The University of Texas at Austin, Department of Sociology

General Comprehensive Examination in Demography

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A1. A recent study by Perreira, Harris, and Lee (Demography Aug. 2006) shows "that first-generation youth of Hispanic, Asian, and African heritage obtain more education than their parents, but the second generation and third or higher generations lose ground." Present at least two explanations for this pattern of effects. Where applicable, identify the researchers associated with the explanation and any empirical findings that support that position.

A2. Present at least two common theories regarding the causes of the spatial concentration of urban minority poverty in the United States during the 1970s and 1980s. Describe general trends in racial segregation during the 1990s. Which of these two common theories developed to describe earlier patterns, is best supported by recent trends in segregation?

Part B. Health/Mortality. Please answer B1 or B2.

B1. A substantial literature documents large differentials in health outcomes by race-ethnicity and nativity status and the fact that these differences can not be completely explained by socioeconomic status. Write an essay describing what we know about the impact of families on health. Your answer could focus on differentials in infant mortality by mother's marital status or on the effect of marital status on self-reported health or mortality. Then hypothesize on the potential role of families in race-ethnic or nativity differentials in health outcomes. Finally, explain some of the difficulties researchers might have in testing these hypotheses either using existing data or data you would collect.

B2. Since the industrial revolution, there has been great improvement in life expectancy. What is known about the causes of this massive decline in mortality? What is still being debated? How does the answer differ for poor countries as compared to rich countries?

Part C. Fertility. Please answer C1 or C2.

The following story appeared in Newsweek:

Sept. 27 issue - Pessimism is a potent contraceptive. How else to explain the recent sharp drop in fertility among Asia's newly industrial tigers? Birthrates that had been declining slowly for decades due to rapid urbanization suddenly fell off a cliff around the millennium—suggesting to demographers a new variable at
play. "The notion of global security has become primary for everyone," says Paulin Straughhan, a sociologist at the National University of Singapore.

Call it the fear factor. Beginning with the 1997-98 Asian financial crisis, external developments have weighed heavier on childbearing decisions, experts now theorize. Events like 9/11, the U.S. invasion of Iraq and this month's terrorist bombing in Jakarta give people economic jitters and a sense of hopelessness about the future. "How can [young people] even think about having families if they can't guarantee a bright future?" says James Hsien, a demographer with the Taipei government. "Uncertainty is central to their psychology."

The impact on childbearing has been dramatic. South Korea's total fertility rate (the number of children a woman has in her lifetime) fell from 1.47 in 2000 to 1.17 in 2002, the largest two-year decline on record. In Singapore, the TFR has dropped from 1.6 to under 1.3 in the past three years; between 1980 and 2000 the figure had crept down 0.2 points. Hong Kong's fertility rate (0.93) is among the world's lowest. Despite official efforts to prop up birth-rates, all four tigers have slipped below Japan for the first time since industrialization.

The financial crisis kicked off this decline by killing the widespread assumption that living standards would rise indefinitely. "The economic crisis hit young people hard with rampant unemployment," says Kim Seung Gwon, a demographer at the Korean Institute for Health and Social Affairs in Seoul. "They get married later than before and want fewer babies." In Taiwan, for instance, 30 percent of 35-year-olds remain unmarried, and a quarter of those who wed opt not to have children. They worry about housing prices, tuition at elite schools and unemployment.

Efforts to pump up fertility have a poor track record. Singapore's programs to facilitate dating and marriage, begun with much fanfare in the 1980s, only slowed the decline in births per family. Other efforts in Seoul (nursing support for third children, exemptions from kindergarten fees) and under discussion in Taipei (tax breaks and an educational campaign) won't likely fare better, Hsien predicts.

C1. Please do the following:

a) Briefly critique the adequacy of the explanation given in the article for the low fertility of these countries;

b) Propose at least one alternative explanation;

c) Describe a research design, using either micro-level or macro-level data, that should be able to distinguish between the explanation in the article and your alternative(s).

C2. The last paragraph of the Newsweek article offers little hope that government policies designed to increase the TFR will have much if any impact. Do you agree with this assessment? McDonald reaches a somewhat different conclusion in his paper in the September 2006 issue of PDR. Write an essay in which you review the reasons governments might have to increase fertility when it has fallen well below the replacement level, and then assess the evidence for believing such policies could be effective, as well as the reasons for pessimism on this front.
Part D. Methods. Please answer D1 or D2.

Sometimes people think that there is a close association between life expectancy and the average age of a population, and that even as little as 80 years ago in rural China, when life expectancy was not much above 30, the average age of people living in the population must have been quite low, say around 15 or 20. But as most demographers know, it is not quite this simple. In this section, we will explore different aspects of the relationship between average age at death (life expectancy), and average age of the population, under different assumptions about under-five mortality. You may choose either of two explorations, comparing two stationary populations (D1), or looking at the evolution of a single population through time (D2).

D1. Assume you are given an unabridged life table, including the l and L functions for all ages. This can be interpreted as a description of a stationary population. This life table is then modified in the following way: mortality is artificially increased prior to age 5 but not after age 5. Specifically, for each age \( \geq 5 \), \( l_x \) is replaced by \( r_l \), and \( L_x \) is replaced by \( r_l L_x \), where \( r \) is some constant, \( 0 < r \leq 1 \). Before age 5, it is sufficient here to say that the radix \( l_0 \) is unchanged and to assume that \( L_0 \) is replaced with \( [(1+r)/2] L_0 \).

Using life table functions and \( r \) if needed,

a) give a formula for the mean age at death for those who die after age 5 in the modified population, and show that it is the same as in the original population;

b) give a formula for the mean age of the living population above age 5 in the modified population, and show that it is the same as in the original population (assume that the mean age of persons age \( x \) to \( x+1 \) is \( x+1/2 \), and that the mean age of persons age 85+ is 90);

c) give a formula for the proportion of all deaths that occur after age 5 in the modified population, and show that is only the same as in the original population if \( r=1 \);

d) give a formula for the proportion of the population that is older than age 5 in the modified population, and show that is only the same as in the original population if \( r=1 \);

e) give a formula for the mean age at death for those who die before age 5 in the modified population, and show that it is only the same as in the original population if \( r=1 \);

f) what kind of additional information would you need, or what kind of approximations might you make, to calculate the mean age of persons younger than age 5 in either the original or the modified populations?

D2. Consider a population that for a long time had been subject to constant rates of fertility and mortality, was closed to migration, and in which the Net Reproduction Rate was 1.0. Describe what would happen to the age distribution of this population if there
was an instantaneous increase in under five mortality (such as was described in D1) over the following 200 years. What would happen to:

a) the average age of the whole population,

b) the average age of the population above age 5,

c) the average age at death in the population.

Of course, you do not have enough information to give quantitative estimates of these changes, but please try to give as complete a description as possible of the time path of these values, and to the factors that would be influencing them.