

**Cross-Time and Cross-National Comparisons of the Transition to Adulthood:
Brazil, Mexico, and South Korea, 1970-2000**

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ABSTRACT

Using census data from Brazil, Mexico, and South Korea in two years, 1970 and 2000, we conduct cross-time and cross-national comparisons of the transition to adulthood. The three countries, which showed relatively similar levels of demographic, economic, and educational development in 1970, have, since then, followed considerably different trajectories of economic and educational models. We examine how these different national “scenes” produced very different patterns of transition to adulthood, addressing how institutional contexts shape life courses of young adults. To measure the timing and complexity of the transition to adulthood as a whole, we apply entropy analysis that provides a single measure summarizing combinations of multiple demographic statuses held by young people. We compare the age distributions of age-specific entropy across countries in each year to identify which countries show more heterogeneity in status combinations at specific stage of life course, how the patterns have changed over time, and how they relate to the economic development trajectories of these three countries.

Cross-Time and Cross-National Comparisons of the Transition to Adulthood: Brazil, Mexico, and South Korea, 1970-2000

Cross-national comparative research on the transition to adulthood allows us to relate the structural features of social institutions, such as schools, families, labor markets, and welfare states to national-level variation in the timing and statuses involved in the transition to adulthood (Corjin and Klijzing 2001; Breen and Buchmann 2002; Cook and Furstenberg 2002; Lloyd 2005). Recent cross-national research on the transition to adulthood has applied a method with which to consider simultaneously multiple markers of adulthood instead of examining each status separately (Fussell, Gauthier, and Evans 2007; Grant and Furstenberg 2007). The strategy of these cross-national comparisons is to describe the heterogeneity in status combinations at specific ages during the transition to adulthood and relate differences in the structure of the young adult life course to that society's institutions.

Most research on institutional influences on the transition to adulthood focus on advanced industrialized countries. We know much less about these relationships in developing countries. Moreover, many cross-national studies have examined patterns of the transition to adulthood only at a fixed time point using cross-country data collected in single years. While a cross-sectional research design is useful for addressing how cross-national differences in current arrangements of social institutions are related to different patterns of the transition to adulthood, the design does not expose how historical changes in social institutions have affected the processes of becoming adult. Even a similar social change such as modernization and industrialization may result in different age and gender patterns of the transition to adulthood, depending on how the process is filtered through specific local contexts.

In this study, we examine differences in age specific heterogeneity of status combinations during the transition to adulthood in historical and cross-national perspectives using census data in two years, 1970 and 2000 from each of three countries -- Brazil, Mexico, and South Korea (Korea, hereafter) -- that are similar in their social and economic development in 1970 but followed distinct economic trajectories over the next 30 years. These countries contrast in their state-driven models of industrialization, with Korea engaging in export-oriented industrialization and Brazil and Mexico following import-substitution industrial strategies (Davis 2004). In 1970, as developing countries, Brazil, Mexico, and Korea showed relatively similar levels of demographic, economic, and educational development. All three were experiencing significant fertility declines so that members of relatively large birth cohorts later had fewer children, and therefore both the nation and individuals would have smaller child dependency ratios. All three countries expanded their primary and secondary education programs during this time. Korea's export-oriented model made it into one of the Asian Tiger economies, with rapid economic growth and state-led investment in many social and economic programs. The cohorts that came of age during this period had received substantial human capital investments and entered expanding labor markets, at least until the economic crisis that began in 1997. Both Brazil and Mexico experienced the "lost decades" of the 1980s and 1990s, so that youth, even those with education, faced contracting labor markets and difficulty making the transition to adult statuses. We expect that these different national scenarios produced very different patterns of transition to adulthood, especially contrasting the Latin American cases to the Korean case.

To capture the pattern of transition to adulthood in each country and period, we use an entropy measure of qualitative variance that summarizes how age-specific cohorts combined demographic statuses (Billari 20002001; Fussell 2005). We consider four transition markers:

school attendance, employment, household headship, and marital status. Using census data in 1970 and 2000, we calculate the entropy measure (joint entropy), which can be interpreted as the heterogeneity in status combinations for each single-age group from 12 to 30 years old. When assembled by age they provide a synthetic cohort experience of heterogeneity of statuses in the transition to adulthood. This quantitative measure of qualitative variance allows us to compare the cohort experience of adolescence and young adulthood between years within a country, or in the same year in all three countries.

The heterogeneity of status combinations indicates the degree to which young people's life course is standardized in a fixed set of status combinations at specific ages. The statistical method is agnostic as to which statuses are combined, but the modal status combination for adolescent ages is attending school, not in the labor force, never-married, and not a household head. Life course sociologists have observed this standardization of adolescence historically in advanced industrialized countries (Buchmann 1989; Shanahan 2000) as well as in some developing countries (Fussell 2005; Grant and Furstenberg 2007).

While adolescence has become more standardized, life course scholars have observed that the transition to adulthood has become increasingly destandardized in most advanced industrialized countries (Bruckner and Mayer 2005; Fussell and Furstenberg 2005; MacMillan 2005; Modell, Furstenberg, and Hershberg 1976; Rindfuss 1991). Destandardization is defined as the dispersion of an age cohort into a greater variety of status combinations so that there may not be any modal combination that describes the majority. In advanced industrialized societies destandardization is associated with both ideological and structural change. Specifically, individuals' beliefs in gender egalitarianism, self-actualization, and self-fulfillment have led some to pursue unusual status combinations and delay entry into or forgo certain statuses (Beck

and Beck Gernsheim 2002; Lesthaeghe 1983). These delays are associated with prolonged post-secondary education as well as a period of exploration of careers or other life pursuits. Others (Buchmann 1989; Dannefer 2000; Heinz 2003; Lichter, McLaughlin, and Ribar 2002; MacMillan 2005; Mayer 2001, 2004; Oppenheimer, Kalmijn, and Lim 1997; Shanahan, Miech, and Elder 1998) emphasize the structural changes that have deregulated the life course and made it more difficult for young people to achieve the economic stability necessary to form families. There is some evidence that young people have increasingly postponed marriage and childbearing in order to cope with restructured labor markets, temporary and irregular employment, and weaker welfare states (Dannefer 2000; McDonald and Evans 2003). However, it is unclear whether destandardization, and these explanations for it, apply in developing countries where the institutions structuring the adolescent and young adult life course have evolved more recently and in distinct ways.

Our hypotheses are based on the changes described above in these three countries and the experiences of advanced industrialized countries. We expect to see that during early adolescent ages (12-15) status heterogeneity will have decreased as boys and girls became more likely to attend school and refrain from employment. In Korea, where the rewards for completing high school are more tangible, we expect to see that this decrease in status heterogeneity persists into older adolescence (16-17), whereas this is less likely to have occurred in Brazil or Mexico where economic conditions have necessitated early entry into the labor market and made the anticipated returns to education less certain.

Expectations derived from research on the de-standardization of the life course pertain to ages after secondary education is complete (ages 18 and older). In all three countries, as in advanced industrialized countries, adult statuses include employment, though mostly for men,

marriage or cohabitation, household headship, and parenthood.¹ The linkage between marriage and household headship in these developing countries is weaker than in Western countries, where adult children leave the home before they marry or at the time of marriage and are economically independent thereafter. In these countries married children may continue to live with their parents, but rarely live independently of their families as single adults. Thus the transition to economic independence may be less marked. Ideological challenges to these norms have been less pervasive, making the ideological changes observed in Western countries less salient explanations for destandardization. However, structural changes described below are likely to be analogous to those described in the literature on destandardization in Western countries.

Our expectation is that if there is no substantial change in the social institutions and norms structuring the timing and statuses that constitute young adulthood, there will be no change in the levels of heterogeneity at young adult ages (18-30). However, in countries where tertiary education expanded to high but not universal levels, as in Korea, we expect to see an increase in heterogeneity since age cohorts would be more divided among status combinations. When tertiary education expanded only modestly, as in Brazil and Mexico, increases in heterogeneity would be modest as well. Changes in marriage and household formation patterns would also affect age-specific heterogeneity although, because the timing of these events is less dependent on age-graded institutions, the effect is likely to be weaker. For example, a shift in the average age at marriage with little variation in marriage timing, as in the case of Korea, would cause a decrease in heterogeneity at ages when few are married and an increase in heterogeneity

¹ We do not consider parenthood here since censuses do not ask men about this status and we prefer to maintain comparability between men and women.

over the range of ages in which marriage is concentrated. A more modest shift in age at marriage with a lot of variation in marriage timing, as in the case of Brazil, would cause more modest changes in heterogeneity. Since marriage and household headship are associated, and we have no information on average age at household formation, we expect that changes in household headship will operate similarly to those of marriage.

Change in social and economic structures and institutions

In 1970 Korea's GDP per capita was two-thirds of Brazil's and half of Mexico's (Table 1). However it soon launched a state led export-oriented industrialization project that would increase GDP per capita by a factor of six. In contrast, the import-substitution industrialization projects undertaken by Brazil's and Mexico's governments in the 1960s, which were based on external borrowing, soon collapsed and resulted in economic liberalization and restructuring in order to repay foreign loans during the 1980s in Mexico and the 1990s in Brazil. During this period Brazilian per capita GDP grew by a factor of only 1.75 in real terms and Mexican per capita GDP grew by a factor of only 1.68. These differences in economic trajectories translate into wide differences in the ability of the government and families to invest in children.

Changes in educational opportunities in Korea between 1970 and 2000 are as remarkable as economic changes during the period. The net secondary enrollment ratio, a measure of the percentage of secondary school aged children who were actually enrolled in school, increased from 38% to 91% in Korea during this time, a gain of 53 percentage points. Brazil and Mexico made similar gains, but started from lower enrollment ratios. By 2000, they were still lagging behind Korea. Korea's investments in education are even more evident in the gross tertiary enrollment ratio which increased more than ten times from 7% to 78% between 1970 and 2000.

The increase in tertiary enrollment was much more moderate in both Brazil (from 5 percent to 16 percent) and Mexico (from 5 percent to 20 percent). Brazil's and Mexico's educational expansion efforts were stymied by the government's economic difficulties and inability to invest in education, as well as families' needs for children to work and the lack of perceived pay-off for investments in education.

In all three countries families were reducing their fertility and national population growth rates were declining. The total fertility rate (TFR) in Korea declined from an average of 4.7 births per woman in 1970 to a below replacement level of 1.5 in 2000. Brazil and Mexico had higher TFRs in 1970, 5.4 and 6.8 respectively, and although their declines were steep they still had TFRs above replacement level in 2000 (2.5 and 2.7, respectively). All three countries also experienced large gains in life expectancy, on the order of 10 or more years. These demographic changes shifted the child dependency ratio to levels lower than 1.0 and therefore allowing for greater societal, and presumably familial, investments in children's education and welfare.

Families' ability to allow their children to go to school and stay out of the labor force is a critical investment in children which also contributes to the standardization of adolescence. In 1970 large proportions of young men aged 15 to 19 were participating in the labor force in all three countries (Brazil: 59.3%; Korea 44.1%; Mexico 49.5%). Lower but still significant proportions of young women of this age were also in the labor force (Brazil 23.3%; Korea 35.9%; Mexico 21.6%). By 2000, the labor force participation of these secondary and tertiary school age men had had not changed at all in Mexico and had declined by 15 percentage points in Brazil, but in Korea it had diminished by 39 percentage points – only 5.1% of Korean men age 15-19 were employed. For women of this age the percentage in the labor force had increased slightly in Brazil (from 23.3% to 25.0%) and Mexico (from 21.6% to 23.9%), but decreased in Korea (from

35.9% to 7.3%). These differences between countries in labor force participation show how families' preferences and abilities to keep children out of work and in school contribute to the virtuous cycle of economic development and the standardization of adolescence.

These macro-level measures of social and economic change in the three countries under consideration provide a comparative picture of change in the social institutions that structure the transition to adulthood. It is apparent that Korea fares comparatively well in having stronger economic growth, greater educational expansion, and more favorable demographic conditions, which translate into greater investments in youth and a consequent standardization of the early life course. Brazil and Mexico, while distinct in their national histories, are less distinguishable by these measures. Weaker economic growth, less extensive educational expansion, and only somewhat favorable demographic conditions allowed for more modest investments in young adolescents and very little additional investment in older adolescents. In these countries the transition to adult statuses occurs at younger ages and in a less standardized way.

DATA AND METHOD

Entropy Analysis

Using the entropy transformation, researchers have developed measures of inequality in the distribution of continuous or ordinal variables such as income, population distribution, and occupation (Allison 1984; Gorard and Taylor 2002; Magidson 1981). Applying a similar idea to nominal variables, Billari (2001) used Theil's entropy index to measure heterogeneity in the sequences of statuses that young Italian held during the life course. We apply Billari's approach, which examined status combinations of cohorts across life courses, to calculate the entropy index for each age from cross-sectional census data. We calculate the index for men and women

separately in each country and each census. In other words, to address cross-time and cross-national differences in the timing and complexity of the transition to adulthood, we compare the distribution of the entropy index by age across the three countries in 1970 and 2000, respectively, for men and women separately. Following our previous work (Fussell 2005), we consider our entropy measures across ages from cross-sectional data to constitute a synthetic cohort which is assumed to follow the pattern across life courses as seen in the age-specific distribution of status combinations from cross-sectional census.

We consider four major statuses in the transition to adulthood: school attendance, labor force participation, ever-married status, and status as head of household or spouse of the head. To obtain these four transition markers for a large number of young people by age, we rely on census data in each country. For Brazil and Mexico we use one percent samples of U.S. census data for 1970 and 2000 made available from the Integrated Public Use Microdata Series (IPUMS) Database (Ruggles, Sobek, Alexander, Fitch, Goeken, Hall, King, and Ronnander 2004). For Korea, we use the one percent Census for 1970 and the two percent sample for 2000. To maximize comparability in measurements across census data, we treat each of the four statuses as dichotomous. In each census, we distinguish people who are currently attending schools from those who are not. For labor force participation, we separate those who hold any job regardless of whether it is full or part time from those who do not hold a current job (both those unemployed and not in the labor force). For ever-married status, we code those who are currently married, divorced, or widowed as 1 and those who have never been married as 0. Brazilian and Mexican census data have another category of cohabiters which we coded as married. Reflecting the very low prevalence of cohabitation, the separate category for cohabiters

does not exist in Korean census data. Finally, we distinguish those who are the head of household or the spouse of the household head from those who are not either.

Considering these four dichotomous statuses, in principle at an age individuals can be distributed into one of 16 potential status combinations. The four-dimensional entropy index can be calculated as (Cover and Thomas 1991):

$$H(S, W, M, H) = - \sum_{s=S} \sum_{w=W} \sum_{m=M} \sum_{h=H} p_i(s, w, m, h) \log_2 p_i(s, w, m, h)$$

where S, W, M, and H are the four dichotomous variables representing statuses held at any age (school attendance, labor force participation, ever-married, and household headship), p is the joint distribution of individuals in each of 16 status combinations, and i indexes age. With a total of 16 status combinations, the entropy index contains a value from 0 to 4 indicating the degree of heterogeneity in status combinations at a specific age (a higher value indicates a higher degree of heterogeneity). We also break up total joint entropy into joint entropy of economic statuses, which includes only school attendance and labor force participation, and joint entropy of family statuses, which includes only ever-married status and household headship. This allows us to see the extent to which total joint entropy is due to either economic statuses or family statuses.

Since this is a qualitative measure of variance, we use a qualitative standard to discern whether differences between countries and genders are important. Age-specific status entropy of synthetic cohorts is distributed in a highly patterned way, so rather than being concerned with the size of differences between specific measures, we examine whether there is a difference in the overall pattern that appears significant. In other analyses, boot-strap samples have been drawn to create confidence intervals and gauge whether differences are statistically significant. However, this focus on differences at specific ages obscures the more important difference of the overall pattern of distribution. In this analysis we are mainly concerned with differences between 1970

and 2000 in total joint entropy ($H(\text{SWMH})$), joint entropy of economic statuses ($H(\text{SW})$) and joint entropy of family statuses ($H(\text{MH})$).

Results

The joint entropy of status combinations shows a fairly consistent pattern of increasing from age 12 through the early 20s, and then diminishing to varying extents. Insofar as social structures age grade society, it is useful to break the life course into age ranges. In our analysis we distinguish age groups younger than 15, ages 15 to 17, ages 18 to 24, and ages 25 and older to facilitate discussion. These age ranges are labeled young adolescence, late adolescence, and the first and second parts of young adulthood, although these labels are not definitive.

In young adolescence, before age 15, status combinations are relatively homogeneous making joint entropy relatively low. The modal combination of statuses in young adolescence is: attending school, not in the labor force, non-household heads, and unmarried. Between 1970 and 2000 all three countries experienced a decline in heterogeneity of status combinations, or joint entropy, at age 14 (the youngest year for which employment was recorded in Korea), supporting the hypothesis that standardization of adolescence occurred in all three countries (Figures 1a & 1b). The change was greatest in Korea where young men's and women's joint entropy at age 14 declined from 1.9 and 0.9 respectively in 1970 to 0.1 for both genders in 2000. In Brazil the change was less dramatic, declining from 1.6 in 1970 for both men and women to 1.2 and 1.1 respectively in 2000. Similarly there was only a small decline in Mexico from 1.7 in 1970 for both genders to 1.4 in 2000 for both genders. The standardization of young adolescence is evident in all three countries, but differs in degree with Korea having experienced the most standardization.

In late adolescence the modal status combination described above decreases as young people are legally allowed to enter the labor force or leave school, which usually occurs between age 15 and 17 (Table 1). If young people change statuses in substantial proportions joint entropy increases, reflecting the more heterogeneous status combinations of the age cohort. The hypothesis of standardization of adolescence is only supported for Korea. Between 1970 and 2000 joint entropy at age 16 for men and women went from 0.8 to 0.3 in Korea. In Brazil joint entropy changed very little: men's and women's joint entropy went from 1.8 and 2.0, respectively, in 1970 to 1.8 and 1.9 in 2000. Similarly in Mexico men's and women's joint entropy stayed the same between years at 1.9 and 2.2, respectively. It appears that the standardization of late adolescence only occurred in Korea during this period.

Early adulthood begins in all three countries when secondary education is complete and young people are legally able to enter the labor force, marry, and enter into contracts that might be necessary to establish their own household, usually at or after age 18 (Table 1). These status transitions all push joint entropy higher, relative to adolescence, but we only expect change between years if one of the social structures making up the life course regime encourages greater or lesser heterogeneity in status combinations at these ages. As young adult age cohorts combine all four statuses in different proportions joint entropy typically peaks, usually between 18 and 24, and then begins to decline or level out between 25 and 30. Selecting age 21 as a point of comparison, we see that in this range of ages joint entropy has increased in all three countries between 1970 and 2000. In Korea, joint entropy increased for men and women from 1.2 and 1.6, respectively, to 2.2 and 2.4. In Brazil, it increased for men and women from 2.3 and 2.6, respectively, to 2.8 and 3.2. In Mexico, it did not increase for men but stayed at 2.7 in both years and for women it increased slightly from 2.6 to 2.9. Thus, in Korea and Brazil, young adulthood

has become more heterogeneous, although perhaps for different reasons, but there is very little change in the heterogeneity of young adulthood in Mexico, suggesting that there young adulthood remains largely the same as in the past.

These different patterns underscore the fact that there are many different causes of increased heterogeneity in young adulthood – consistent with the literature on the destandardization debate in advanced industrialized countries. Table 1 is helpful in suggesting why these increases in heterogeneity exist. The increased heterogeneity in Korea is likely due to much greater participation in post-secondary education, although the decline in labor force participation rates at this age suggests that there has in fact been a standardization of this age range toward a more adolescent combination of statuses than was the case in 1970 when the status combinations were more adult-like (not in school, employed, married, and household head). In Brazil, the increase is more likely due to young adults combining statuses in a greater variety of ways, as a result of increased post-secondary educational participation, lower rates of employment among men, higher rates of employment among women, and a later mean age at marriage. In Mexico, where there was no change in the value of joint entropy, it is possible that there were shifts in the categories in which the age cohort was distributed. These explanations for change or no change in heterogeneity during young adulthood will be investigated later in this paper.

The second part of young adulthood – in the mid to late twenties – shows the settling into adult status combinations, and generally lower levels of heterogeneity compared to the first part of young adulthood. Selecting age 27 as a point of comparison we see that between 1970 and 2000 young men and women in Korea experienced an increase in joint entropy from 1.9 and 2.1 to 2.6 and 2.6, respectively. In Brazil, men and women experienced a similar increase in joint

entropies from 2.1 and 2.2 to 2.6 and 2.9, respectively. In Mexico, men's joint entropy remained similar, 2.4 in 1970 and 2.3 in 2000, while women's joint entropy increased from 2.0 to 2.5.

While both Korea and Brazil and Mexican women appear to be following a pattern of "destandardization" – although again this is likely to be for different reasons – Mexican men's lives show very little change over time.

These patterns of joint entropy provide us with sufficient information to support the hypothesis that adolescence is becoming more standardized in developing countries. The joint entropy measure also usefully allows us to quantify and compare countries with respect to how much the life course has become standardized and at what ages this has occurred. It leaves some questions unanswered however, specifically, how to understand the causes of increased levels of joint entropy. To answer this, we break apart joint entropy into two components, entropy due to school and work, or economic status entropy, and entropy due to marriage and household headship, or family status entropy.

Figures 2a-b through 4 a-b show the total joint entropy, $H(SWMH)$, and joint entropy due to economic statuses, $H(SW)$, and family statuses, $H(MH)$ for 1970 and 2000. These graphs show us the extent to which the level of total joint entropy in each year is due to either economic statuses or family statuses and how much change occurred between years in these component statuses. Specifically we are interested in two questions: (1) why did joint entropy decrease in late adolescence in Korea, but remain relatively stable in Brazil and Mexico? And (2) why did early adulthood become more heterogeneous in Brazil and Korea, but not in Mexico?

We already observed that standardization continued into late adolescence in Korea, but not in Brazil and Mexico. Our macro indicators suggest that this was due to Korea's success and Brazil's and Mexico's failure to expand secondary education during the intervening decades.

This explanation is largely supported by Figures 3a-b which show that the decline in total joint entropy at age 16 in Korea was due to a decline mostly in the heterogeneity of economic statuses ($H(SW)$), and to a lesser extent in family statuses ($H(MH)$). In Brazil (Figures 4a-b) and Mexico (Figures 2a-b) the values of these three indicators, $H(SWMH)$, $H(SW)$, and $H(MH)$, is largely unchanged between the two years. Put simply, in Korea more 16 year olds held the modal combination of statuses in 2000 than in 1970, while in Brazil and Mexico the distribution across status combinations was similarly distributed in both years. This confirms our expectation that the standardization of adolescence, which is largely driven by school attendance, proceeded through late adolescence in Korea but came to a halt in Brazil and Mexico for late adolescents.

Next we demonstrate why the young adult years became more heterogeneous in Brazil and Korea but remained stable in Mexico. Nearly all the graphs demonstrate an increase in the relative importance of economic and family statuses during the age range 18 to 24, with family statuses taking an increasingly more important role in determining the level of joint entropy. Typically, $H(SW)$ and $H(HM)$ form two distinct humps, showing that the transition from school to work and the transition into marriage and household headship occur at distinct ages. This is more the case for men than for women, for whom leaving school and entering marriage and household headship are often more closely associated. The figures for Brazil and Korea (Figures 4a-b and 3a-b) reveal the different explanations for increases in total joint entropy in early adulthood.

In Korea in 1970 almost all the increase in joint entropy in early adulthood, relative to adolescence, was due to family statuses. After the educational expansion in the intervening years, young people delayed marriage and household headship to even later ages than they had in 1970. Thus, by 2000 economic statuses contribute most to joint entropy in adolescence and young

adulthood, and only in the later part of early adulthood do family statuses contribute more than economic statuses to total joint entropy. The young adult life course is particularly orderly in Korea in both periods with cohorts coordinating their status in socially and institutionally prescribed ways. This suggests that young adulthood, for many, has become standardized to be more like late adolescence for many, but because this is not uniform and economic statuses may also be combined with family statuses young adulthood has become more heterogeneous rather than less.

In Brazil the increase in heterogeneity between 1970 and 2000 is due to even greater flexibility in status combinations than was already in evidence in 1970. For men in both periods, the age distribution of economic and family statuses form separate humps, while for women, the distributions of economic and family statuses overlap during the young adult years, contributing to even higher levels of joint entropy at these ages. The differences between the two years are in degree rather than in kind. While economic statuses show slightly higher entropy levels in young adulthood for both men and women, family statuses remain stable for men or increase slightly for women. These patterns suggest that the increase in heterogeneity of status combinations is due to the relative lack of proscriptions on young people's status combinations and the overlapping ages at which economic and family status transitions occur.

Mexico is remarkable for the stability of status combinations. As in Brazil the age distribution of economic and family statuses form two separate humps for men and overlap to a large degree for women. Between 1970 and 2000 for both men and women there is slightly higher joint entropy due to economic statuses in the first part of early adulthood, but this amounts to relatively little change in men's joint entropy. For women there is an increase in joint entropy at most ages after 15 due to greater heterogeneity in economic statuses, as more women

combined employment with other statuses. In this closer analysis, Brazil and Mexico have more in common with each other than either has in common with Korea. However, what distinguishes Brazil and Mexico is Mexican age cohort's greater adherence to early marriage, while Brazilians have been more apt to delay marriage.

Conclusions

This analysis sets an important precedent for analyses of the transition to adulthood in developing countries by demonstrating how these countries can be compared. In doing so, we reach several conclusions. First, we find that adolescence is becoming more standardized in middle-income developing countries, although to varying extents. All three countries experienced substantial economic growth during the 1960s and 1970s, leading them to achieve nearly universal primary education and expand secondary education in the next decades. However, while Korea's economy grew steadily since the 1970s, Brazil and Mexico experienced economic crises that prevented them from creating employment, especially for young labor market entrants. Thus, only small proportions of youthful age cohorts endured in secondary or post-secondary education since the need to enter the labor market was great and the rewards for staying in secondary and tertiary school were uncertain and unevenly distributed. Thus, although there are differences between countries in the extent to which adolescence is standardized, standardization is evident in all three of these countries. This is probably the case in most countries that have achieved or are near achieving universal primary and secondary education. Indeed, the strong relationship between universal education, age, and status standardization during adolescence is well established in advanced industrialized countries, although it has not been demonstrated in developing countries.

Our second finding is that young adulthood, while inevitably more heterogeneous than adolescence, also varies widely in how heterogeneous it may be. Korea's example shows that status heterogeneity may be minimized by delaying entry into marriage and household headship, nevertheless less than universal participation in post-secondary education will increase status heterogeneity. Status heterogeneity is increased as well when economic and family transitions are closely timed, as is the case in Brazil and Mexico. Furthermore, when there are few proscriptions on which statuses can be combined, and members of age cohorts combine statuses in multiple ways, status heterogeneity is also increased. These cases demonstrate the ways in which status heterogeneity varies and how this variation is related to specific social structures and institutions. By concentrating transitions into a short range of ages and placing no limitations on which statuses may be combined, status heterogeneity is maximized, making for a relatively "disorderly" life course. Conversely, by separating the ages at which specific status transitions occur and prescribing how statuses may be combined, status heterogeneity is minimized and the life course is more orderly.

In the U.S. the debate over whether orderliness in the life course matters concluded that disorderliness itself is not the problem at the individual level, rather the role statuses involved and their qualities make the difference for life outcomes (Rindfuss, Swicegood, and Rosenfeld 1987). Our societal-level analysis of orderliness and disorderliness in the young adult life course asks a different, though related, question. We ask whether social structures matter for how age cohorts make the transition to adulthood. Our answer is that economic development models and state investments in education clearly make a difference in the experience of adolescence. We may also infer from our examples that when economic development leads to employment growth and greater returns to education, a virtuous cycle develops so that young people persist in school

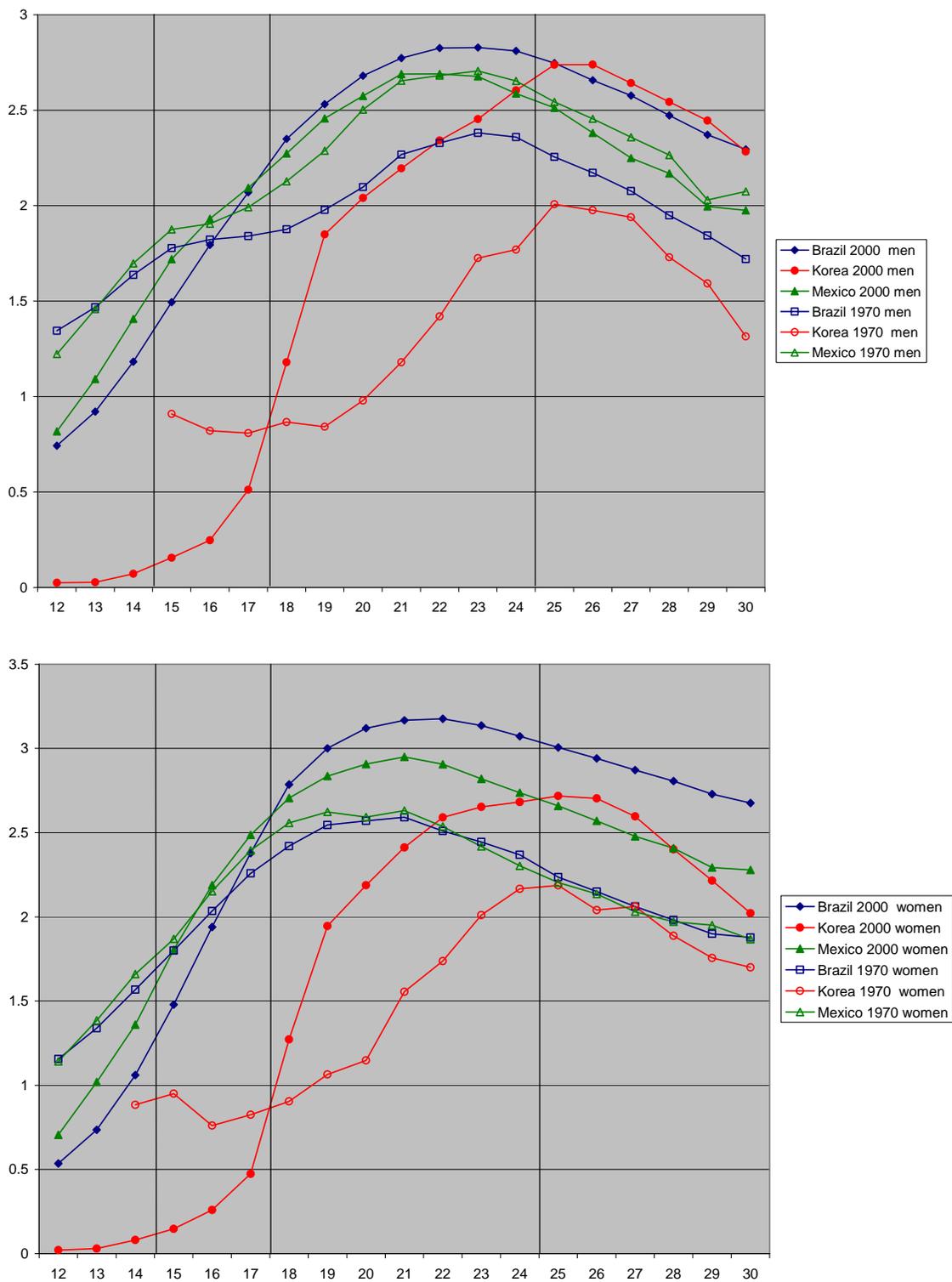
and perhaps delay entry into family statuses. Most importantly we have shown that economic development trajectories and the social institutions they build have strong implications for how the life course is experienced.

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Figure 1a-b. Joint entropy for men and women in Brazil, Korea, and Mexico 1970 and 2000.



Figures 2a-d. Joint Entropy of all statuses, economic, and family statuses for Mexican men and women, 1970 and 2000

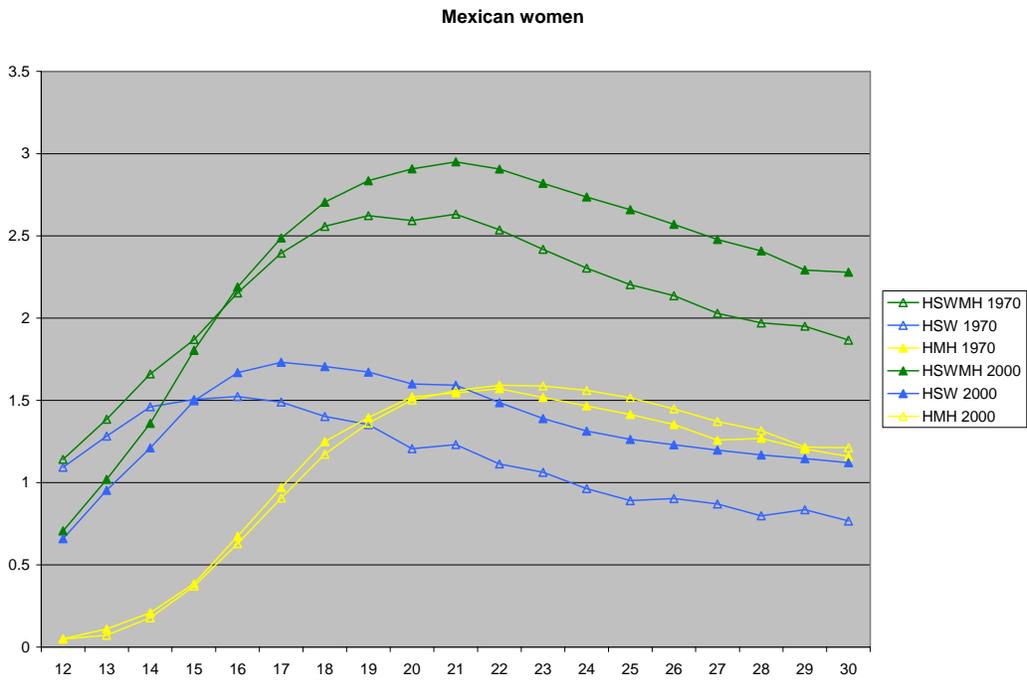
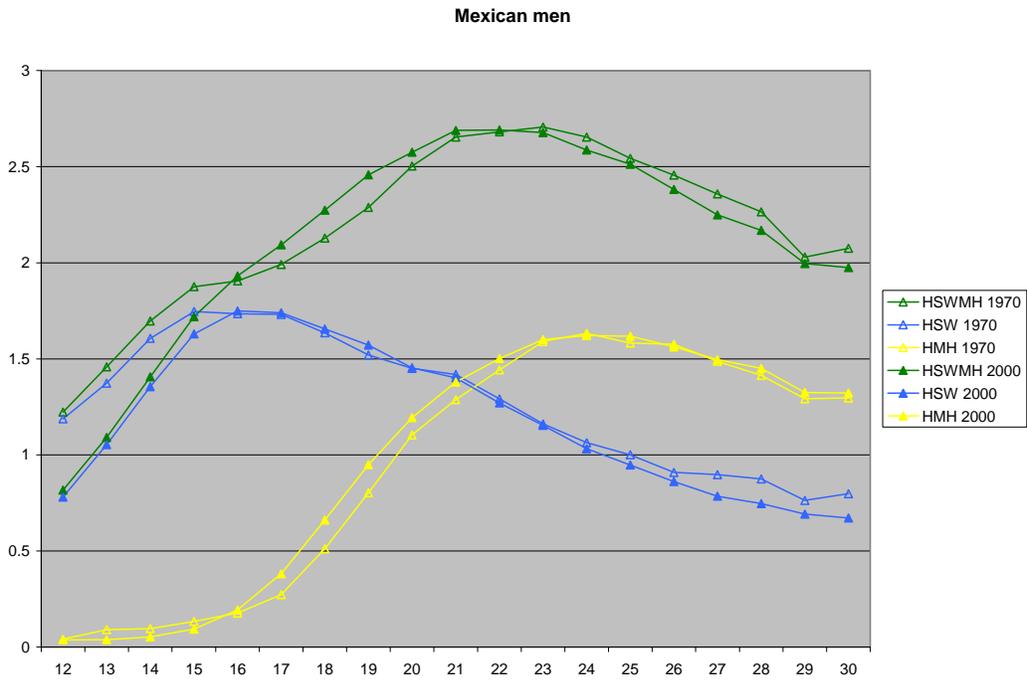


Figure 3a-d. Joint entropy of all statuses, economic, and family statuses for Korean men and women, 1970 and 2000

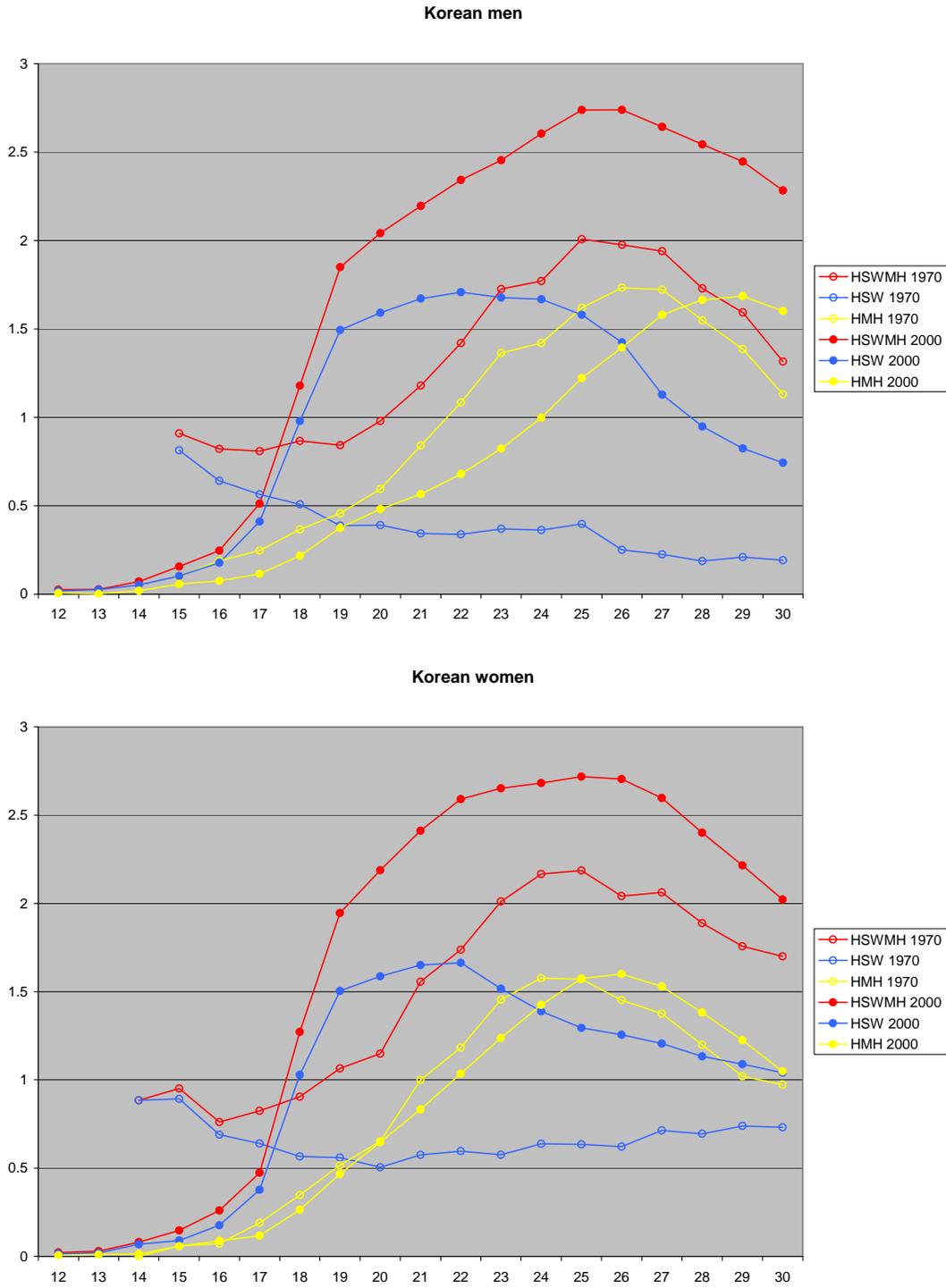
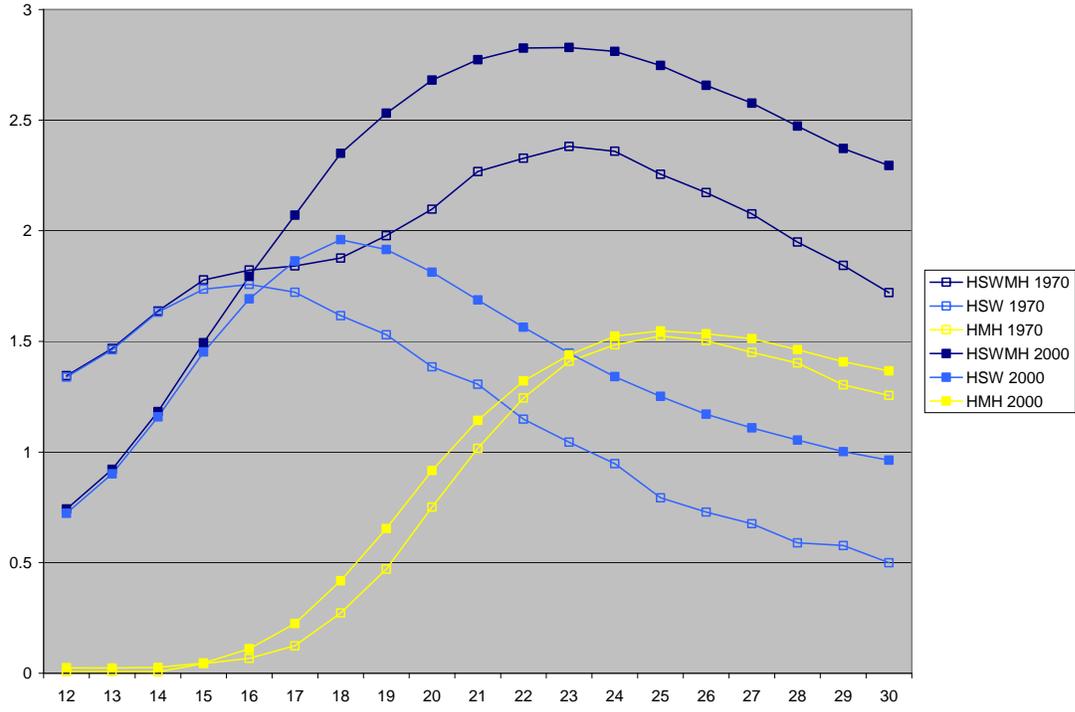


Figure 4a-d. Joint entropy of all statuses, economic, and family statuses for Brazilian men and women, 1970 and 2000



Brazilian women

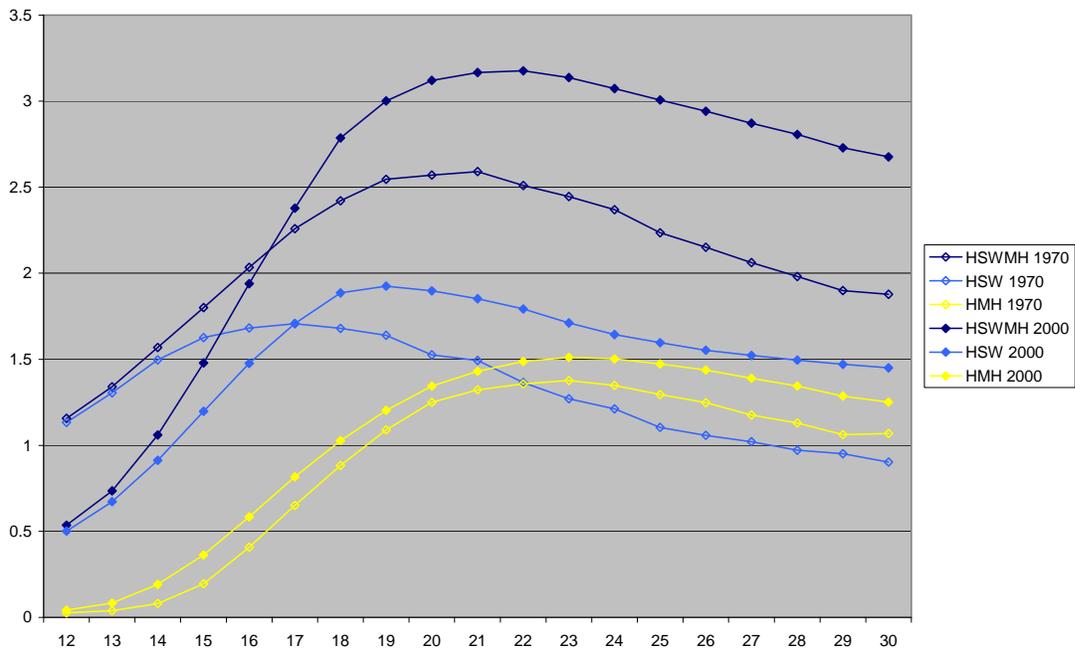


Table 1. Economic, demographic and social indicators for Brazil, Korea, and Mexico in 1970 and 2000

	1970						2000					
	Brazil		Korea		Mexico		Brazil		Korea		Mexico	
Economic measures												
GDP per capita (I \$, 2005)	4,761		3,030		6,169		8,405		18,608		10,360	
Net secondary enrollment ratio (%)	17		38		17		68		91		57	
Net tertiary enrollment ratio	5		7		5		16		78		20	
Demographic measures												
Population (1,000s)	95,684		32,241		52,775		167,724		47,275		97,015	
Rate of increase (%)	2.7		N/A		N/A		1.5		0.9		1.4	
Total Fertility Rate	5.4		4.7		6.8		2.5		1.5		2.7	
Life expectancy at birth (years)							64.4	72.0	70.6	78.1	70.4	76.4
% age 0-17	52.7		48.5		52.8		37.735.9		26.1		42.3	
% age 18-22	9.0		8.2		9.1		10.2		6.9		9.4	
% age 65+	5.1		3.3		3.7		5.8		7.7		5.7	
Child dependency ratio (0-17 year olds/ 18-64 year olds)	1.11		1.01		1.20		0.75		0.40		0.80	
Social Indicators	men	women	men	women	men	women	men	women	men	women	men	women
Compulsory school ages	6-10	6-10	6-12	6-12	6-14	6-14	7-14	7-14	6-12	6-12	6-15	6-15
Legal age of employment	14	14	14	14	14/16	14/16	14	14	15	15	14/16	14/16
% in school at 10-14	66.8	63.8	88.0	81.1	72.4	67.1	93.9	94.6	99.8	99.8	89.1	87.5
% in school at 15-19	38.3	34.8	41.7	27.7	31.4	22.3	64.9	65.5	85.8	86.0	43.1	40.4
% in school at 20-24	17.1	13.2	8.9	3.6	12.7	6.5	23.6	25.1	39.4	31.3	15.3	13.3
% in school at 25-29	6.7	4.7	2.1	0.1	5.5	3.2	10.2	12.2	11.6	3.5	5.5	4.6
LFP rate at age 10-14	24.5	8.8	-	-	8.7	4.1	10.2	4.9	-	-	8.2	3.5
LFP rate at age 15-19	59.3	23.3	44.1	35.9	49.5	21.6	44.0	25.0	5.1	7.3	49.5	23.9
LFP rate at age 20-24	84.8	26.8	76.6	39.3	75.3	23.0	73.6	43.9	32.6	46.5	78.1	34.0
LFP rate at age 25-29	93.6	22.4	92.3	26.2	85.3	17.2	82.3	48.8	73.5	46.4	88.4	35.8
Legal age at marriage	18	18	18	16	17	15	18	18	18	16	17	15
Mean age at first marriage	25	22	26.7 ^a	22.6 ^a	24.5	21.1	28	26	29.3	26.5	26.7	23.9

Note: Source for GDP per capita is Heston, Summers, and Aten (2009): Penn World Table Version 6.3.

Note: Source for net school enrollment ratios is The World Bank Group (2009): EdStats Query.

Note: Source for 2000 figures for population, rate of increase, life expectancy at birth is UN Demographic Yearbook, Tables 3 and 22.

Note: Source for TFR is U.S. Census Bureau, International Data base (2010).

Note: Source for age distributions and child dependency ratios is author's calculations from census samples.

Note: Compulsory school ages for Brazil and Mexico are found in Global Education Digest, 2008. Table 1. Education systems.

<http://stats.uis.unesco.org/unesco/TableViewer/tableView.aspx?ReportId=163>.

Note: In Korea, although mandatory school age increased to 15 since 1985 in remote island areas, it is only in 2004 when the age of mandatory education increased to 15 in nationwide (Source: Ministry of Education, Science, and Technology, <http://english.mest.go.kr/main.jsp?idx=0201040101>). In 1970, 14 was the youngest age for which the question of employment was asked in Korean census.

Note: Source for legal age of marriage in 2000 is UN Demographic Yearbook, Table 24.

Note: Source for average age at marriage in Mexico is INEGI 2001, Estadísticas de matrimonios y divorcios. Cauderno número 8. For 1970, Quilodrán (1993).