

Duke University

Department of Sociology

**GRADUATE QUALIFYING EXAMINATION**

**POPULATION STUDIES**

AUGUST 25, 2008 – AUGUST 26, 2008

THIS EXAMINATION HAS TWO SECTIONS. YOU MUST ANSWER ONE QUESTION FROM PART A AND TWO QUESTIONS FROM PART B. YOUR ANSWERS SHOULD BE AS COMPLETE AS POSSIBLE. YOUR EXAMINATION SHOULD NOT EXCEED A TOTAL OF SIXTEEN (16) DOUBLE-SPACED PAGES, EXCLUDING REFERENCES. YOU SHOULD FOLLOW A JOURNAL FORMAT (E.G. DEMOGRAPHY) FOR REFERENCES AND CITATIONS. YOU HAVE 24-HOURS FROM THE TIME YOU PICK UP YOUR EXAMINATION TO RETURN IT TO CLAUDETTE PARKER.

PLEASE, SIGN BELOW AT THE TIME YOU PICK UP THIS EXAMINATION AND AGAIN WHEN YOU RETURN IT. NO DISCUSSION OF ANY QUALIFYING EXAMINATION WITH ANY OTHER PERSON IS PERMITTED UNTIL AFTER ALL EXAMINATIONS HAVE BEEN COMPLETED.

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GRADUATE QUALIFYING EXAMINATION

POPULATION STUDIES

**Part A. Answer one of the following two questions.**

**A.1.** In the construction of *period population life tables*, the estimation of  ${}_n a_x$ , the number of persons-years lived by those who die in the age interval  $x$  to  $x+n$  and the associated conversion of  ${}_n m_x$  to  ${}_n q_x$  are key methodological decisions. Describe four approaches:

- a. (i) the piecewise-linear  $l_x$  method,
- b. (ii) the piecewise-exponential  $l_x$  method,
- c. (iii) the Keyfitz (1966) polynomial iterative method, and
- d. (iv) the method of borrowing  ${}_n a_x$  from other populations.

What are the limitations of each method?

How are they affected by the width of the age intervals used to construct the life table?

If you could do a “mixed methods” calculation of an abridged (ages 0-1, 2-4, 5-9, 10-14, ..., 95+) population life table from a given set of period occurrence/exposure mortality rates, in what regions (ages) of the table would you use one of the four methods identified above as compared to others?

**A.2.** Use the tools of a demographer to think about the prime topic (at the moment at least) being discussed by the two main presidential candidates – the cost/demand for oil. Focus your attention on a major consumption class –oil used for transportation. How could one use the general models of standardization and/or population projection to build a simple model of oil used (for transportation) now and ten years into the future? Use hypothetical data in a spreadsheet to show the data that you would need, some preliminary calculations you would make, and the implications of these calculations.

(We suggest that you think about the changing cohort composition and size of the population of vehicles. Assume newer model cars will get better gas mileage and make simplifying assumption for miles driven per year (e.g., “no increase” in miles driven per vehicle) and other relevant parameters.

The key question to be asked with your model: *If the average mpg of new cars increased by 5 mpg per year for ten years, then what would be the impact on oil consumption of this “cohort replacement”?*

**Part B. Answer two (2) of the following three (3) questions.**

**B1)** The life course perspective takes “a long view” to examine the linkages among life transitions across the life span and the cumulative impact of earlier statuses and transitions on later statuses and transitions. A major focus in recent years has been on the life course mechanisms influencing the emergence of health disparities between subpopulations.

B1.1-Identify three mechanisms that appear to operate over the life course to produce health disparities. How do these mechanisms purportedly contribute to the emergence of health inequalities. Cite key literature.

B1.2-What evidence is there that these mechanisms may vary in their relative impact depending upon health condition or disease (select one) *and* upon gender or race (select one).

B1.3-What major methodological challenges in data gathering and analysis confront efforts to take “a long view” in studying emergent health inequality.

**B.2.** Recent decades have seen increases in human life expectancy in the U.S. and even more so in other nations around the world. These increases have been accompanied by a sometimes heated debate in the demography of aging between groups of “pessimist” demographers such as Olshansky and Charnes who argue for intrinsic limits (upper bounds) to human life expectancy and life span and “optimist” demographers such as Oeppen and Vaupel and Bongaarts who claim that the evidence supports continued increases in life expectancy for years to come.

Review this debate and its major antagonists.

Relate the debate to research contributions on trends in the health and disability status of the elderly population.

Tell us how you come down on the debate and in what directions you think research on aging, health/disability, and mortality should be pursued in order to shed empirical light thereon.

**B.3.** Answer the following questions about “low fertility”?

B3.1. What is low fertility? Low compared to what?

B3.2. It is commonly stated that replacement fertility is when the TFR (total fertility rate) equals 2.1? When is this true and when is it not true?

B3.3. The TFR is a “period measure”. What does this mean? Can period and cohort measures of fertility (say the TFR and CEB, children ever born) be different over the long run (i.e., long run equals a generation or more or 30+ years). When they are “different” which one is “correct”?

B3.4. In many countries the TRF is 1.5 or below. In these same countries, women report an intent to have two children (on average). How can this difference be explained?