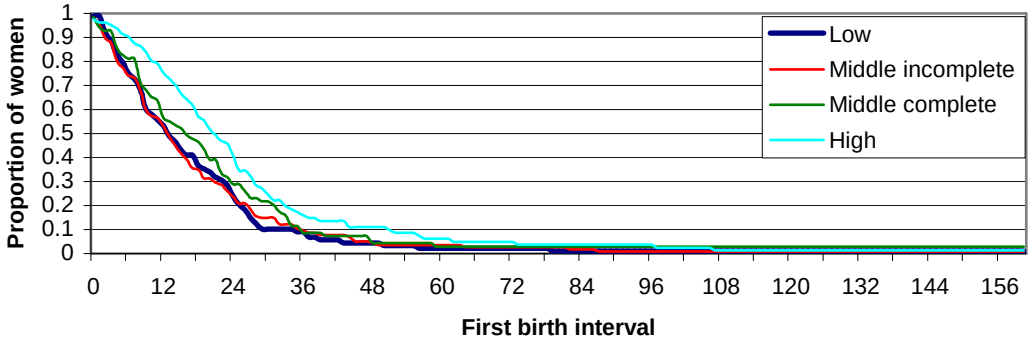
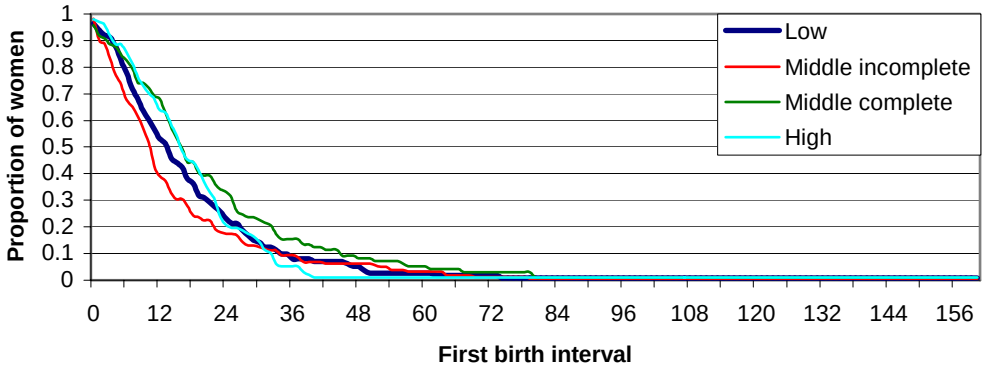


Figure 25 Birth cohort 1971-1976, Karnataka



[i] In the case of India, for instance, a lot of emphasis is put on the status enhancing potential of education and in that way its impact on the mean age at first marriage and the mean age at first birth partnership and fertility behavior (Kasarda et al 1986; Jejeebhoy 1995; Basu 1996; Mason, 1984).

[ii] Why southern India? The states of southern India depict a picture of development as one of the driving forces of fertility transition and the prevalent gender systems that play a central role in explaining the pace at which fertility transition proceeds (Sathar, Callum and Jejeebhoy 2001, Bongaarts and Watkins 1996). Studies by Dyson and Moore (1983), Mason (2000) show that women in south India portray more egalitarian gender relations by playing a more decisive role within the family and outside it than the northern part of India. This egalitarian gender relation tends to improve female individual autonomy that plays an important role in determining patterns of reproductive and contraceptive behaviour (Sathar, Callum and Jejeebhoy 2001). In this study we do not intend to focus on the whole of India. Our focus is mainly on one of the states of southern India, Karnataka. This state has been immensely affected by the convergence and the combination of the ongoing programmes to improve demographic, socio-economic and educational transition to achieve rapid population stabilization.

[iii] For examples of empirical applications of methodological individualism to demography see Willekens, 1992, Hutter, 1994; de Bruin 1999; Padmadas, 2000, Matsuo, 2003.

[iv] Studies by Cleland and Jejeebhoy (1996), Jejeebhoy (1995), Parasuraman et al (1999), for instance, have stressed the importance of educational thresholds in timing life events in the life course of a woman. They influence the number of children that the woman will eventually bear in her reproductive life (discussion on the concepts of total fertility, wanted and unwanted fertility, see Bongaarts 2003, Cleland 2002) With

educational differentials and the transition period in which the country is in the total fertility, wanted and unwanted fertility is affected.

[v] Intermediate fertility-level countries are defined by UNPD as countries with total fertility rates ranging from 2.2 to 4.9 (Cleland 2002, Bongaarts 2003).

[vi] In 1985, Van de Kaa finds that there are only a few European countries where the TFR is still above replacement level. In most countries, the TFR is closer to 1.50, or even below that. In countries like Sweden and Denmark, however, a stabilization or even upward correction is taking place. Van de Kaa concludes that "the days of the 'king-child' are over in Europe" (Van de Kaa, 1987, p.18). Since that time fertility has declined significantly in Eastern Europe, while in a number of Northern and Western European countries it has stabilized or even slightly recovered (Council of Europe, 2001).

[vii] This statement is subject to the concept of Second Demographic Transition. Second Demographic Transition in this case is generally acknowledged as country below replacement level. For Japan, see discussion by Kono, 1992 (quoted in Ogawa and Retherford, 1993) and Atoh, 2001.

[viii] In Japan the main achievement over the period 1955-1970 was the narrowing of the gender gap in terms of secondary school enrolment and completion. Table 3 shows that the proportion of women moving into upper secondary education increased substantially from 47.4 percent in 1955 to 82.7 percent in 1970. Women also started enrolling in tertiary education, and the female advancement rate to junior college or university increased from 2.4 in 1955 to 6.5 in 1970. The male advancement rate to junior college or university increased from 13.1 in 1955 to 27.3 in 1970. By 1990, the rate of advancement to upper secondary school was high for both males and females at nearly 95 percent. Furthermore, female enrolment at the post-secondary level increased dramatically. The same table shows that the proportion of female high school graduates entering junior college increased from 19.9 percent in 1975 to 22.2 percent in 1990, while the proportion entering university increased from 12.5 percent in 1975 to 15.2 percent in 1990. In the 1990s, this trend towards higher female educational attainment continued. Table 3 shows that the proportion of female high school graduates advancing to junior college decreased from 22.2 percent to 17.2 percent, while that proportion advancing to university increased from 15.2 percent in 1990 to 31.5 percent in 2000.

[ix] Results from NFHS-2 suggests that illiteracy of women still stands at 55 percent amongst ever-married women age 15-49 in Karnataka in comparison to 58 percent of illiterate women for the whole of India. However note should be made of the fact that the level of illiteracy has declined from 62 percent as observed in NFHS-1 (1992-93) to 55 percent as observed in NFHS-2 (1998-99). The level of illiteracy is found to decline with age i.e. from 61 percent at the age of 45-49 to 53 percent in the age 15-29. This suggests that there is an ongoing change in the higher educational attainment of women found largely amongst the younger cohorts of women in the NFHS-2 survey. However amongst the literate women the largest proportion are those who have completed primary school ie 5-7 completed years of education. There has been an increase in the percentage of women from 14 percent in NFHS-1 (1992-93) to 20 percent in NFHS-2 (1998-99) who have completed high school i.e. having 10-11 completed years of education. Data from the same survey for the highest level of education shows that amongst the ever-married women aged 25-29 at the time of survey, 12 percent of them had higher secondary complete and above educational level as there highest complete educational level. These women are from the birth cohort 1970-1976.

[x] The National family Health Survey (NFHS) 1998-1999 is the second round of the survey conducted after its success with the first survey conducted in the year 1992-93. The principal objective of this survey was to provide state and national estimates of fertility, the practice of family planning, infant and child mortality, maternal and child health and the utilization of health services provided to mothers and children. The survey covered a representative sample of more than 90,000 eligible women aged 15-49 ever-married from 26 states that comprise more than 99 percent of India's population (IIPS 1998-99).

[xi] In the National family Health Survey, women have been asked about their highest educational level. Women state their educational level as no education, primary, secondary and higher. The dataset also gives us information on the single years of education for all the respondents who had been to school and whether the respondent is still in school or not. The single years of education helps us in knowing how many completed years of education constitute a particular category of highest educational attainment. Based on the highest educational level of the women and the single years of education, NFHS classifies the educational attainment of women in the survey as having no education, incomplete primary, complete primary, incomplete secondary, and complete secondary and higher. The classification of NFHS has further been reclassified into low, middle incomplete, middle complete and high. Women who state their highest

educational level as primary education incomplete or primary education complete have been operationalised as those with low level of education. Middle level of education has been divided into two parts, one that takes into account women who had incomplete middle education and the other who have completed middle educational level. Primary education in the context of Karnataka is also called compulsory education. Some parents send their daughters to attend primary school, as it is mandatory. However many still do not send their daughters to school and these girls remain eventually illiterate. But for girls to have middle incomplete educational level is already an achievement. Thus middle level of education brings about a clear distinction between primary compulsory education and going further ahead with education as a matter of choice.