



The 1978 Meeting of the Population Association of America  
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## CURRENT ITEMS

### THE 1978 MEETING OF THE POPULATION ASSOCIATION OF AMERICA

The Annual Meeting of the Population Association of America was held in Atlanta, Georgia, at the Atlanta Hilton from April 13 to 15. The program included 42 sessions of papers, 2 panel sessions, and 26 roundtable luncheon discussions. Abstracts of the papers are provided on the following pages by order of the session in which they were presented. This information updates that provided in the abstract booklet available at the conference. An address to which requests for copies of papers can be sent is included. For an index to authors of these papers, see pages 599-600.

DEMOGRAPHIC TRANSITION: THEN AND NOW  
Organized and Chaired by  
John Knodel, University of Michigan

#### The Problem of a Gap during Fertility Declines

Carl A. Mosk, Department of Economics, University of California, Berkeley, CA 94720.

In this paper, the author explores the effect that the psychological and economic costs of averting births have on the process of fertility transition. A model developed by Easterlin is applied to the instance of two populations, A and B, in which the costs of regulating intra-marital natality are jointly determined. It is demonstrated that if the initially desired surviving family size ( $C_d$ ) falls below that obtaining with natural fertility ( $C_n$ ) in population A but not in population B, the decline of natality in population A may be considerably impeded. The gap between ( $C_n$ ) and ( $C_d$ ) widens dramatically in population A and then closes very slowly. But in the case of B the decline will probably occur far more rapidly. The methodological implications of these findings for the statistical analysis of fertility determinations are briefly touched on. Finally, the paper closes with two examples, one concerning the Western European transitions and the other involving the prefectures of Japan.

#### Fertility Decline in Korea and Its Relationship to Development Patterns

Robert Repetto, Department of Population Sciences, School of Public Health, Harvard University, 665 Huntington Avenue, Boston, MA 02115.

The fertility decline in the Republic of Korea between 1960 and 1975 was one of the fastest in history. It can be explained partly by the end of the 1950s baby boom and partly by the rapidity of economic development. Development provided alternative sources of security, raised the costs of children, and increased both rewards and access to education. It induced rapid urbanization and female labor force participation, especially by unmarried women in urban jobs. Yet, fertility fell equally rapidly among rural, uneducated, nonworking women. The rapid convergence of socioeconomic fertility differentials is related to the relative absence of vertical stratification. Evidence from econometric analysis also supports the important role of the very equal distribution of income in Korea's rapid fertility decline.

The Transition from Natural to Controlled Fertility in Taiwan: A Cross-Sectional Analysis of Demand and Supply Factors

Shireen J. Jejeebhoy, Population Studies Center, University of Pennsylvania, 3718 Locust Walk, Philadelphia, PA 19104.

Three factors are usually proposed as inducing the transition from natural to regulated fertility. Fertility regulation may occur when the demand for children is reduced, when general attitudes towards fertility regulation become positive, and when factors such as infant and child survival prospects and natural fertility conditions increase the potential supply of surviving children. Applying the Easterlin framework for fertility determination, the author considers the effect of these three factors in the shift from natural to regulated fertility in Taiwan in 1965. Cross-sectional data for continuously married women aged 35-44 are used. The results indicate that at the initial stages of the fertility transition the regulating subpopulation can be distinguished from the natural fertility subpopulation primarily by an increase in the potential output of surviving children and a decline in the drawbacks associated with fertility regulation. These two factors, rather than a decline in desired fertility, may be said to induce the transition from natural to regulated fertility.

Changes in Fertility in the Central Asian Part of the Soviet Union, 1897-1970

Ansley J. Coale, Office of Population Research, Princeton University, 21 Prospect Avenue, Princeton, NJ 08540.

Russia was studied as part of a major research project at the Office of Population Research on the decline of fertility by province in Europe. Originally it had been planned to confine the study of Russia to European Russia, but the surprising trends in Central Asia and the Transcaucasus made them an irresistible attraction.

In 1897 and 1926 the populations of Central Asia and the southern Transcaucasus were characterized by very early and universal marriage for women and surprisingly moderate levels of marital fertility (only about half the Hutterite level). Between 1926 and 1959, and again between 1959 and 1970, in the Central Asian area, marital fertility rose substantially while the mean age of marriage also increased. By 1970 marital fertility was approximately 50 percent higher than in 1926. The age structure of fertility was such as to be consistent with the virtual absence of the voluntary control of fertility. These facts raise interesting questions concerning accepted theories that relate the reduction of fertility to social and economic progress.

DEMOGRAPHIC POLICIES IN DEVELOPED COUNTRIES

Organized and Chaired by

Robert J. Willis, National Bureau of Economic Research  
and Stanford University

Fertility Differences between Working and Nonworking Wives

T. Paul Schultz, Economics Department, Economic Growth Center, Box 1987, Yale University, New Haven, CT 06520.

If the market wage is independent of hours worked, the allocation of a working wife's time between market and nonmarket activities does not affect the value of her time. For a nonworking wife, however, changes in household constraints are likely to affect the value of her time. Specifically, an increase in her husband's wage increases the shadow value of her time if, as seems plausible, her husband's time in nonmarket activities is a substitute for her own. As a consequence, activities that are relatively intensive in their use of the nonworking wife's time, such as children, increase in cost, which decreases their demand. This framework implies a more positive response of fertility to the husband's wage among working than among nonworking wives. These implications are derived and tested against 1967 U.S. survey data for white and black couples.

Monitoring the Health Impact of Restricting Public Funds for Abortion

Barbara L. Lindheim, The Alan Guttmacher Institute, 515 Madison Avenue, New York, NY 10022.

Within the past year, most states have restricted public funding of abortion, limiting the access of a large segment of U.S. women to a formerly widely employed means of fertility control. The author describes a research project being carried out jointly by the Alan Guttmacher Institute, Princeton University, and the Population Council to assess the fertility outcomes of this policy change. Data and conceptual problems will be minimized by focusing on changes in pregnancy outcome among Medicaid-eligible women conceiving shortly after the funding cutoff and by limiting the study to four target states terminating funding and several continuing states.

The proportions of Medicaid-eligible women obtaining abortions and giving birth will be compared pre- and post-cutoff and in continuing states. Information from state Medicaid data files on the number of publicly funded births and abortions will be supplemented by a survey of abortion patients in all major providers in the target states, yielding estimates of the number of Medicaid-eligible women securing abortions on their own. Surveillance data on the incidence of illegal abortion morbidity will also be used. The difficulties and importance of field research in response to sudden policy changes are discussed.

Population Redistribution Policies in Hungary and an Assessment of Their Effectiveness

George J. Demko, Department of Geography, Ohio State University, Columbus, OH 43210; Roland J. Fuchs, University of Hawaii; and T. J. Camarco, Ohio State University.

The authors introduce a research project in which the spatial population problems as perceived by Hungarian government officials and planners are described, the policy and policy goals established to solve or ameliorate these problems are identified, and the effectiveness of the policy in achieving the stated goals is evaluated.

The historical problem of the primacy of Budapest and, more recently, the northern tier of counties extending east and west from Budapest is well documented. The demographic goals of policies developed to counter this trend include (1) stemming in-migration to Budapest, (2) reducing (and even reversing) the out-migration from the less economically developed counties of Budapest, and (3) stimulating the rate of urban population growth in the less developed counties, especially those containing the five main provincial cities of Győr, Miskolc, Debrecen, Szeged, and Pécs. These goals are posited as hypotheses and tested with data from 1968 to 1975 using graphic techniques.

An attempt is made to determine the system of relationships which is operating to achieve spatial demographic goals in Hungary. A dynamic model is developed in order to measure the effects of government policies on population redistribution. Regional capital investments are discerned to be primary in the system and affect net migration and urban growth rates in the regions after time lags, through a set of intervening variables. When calibrated for two- to three-year time lags from time of investment to alteration in migration trends, regression analysis lends credence to the validity of the system and the limited success of Hungarian policy in achieving population redistribution goals.

The Development of Population Policy in Japan, 1945-1952, and American Participation

Deborah Oakley, University of Michigan. Mailing address: 1709 Pontiac Trail, Ann Arbor, MI 48105.

Japanese population policy during the period of Allied occupation, 1945-1952, was a combination of explicit administrative and legislative statements of government concern about population growth. The author uses a model adapted from Hofferbert in order to analyze the development of population policy in Japan during the period of Allied occupation, 1945-1952.

Features of the model include historic-geographic conditions, socioeconomic trends, mass political behavior, governmental institutions, initiatory elite behavior, and decision-making elite behavior. The results of the analysis of the process of policymaking as well as the determinants of the policy show that the American occupying forces facilitated the timing and form of population policy, while Japanese participation was important in affecting the content of the policy. The impact of the American experience in Japan on population activities in the United States is also examined by the author.

THE DEMOGRAPHY OF THE SOUTH (Panel Session)  
Organized and Chaired by  
Robert H. Weller, Florida State University

ISSUES IN DEMOGRAPHY AND AGING  
Organized and Chaired by  
William J. McAuley, University of Wisconsin at Green Bay

Explaining and Predicting Service Use by the Elderly

Elizabeth W. Moen, Department of Sociology, University of Colorado, Boulder, CO 80302.

In this paper, the author examines why the elderly do not take advantage of existing programs and services and what the level of aged dependency and demand of services in the future will be. Data were obtained through 25 in-depth interviews and briefer interviews with clients and service personnel in senior citizen centers, meal sites, and agencies.

The findings confirm that today's elderly are reluctant to admit need or accept help and may even deny using services. They seem to have devised their own model of services, with the most acceptable being those they perceive they have earned or which require a donation, and those having a minimum income eligibility being the least acceptable. These findings are explained in terms of relative deprivation and through an analysis of the social and economic history of age cohorts representing the older, younger, and future elderly. It is concluded that while there are trends that will both reduce and increase aged dependency, since successive cohorts have experienced better times and a more liberal social atmosphere, the future elderly will feel increasingly needier and become increasingly aggressive about getting assistance.

Retirement and Interstate Migration

Albert Chevan, University of Massachusetts. Mailing address: 25 Lantern Lane, Orchard Valley, R.F.D. No. 5, Amherst, MA 01002; and Lucy Rose Fischer, University of Massachusetts.

Studies of the relationship of migration to employment have focused on migration during the early stages of work careers. In this study, migration of the recently retired is observed and found to be related to two factors unique to the last stage of work careers--retirement and concern for climate. Analysis of 1970 census data shows that previous lifetime migration as well as the usual social class variables continue to exert an influence on migration. Migration of retirees to the "sunshine" states and to other states is predicted and differences noted between the two streams. An additive model of effects best describes the relationships observed. A broader understanding of the impact of retirement on migration is gained through a couple analysis in which joint patterns of retirement are observed.

The Transition to Adulthood: Sex Differences in Educational Attainment and Age at Marriage

Margaret M. Marini, Battelle Human Affairs Research Centers, 400 N.E. 41st Street, Seattle, WA 98105.

The transition to adulthood involves a number of role changes, but the timing of the transition is, in large part, causally determined by educational attainment and age at marriage. These two variables are positively related for both sexes, but because women marry earlier than men, the relationship is stronger for women. Analyzing data from a 15-year follow-up study of the high school students studied by Coleman in The Adolescent Society (1961), the author examines sex differences in the determinants of educational attainment and age at first marriage and in the relationship between these two variables.

The results, based on estimation of a simultaneous-equation model, indicate that women's earlier age at marriage is an important factor limiting their educational attainment. Age at first marriage has no significant effect on the educational attainments of men but has a stronger effect on the educational attainments of women than any of the variables usually considered in models of the male educational attainment process. Educational attainment also exerts a stronger effect on the timing of marriage for women than for men, although it has a significant effect for both sexes.

Differentials in Survivorship of the Older Populations among Areas within a State

R. Thomas Gillaspy, Ethel Percy Andrus Gerontology Center - Room 210B, Social Policy Laboratory, University of Southern California, University Park, Los Angeles, CA 90007; Kenneth G. Keppel, Pennsylvania State University; and Gordon F. De Jong, Pennsylvania State University.

It has often been assumed when making estimates or projections of populations of sub-state areas that survival ratios of that state, region, or even the nation may be used since significant differentials are not expected within the state. The validity of this assumption is questioned, employing single-year-of-age survival ratios estimated for each planning and service area in Pennsylvania. On the basis of regression analysis, with survival ratios transformed into log-odds of survivorship, estimates are made to determine whether the survival functions of the areas are statistically the same as the survival functions of the state. The survival functions are partitioned into two groups by age: 10-49 years old and 50-84+ years old. Briefly, the results indicate that, at least for Pennsylvania, significant differences are more likely to occur among the older group.

APPLIED MATHEMATICAL DEMOGRAPHY

Organized and Chaired by  
Michael A. Stoto, Harvard University

Seasonal Variation in Fecundability: Effects on Birth Intervals and Birth Rates

Jane A. Menken, Office of Population Research, Princeton University, 21 Prospect Avenue, Princeton, NJ 08540.

In a number of regions of the world, the conception rate seems to vary dramatically over the year, even though indications of deliberate fertility control are lacking. In some areas, the swings may be attributed to seasonal migration of males; in others, a reasonable explanation remains to be found.

In order to study the extent of the influence such swings may have on fertility, the author first attempts to develop a simple probability model incorporating seasonal variation in fecundability, fixed rates of live births and abortions following conception, and fixed durations of the pregnancy and postpartum periods associated with each pregnancy outcome. She then proceeds to examine the variations in monthly birth rates resulting from two different

patterns of seasonal variation in fecundability, namely, migration for several months at a time and cyclical swings in fecundability. The author also considers the effects of such changes on birth intervals or, more directly, on times to conception and presents a crude method of estimating the birth rate in the absence of seasonal migration.

A Model for the Analysis of the Comparative Effects of Energy-Related Effluents on Human Health

Robert T. Lundy, Argonne National Laboratory. Mailing address: 558 White Oak Road, Bolingbrook, IL 60439.

The evaluation of energy policy often requires the assessment of the effects of various options on human health. The health effects to be expected from the effluents anticipated from various systems of energy production are quite diverse. Consequently the relatively simple models that have often been employed in analyzing health effects are not suitable for making comparisons between different energy systems, and indeed in some cases cannot even make valid analyses within systems.

In this paper, a general model for the assessment of health risks as indexed by mortality is developed as a projection model for both population growth and risks of death. The use of this model for assessments is demonstrated. The effects of various assumptions about dose-response functions, level and duration of exposure to effluents, and competing risks on the projection process and parameters of demographic interest are explored.

Estimating the Intrinsic Rate of Increase from the Average Numbers of Younger and Older Sisters

Noreen J. Goldman, Office of Population Research, Princeton University, 21 Prospect Avenue, Princeton, NJ 08540.

The author describes an indirect technique for estimating the intrinsic rate of increase ( $r$ ) of a stable population. The technique utilizes kinship data--specifically, the ratio of the number of younger sisters ever born to the number of older sisters ever born for a random sample of women.

Based on stable population theory, a mathematical relationship is developed between the ratio of younger to older sisters ( $Z$ ) and  $r$ . A simple formula relating  $r$  and  $Z$  is derived and is readily converted into an estimation procedure for  $r$ . The technique appears useful when accurate vital registration data are lacking: data on numbers of sisters can be obtained by survey, and, for some localities, genealogies may already be available from historical and anthropological sources.

Leslie Matrices with Eigenvalue Multiplicity

David D. McFarland, Department of Sociology, University of California, Los Angeles, CA 90024.

The eigenvalues of a Leslie population projection matrix play a central role in discussions of convergence to a stable population. It is mathematically convenient--and customary--in such discussions to assume that the various eigenvalues are all distinct of algebraic multiplicity one. In this paper, the author sets out to demonstrate that it is possible for Leslie matrices to have eigenvalues with multiplicity greater than one and to show that such Leslie matrices do not seem to exhibit any peculiarities of appearance that would alert the investigator short of an attempt at spectral decomposition. He also discusses the precise nature of the difficulties caused by eigenvalue multiplicity, indicates appropriate means of analyzing Leslie matrices with eigenvalue multiplicity, and relates the results of this study, where two eigenvalues are exactly equal, to the much more common case where two eigenvalues are nearly equal in magnitude.

ECONOMIC ASPECTS OF FERTILITY IN LDCs  
Organized and Chaired by  
James E. Kocher, Harvard University

Economic Influences on Breast-Feeding, Contracepting, and Birth Spacing in Peninsular Malaysia

William P. Butz, The Rand Corporation, 1700 Main Street, Santa Monica, CA 90406; and Julie DaVanzo, The Rand Corporation.

In this paper, the authors present initial results from a survey and research project designed to estimate responsiveness of couples' behavior to changes in specific factors influenced by policy in Peninsular Malaysia. Changes over time in major demographic variables are documented, and regressions are reported explaining length of postpartum amenorrhea; length of full, partial, and total breast-feeding; length of menstruating interval; use of contraceptives by type; length of birth interval; child mortality; and birth weight. Units of observation correspond to individual births in the retrospective life history of female respondents. Biomedical and economic hypotheses are tested. Results are consistent with the available literature and suggest systematic responses to economic changes that account for a significant part of the observed trends in birth spacing, breast-feeding, and contraceptive use.

The Effect of Child Mortality on the Quantity and Quality of Children in Guatemala

Kathryn H. Anderson, Department of Economics, North Carolina State University, Raleigh, NC 27607.

The author applies a variation of Becker's production-consumption model to the estimation of the demand for child services in order to examine the effect of child mortality on the number of births and child quality in Guatemala. Three demand functions are estimated simultaneously: the demand for live births is a log-linear function of wages, income, child survival, and prices; the demand for child survival is a log-linear function of wages, prices, income, and live births; and the demand for child quality is a log-linear function of wages, prices, income, child survival, and live births. The model is then converted into a recursive system of equations by substituting three instruments for child survival in the demand for live births; these instruments are variables designed to estimate replacement mortality and expected mortality. With the substitution, each equation is estimated using ordinary least squares.

The estimation of the demand for live births shows significant results for wage, schooling, and mortality effects. The mortality estimation is not successful; wages, income, and efficiency do not significantly determine child mortality. The quality regression points up price variables as the most important determinants, with area of residence, type of marriage, and sex preference all being significant.

Determinants of Female Labor Force Participation and Family Size in Less Developed Countries

Stanley K. Smith, University of Florida. Mailing address: 16 N.W. 29th Street, Gainesville, FL 32607.

In this study, the Chicago model of household decision-making provides the theoretical basis for an empirical investigation of the determinants of female labor force participation (FLFP) and family size in less developed countries. Two extensions to the model are suggested. Allowance is made for the degree to which work and child care can be carried out simultaneously and for the potential direct effects of unplanned fertility on FLFP over time.

The empirical work is based on sample survey data from Mexico City. The results for family size generally support the implications of the theoretical model. Classifying FLFP according to the degree to which work and child care can be carried out simultaneously produces some major differences in the de-



terminants of FLFP. Finally, unplanned fertility is found to have a negative effect on work that cannot be performed simultaneously with child care and a positive effect on work that can be.

Relationships among Land, Tenancy, and Fertility among Philippine Barrios

Wayne Schutjer, Pennsylvania State University; C. Shannon Stokes, Department of Agricultural Economics and Sociology, 6 Weaver Building, Pennsylvania State University, University Park, PA 16802; and Gretchen Cornwell, Pennsylvania State University.

Historical data from the United States and Canada suggest that the availability of easily accessible land was an important factor supporting high fertility. Evidence from other areas is scattered, although some information is available regarding the relations between land availability and fertility in Bangladesh, Southern Poland, Mexico, and seventeenth-century France. The authors present findings regarding relationships among agricultural production patterns, tenancy, socioeconomic conditions, and fertility in a sample of Philippine barrios. The findings reveal consistent differences in fertility among the sample barrios. Lowland areas are characterized by higher tenancy rates, lower income, traditional behavior, poorer socioeconomic conditions, and higher fertility. The direct effect of land ownership is found to increase fertility. However, the indirect effect of land ownership through its influence on female education and level of living is to lower fertility, and in total to offset the positive direct effect.

COMMITTEE ON POPULATION STATISTICS (Panel Session)  
Organized and Chaired by  
Jeanne Clare Ridley, Georgetown University

What's New in the 1980 Census

Manuel D. Plotkin, U.S. Bureau of the Census, Washington, DC 20233.

The purpose of this presentation is to review selected aspects of the 1980 decennial census that will differ from the 1970 census and to summarize current preparations for conducting the census. Some new or expanded coverage improvement techniques are also discussed.

The focus of the paper is on the census of population. In 1980 a short form will ask questions on a 100 percent basis and one long, or sample, form will contain both 100 percent questions and sample questions. Although there is a great deal of continuity in questionnaire content from 1970 to 1980, there are also important changes on both forms. No 1970 short form question has been dropped for 1980, but the orientation of the relationship question has changed and a question on Hispanic origin has been added. Regarding the long form, some 1970 questions have been dropped and some new ones added for 1980.

Current Issues in Geographic Definitions

Richard L. Forstall, Population Division, U.S. Bureau of the Census, Washington, DC 20233; and Cornelia Flora, Kansas State University.

The authors describe major highlights and changes planned for the 1980 census. They note that the 1970 urban-rural definition will be retained with only minor variations, more township data will be published, and annexations data will be published after 1980 on both "forward" and "backward" comparability bases. Proposals for revised criteria for defining SMSAs, being issued by the Office of Federal Statistical Policy and Standards (OFSPS), include somewhat tighter requirements for recognizing an SMSA, including sparsely populated outlying counties, and identifying multiple central cities. Some population data will appear for both 1970 and new (\$1,000 sales) farm

definitions; a Volume II report will cross-classify rural population by income source, residence type, etc.

Problems with data use include (1) accessibility of data for small geographic areas, (2) meaning of the different geographic designations, and (3) comparability of data over time. An intermediate form of data needs to be made available between computer tapes and published reports for small areas. The farm/nonfarm designation may be related to residence, tenure, occupation, and/or income source. The authors' use of the term is based on the historical period when these factors were synonymous.

Prospects for Improving the Utility of Immigration and Naturalization Service Data

Robert Warren, Immigration and Naturalization Service, Washington, DC 20536.

No abstract received.

ISSUES IN MORTALITY RESEARCH  
Organized and Chaired by  
Jack E. Eblen, United Nations

The Collection of Statistical Data on Mortality in Africa, Asia, and Latin America

Dominique Waltisperger, Development Centre, Organisation for Economic Co-operation and Development, 94 Rue Chardon Lagache, 75016 Paris, France.

As a result of the recent relative disinterest of demographers in research subjects concerning mortality, many difficulties are encountered when raw survey data are needed, when trying to find relevant national life tables, when only insufficient country data are available, or when attempting to determine the growth rate of a population. The project outlined in this paper would assist in the location of statistical information and the creation of a data bank on mortality; the drafting of bibliographical compilations containing the methodological information and a detailed description of the relevant statistical tables; the publication of collections of crude statistics on mortality (deaths and population by age) for which each statistical series has been evaluated (regularity indices, graphic representations, application of the Brass method to cumulative deaths, etc.); the publication of a study presenting a synthesis of the mortality patterns of the countries for which data of sufficient quantity and quality are available; and the construction of mortality models by continent based on the best statistics.

The work on the first four points is being coordinated by the OECD Development Centre. The construction of new mortality models will be undertaken by the U.N. Population Division. The annotated bibliographies for Africa, Asia, and Latin America have been completed and will be published shortly. At present, the documentation that has been collected is either still in its original form (complete reports) or in the form of photocopies. It is planned to transcribe this information onto microfilm cards. The diffusion of the statistical collections should be possible by August 1978. The fourth phase of the project will begin as soon as the results of the data evaluation are available and should be completed by the end of the year.

Patterns of Differential Mortality during Infancy and Early Childhood in Developing Nations with Examples from Costa Rica

Michael R. Haines, Department of Economics, Uris Hall, Cornell University, Ithaca, NY 14853.

In this paper, the author deals with the issue of differentials in mortality in infants and young children in developing areas. Infant and child mortality is a good indicator of differential social and economic development

both between and within nations and is an important part of overall mortality. It is related to such factors as nutrition, environmental sanitation, crowding, availability of medical care, environmental mortality risk, geographic location, and fertility levels. Indirect mortality estimation techniques furnish a means to circumvent deficiencies in vital registration data. Costa Rica for the period 1968-1973 was chosen as a case study. The main features of the study are two cross-sectional regression analyses, one of canton level data and one of individual families (from a sample of the 1973 census).

The general conclusions are that factors relating to endogenous social and economic development are at least as important as those related to such exogenous factors as medical care and sanitation. Also, significant differentials in infant and child mortality appear along such dimensions as rural-urban residence, education of mother, income, and geographic location.

#### Causes of Death Which Contribute to the Mortality Crossover Effect

Charles B. Nam, Center for the Study of Population, Institute for Social Research, Florida State University, Tallahassee, FL 32306; Kathleen A. Ockay, U.S. Bureau of the Census; and Norman L. Weatherby, Florida State University.

Death rates vary over the life cycle in a standard fashion, with mortality probabilities being highest in infancy and at older ages. Nevertheless, when age curves of mortality are compared for different populations, they sometimes can be seen to intersect so that one population has higher death rates at younger and middle ages and lower rates at older ages. Past research has shown that this phenomenon is not due to erroneous data and is probably a result of some type of selection in survival patterns.

In this study, the authors analyze a sample of pairs of mortality curves, 50 of which cross over and 50 of which do not, for combinations of countries and dates, in order to discover which causes of death are associated with the crossover phenomenon at the older ages. Cardiovascular and other and unknown diseases appear to contribute strongly to the crossover effect. The authors conclude that further research is needed to deal with other comparisons and to explore the underlying social and environmental factors contributing to this phenomenon.

#### LABOR FORCE STUDIES

Organized and Chaired by  
Jean C. Darian, Rutgers University

#### Early Labor Force Experiences and Female Work Commitment

Glenna D. Spitze, University of Illinois. Mailing address: 405 West Main, Urbana, IL 61801.

In this paper, the author examines one part of the process by which young women develop tastes for and attitudes about work and the effect of early experiences in the labor market on those attitudes. In addition, the impact these tastes and attitudes developed in early life have on the decisions young women make about market work immediately after completion of their education is considered. Using a subsample of the National Longitudinal Survey of Young Women, the author shows that this process differs by race and depends upon whether the woman is married or has children. Employment experience, particularly while married or with children, causes increasing permissiveness regarding work for women, as well as increasing labor force participation. The conjunction of positive attitudes toward work and favorable work experiences, involving high income, status, or job satisfaction, increases the probability of being in the labor force for women of both races.

Socioeconomic Determinants of Married Women's Labor Force Participation: A Closer Look

Pamela S. Cain, Department of Social Relations, Johns Hopkins University, Baltimore, MD 21218.

The effects of adolescent socialization experiences upon women's current labor force participation (LFP) have been relatively little researched. In this paper, the author develops a model which synthesizes sociological and economic approaches to the subject, encompassing processes of sex-role socialization and human capital investment (i.e., work-preparatory training), as well as the more immediate marital contingencies (including price factors) that are usually examined. The model is estimated for a national sample of 1,015 white women who were interviewed twice over a 15-year period, once as high school sophomores and later at age 30.

Pronounced interactions are found between variables in the model and the presence of preschool children. Although few of the background and work-preparatory variables are significant determinants of current LFP, those which are significant, coupled with significant influences of the marital context, conform to an anticipated pattern. Compared with women without young children, women with young children are markedly more responsive to variables representing their own sex-role attitudes as adolescents and as adults, and less responsive to variables representing their investments in training or tastes for work. These findings are discussed in light of the various barriers to women's combining working and child-rearing and in relation to past empirical research, with particular attention given to the effects of earnings and education.

The Prediction of Young Mothers' Labor Force Participation and Future Participation Expectations through Use of a Household Decision-Making Model

Eileen Crimmins-Gardner, Department of Sociology, University of Illinois at Chicago Circle, Chicago, IL 60680; and Phyllis A. Ewer, University of Illinois at Chicago Circle.

Data from a panel study of a marriage cohort are used to investigate the factors influencing young mothers' current and expected future labor force participation. Regression analysis is used to estimate the effects of various income measures, the financial and emotional costs of working, family work experience, and the attitudes of the women and their husbands to labor force participation. Results indicate that for mothers of young children the financial and emotional costs of children and the husband's attitudes are important determinants of labor force participation. Expected future labor force participation is related to the emotional costs of working and the wife's potential income.

The Long-Term Labor Supply of Rhode Island Women

W. Ward Kingkade, Department of Sociology, Brown University, Providence, RI 02912; and Robert J. Magnani, Brown University.

In this paper, the authors examine the determinants of cumulative labor market activity over the life cycle of a sample of married Rhode Island women. The summary dependent variable is the proportion of married life during which a woman has been employed. A socioeconomic model is developed in which the determinants of labor force attachment are classified into three broad categories, economic constraints, socio-structural factors, and individual preferences. The models are evaluated through the use of multiple regression and analysis of covariance techniques.

The wife's preferences for market over nonmarket activities emerge as a powerful predictor of life cycle labor market activity. The income effect emerges as hypothesized, but interaction with life cycle stage is also observed. Wife's education is of negligible importance in the additive models, but exhibits strong interaction with life cycle stage, as might be expected on the basis of the "added worker" hypothesis.

THE DEMOGRAPHY OF ASIA  
Organized and Chaired by  
Peter J. Donaldson, International Fertility Research Program

Migration and Fertility in the Philippines

Virginia A. Hiday, North Carolina State University, Raleigh, NC 27607.

The effect of migration and urbanization on fertility in a less developed nation is explored by a comparison of three groups of women from two Philippine rural communities: rural sedentary women, rural migrants, and urban migrants. Age-specific fertility rates and child-woman ratios reveal a declining gradient of fertility with social distance from the rural home communities. Age at marriage and education are positively associated with distance from the home communities and negatively associated with fertility. These data lend support to the hypothesis that recent migration is innovative, engaged in by persons more influenced by modernization who are motivated by aspirations to new goals, and thus has a negative effect on fertility. Urbanization exerts its major impact after the peak fertility years of ages 20-29, influencing urban migrants to bring their fertility under voluntary control. No such curtailment appears in the late reproductive behavior of rural sedentary or migrant women. Urbanization thus appears to have a negative effect on fertility independent of migration.

Risk of Childbirth following Infant Mortality in Korea

Chai Bin Park, School of Public Health, University of Hawaii, 1960 East-West Road, Honolulu, HI 96822; Seung Hyun Han, Korean Institute for Family Planning; and Minja K. Choe, East-West Population Institute.

This study is based on 23,635 retrospective birth records of 6,285 Korean women who were respondents in the 1971 National Fertility Survey. The findings indicate that during the days prior to the introduction of the family planning program only the "physiological effects" of infant mortality had an influence on subsequent fertility; infant mortality reduced the birth interval but it did not increase the probability of bearing an additional child. Since contraceptive methods were made available throughout the country, marked differences have been observed both in birth intervals and parity progression ratios according to the fate of the last infant, suggesting the emergence of an infant mortality "replacement effect". The proportion of births attributable to infant mortality in this way has increased tremendously in recent years in spite of the decrease in infant mortality. However, the overall magnitude of such births remains rather small.

Determinants of Age at First Marriage: A Study of West Malaysia

Barbara R. Von Elm, International Center for Research on Women. Mailing address: 8 South Van Doren Street, Apt. U 504, Alexandria, VA 22304.

Nuptiality, usually studied as a predictor of fertility, warrants examination in its own right. In this paper, the author studies the relationship between social background characteristics and nuptiality among Malaysian women. With data obtained from the 1966-1967 West-Malaysian Family Survey, multiple classification analysis is used to determine the relative effects of education, fathers' occupation, residence before marriage, and premarital work experience on age at first marriage.

The results show that ethnicity is the most important factor in explaining variations in nuptiality. Due to unique cultural, residential, and occupational patterns, ethnicity appears to be largely responsible for differentials by fathers' occupation and place of residence. While education has the greatest influence on timing of marriage for Indian and Malay women, premarital work experience has the greatest effect for Chinese women. Increased age at marriage is found only among women with urban backgrounds and among daughters of blue- and white-collar workers. This suggests that urbanization may have a large bearing on rising age at marriage.

The Potential Effectiveness of Compulsory Family Size Limitation as a Fertility Reduction Policy for Asian Countries

Timothy D. Hogan, Department of Economics, Arizona State University, Tempe, AZ 85281.

The purpose of this study is to evaluate the potential effectiveness of a legally imposed limitation on family size in reducing the rate of growth of the populations of the developing nations of Asia (and implicitly also of Africa and Latin America). To accomplish this objective, a relatively simple population projection program, incorporating a subroutine allowing simulation of the impact of family size limitation upon fertility rates, was used to produce paired sets of projections of the future population growth of a representative Asian country. Each set of projections includes a "control solution", based entirely upon the plausible future trends in fertility and mortality, and a "compulsory-limit" run, for which the same assumed trend in fertility rates is the fundamental basis of the projection but with the actual age-specific fertility schedule modified to simulate the probability of birth for women having three or more living children reduced to zero. The gross reproduction rate, the absolute growth of population, the annual rate of population growth, and the dependency ratio are then measured. The results indicate that a policy compulsorily limiting family size to three living children would have immediate and significant effects upon the populations of developing Asian countries. Such a policy would produce a very rapid decline in fertility from current levels, and the fertility experience of a population subject to such mandatory controls would remain substantially below the declining fertility path expected to occur in such developing societies without a compulsory family size limit. The simulation results also reveal that the reduction in fertility would slow population growth and decrease the dependency ratio.

TEENAGE FERTILITY

Organized and Chaired by

Linda J. Waite, University of Illinois at Urbana-Champaign

Age at First Birth and the Pace and Components of Subsequent Childbearing

T. James Trussell, Office of Population Research, Princeton University, 21 Prospect Avenue, Princeton, NJ 08540

Data from the 1973 National Survey of Family Growth are analyzed by life table procedures to determine the effect of age at first birth on subsequent fertility. Younger ages at first birth are strongly associated with a faster pace of subsequent childbearing (and, therefore, completed fertility) and with higher proportions of unwanted and illegitimate children. These conclusions also hold within racial, educational, and religious subgroups. A large proportion of the widely noted racial and educational fertility differentials can be explained by differences in age at first birth. These results, in addition to their descriptive value, have important implications for population policies and programs. If women do have their first births at a young age, our analysis shows that their subsequent childbearing is rapid regardless of their marital status and that their ability to control their fertility both in terms of number and timing of births is lower. Although the differentials in the first years after childbearing begins appear to have diminished in the period since 1965 for whites and are not large in absolute terms for blacks, these young women are still a group in need of special attention and help.

Age at First Birth and Later Economic Well-Being

Sandra L. Hofferth, The Urban Institute, 2100 M Street, N.W., Washington, D.C. 20037; and Kristin A. Moore, The Urban Institute.

The authors use data from the National Longitudinal Survey of Young Women on a subsample who have borne a child by age 27 to examine the effects of early childbearing on later economic well-being within a path analytic framework. The direct effects are that later childbearers complete more education, have smaller families, and work fewer hours at age 27. The effect of age at first birth on education is recursive among women having a first child by age 18 but simultaneous among later childbearers. However, effects on economic well-being at age 27 are indirect. Lower education is related to reduced earnings among women and among other household members (usually the husband). Since resources must be divided among more family members, the incidence of poverty is greater. For women who are at least 19 when they have their first birth, the timing of that birth has diminished importance for their later well-being.

A Cohort Analysis of Teenage Fertility in the United States Since the Depression

Martin O'Connell, Population Division, U.S. Bureau of the Census, Washington, D.C. 20233.

Utilizing the dates of first birth and first marriage from the June 1977 Current Population Survey (CPS), the author analyzes teenage childbearing for cohorts of women born since the Depression.

Among blacks, the proportion of women born between 1928-1932 and 1953-1957 who have had a premarital conception terminating in a live birth increased from 25.8 to 40.9 percent; the corresponding increase for whites was from 6.5 to 12.0 percent. The proportion of black teenage women who have had a premarital birth has increased from 19.3 percent for the earliest cohort to 35.6 percent for the most recent cohort; however, the percentages for whites have varied between 3 and 4 percent for the corresponding birth cohorts.

A comparison of the CPS data with two National Natality Surveys and the 1971 Zelnik-Kantner study on teenage fertility suggests that improved reporting of illegitimate births since the early 1960s has produced an artificially exaggerated rise in teenage illegitimacy among white women since World War II as reported by vital statistics.

Fertility of Adolescent Mothers

C. M. Suchindran, Department of Bio-Statistics, School of Public Health, University of North Carolina, Chapel Hill, NC 27514; Rebecca A. Teeter, University of North Carolina; and Helen P. Koo, Research Triangle Institute.

The purpose of this paper is to compare the childbearing experience of women who begin bearing children during adolescence with women who start childbearing after adolescence. The study is based on the June supplement of the 1975 Current Population Survey, a nationally representative sample of both white and black U.S. women. The data contain information on the number of children ever born, the dates for the first three and the last two births, and the beginning and ending dates of the first and most recent marriages. Because the fertility rates of all age groups have changed in the past few decades, the period in which a woman had her first birth may affect her subsequent fertility behavior. Hence, the authors control for the period effects by broadly grouping women by the year in which they had their first birth: 1930-1945, 1946-1960, and 1961 or later. To study the differential fertility experiences of women who became mothers at different adolescent ages, the authors divide the year at first birth groups according to mothers' age at first birth: under 17, 17, 18, 19, 20-24, and 25-29. The comparison of the fertility performance of these groups is done using three different procedures: descriptive, life table, and categorical data analyses.

The preliminary analysis seems to confirm the hypothesis that the adolescent mothers have shorter birth intervals and progress to higher parities at a faster rate than do mothers who start childbearing in their twenties.

HISTORICAL DEMOGRAPHY  
Organized and Chaired by  
J. Dennis Willigan, University of Utah

Mortality Differentials within and among Large American Cities in 1890: A Statistical Study

Robert Higgs, Department of Economics DK-30, University of Washington, Seattle, WA 98195; and David Booth, University of Washington.

The authors present a multiple regression analysis of demographic and social data for 335 wards in 17 American cities in 1890. The most important findings are: (1) that density effects on mortality were uniformly positive and statistically significant, the magnitude of these effects was much greater for child mortality than for adult mortality, and child mortality was more sensitive to persons per dwelling than to persons per acre; (2) that unsanitary conditions, as measured by the city-specific typhoid fever death rate, significantly increased mortality, and child mortality was much more sensitive in this respect than adult mortality; (3) that given the same age composition and population density, foreign born whites, native born whites, and the colored population had about the same adult death rate; and (4) that the adult death rate was especially low in Minneapolis, St. Paul, and Kansas City and ranged upward to highs in Jersey City, Newark, and New Orleans, while the pattern of city-specific differentials in the child death rate was completely different and defies explanation.

Mortality Fluctuations in England, 1539-1840: Climatic and Economic Causes, Demographic Consequences

Ronald D. Lee, Population Studies Center, University of Michigan, 1225 South University Avenue, Ann Arbor, MI 48104.

The author presents distributed lag estimates of the effects of temperature, rainfall, and wheat prices on short run fluctuations in mortality, nuptiality, and marital fertility in England, 1539-1840, and for sub-periods, using annual and monthly data from the Cambridge Group. It is found that high prices raise mortality, particularly after one and two years, but that in the third and fourth years mortality falls below normal. Only extremely high prices affect mortality contemporaneously, but even minor variations in prices affect mortality in subsequent years. Hot summers and cold winters increase mortality, whereas rainfall has little effect. High prices reduce marital fertility in the first two years, followed by a positive echo, and the effect on nuptiality is similar. These effects are virtually identical in each of three sub-periods. Mortality and associated morbidity first depress births, particularly after exactly nine months, then increase them, with a net effect nearly zero. Finally, it is shown that mortality has a strong net positive effect on nuptiality.

Migration and Adolescence in Nîmes, France, 1906

Leslie Page Moch, University of Michigan. Mailing address: 922 West Charles, Champaign, IL 61820.

Studies of the development of adolescence as a unique stage of the life cycle have not adequately considered origin as a determinant of adolescent status, yet the emergence of adolescence coincides with widespread migration to metropolitan areas in Europe and America. Using census lists for the



French city of Nîmes at the beginning of the twentieth century, the author investigates the hypothesis that migrant status is negatively related to adolescent status as defined by family membership and labor force participation and finds evidence to support the hypothesis. The status of migrant youth from three hometowns is then compared and it is found that the group from the administrative center is remarkably different from those from the other two hometowns which were a commercial center and a rural village. The differences are explained in terms of characteristics of the hometowns. Finally, a typology of options for urban young people based on origins and parentage is proposed.

The Female Life Cycle in a Belgian Commune: La Hulpe, 1847-1866

Susan C. Watkins, Office of Population Research, Princeton University, 21 Prospect Avenue, Princeton, NJ 08540; and James McCarthy, Princeton University.

The authors take data collected from the civilian population register of the Belgian commune of La Hulpe and use the framework of a life cycle to provide a demographic description of the female population. The major events considered are first marriage, birth of first child, and death of husband. A life table approach is used to calculate probabilities of each of these events. Since women are simultaneously at risk of out-migration and death, as well as any of the above events, the situation is one of competing risk, and multiple decrement tables are calculated.

Results show that age at marriage was high and that duration from marriage to first birth was very short, with more than half the first births being either illegitimate or premaritally conceived. While female mortality during the childbearing years was not a great competing risk, out-migration was, both before and after marriage.

MIGRATION TYPES AND THEIR CORRELATES

Organized and Chaired by

Sidney Goldstein, Brown University

Repeat Migration in the United States: Who Moves Back and Who Moves On?

Julie DaVanzo, The Rand Corporation. Mailing address: 16541 Akron Street, Pacific Palisades, CA 90272.

In this paper, the author presents descriptive and multivariate analyses of return and non-return repeat migration using Income Dynamics Panel data. The author finds first that return migration is negatively selective of those at risk when the interval of absence is very short (about one year) but positively selective for longer absences. The act of returning after a very short absence makes up one part of a migration sequence that seems to have been carelessly conceived and in which economic adversity figures throughout. Second, migration onward to new locales is positively selective of those at risk, especially for very short intervals of absence. A sequence of repeat moves involving no quick "corrective" return compounds the initial positive selection through primary migration. Third, longer distance initial moves are more likely to be followed by a subsequent move. And, finally, the more location-specific capital the individual had at origin before first moving, the more likely a return there will be.

Correlates of Net Migration Rates of Blacks in the Deep South, 1960-1970

Eui Hang Shin, Department of Sociology, University of South Carolina, Columbia, SC 29208.

Using the theoretical notion of an "ecological complex", the author constructs a multistage path model of black migration. This model is used to test a series of hypotheses on the causal relationships between net migration

rates and environmental, sustenance organization and products of sustenance organization variables of black population for 405 selected counties in the Deep South. The independent variables in the model jointly account for about 52 percent of the variance in net migration rates for the 1960-1970 period. Among the independent variables considered, the personal income variable is shown to have the largest effect on the net migration rate, followed by the percent of the labor force in agriculture and percent black population. A detailed comparison between the findings of previous studies and the present study is presented.

Native, Non-Native Return and Non-Return Migration to a Colombian Metropolis  
Justin Friberg, Virginia Polytechnic Institute and State University,  
Blacksburg, VA 24061.

Fragmentary evidence indicates that important differences exist between returning and non-returning migrants to Latin American cities. In this study of recent cityward migration to Bucaramanga, Colombia, three groups--native return, non-native return, and non-return migrants-- are compared with respect to place of origin, occupation, education, and reason for moving. The data are derived from migration histories of 866 migrants sampled in Bucaramanga in 1971.

Results confirm that substantial differences exist among the groups. Upon arrival in Bucaramanga, return migrants, particularly natives, are generally better skilled, better educated, and more responsive to personal and social considerations. They also report more residential experience in larger and foreign cities than non-return migrants. Findings suggest that not only do return migrants comprise a sizeable share of the cityward migration stream, but that they also contribute to the character of urban growth.

Female Migration in Chile: Types of Moves and Socioeconomic Differentials  
Joan M. Herold, Population Studies Center, University of Pennsylvania, 3718  
Locust Walk, Philadelphia, PA 19104.

In this paper, the author examines selected characteristics of inter-provincial female migration in Chile for the period 1965-1970. The focus is on migrants to the capital and migrants to other urban areas, with a view to determining differences and similarities between these flows. Age, educational level, and occupational status are the major variables used in the analysis, and migrants are disaggregated according to the type of move (first, return, or repeat). Data are from a five percent sample taken from the 1970 Chilean census.

The analysis shows that, excluding returnees, migrants to other urban areas are differentiated from those to Santiago by their older age distribution, higher educational levels, and higher status occupations, and are more likely to be making a second (or higher order) move. Moreover, educational measures suggest that, except among young first movers to Santiago, female migration to urban Chile may be more characteristic of the upper than of the lower strata of the society.

ETHNIC AND SOCIOECONOMIC SEGREGATION  
Organized and Chaired by  
Franklin D. Wilson, University of Wisconsin

A Measure of Population Clustering Based on Spatial Patterns: An Application of Linear Programming  
Jeffrey S. Passel, Population Division, U.S. Bureau of the Census, Washington, D.C. 20233; and Diana DeAre, U.S. Bureau of the Census.

Although population clustering or residential differentiation is an inherently spatial phenomenon, traditional measures of residential segregation

attempt to measure the unevenness in two distributions of residences or populations without taking into consideration their spatial distribution. A measure of population clustering should not only indicate whether one group is concentrated in certain blocks or tracts but should also measure the extent to which these localized concentrations are clustered or dispersed. In this paper, a measure of residential differentiation is proposed that takes into account these spatial arrangements.

The proposed measure is based on the assumption that an unclustered distribution is one in which the proportion of the city's white population residing in any given tract is the same as the proportion of the city's black population residing in the same tract. The measure considers not only the proportion of the population that would have to be shifted to achieve an even distribution but also the minimum number of person-miles of movement required to achieve this distribution. The measurement model is a version of the "transportation problem" and is solved by linear programming.

The properties of the proposed measure are illustrated with a number of simplified hypothetical residential distributions and with selected SMSAs. Other applications of the proposed measure and avenues for further research are discussed.

Structural Correlates of Black-White Occupational Differentiation: A Reassessment

Robert J. Magnani, Department of Sociology, Brown University, Providence, RI 02912; and Mark J. LaGory, State University of New York at Albany.

The authors examine some of the structural characteristics of local labor markets associated with intermetropolitan differences and black-white occupational differentiation. They attempt to resolve some of the conceptual inadequacies in the structural approach to racial inequality. A model is presented and evaluated in which occupational differentiation is seen to be a function of the following five groups of factors: (1) general industrial and demographic characteristics of the local area, (2) the spatial structure of the local area, (3) general characteristics of the black population, (4) racial differences in labor force characteristics, and (5) region.

The study indicates the importance of taking into account "objective" criteria in explanations of racial differentiation. Several reasons for the frequently observed variation in levels of occupational differentiation by region are suggested. These explanations involve differences in metropolitan size, population and employment distribution, and population composition. The results also indicate that several of the relationships are complex and not well represented by simple additive functions.

Racial and Ethnic Residential Segregation in Boston, 1830-1970

Nathan Kantrowitz, Department of Sociology, Kent State University, Kent, OH 44242.

In this paper, the author concludes that racial segregation has remained stable since about 1940, while the evidence suggests periods of rising segregation prior to the Civil War and in the early twentieth century. Segregation between European ethnic populations seems to have declined little during the twentieth century. The small Oriental and Latin populations show similar patterns in the contemporary city.

Residential Segregation by Female Occupation: Cleveland, 1940-1970

Eugene S. Uyeki, Case Western Reserve University. Mailing address: 2281 Woodmere Drive, Cleveland, OH 44106.

This paper is about one aspect of the status of women, namely, the social distance between females by occupational groupings. Indexes of segregation and dissimilarity are computed for the period 1940-1970 for females by occupation in Cleveland. The results suggest that the patterns of female residential distribution by occupation are similar to those for male workers.

There is a greater segregation of the higher and lower occupational groups and a dissimilarity of distant occupation groups for all four decade periods. There are some differences, notably those relating to the later occurrence of greater segregation for female managerial workers and female sales workers.

The Concern over Property Values: Implications for Racial Residential Segregation

Diane Colasanto, Department of Sociology, 8111 Social Science Building, University of Wisconsin, 1180 Observatory Drive, Madison, WI 53706.

The incompatibility of the residential preferences of individual blacks and whites is one important barrier to the racial integration of neighborhoods. In this paper, the author attempts to demonstrate that the structure of the housing market plays a role in the determination of individual preferences. Specifically, the hypothesis is that differences in the perceptions of individuals about the operation of the housing market lead to differences in the level of acceptance they will have for racially mixed neighborhoods. This hypothesis is tested for whites only using data from the 1976 Detroit Area Study.

The hypothesis is supported by the finding that variables which describe an individual's perception of (a) the behavioral and status characteristics of blacks and (b) the reaction of other whites to the integration of their neighborhoods are significantly related to residential preferences. Additional specifications of the theoretical model are also tested. The implications of these results for the original hypothesis are discussed.

The Utilization of Sample Survey Data in Measuring Socioeconomic and Racial Residential Segregation

Albert A. Simkus, Center for Demography and Ecology, Department of Sociology, Social Science Building, University of Wisconsin, 1180 Observatory Drive, Madison, WI 53706.

No abstract received.

DEMOGRAPHY OF THE FAMILY IN LDCs: TRENDS AND ISSUES

Organized and Chaired by  
Marta Tienda, University of Wisconsin

The Effects of Household Composition on Household Expenditure Patterns

Roberta Barnes, U.S. Bureau of Labor Statistics, 441 G Street, N.W., Room 4921, Washington, DC 20212.

The author attempts to assess the impact of household size and composition on household expenditures. Specifically, the goal is to estimate the total effect the presence of a particular type of person, as defined by age and sex, has on the level of household demand. Among other things, the model of household demand accounts for an interaction between household composition and income, a nonlinear relationship between income and consumption, and economies of scale in consumption. Using data from a household survey in India, the author estimates equations for three commodities: total expenditures, total food expenditures, and foodgrains. The results confirm the importance of including demographic variables in demand studies. The income elasticity and marginal propensity to consume are shown to vary with composition. Finally, the data suggest a nonlinear relationship between consumption and income as well as between consumption and composition.

Economic Class, Economic Mobility, and the Developmental Cycle of Households: A Case Study in Rural Bangladesh  
Mead T. Cain, Center for Policy Studies, The Population Council, One Dag Hammarskjold Plaza, New York, NY 10017.

The author considers the relationship between the developmental cycle of households and their economic mobility in rural Bangladesh and proceeds to state two major assertions. First, in the current socioeconomic and demographic context of rural Bangladesh, a parental strategy of fertility maximization will tend to increase the chances of upward intra-generational mobility and decrease the chances of downward inter-generational mobility. Second, there are systematic economic class differences in family life cycle processes which contribute to widening the gap between rich and poor in rural Bangladesh.

The ways in which variations in the course of the household life cycle influence economic mobility are discussed. These include effects through child labor utilization, effects on the probability of property loss during economic crises, and effects on the probability of property loss at the time of household dissolution.

Data are presented which show economic class differentials in demographic factors affecting the course of the household life cycle. These include child and adult mortality and children's age at leaving the household. The implications of the analysis for population policy are discussed.

A Theory of Marriage Formality: The Case of Guatemala  
Amyra Grossbard, Department of Economics, Occidental College, Los Angeles, CA 90041.

In this paper, the author considers the determinants of choice between formal and consensual marriage. A theory based on the assumptions of voluntary individual choice and the existence of markets predicts asymmetry in male and female attitudes to formal marriage. That theory is then tested on data from a 1974 Rand INCAP (Institute of Nutrition of Central America and Panama) survey of six Guatemalan communities. Regression analysis confirms the theory by showing that female income and general resources increase the probability of formal marriage for the woman, while this is not so for the male.

Residence, Life Cycle Stage, and Household Extension in the Philippines  
William F. Stinner, Department of Sociology and Anthropology, Utah State University, Logan, UT 84322; and Melinda Bacol-Montilla, Utah State University.

This paper evaluates the "child replacement" hypothesis (i.e., that extended kin live in households instead of, rather than in addition to, own children of the household head) in the Philippines. The specific focus of the research is on the impact of age of household head and the age composition of dependent children individually and simultaneously on the relationship between numbers of surviving dependent children and the presence and number of nonnuclear relatives in the household. The data are drawn from the five percent sample taken in conjunction with the 1970 census enumeration, and the units of analysis are 254,168 households headed by currently married males with spouse present. Although general support for the child replacement hypothesis is found, variations do exist dependent upon the age of household head and the age locations of dependent children. Very little differences in the general pattern are evident between urban and rural households, respectively.

APLIC SESSION: INCREASING POPULATION LIBRARY EFFECTIVENESS:  
 HOW PAA MEMBERS CAN OBTAIN INFORMATION EFFECTIVELY  
 Organized by Martha Bargar, U.S. Bureau of the Census  
 Chaired by Kathryn H. Speert, Columbia University

APLIC: A Bridge between the User and Information

Helen K. Kolbe, George Washington University. Mailing address: 10594 Twin Rivers Road, Columbia, MD 21044.

Population and family planning information has often been elusive--difficult to identify and difficult to obtain--because of a lack of bibliographic control in these subject areas. The problem was exacerbated by the increase in the volume of literature that occurred as national attention and research funding focused on the consequences of rapid population growth during the 1960s. In 1968 the Association for Population/Family Planning Libraries and Information Centers--International (APLIC) was founded by a small group of concerned librarians and information specialists. Membership grew in the next 10 years from 15 North American members to over 140 members in 13 countries. The Association has steadily worked to improve the tools and techniques for information handling and to improve the flow of information between producers and users. The development of new bibliographic tools and information services has helped to bridge the gap between the user and information.

Censuses Printed and Computer Stored

Judith S. Rowe, Princeton University Computer Center, 87 Prospect Avenue, Princeton, NJ 08540; and Doreen S. Goyer, Population Research Center, University of Texas.

Demographic data in machine-readable form are important to researchers for their flexibility of analysis and for the quantity of information not available in printed reports. At the same time, the printed census results do not involve considerable outlay of funds and availability of equipment for their use.

The authors suggest that there is a need for both formats. They note that computerized data and the documents which describe them have not been readily available in the past since they were prepared for in-house use. They describe some of the current resources for locating these data as they become increasingly available to outside users.

The situation for locating printed censuses is also complicated by the present lack of one complete reference source. This is changing, and the authors describe currently available search methods and what methods will be available soon. They then present some suggestions for the future resolution of the problem.

POPLINE and MEDLINE

Joseph Leiter, National Library of Medicine, 8600 Rockville Pike, Bethesda, MD 20014.

No abstract received.

Tools for Reference Information: Indexing and Abstracting Services

Patricia E. Shipman, Carolina Population Center, University Square East, Chapel Hill, NC 27514; and Carann Turner, Carolina Population Center.

The authors review some of the major printed and computerized indexing and abstracting services which currently exist for the population field, both those specific to the field and those with wider subject coverage. Population bibliographies such as Population Index and Population Sciences and computerized systems for population such as POPINFORM and the PopScan Service

as well as other relevant publications and services are evaluated on the basis of subject scope, ease of use, cost, and other pertinent features.

The paper ends with a comparison of the printed and computerized forms of these services and some suggestions as to their use.

HOW SAFE ARE CHILDBEARING AND BIRTH CONTROL?  
Organized by Roger W. RoCHAT, Center for Disease Control  
Chaired by Judy Rooks, Center for Disease Control

Maternal Mortality and Abortion Associated with Different Fertility Control Strategies

Roger W. RoCHAT, Center for Disease Control. Mailing address: 1010 Liawen Court N.E., Atlanta, GA 30329; Deborah Lee, Emory University; Kenneth M. Schulz, Center for Disease Control; and C.M. Suchindran, University of North Carolina.

The cumulative mortality risk to females of different reproduction and fertility control strategies is not known; such risks should be used to evaluate national maternal health, family planning, and population control policies as well as for individual decision-making by women of reproductive age, educators, and health workers. In this paper, the authors describe a probabilistic micro-simulation model to examine mortality associated with these different strategies.

Comparisons were made between pill, IUD, and barrier method users who started intercourse at age 15, wanted only 2 children (the first at age 20 and the second at least 18 months later), chose abortion for contraceptive failure, and were surgically sterilized at age 35. Three cohorts of 20,000 women were examined for each contraceptive method.

Over 99 percent of women using each method achieved their desired family size. No significant difference in mortality was detectable between these three strategies, but there were marked differences in the proportion of women using abortion for contraceptive failure. Approximately 43 percent of pill, 64 percent of IUD, and 86 percent of barrier method users required at least one abortion for contraceptive failure, and 14 percent, 34 percent, and 67 percent, respectively, of pill, IUD, and barrier method users required more than one abortion.

The Safety of Childbearing following Induced Abortion: Current Knowledge and Needed Research

Carol J. Hogue, Division of Biometry, 505 Baptist Medical Arts Building, University of Arkansas for Medical Sciences, Little Rock, AR 72202.

The author reviews recent studies of reproduction following induced abortion. Such studies have tended to report no adverse effects of first trimester pregnancy terminations by vacuum aspiration (VA) and slight, but significant, adverse effects of dilatation and curettage (D & C). A Singapore study found lower birth weights for women aborted by D & C, controlling for race, parity, birth interval, and other factors. On average, birth weights for women aborted by VA were actually higher than those for peers, apparently due to the longer birth interval occasioned by the intervening pregnancy termination. The World Health Organization collaborative studies have also found that D & C induced abortions were associated in some countries with lower birth weights. Incidences of some other complications of pregnancy were also elevated in both studies.

The need to determine the risks of second trimester termination on subsequent fertility as well as risks of multiple first trimester procedures are detailed.

Underlying Medical Conditions, Complications of Pregnancy, and Complications of Labor to Mothers of Legitimate Live Hospital Births in the United States  
 Paul J. Placek, U.S. National Center for Health Statistics. Mailing address:  
 P.O. Box 1636, PG Plaza Post Office, Hyattsville, MD 20788.

Data for this report are taken from the 1972 U.S. National Natality Survey, a 1-in-500 survey of legitimate live hospital births linked with a mail follow-back survey of the mothers, physicians, and hospitals associated with those births. Sample data are weighted to reflect national estimates. The data show that 13.9 percent of the mothers had one or more of ten specific underlying medical conditions, 16.3 percent of the mothers had one or more of eight specific complications of pregnancy, and 20.2 percent of the mothers had one or more of nine specific complications of labor. The data also indicate that these complications are interrelated: of mothers with no underlying medical conditions or complications of pregnancy, only 16.4 percent had complications of labor, whereas of mothers with one or more underlying medical conditions and one or more complications of pregnancy, 40.5 percent had complications of labor. These complications and conditions are analyzed according to a wide variety of social and demographic characteristics, maternal health characteristics, and infant health characteristics.

Work during Pregnancy and Subsequent Hospitalization of Mothers and Infants: Evidence from the National Survey of Family Growth  
 Gerry E. Hendershot, U.S. National Center for Health Statistics, 3700 East-West Highway, Room 1-44, Hyattsville, MD 20782.

A large and increasing number of mothers work late into pregnancy and resume work soon after delivery. If work in those periods injures the health of mothers or infants, this trend may become a public health concern. In this paper, the author uses data on ever-married primiparas from the National Survey of Family Growth to investigate the relationship between working in the last trimester of pregnancy and two indicators of illness: hospitalization of mothers for complications of pregnancy and hospitalization of infants during the first year of life. About 4.1 percent of mothers were hospitalized and 11.4 percent of infants; the proportions were higher for mothers who worked in the last trimester than for mothers who stopped work earlier, but the differences were not statistically significant and may not imply a causal relationship. Interactions of the relationship with social and economic factors are also considered.

#### DEMOGRAPHIC POLICIES IN LESS-DEVELOPED COUNTRIES

Organized and Chaired by  
 Paul Demeny, The Population Council

#### Population Measures and Social Policy in Singapore

Janet Salaff, Department of Sociology, University of Toronto, 563 Spadine Avenue, Toronto, Ontario, M5S-1A1, Canada; and Aline Wong, Harvard University.

In this paper, the authors treat Singapore's "social disincentives to higher order births" as social policies, including policies that make social services for multiparous women costly or inaccessible. They consider these policies in a social control framework and examine the multiple features of the relevant measures with emphasis on the fit between this form of policy and the social situation in a "late developing" society.

Characterizing Singapore's state structure as authoritarian in terms of limiting interest group opposition to the ways and means of economic



development as defined by the state, the authors examine the way in which the country's population policies mesh with its style of politics. Neither the ends of economic development (modern industrial capitalism) nor the means to attain them (population size control, hard work, and individual enterprise) are questionable. However, the authors note that such a state does not engage in total social reorganization to achieve its ends. Hence, social policies play a particularly important role in socializing the populace to accept the current socioeconomic order as well as to support the role of the government as a social engineer.

Where Credit Is Due: Causes of Recent Rapid Fertility Decline in Bali

Terence H. Hull, Lembaga Kependudukan, Gadjah Mada University, Yogyakarta, Indonesia.

Recent surveys indicate that the total fertility rate in Bali may have fallen by as much as 35 percent between the late 1960s and 1976. Because the family planning program only began work in earnest in 1969, many observers have pointed to Bali as a dramatic example of the success of family planning in a poor, densely populated area. In this paper, the author suggests that the unique features of Balinese society severely limit the application of the island's experience to other regions. Strong indigenous institutions (banjar) provided security to individuals, thus reducing the need for children, and were also instrumental in the 1950s in building the most extensive network of health clinics in Indonesia. Balinese parents apparently had a latent demand for family limitation which had been unfulfilled because of reluctance to use traditional methods of birth spacing. Such factors imply that credit for rapid fertility decline lies less with the program per se than with the nature of the society it served.

Development Planning and Population Policy in Puerto Rico

Kent C. Earnhardt, Population Laboratories, Suite 400 NCNB Plaza, 136 East Rosemary Street, Chapel Hill, NC 27514.

In this paper, development planning and population policies in Puerto Rico since 1898 are reviewed in light of the relatively small size of the island and an overall population density of 965 persons per square mile. The rate of population growth was one of the highest in the world until reduced by a massive net out-migration in the period 1945-1970 and a substantial real fertility decline between the years 1940 and 1975, especially in the period 1960-1975. Puerto Rico's total fertility rate was 5.9 in 1940, 5.4 in 1950, 4.8 in 1960, 3.3 in 1970, and 2.8 in 1975. Early private and public population policies are examined, including the promotion of out-migration and, occasionally, fertility reduction. The author also discusses the later focus on economic development through industrialization and the growing commitment to a family planning policy after 1970.

Economic Gains from Population Control: Estimates from an Econometric Model

Andrew Mason, East-West Population Institute, East-West Center, 1777 East-West Road, Honolulu, HI 96848; and Daniel B. Suits, Michigan State University.

An econometric model of economic development and demographic change, estimated principally from cross-national data, is employed to evaluate the economic gain from averted births. The economic gain is estimated by comparing simulated growth paths which differ in the number of births averted. In addition, the distribution of benefits between participants in the "family planning program" and society at large is estimated.

PATTERNS OF MARRIAGE AND DIVORCE  
Organized and Chaired by  
Paul C. Glick, U.S. Bureau of the Census

Husbands Who File for Divorce

Ruth B. Dixon, Department of Sociology, University of California, Davis, CA 95616; and Lenore J. Weitzman, University of California at Davis.

One immediate consequence of the California Family Law Act of 1969, which eliminated considerations of fault both in grounds for divorce and in financial settlements, was a significant increase in the proportion of husbands rather than wives who filed for the divorce. Drawing on a sample of final decrees granted in San Francisco and Los Angeles counties in 1968 and 1972, the authors compare couples in which the husband filed for the divorce with couples in which the wife filed, on the basis of their socioeconomic and demographic characteristics, patterns of requests and settlements, and the nature of the legal process. Several hypotheses are tested concerning the effects on these differences of the introduction of "no-fault" divorce legislation.

The Differential Effects of Religion and the Cultural Setting on Ethnic Inter-marriage in Toronto and Montreal, 1971

Madeline A. Richard, Sociology Department, Erindale College, University of Toronto, Mississauga, Ontario, L5L 1C6, Canada; and Douglas F. Campbell, University of Toronto.

The purpose of this paper is to establish the ethnic intermarriage patterns in the Census Metropolitan Areas of Toronto and Montreal at the time of the 1971 census and to examine the impact of religious affiliation on these patterns in both CMAs. The data source for this analysis is the Family File of the Public Use Sample, released by Statistics Canada in September 1976. Propensities for intermarriage are calculated in order to control for the size of the group, and it is this measure, i.e., propensity for intermarriage, which is basic to the analysis.

The data reveal that both foreign born and native born French husbands exhibit a higher propensity for ethnic intermarriage in Toronto than those who live in Montreal. Their British counterparts, however, exhibit similar patterns in both CMAs, and these patterns reveal relatively low propensities for intermarriage. High propensities for ethnic exogamy in both CMAs are exhibited by Italian, Dutch, German, and Scandinavian native born husbands.

When religion of husband, as defined by three broad categories, i.e., Protestant, Catholic, and other, is utilized as a control variable, propensities for ethnic intermarriage for Protestant husbands exhibit slight decreases. In Montreal, propensities for ethnic intermarriage for both Protestant and Catholic husbands either increase or stay the same. When religion of both spouses is used as the control, no significantly different results occur.

Economic and Social Correlates of Cohort Marriage and Divorce in Twentieth-Century Sweden

Robert Schoen, University of Illinois; and William Urton, Department of Sociology, University of Illinois, Urbana, IL 61801.

A theoretical perspective is proposed in which changes in female labor force participation are seen as being of central importance to analyses of changes in marital formation and dissolution. Opportunities for increased female labor force participation are likely to improve the feasibility of marriage, i.e., the ability of a newly married couple to meet social and economic expectations, while possibly reducing the desirability of marriage relative to the available alternatives. At the same time, the greater participation of women in economic life seems to increase both the feasibility

and desirability of divorce. The experience of cohorts of Swedish females born between 1885-1889 and 1940-1944 is examined and found to be consistent with the theoretical arguments advanced.

Family Background, School, and Early Marriage

Elwood D. Carlson, Department of Sociology and Anthropology, Bowdoin College, Brunswick, ME 04011.

The author presents longitudinal data, taken from a national probability sample of American women, which reveal the importance of family backgrounds (parental socioeconomic status, number of siblings, and parental marriage stability) for respondents' decisions about forming marriages during their own high school years. These family features appear to influence marriage timing chiefly indirectly through their impact on school as an alternative to marriage. This basic focus shows that, though they come more often from families with attributes which lead to early marriage, black girls with given educational experiences and family backgrounds are only about half as likely to form early marriages as white girls similarly situated. Among white girls themselves, high rural and low suburban rates of early marriage are shown to be consequences of the differing socioeconomic patterns for families by size of community. Both findings are evaluated briefly.

The Earnings of Men and Marital Disruption

Wendy Wolf, Center for Demography and Ecology, Department of Sociology, Social Science Building, University of Wisconsin, 1180 Observatory Drive, Madison, WI 53706; and Maurice MacDonald, University of Wisconsin.

It has been argued that one of the positive aspects of President Carter's new welfare plan is that it will reduce marital disruptions by increasing the absolute level of males' earnings. The premise behind this assertion is that by increasing the absolute level of male earnings, economic strain in the marriage will be reduced and the wife will perceive more gains from remaining in the married state. Unfortunately, the literature in this area has not definitively shown that it is a man's absolute level of earnings and not some other aspect of his earnings that affects marital disruption.

In this paper, the authors assess the effects of several aspects of the husband's earnings on marital disruption: (1) absolute level of earnings; (2) earnings instability; (3) earnings relative to peers; and (4) "permanent income". Other relevant variables that are known to affect marital disruption are held constant. The data are from a Wisconsin longitudinal study of a cohort of high school seniors who were reinterviewed at age 35. The unique aspect of the data is the presence of detailed earnings histories. The use of these data makes it possible to overcome many of the problems that affected past research in this area.

Children's Experience with Marital Disruption

Larry L. Bumpass, Center for Demography and Ecology, Department of Sociology, Social Science Building, University of Wisconsin, 1180 Observatory Drive, Madison, WI 53706; and Ronald Rindfuss, University of North Carolina.

The authors use life table procedures and data from the 1973 Family Growth Survey to ask three basic questions: (1) What is the cumulative probability by a given age that a child will have experienced a single-parent family as a consequence of marital disruption? (2) Given a marital disruption, what is the cumulative proportion experiencing either remarriage or age 18 by given durations since disruption? (3) What is the average duration of experience in a single-parent family?

Estimates based on the early 1970 period suggest that about a third of all children will spend some time in a single-parent family before age 16 as a consequence of marital disruption (children born between marriages are included in these estimates but those born before their mother's first marriage are not). There are very large differences by race, education, and

the age of the mother at the child's birth. These differences appear in the timing as well as the prevalence of marital disruption.

Of those affected by disruption, one-quarter turn 18 or have their mother remarry within two years of disruption; within five years about half are still in a single-parent family. Subgroup differences in remarriage rates moderate differences in experience of this status by education and age of mother but exacerbate the differences by race.

#### CONTRIBUTED PAPERS: THEORY AND METHODS

Organized and Chaired by

P. Krishnan, University of Alberta

#### Application of Renewal Theory in Contraceptive Follow-Up Study: Example of the IUD

P. T. Liu, Department of Population Dynamics, School of Hygiene and Public Health, Johns Hopkins University, 615 North Wolfe Street, Baltimore, MD 21205; and L. P. Chow, Johns Hopkins University.

The application of the multiple decrement life table technique has greatly facilitated the analysis of contraceptive practice. The technique is particularly useful for analysis of one single segment of contraceptive use.

Contraceptive practice, however, usually consists of a series of recurrent events of use and nonuse. Use of the life table technique for analysis of multiple-segment contraceptive usage is not entirely satisfactory. In this paper, the authors attempt to apply the renewal process for the analysis of the results of contraceptive follow-up studies involving all segments of use.

Using this model, it is possible to estimate the proportion of current users for a given point in time. It is also possible to estimate, for a given time interval, the average duration of actual use, the distribution of the number of segments, and the average number of segments experienced by the acceptors. The practical importance of these parameters for the evaluation of family planning programs is considered.

#### Age-Parity-Nuptiality-Specific Stable Population Model

S. Krishnamoorthy, Center for Population Studies, Harvard University, 9 Bow Street, Cambridge, MA 02138.

The age-parity-nuptiality models so far developed by demographers have had restrictions either on marital status or on the occurrence of births in different marital statuses. In this paper, the author presents a method of constructing a life table that incorporates marital status and parity. He also develops the age-parity-nuptiality-specific stable population model which recognizes not only all types of marital status, but also births to women in any marital status. A method of projecting the age-parity-nuptiality-specific distribution of population is also presented. The proposed model is applied to the U.S. female population for the year 1970.

#### Periodic Regression Analysis: A Demographic Model Building Technique

Michael H. Kutner, Department of Statistics and Biometry, Emory University, Atlanta, GA 30322; Charles W. Warren, Emory University; Richard P. Briggs, Emory University; and Carl W. Tyler, Center for Disease Control.

Periodic or cyclic fluctuations of demographic phenomena are important to model because the nature of the response function could aid in the identification of the causal mechanism of the seasonal pattern, as well as allowing prediction of future trends. Periodic Regression Analysis is presented here by the authors as a viable analytical technique for modeling cyclic demographic phenomena. The technique is applied to fertility data collected in Fulton County, Georgia, for the period 1961-1975.

Decision-Making and Sex Selection with Biased Technologies

Neil G. Bennett, Office of Population Research, Princeton University, 21 Prospect Avenue, Princeton, NJ 08540; and Andrew Mason, East-West Population Institute.

It appears that sex selection techniques of varying quality soon will be available to couples desiring a child of either sex. A decision-making model is employed which describes how couples should choose among alternative sex selection methods in order to maximize the probability of bearing their desired number of sons and daughters.

The general solution to the equation of the line separating the two decision spaces is derived (i.e., to opt for the maximum son-producing technique or for the maximum daughter-producing technique). The sex technology which exists at the time of a couple's decision to have a next birth is associated with a unique proportion sons cutoff. If the couple's proportion of desired additional sons is greater than the cutoff, they should opt for the maximum son-producing technique; if the value is less than the cutoff, they would choose the maximum daughter-producing technique.

## RECENT TRENDS IN NONMETROPOLITAN POPULATION

Organized and Chaired by  
Calvin L. Beale, U.S. Department of Agriculture

The Deconcentration of Nonmetropolitan Population

John F. Long, Population Division, U.S. Bureau of the Census, Washington, DC 20023.

In addition to the shift from metropolitan to nonmetropolitan areas during the 1970s, the nonmetropolitan population itself has undergone a marked population deconcentration. Data from the 1975 Revenue Sharing Estimates of the U.S. Bureau of the Census for incorporated places show that the population of nonmetropolitan towns grew only 3.3 percent from 1970 to 1975--less than the average population growth for the nation. The nonmetropolitan population outside of incorporated places of 2,500 persons and over grew by 9.0 percent, almost twice the national average. Not only are basically rural areas growing faster than urban areas in all categories, but within all areas there is an inverse relationship between the size of incorporated places and population growth. The author suggests that the concentration of population around transportation nodes in both large and small towns, which was necessary when transportation and communication systems were less extensive and less technologically advanced, is no longer needed.

Contributions of Recent Metro/Nonmetro Migrants to the Nonmetropolitan Population and Labor Force

Gladys K. Bowles, U.S. Department of Agriculture. Mailing address: 161 Milledge Heights, Athens, GA 30606.

The author focuses in this paper on certain demographic, social, and economic characteristics of the 6.2 million persons five years old and over who moved from metropolitan to nonmetropolitan areas between 1970 and 1975. The study is based on special tabulations from the Bureau of the Census 1975 Current Population Survey updating the metro status of areas to the extent feasible within the sample design. Characteristics examined include age, sex, and race, which are considered as the primary migration determinants. Family relationship and education are discussed, along with various economic features of metro/nonmetro migrants and comparative nonmigrant and migrant groups. An assessment is made of the impact of the flow of persons between metro and nonmetro areas.

Migration Motivations for Population Turnaround in Nonmetropolitan Areas

James D. Williams, Department of Agricultural Economics, University of Illinois, 305 Mumford Hall, Urbana, IL 61801; and Andrew J. Sofranko, University of Illinois at Urbana.

Data from a 1977 survey of metropolitan and nonmetropolitan origin households migrating to 75 high growth counties of the Midwest are examined via reason analysis to consider the motivational basis for post-1970 in-migration to these areas. Findings suggest that the major motivations for leaving places of origin, especially for those coming from metro areas, are quality of life considerations. Job-related reasons account for about a fourth of the metro migrants' and almost half of nonmetro migrants' reasons. Anti-urban push and pro-rural pull responses are prevalent among the metro migrants. Subsequent analysis of their reasons for leaving the metro residence suggests consistency with other objective variables. Among households with a working-age head, those leaving for quality of life reasons come disproportionately from the largest metropolitan centers and tend to go to the smallest towns. Those moving for non-employment reasons are not more likely than those moving for job-related reasons to have taken an initial income loss, though they tend to be less likely to experience immediate income gains.

Community Structure and In- and Out-Migration in Nonmetropolitan Kansas

Jan L. Flora, Department of Sociology, Kansas State University, Manhattan, KS 66506; and Cornelia B. Flora, Kansas State University.

Nonmetropolitan Kansas counties are analyzed according to sustenance maintenance functions and a typology constructed. Using factor scores derived from the typology, the authors match counties of each of the four types derived on basic structures and pairs them according to different migration patterns. Counties with continuous out-migration are matched with counties in which out-migration has been turned around since 1970. Three of the four types of counties are included in this analysis. Samples of in-migrants, out-migrants, and nonmigrants are drawn in each of the six counties. The total number in the sample is 1,300. In- and out-migrant status is chosen by comparing the 1975 and 1976 lists of the annual population enumeration. Push-pull factors and individual characteristics are compared for migrants in the counties, migrants out of the counties, and nonmigrants in the counties. A model of migration is suggested which includes individual motivation, stressing kinship ties and perception of the area of origin and the area of destination, as well as the macro-structural county characteristics. The model indicates that noneconomic, life-style related motivations for in-migration have a strong influence. For out-migrants, economic and life-style motivations are primordial.

An Analysis of In-Migrants to Rural Connecticut since 1970

Thomas E. Steahr, Department of Rural Sociology, College of Agriculture and Natural Resources, University of Connecticut, Storrs, CT 06268; J. Wright, University of Connecticut; and J. Brown, University of Connecticut.

This report is based on a randomly drawn sample of households located in entirely rural areas of Connecticut. The areas were stratified along two dimensions of location to SMSA boundaries and the volume of net in-migration from 1970-1973. A total of 402 interviews were completed containing data on migration histories of families, demographic and social characteristics of recent and long-term rural residents, reasons for moving into rural areas, and indicators of social integration into the local community. Basic comparisons between long-term and recent (since 1970) residents of rural areas are made using these and other variables. Implications of these findings for other research at the regional and national level are discussed.

The Rural Turnaround in Southern Ohio: A Five County Study

Donald W. Thomas, Department of Agricultural Economics and Rural Sociology, Ohio State University, 2120 Fyffe Road, Columbus, OH 43210; and Douglas C. Bachtel, Ohio State University.

A survey of recent migrants to a five county area in southern Ohio was conducted in the spring of 1977. The study area is part of the Appalachian region of Ohio which has experienced in-migration and population growth since 1970, as compared with out-migration and population decline in previous years. Data were obtained on why people moved, their area of origin, and general social and economic characteristics.

It is shown that migrants were generally younger than the natives and had slightly higher educations and incomes. However, a full range of ages, education, and income were evident among the movers. Reasons for moving given by the migrants tended to center around "getting out of the city" and "living in the country". Job-related reasons and returning home were also prominent responses. Forty percent of the migrants came from outside Ohio. Ohio based migrants were generally from metropolitan areas or counties adjacent to the study area.

Metropolitan Change and Nonmetropolitan Growth

John M. Wardwell, Department of Sociology, Washington State University, Pullman, WA 99164.

Research on the metropolitan-nonmetropolitan migration reversal has heretofore relied upon net migration estimates for counties or upon mobility estimates from the Current Population Survey. In this paper, data from the Continuous Work History Sample of workers in employment covered by the social security reporting system are analyzed to detect changes in county of employment paralleling the turnaround in general population mobility.

The data show that there has also been an employment turnaround or change from net movement to metropolitan areas to net movement to nonmetropolitan areas. This pattern of change is not monotonic across the 1960-1975 period covered by these data. Large metropolitan gain peaks in the middle of this period. The employment turnaround is found only for movement involving the largest metropolitan areas. The smallest metropolitan areas are still gaining at the expense of nonmetropolitan counties, as well as at the expense of every other category of county. Nonmetropolitan out-migration rates for 1970-1975 are below the 1965-1970 levels, but still above the levels observed for 1960-1965.

## CHILD CARE AND FERTILITY: RESEARCH AND POLICY ISSUES

Organized by Harriet B. Presser, University of Maryland

Chaired by Maurice Moore, U.S. Bureau of the Census

Child Care, Non-Familial Activities, and Fertility among Non-Employed Mothers

Harriet B. Presser, Department of Sociology, 4101 Art-Sociology Building, University of Maryland, College Park, MD 20742; and Mary G. Powers, Fordham University.

The relationship between child care use and fertility is explored for non-employed women with children less than five years old. Among child care users, participation in non-familial activities during child-free time is examined. This study is based on the June 1977 Current Population Survey, which included a fertility and child care supplement. The findings indicate

that, for non-employed mothers with such young children, fertility patterns are an important determinant of child care use. Child care use, however, is not related to fertility expectations, except in the case of college-educated women. The large majority of non-employed women do not perceive a relationship between child care availability and seeking a job. This suggests that the greater availability of suitable child care might lead to even higher labor force participation rates among women with children under five years of age--higher than the 41 percent noted for June 1977. Entry into the labor force, facilitated by child care, might reduce subsequent fertility, even though non-employed women do not perceive a direct relationship between child care availability and fertility behavior.

Child Care Arrangements and Fertility of Working Mothers: Changes from 1973 to 1976

Wendy Baldwin, Center for Population Research, NICHD, NIH, Room C725, Landow Building, 7910 Woodmont Avenue, Bethesda, MD 20014.

While there has been substantial interest in the relationship of female labor force participation and fertility, few studies have been addressed to child care, which is a critical factor in the relationship between motherhood and paid employment. The 1973 and 1976 National Surveys of Family Growth, conducted by the National Center for Health Statistics, contain information about the fertility and child care activities of employed mothers. Comparisons between the two years show an increase in the use of child care, regardless of race, full- or part-time employment, age of mother, or age of youngest child. In 1976, 92 percent of full-time workers whose youngest child was under age three made child care arrangements as opposed to 88 percent in 1973. Among part-time workers, the increase was from 69 percent to 78 percent. The use of child care is associated with lower fertility and lower fertility expectations, although the direction of influence is not clear. It is possible that women with larger families are able to rely on older siblings for child care. While the analysis is not yet complete, it is likely that reductions in family size among employed women from 1973 to 1976 account for the increase in the use of child care.

Types of Child Care and Fertility: A Longitudinal Study of Working and Nonworking Mothers

Liliane P. Fløge, Columbia University. Mailing address: c/o Antoine Fløge, 3515 Mallard Road, Levittown, NY 11756.

This study examines the effects of different child care arrangements on the fertility of working mothers. The research is based on a representative sample of young mothers from New York City. Using multiple classification analysis, the author finds that various child care arrangements have differential effects on the fertility of working mothers. In no case, however, is the fertility of working mothers similar to that of nonworking mothers, no matter what type of child care is used by the working mother. Moreover, those arrangements associated with the highest subsequent fertility are also associated with the lowest probability of subsequent employment. It appears, therefore, that there is no child care arrangement which renders the mother and worker roles "compatible". On the other hand, the stability of child care arrangements may be an important factor affecting women's employment and fertility.

Demographic and Nondemographic Components in the Skyrocketing AFDC Program  
Kingsley Davis, Population Research Laboratory, University of Southern California, University Park, Los Angeles, CA 90007; and Susan De Vos, University of Michigan.

No abstract received.



MIGRATION OF WOMEN IN LDCs  
Organized and Chaired by  
Peter C. Smith, East-West Population Institute

Rural-Urban Migration of Women among the Urban Poor in India  
Andréa M. Singh, Indian Social Institute, Lodi Road, New Delhi, India.

This study focuses on the social and cultural factors underlying variations in male and female patterns of rural-urban migration among the urban poor in the major cities of India (i.e., Bombay, Calcutta, Delhi, and Madras). The author examines the influence of caste and regional factors on differential sex ratios in migration streams among the urban poor. These differences are shown to be highly consistent regardless of the distance travelled in migration. The reasons for them and their consequences both for the women who come to the city and those left behind in the village are discussed. The influence of female labor force participation on sex ratios before and after migration is discussed, and the differences in employment opportunities for males and females within the urban occupational structure are shown. The author also examines the recently observed trend towards more equal sex ratios in the major cities, the reasons for it, and the possible consequences of such a change.

Intra-Family Selectivities of Urban Migrants from Rural Mexico: Males and Females Compared

Arlene C. Rengert, West Chester State College. Mailing address: 4808 Florence Avenue, Philadelphia, PA 19143.

The greater incidence of female, in contrast to male, migration in Mexico is demonstrated through urban in-migration statistics and a mapping of in- and out-migration of males and females for Mexican states, 1965-1970. With this aggregate setting as background, the author presents a micro-study of out-migration from rural villages to cities in which relative economic status, size of the family of origin, and family position (birth order) are examined in association with city-ward propensity for each sex. Data are for 1,912 villagers from the Ojuelos region. The analysis indicates that city-ward migration from rural villages in Mexico may be a different socioeconomic or spatial process for women than for men.

Towards a Theory of Female Migration in Developing Countries

Veena N. Thadani, Center for Policy Studies, The Population Council, One Dag Hammarskjold Plaza, New York, NY 10017; and Michael P. Todaro, The Population Council.

Existing theories of migration, based on predominantly male samples, have assumed the non-significance of differences between the determinants, consequences, and patterns of male and female migration.

In this paper, these assumptions are questioned and potential differences between the migration of men and the autonomous migration of unattached women are examined.

A conceptual framework for the analysis of autonomous female migration that identifies variables particular to women is proposed. Thus, if the goal or motive of migration is, as is generally assumed, economic betterment and/or status mobility, divergence between male and female goal attainment is immediately apparent. For men, wage earning employment is the sole avenue to economic betterment and status mobility; for women, marriage provides an additional or alternative approach to the same end. These and other differences in the constraints, goals, and attainment strategies of males and females are incorporated in a formal, empirically testable framework.

DEMOGRAPHIC TRENDS AMONG MINORITY GROUPS IN THE UNITED STATES  
 Organized by Aaron O. Handler, Indian Health Service  
 Chaired by Cindy Taeuber, U.S. Bureau of the Census

Saturday Night Special: Recent Trends in Homicide Mortality among Blacks and Whites in the United States

Reynolds Farley, Population Studies Center, University of Michigan, 1225 South University Avenue, Ann Arbor, MI 48104.

Mortality rates by cause of death for 1940-1975 are used to calculate multiple decrement life tables and age-standardized indexes of mortality for men and women of both races. The results show that not only is there a persistent racial difference in homicide mortality with rates for nonwhites exceeding those of whites by a factor of between six to ten, but there is also a persistent sexual difference with rates for males exceeding those for women by a factor of four or five. Trends over time among both races are similar. Between 1940 and the mid-1960s, homicide mortality fluctuated within a narrow range, but since 1965 these rates have increased rapidly. Homicide is a major killer of nonwhite men. Elimination of this cause of death would do more to lengthen the life span of nonwhite men than the elimination of any other single cause of death with the exception of cardiovascular disease and malignant neoplasms.

Mortality Trends among American Indians and Alaska Natives, 1955 to 1975

Aaron O. Handler, Vital Events Branch, Office of Program Statistics, Indian Health Service, 5600 Fishers Lane, Room 6A-38, Rockville, MD 20857.

In this paper, the author presents trend information for the period 1955-1975 concerning the mortality experience of the Indian population residing in the 25 states in which the Indian Health Service has had the responsibility for providing comprehensive health services. Mortality rate reductions have occurred for several causes since the inception of the Indian Health Service. Infant mortality is down by 71 percent, certain diseases of early infancy are down 70 percent, mortality from influenza and pneumonia is down 63 percent, and mortality from gastroenteric causes is down 88 percent.

In spite of the dramatic improvements achieved in the past two decades, the health circumstances of the Indian population continue to lag behind those of the general population. The 1973-1975 age-adjusted mortality rates for the following causes are still much higher than those for Americans as a whole. Mortality from cirrhosis of the liver is 4.1 times as high, mortality from accidents is 3.7 times as high, mortality from homicide is 2.8 times as high, and mortality from suicide is 1.8 times as high.

What Is the Annual Net Flow of Undocumented Mexican Immigrants to the United States?

David M. Heer, Population Research Laboratory, University of Southern California, Los Angeles, CA 90007.

Senior government officials have claimed that in recent years an average of 1.4 million illegal aliens have entered the United States annually without apprehension. This conjectural figure does not take into account the fact that the net flow of immigrants is always less than the gross flow. In this paper, various estimates are made concerning the net flow of undocumented Mexican immigrants to the United States in the period 1970-1975. These estimates are based on the growth of the population of Mexican origin according to the Current Population Survey. A preferred estimate of an annual net flow of 116,000 is suggested. The historical relation between net immigration into the United States and the domestic unemployment rate, together with other cited evidence, suggests that the annual net flow of undocumented Mexican immigrants into the United States was larger in the 1960s than it has been since 1970.

DEMOGRAPHIC ASPECTS OF INCOME DISTRIBUTION IN LATIN AMERICA

Organized and Chaired by  
Thomas W. Merrick, Georgetown University

Income Redistribution and Mortality Change: The Cuban Case

Sergio Diaz-Briquets, International Development Research Centre SSHR, Box 8500, Ottawa, Ontario, K1G 3H9, Canada.

A causal relationship can be posited between mortality and income distribution; at similar levels of development, countries having a more equitable income distribution tend to have lower mortality than countries where income is less equally distributed. The evidence for Cuba reviewed in this paper supports this contention. Beginning in the early 1960s, Cuba began to experience a series of drastic social and economic changes that brought about a substantial reduction in income differentials. These changes, by emphasizing the elimination of social and regional differentials, had a marked effect on mortality decline as health facilities, superior housing, better educational opportunities, etc., were placed within the reach of previously disadvantaged population subgroups. Of particular interest is that the mortality improvements occurred in an economic context that until recently was characterized by an uncertain performance. The Cuban experience suggests that low income countries can substantially accelerate mortality declines by the institution of policies geared to the elimination of social differentials. Some qualifications are noted regarding some of the social and political costs of the Cuban model and its applicability to other developing countries.

Income Distribution as a Factor in Coale's Preconditions for a Fertility Decline: Evidence from Mexico

John R. Weeks, Department of Sociology, San Diego State University, San Diego, CA 92182.

Mexico City is used as a case study to test Coale's hypothesis that fertility will not decline unless (a) people accept calculated choice as a valid part of marital fertility, (b) advantages from lower fertility exist and are known about, and (c) people have mastered an effective form of fertility control. Data are drawn from a family planning survey undertaken in Mexico City in 1971 and from the Mexican census. Using these cross-sectional data, the author operationalizes several measures of each of Coale's three preconditions and relates them to fertility levels. Attention is focused especially on the second precondition, and specifically on the role that income distribution might play in opening or closing the advantages to be gained from lower fertility.

Demographic Factors and Their Food and Nutrition Policy Relevance: The Central American Situation

Charles H. Teller, Institute of Nutrition of Central America and Panama, INCAP-DNA, Apartado 11-88, Guatemala City, Guatemala; and Vernon Bent, Institute of Nutrition of Central America and Panama.

The authors examine the contribution that the applied population field can make to food and nutrition policy planning. A conceptual framework is presented which indicates how demographic processes and structures interact with agro-economic structures to affect three important policy areas: family health, food availability, and service demand.

Trends in selected demographic factors related to the food and nutrition situation are presented for Central America and Panama. They suggest the potential advantages in nutrition for a country such as Costa Rica in which the demographic structure has recently been changing radically. Trends in malnutrition for Central America as a whole reveal little evidence of improvement, and a substantial increase in the number of malnourished children aged 0-4 has occurred between 1965 and 1975. There was a modest average

yearly increase in per capita calorie and protein availability in 1960-1970, but the increase declined in 1970-1974.

It is concluded that in countries which do not effectively promote income, land, and employment distributive policies, demographic dynamics can place serious constraints on improving the nutritional situation.

#### FAMILY AND HOUSEHOLD AS DEMOGRAPHIC CONCEPTS

Organized and Chaired by  
Frank D. Bean, University of Texas

#### Changes in Household Living Arrangements 1950-1976: A Progress Report

Victor R. Fuchs, National Bureau of Economic Research, 204 Junipero Serra Boulevard, Stanford, CA 94305; Robert T. Michael, National Bureau of Economic Research; and Sharon R. Scott, National Bureau of Economic Research.

The past 25 years have seen an unprecedented increase in the proportion of adults who live alone. Current Population Survey figures indicate that from 1950 to 1976 the percentage of adults living alone rose from 3.9 to 10.0--an 11 million person increase. The authors estimate age-sex-marital status-specific proportions of adults living alone in 1950 and decompose the change from 1950 to 1976 into the portions attributable to population growth, age-sex-marital status composition shifts, and status-specific behavioral change. A comparable decomposition of the growth in female-headed families over the same period is performed.

The determinants of the change in the propensity to live alone are explored using a multivariate cross-state regression analysis. These regressions include as explanatory variables income, urbanization, and occupational structure, among others. Results from weighted regressions across states based on 1970 census data are used to track the changes in living arrangements over time from 1950 to 1976.

#### Recent Trends in the Household and Family Status of Young Adults

James A. Sweet, Center for Demography and Ecology, Department of Sociology, Social Science Building, University of Wisconsin, 1180 Observatory Drive, Madison, WI 53706.

In this paper, the author examines changes between 1960 and 1970 in the household and family living arrangements of young men and women aged 18-24. Period first marriage trends by education are reviewed. The distribution of living arrangements (household head, member of non-family household, member of parental household, member of other family household, resident of group quarters) specific for subgroups defined by educational attainment and school enrollment are presented. Single year of age probabilities of living in the parental household are then given. Finally, the age function of first marriage and the age function of never-married persons living outside of the parental household are combined to produce period life table estimates of person years spent outside of both marriage and the family of origin.

The paper concludes on the frustrating note that because of the Current Population Survey practice of enumerating most college students as a part of the household of their parents, it is impossible to carry the analysis forward beyond 1970.

#### Households, Family Structure, and the Racial Distribution of Income, 1967-1975

Judith J. Treas, Andrus Gerontology Center, University of Southern California, University Park, Los Angeles, CA 90007.

In this paper, the author considers the impact of family structure on racial inequality in the United States and points to the importance of the family as an analytic unit in the study of income distributions. The income

gap between white and black families has remained virtually constant in recent years. Despite black socioeconomic progress during the 1960s and 1970s, these gains have been offset by changes in family structure which have shifted many blacks into family types characterized by low income. The analysis is based upon a computerized file of published tabulations from the March Current Population Survey. Gini, log-variance, and information-based measures of inequality are calculated for detailed income distributions by race, age of head, and family type from 1967-1975. When the information-based measure is used to standardize for racial differences in age distribution and family structure, racial contributions to overall inequality are reduced since blacks have a disproportionate share of such low-income units as female-headed families.

An Exploration of the Dynamic Relationship between Family and Household Composition

Doris P. Slesinger, Department of Rural Sociology, 240 Agricultural Hall, University of Wisconsin, Madison, WI 53706.

The household composition of 123 Wisconsin mothers from urban and rural areas who gave birth in 1974 is analyzed with respect to family members, female headship, marital status, and how stable this unit remains over time. At three time points during 17 months the households were classified into four types, depending upon whether the mother was living alone with her child, a male partner was present, or extended family members were or were not present. One-third of the households changed from one classification of household type to another. One-third of the women headed households, but only two-thirds remained in that classification over the time period. The marital category "separated" was least stable, suggesting some ambiguity in the self-definition. Analysis of background characteristics reveals that poverty status and mother's education had the strongest relationship to likelihood of change in household composition.

MARXIST PERSPECTIVES ON DEMOGRAPHIC PROCESSES

Organized and Chaired by

Michael E. Conroy, University of Texas

The Politics of Reproduction: Hampshire County, Mass., 1680-1800

Nancy R. Folbre, Department of Economics, University of Massachusetts, Amherst, MA 01002.

In this paper, the author describes the political context affecting fertility decisions in New England before 1800, with a special emphasis on one area of western Massachusetts in which early fertility and mortality trends have been well documented. A Marxist methodology is used to argue that reproduction, like production, is greatly affected by forms of hierarchical social control. The process of capitalist development in New England shifted production from the household to the factory. In so doing, it created new relationships between men and women and between parents and children that were central to the process of fertility decline.

Plantations, Population, and Poverty: The Roots of the Demographic Crisis in El Salvador

Gerald E. Karush, Department of Sociology, University of Maine, Orono, ME 04473.

The author considers the demographic crisis in El Salvador in terms of the existence of widespread rural poverty, which itself is a function of the type of dependent economic development found throughout Latin America. In El Salvador such development resulted in the evolution of a plantation economy characterized by a high concentration of wealth, power, and privilege in the

hands of a small ruling class, and the emergence of a large, impoverished, rural wage labor force who exhibit high fertility and whose existence is essential to the survival of the plantation economy. Thus, high population growth is a consequence rather than a cause of poverty. The plantation system perpetuates poverty in several important ways. Further, population growth in El Salvador is intimately bound up with rural poverty, with the consequence that family planning programs alone are insufficient to reduce fertility. In conclusion, the author contends that changing the institutional legacy of dependent capitalist development, i.e., the plantation economy and its attendant class structure, should be the major population policy objective.

Do Parents Buy or Produce Children? A Marxist Critique of the Modern Science/Ideology of Fertility

M. E. Giménez, Department of Sociology, University of Colorado, Boulder, CO 80309.

No abstract received.

RECENT RAPID FERTILITY DECLINES IN LDCs  
Organized and Chaired by  
George J. Stolnitz, United Nations

Predicting Fertility Trends in Less Developed Countries over the Next Century  
Amy Ong Tsui, Community and Family Study Center, University of Chicago, 1411 East 60th Street, Chicago, IL 60637; Jay Teachman, University of Chicago; and Donald Bogue, University of Chicago.

Fertility trends in the developing world have taken a sudden and significant turn during the decade 1965-1975. There are indications that the recent reductions in birth rates are linked to organized efforts to provide family planning services and that in some areas the decline precedes significant socioeconomic development. In this paper, changes in total fertility rates between 1968 and 1975 for all developing countries with one million or greater population are analyzed against changes in sociological and demographic factors measured for the same time period. The results show that the strength of the family planning effort is a critical factor in inducing or accelerating fertility decline. The formulated model of change allows the authors to chart out a new course for fertility trends for the future and to predict the decline in family size over a given period that corresponds to strong, medium, or weak levels of family planning effort.

The Role of Family Planning Programs in Recent Rapid Declines in LDC Fertility  
James W. Brackett, Office of Population, U.S. Agency for International Development, Department of State, Washington, DC 20523; R.T. Ravenholt, U.S. Agency for International Development; and John C. Chao, U.S. Agency for International Development.

It is now widely accepted that rapid fertility declines have occurred, though precise magnitudes and levels continue to be a subject for debate. Much attention is now focused upon understanding the factors which brought about these declines.

Recent World Fertility Survey data for countries with vigorous family planning programs show high contraceptive use among groups traditionally assumed to be resistant to family planning. Contraceptive knowledge in such countries is high--90 percent or more. In contrast, in Nepal where the family planning program has not yet been widely implemented, only about one respondent in five knew any method of contraception and only 6 percent knew



On the Malleability of Fertility-Related Attitudes and Behavior

Josefina Jayme Card, American Institutes for Research, P.O. Box 1113, Palo Alto, CA 94302.

The author examines the malleability of fertility-related attitudes and behavior by analyzing data collected from cross-sectional groups of Filipino migrants who had lived in the United States for varying lengths of time. The findings are compared with data from a control group of Caucasians from the Filipinos' neighborhoods. With increasing number of years lived in the United States, Filipino migrants' fertility-related knowledge, attitudes, and desires became increasingly similar to those of the Caucasian group, but their contraceptive behavior did not. While approximately equal numbers of Filipinos and Caucasians were contracepting, Filipino couples, regardless of duration of stay in the United States were using less effective methods with less regularity. Despite these contraceptive behavior patterns, Filipino migrants perceived that they would have 0.32 fewer children in the United States than they would have had had they remained in the Philippines. By far the most predominant reason given by Filipino respondents for changing fertility patterns in the United States was the difficulty of obtaining child care in the new environment.

Status Attainment of Immigrant and Immigrant Origin Groups in the United States, Canada, and Israel

Monica Boyd, Department of Sociology, Carleton University, Ottawa, Ontario, K1S 5B6, Canada; David L. Featherman, University of Wisconsin; and Judah Matras, Carleton University and Hebrew University.

Utilizing data from OCG II, the Canadian National Mobility Study, and the Israel Central Bureau of Statistics National Mobility Survey, the authors compare patterns of educational achievement and occupational attainment of male immigrants and their offspring in the United States, Canada, and Israel. For all generation groups in the United States, Canada, and Israel, education is a major mediating variable between family origin and current occupational status. For all three societies, the second generation is more mobile educationally and occupationally than are the immigrant or third generation populations. However, Multiple Classification Analysis of ethnic-generation-specific groups reveals country of origin effects to be far more dramatic for Israel than for Canada and the United States. For all three countries, ethnic-national origin effects diminish when social background and educational differences are taken into account, but within each society there are subpopulations which remain relatively advantaged or disadvantaged by their ethnic-national origins.

Immigrants Don't Cost, They Pay

Julian L. Simon, University of Illinois. Mailing address: 1105 South Busey, Urbana, IL 61801.

The common objections to immigrants are that they cause unemployment among veterans and utilize many social welfare services whose cost exceeds the contributions in taxes paid by the immigrants.

Evidence is examined for legal immigration into Canada, the United Kingdom, and Israel, and for illegal immigration into the United States. Specific issues considered are: amount of unemployment caused among veterans (negligible or undetectable statistically); extent of unemployment among immigrants (small and of short duration after entry); age composition of immigrants with respect to labor force participation or dependency (mainly young adults, disproportionately male, and single); education and medical social services used (less than veterans, negligible in the case of illegals); and taxes paid by immigrants (considerable).

On balance, the effects of immigrants are positive. The immigrants contribute far more in taxes than they obtain in social services. Intensive investigation of Russian immigrants into Israel shows that the immigrants have a rate of return on "investment expenditures" of an astonishing 80 percent per year.



POPULATION EDUCATION  
Organized and Chaired by  
Paul D. Tschetter, East Carolina University

Mother-Child Communication about Sex and Birth Control

Pearla Brickner Rothenberg, Center for Population and Family Health, Columbia University, 60 Haven Avenue, B-3, New York, NY 10032.

The author explores the extent of communication about sex and birth control between mothers and two of their children between the ages of 10 and 18. Results indicate that mothers are more likely to discuss these issues with their older and female children. Variations in patterns of communication are also examined by mother's education, race, and family income. Since many of the questions were asked of both mothers and children, comparisons are made of mother and child reports of discussions about sexual relations and birth control. The mother's attitudes towards premarital sex and use of birth control, as well as her own behavior in these areas are examined and their relationship to her communication with her children about these topics explored. The relationship between presence of communication and children's knowledge about birth control is also discussed.

Analysis of Responses to Advertising by Radio

Winfield Best, Winfield Best Communications. Mailing address: Route 5, Box 212, Jones Ferry Road, Chapel Hill, NC 27514.

No abstract received.

Do Workshops Work? Participants' Activities following Population Education Workshops

Elaine M. Murphy, Zero Population Growth, 1346 Connecticut Avenue, N.W., Washington, DC 20036.

Zero Population Growth (ZPG) is midway through the third year of its national population education teacher-training project. To date, ZPG's Washington-based professional staff has led or cosponsored 34 workshops in 15 states, directly reaching a total of 2,000 teachers, curriculum specialists, school administrators, and professors of education. The author's purpose in this paper is to examine the practical impact on participants attending population education workshops.

The author presents findings from formal evaluation of the ZPG workshop model, funded by HEW's Office of Environmental Education and independently validated, which details workshop participants' activities on behalf of population education. For example, 67 percent of teachers had instituted a population unit at least three hours long into their courses. Other data from the evaluation are presented along with information about teaching materials and teacher-training methods.

The Greening of Population Education

Leon E. Clark, Population Reference Bureau, 1337 Connecticut Avenue, N.W., Washington, DC 20036.

The fall in U.S. birth rates has taken the glamour out of population education, thereby creating an opportunity for population education to come of age. The author argues that population studies should be added to school and college curricula for the same reasons that other subjects are there: to promote the intellectual, moral, and social development of students.

The author proceeds to give 12 reasons to support the contention that population studies are uniquely suited to further the traditional goals of American education, and he contends that they are much better suited for this than many subjects now in the curriculum. A corollary of this argument is

that special pleading for population education on the grounds that new reproductive values or rationalized fertility behavior are needed is both wrong and unnecessary. To study population because there is a problem is comparable to studying biology because there is cancer, chemistry because there is air pollution, or history because there is war.

Population Education: Congressional Activity

Kathy Parks, U.S. House Select Committee on Population Education, Washington, DC 20515.

No abstract received.

NEW DIRECTIONS IN HUMAN ECOLOGY

Organized and Chaired by

Lois MacGillivray, Research Triangle Institute

Criminal Acts and Community Structure: A Routine Activity Approach

Marcus Felson, University of Illinois, Urbana, IL 61801; and Lawrence E. Cohen, University of Illinois at Urbana-Champaign.

In this paper, the authors present a "routine activity approach" for analyzing crime rates, which helps to explain their trends and cycles in the United States, 1947-1975. In contrast to the usually cited criminological analyses which emphasize the characteristics of offenders, the routine activity approach focuses upon the circumstances in which offenders carry out criminal acts. Specifically, most predatory criminal acts require at a minimum the concurrence in space and time of likely offenders, suitable targets, and the absence of capable guardians against crime. Amos Hawley's human ecological theory proves useful for investigating how the social structure produces this concurrence.

Growth and Succession in Suburban Communities

John R. Logan, State University of New York, Stony Brook, NY 11790; and Moshe Semyonov, State University of New York at Stony Brook.

Previous studies of the growth of metropolitan communities, drawing primarily on ecological theory as represented by Burgess's concentric zone model of the metropolis, have highlighted the effects of distance from the city center on community development. Using data from one major suburban region, the authors show that a more complete examination of Burgess's ecological life cycle theory reveals its suitability for also dealing with the effects of the initial development pattern, age of housing stock, and minority and low-income presence. In addition, they show that growth and succession are significantly affected by characteristics of community political and social structure, which supports the contention that the microeconomic theory of human ecology must be supplemented by a theory of communities as collective actors.

Changing Metropolitan Morphology and Municipal Service Expenditures in Cities and Rings

David F. Sly, Institute for Social Research, Florida State University, Tallahassee, FL 32306; and Jeff Tayman, Florida State University.

In this paper, the authors submit that the major structural changes occurring in postwar metropolitan America have led to the emergence of the ring as the hub of metropolitan activity and that as this happens rings must

increasingly pay for services which are increasingly utilized by non-ring residents. Cross-sectional analysis of 1960 and 1970 data shows that central city population size, central city to ring commuters, and outside SMSA to ring commuters all exercise a strong positive effect on ring municipal service expenditures. The magnitude of these effects not only remained strong when controls are introduced but also increased over the decade. Furthermore, the positive impact of the ring population on city service expenditures noted by several researchers, while pervasive in 1960, had diminished considerably by 1970. The results lend support to the idea that a functional balance is emerging between cities and rings of metropolitan areas.

Ecological Models and Changing Patterns of Migration

David E. Myers, Department of Sociology, Washington State University, Pullman, WA 99164.

Ecological models of migration have traditionally sought to explain migration streams between places in terms of the organizational characteristics of those places. Migration in these models functions as an equilibrating mechanism which maintains the balance between organizational structure and population.

Increasingly, empirical studies of migration streams have shown that characteristics of an area do not adequately explain in-migration, out-migration, and net migration. These studies also show indications of decreasing areal selectivity in migration through the increasing homogeneity of migration stream and counter-stream. These findings pose two dilemmas for the utility of ecological theory for the explanation of patterns of population redistribution.

The first dilemma arises in the operational correspondence between conceptual propositions and geographic space. Differences in social organization are measured with reference to a specific geographic unit (most frequently the county) which may not capture the variation in social organization in physical space. The second dilemma arises in the increasing organizational homogeneity across places. If organizational differences diminish and migration streams persist, ecological theory is left with few conceptual tools for the explanation of these migration streams.

Both dilemmas may be resolved through a reformulation of ecological theories of migration. This requires that the central propositions in the theory be stated in such a way as to remove the operational link to specific administrative classes of places.

Human Ecology, Community Studies, and Comparative Sociology: Common Ground for Future Work

Sally K. Ward, Department of Sociology, Rutgers University, Newark, NJ 07102.

In this paper, the author examines the linkages between human ecology and the fields of community sociology, community power studies, and comparative or cross-national studies. Three areas of overlap are discussed. The first is the shared concern that human ecology and community sociology have with interdependence among communities. Ecologists have tended to concentrate on dominance as an aspect of interdependence, and it is suggested that they could profit by studying the work of community sociologists on another aspect of interdependence, that of external control. Secondly, human ecology and community power studies are concerned with community power, or dominance, as that concept has been developed in ecology. Both the conceptualization and the operationalization of power are discussed, and questions for further work are raised. The third area of overlap discussed in the paper consists of the similarities between ecological work using the community as a unit of analysis and comparative work using the nation as a unit of analysis. The author suggests that ecologists could contribute to comparative work by expanding their interest in interdependence to an analysis of such international phenomena as foreign control over production.

NATURAL FERTILITY  
Organized and Chaired by  
John Bongaarts, The Population Council

Lactation and Fertility in Bangladesh

Sandra L. Huffman, Department of Population Dynamics, School of Hygiene and Public Health, Johns Hopkins University, 615 North Wolfe Street, Baltimore, MD 21205; A. K. M. Alauddin Chowdhury, Cholera Research Laboratory; and Zenas M. Sykes, Johns Hopkins University.

The authors present an analysis of data from various phases of a study on postpartum amenorrhea in Bangladesh. The data indicate good aggregate consistency of response on menstrual status, but less individual consistency on duration of postpartum amenorrhea. Using life table techniques, the authors calculate the median duration of amenorrhea as 19.9 months for women with births from February through September 1974. The seasonal trend in return to menses has a substantial influence on duration, with the median duration decreasing from 21.5 months for women with February births to 16.9 months for those with September births. By contrast, the difference in the median duration of postpartum amenorrhea varies by only 2 months for women in the lowest and highest quartiles of weight and weight for height.

Evidence of Increase in Natural Fertility during the Earlier Stages of Modernization: Two Case Studies

Anatole Romaniuk, Census Characteristics Division, Room H333-A, Building 8, Carling Avenue, Ottawa, Ontario, K1S 5A4, Canada.

In this paper, the author develops the hypothesis that, as a result of health improvements and the relaxation of customs inhibiting procreation, the fertility rate may actually increase during the earlier stages of modernization. As birth control reaches a level of incidence high enough to offset the upward tendency of natural fertility, the birth rate diminishes to a low level typical of modern populations. Data for two populations, one African from Zaire, the other Canadian Indians, are analyzed, and the results tend to support this hypothesis. An attempt is also made to identify the major factors associated with modernization that are likely to have contributed to the rise in the natural fertility of these two populations. Some generalizations are attempted with regard to procreative behavior during the earlier stages of modernization.

Age, Biological Factors, and Socioeconomic Determinants of Fertility: New Measures of Cumulative Fertility for Use in the Socioeconomic Analysis of Family Size

Bryan L. Boulier, Office of Population Research, Princeton University, 21 Prospect Avenue, Princeton, NJ 08540; and Mark R. Rosenzweig, Yale University.

To influence the number of children ever born to a woman, socioeconomic variables must operate through behavioral mechanisms such as the age at marriage, the level of fertility in the absence of deliberate fertility control, and the level of control exerted to reduce fertility within marriage. In this paper, two new measures of cumulative fertility which are standardized for the age-fecundity relationship and for exposure to the risk of conception associated with marriage duration are described. These measures appear to be superior to children ever born in allowing more precise estimates of the relations of socioeconomic variables to fertility. A simple model of fertility behavior which incorporates some of the mechanisms through which socioeconomic factors may affect fertility is developed and applied to data from the Philippines and the United States to demonstrate the properties of the measures.

The Introduction of Family Limitation in a Natural Fertility Population

Lee Bean, Department of Sociology, University of Utah, Salt Lake City, UT 84112; Klancy de Nevers, University of Utah; Geraldine Mineau, University of Utah; Mark Skolnick, University of Utah; and Dean May, University of Utah.

In this paper, the authors examine the fertility of approximately 42,000 Latter Day Saints (Mormon) women and their ancestors. The women were married once only, and all were born between 1800 and 1899. In this population, a fertility peak of 8.4 children ever born is observed among the 1840-1849 birth cohort. Fertility declines systematically for each successive cohort. While the mean age of first marriage increases from the 1840-1849 birth cohort to the 1890-1899 birth cohort, the same pattern of fertility decline is observed among three age-of-marriage groups. The decline in fertility is associated with increasing birth intervals which may in part reflect increasing proportions of children surviving. Of primary interest is the rapid and sharp decline in the mean age at last birth, suggesting the potential significance of values related to the timing of childbearing. Among women married before age 20 and between ages 20 and 24, the mean age at birth of the last child declines by roughly five years from the peak fertility cohort to the most recent (1890-1899) birth cohort.

MIGRATION AND LABOR FORCE STRUCTURE

Organized by Vernon Renshaw, U.S. Bureau of Economic Analysis  
 Chaired by David Cartwright, U.S. Bureau of Economic Analysis

Some Spatial Aspects of Work Force Migration in the United States, 1965-1975

David L. Brown, U.S. Department of Agriculture, Room 496, ESCS-EDD-500 12th Street, S.W., Washington, DC 20250.

The author describes research concerned with recent shifts in the regional and metropolitan-nonmetropolitan location of population and economic activities. Continuous Work History Social Security data are used to analyze streams of worker migration into and out of various employment locations, thereby allowing for a further specification of some important spatial aspects of post-1970 population change.

The research findings show that while the nonmetropolitan turnaround resulted largely from net out-migration from the largest SMSAs, migration streams from smaller SMSAs also had an impact. The nonmetropolitan reversal vis-a-vis core counties of the largest SMSAs was produced by both increased in-migration and decreased out-migration (i.e., increased nonmetropolitan worker retention). However, increased in-migration was the sole source of reversal vis-a-vis large SMSA suburbs and smaller SMSAs. It is also suggested that broad generalizations concerning the geographic bases of recent trends in population distribution may be misleading. For example, three of the four census regions had nonmetropolitan net in-migration, but the regional and/or metropolitan sources of in-migration were distinctly different.

Urban Migration of Persons Employed in Two-Digit Industries: A Regional Analysis Using the Ten Percent Continuous Work History Sample

Morris M. Kleiner, School of Business, Summerfield Hall, Room 302, University of Kansas, Lawrence, KS 66045.

Changes in the industrial composition of a metropolitan work force have a significant influence on the economic base of an urban area. In this study, the author analyzes the metropolitan migration, employment change, and wage change of persons employed in specific two-digit industries. The model is developed by two-digit Standard Industrial Classification (SIC) using the 10 percent sample from the Continuous Work History Sample of the Social Security Administration for the period 1971-1975.

A regression model is estimated for SMSAs of 250,000 or greater for the four major census regions, Northeast, South, North Central, and West. The

model is better able to explain variations in in- and out-migration across areas and industries than in employment or wage changes. The implications of the model for developing urban labor market policy are explained, as well as the potential use of the model to assess the impact of changes in government and business location decisions on local economies.

The Composition of Migration Streams and Equilibrium Models: The Michigan Experience

James J. Zuiches, Department of Sociology, 418A Berkey Hall, Michigan State University, East Lansing, MI 48824; and Michael Price, Michigan State University.

The application of equilibrium models to internal migration streams has been stimulated by the migration turnaround in many industrial countries. The reversal in net migration and general decline in growth rates of metropolitan areas suggest a limit on societal urbanization. Such a balance between core and periphery areas in highly industrialized societies has been theorized to result from a convergence among subnational areas in social and economic characteristics. Examining the compositional characteristics of migrant labor force flows between Michigan (a highly industrialized state) and the rest of the United States and those flows internal to Michigan between metropolitan and nonmetropolitan settings, the authors find support for the equilibrium and convergence hypotheses. Using the 1960-1975 Continuous Work History Social Security files, the authors decompose the dynamics of labor force trends in terms of labor force migration, turnover, and stability. Analysis of the compositional makeup of annual migration streams provides additional insight into the effects of the business cycle on such mobility.

EFFECTS OF FAMILY SIZE ON CHILD WELL-BEING  
Organized and Chaired by  
Anne D. Williams, University of Pennsylvania  
and U.S. House Select Committee on Population

The Effect of Family Size on Female Educational Attainment in Taiwan

Albert I. Hermalin, Population Studies Center, University of Michigan, 1225 South University Avenue, Ann Arbor, MI 48104; Judith A. Seltzer, University of Michigan; and Chin-hsiang Lin, Taiwan Provincial Institute of Family Planning.

In this paper, the authors focus on the determinants of female educational attainment in Taiwan with particular attention to the role of family size and composition effects. Data from a large and representative sample of Taiwanese wives of childbearing age are analyzed in a multiple regression model designed to predict educational attainment. Although studies of the relationship between educational attainment and family size in the United States indicate that coming from a large family adversely affects the years of schooling an individual completes, all other things being equal, the Taiwanese data show that family size has little effect on female educational attainment. In addition, the sex composition of a woman's family of origin is not linearly related to the number of years of education she has completed. Thus, in Taiwan female educational attainment is largely a function of socioeconomic background variables rather than of family size and composition.

A Cost of Siblings: Child Schooling in Urban Colombia

Nancy Birdsall, Economic Growth Center, Yale University, Box 1987, Yale Station, New Haven, CT 06520.

In this paper, the author considers whether the number of children a family decides to have is systematically related to the amount of resources that parents allocate to children. The relationship between family size,

household spending per child on education, and child educational attainment is analyzed using 1967-1968 data from a household expenditure survey in four cities of Colombia. A cost of siblings, that is, the decrease for any one child in annual spending by parents for education per child, is estimated. This estimation is based on a model in which fertility and child "quality" are jointly determined and are functions of the education and income of parents, as well as the cost of family planning and the availability of schooling. The relative importance of parents' income, the household's economic environment, and family size in influencing children's education is discussed.

Impact of Size of Family and Social Status on Child Development

Basil G. Zimmer, Department of Sociology, Brown University, Providence, RI 02912.

In this paper, the author examines how size of family and social status affect the mental and physical development of children. The study is based on data for approximately 13,500 children born in Aberdeen, Scotland. The physical and mental development of these children was followed from birth through the 11 plus examination. Data on physical development at age 5 years, and test scores at ages 7, 9, and 11 years, were obtained from school records.

From the Aberdeen Maternity Hospital data were obtained on birth weight; age of mother at marriage and at time of child's birth; her education, premarital occupation, and her father's and husband's occupation; and the birth order of the child.

The analysis first focuses on the relationship between physical and mental development, then attempts to account for variations in level of development by examining the impact of size of family and birth order, controlling for social class, social mobility, birth weight, and wife's age at time of the child's birth.

Is the Association between Family Formation Patterns and Child Health Causal?

Abdel A. Omran, Department of Epidemiology, School of Public Health, University of North Carolina, Chapel Hill, NC 27514.

The relation between child health and well-being and family formation patterns is analyzed using data from developed and developing countries. The independent variables considered in the causal analysis include parity (or birth order), family size, preceding and succeeding birth interval, and maternal age. The dependent variables include pregnancy wastage, perinatal and child mortality, child morbidity, physical and intellectual development, and adjustment. The data are critically examined in order to evaluate seven major prerequisites necessary to establish a cause and effect relationship. These are: strength of the association, its authenticity (not spurious), temporality (antecedent-consequence), consistency, plausibility and coherence, biological gradient, and experimental proof.

NEW METHODS OF ANALYSIS FOR LDCs

Organized and Chaired by

Kenneth Hill, National Research Council

The Postpartum Non-Susceptible Period: Development and Application of Model Schedules

R. J. Lesthaeghe, Interuniversity Programme in Demography, Centrum Sociologie, Vrije Universiteit Brussel, Pleinlaan 2, 1050 Brussels, Belgium; and H. J. Page, Vrije Universiteit Brussel.

The duration of the postpartum non-susceptible period is a major determinant of birth intervals in populations with relatively low levels of contraception. Moreover, since it depends largely on the duration of breast-feeding, this non-susceptible period may change rapidly with socioeconomic

development. Its study is, however, seriously hampered by the limited and defective nature of the data that can be obtained. In the absence of intensive large-scale prospective studies, sizeable reporting errors and sampling fluctuations are inevitable.

The authors propose a system of model schedules that summarizes the underlying regularities found in empirical schedules. Using a logit transformation, the authors relate observed schedules to a standard schedule by just two parameters. The system provides a means of obtaining relatively robust estimates of the duration distribution of lactation or amenorrhea from partial or flawed data.

Several applications of the models for estimation problems, for simulation purposes, and for the analysis of the relationships between postpartum variables are suggested.

Estimating Infant and Childhood Mortality under Conditions of Changing Mortality

Alberto Palloni, Department of Sociology, University of Texas, Austin, TX 78712.

In this paper, the author attempts to develop a method to estimate infant and childhood mortality in situations in which conditions of mortality have been improving or deteriorating. The method requires knowledge of the proportion of children dead to ever-married females classified in five-year age groups and, in addition, presumes knowledge of the age distribution of children surviving. Various techniques are defined that would be useful according to the particular circumstances which the researcher may face. All of these techniques are tested utilizing simulated data which were generated by combining a variety of fertility and mortality histories. A large proportion of these histories are characteristic of developing countries, the most likely candidates for the application of these techniques. In conclusion, the author presents an analysis of the robustness of the estimates to errors in the data, such as omission of children and age misstatement.

Completeness of Death Registration: An Evaluation of the Brass Technique

Linda G. Martin, U.S. House Select Committee on Population, House Annex No. 2, Room 3584, Washington, DC 20515.

William Brass has developed a method of estimating completeness of death registration using only data on deaths and population by age and sex for a particular period. In this paper, the Brass method is briefly outlined, and the assumptions upon which it is based are discussed. In particular, the implications of the failure of the assumptions of stability of the population and of no age differential in the completeness of death registration are investigated. In the former case, it is found that when mortality has been declining, use of the Brass technique leads to underestimation of the completeness of death registration.

A modification of the Brass technique based on knowledge of the duration and rate of mortality change is proposed for use in populations destabilized by mortality change. Using simulated destabilized populations, the author tests the modification and finds it to yield more accurate estimates of completeness of death registration than the unmodified technique. The usefulness of the modified technique is further illustrated by applying it to data on Costa Rican females in 1963.

Comparing Vital Rates Estimated from Vital Statistics with Those Estimated from Own Children Methods with Examples from Costa Rica

Roger C. Avery, Sociology Department, Room 323, Uris Hall, Cornell University, Ithaca, NY 14853.

Vital rate estimates from own children methods depend on the accuracy of the procedures and of age reporting. Vital registers also have problems, suffering from selective undercounting or inaccurate reporting. In this



paper, the author studies the errors in both procedures and describes a new own children estimation procedure which provides fertility histories for each woman.

Using this method, the author constructs own children estimates of fertility and child mortality from the 1973 Costa Rican census and compares these estimates with vital statistics. Comparisons are made of births and child deaths in local areas and the age and parity distribution of mothers. Age misreporting causes substantial distortions in the own children estimates; however, these methods give more detailed characteristics of mothers and suggest substantial variations in vital statistics coverage. This can affect local area multiple regression analysis. Thus, the  $R^2$  of an infant mortality model and the effects of family planning on fertility are substantially higher when own children measures are used.

#### FERTILITY THEORY: PSYCHOSOCIAL AND SOCIOLOGICAL ORIENTATIONS

Organized and Chaired by

Paula E. Hollerbach, Queens College and The Population Council

#### Childbearing Intent and Contraceptive Use as Components of Dependent Fertility Variables in the United States

Warren B. Miller, American Institutes for Research, P.O. Box 1113, 1791 Arastradero Road, Palo Alto, CA 94302.

In the United States there are two types of behavior that are especially important in determining the occurrence of conception: proceptive behavior, in which the intent is to achieve conception, and contraceptive behavior, in which the intent is to prevent conception. In this study, the pregnancy histories of 642 married women were recorded over a two-year interval, and all conceptions that occurred were classified according to proceptive or contraceptive intent and behavior.

It was observed that different categories of conceptions were predicted by different sets of initial psychological and interpersonal traits. Further, in the prediction of certain conceptions, an interaction between psychological and interpersonal traits and the women's contraceptive method was apparent. It is concluded that an improved understanding of the antecedents to conception can be achieved at the micro-level by incorporating proceptive intent and contraceptive use into the definition of certain fertility variables.

#### Fertility Decision-Making Theories: A Test Using Sequential Pregnancies

Patricia G. Steinhoff, Department of Sociology, University of Hawaii, 2424 Maile Way, Honolulu, HI 96822; James A. Palmore, University of Hawaii; and R. G. Smith, University of Hawaii.

The work of Hollerbach, Miller, and others has led to a reconceptualization of fertility decision-making as a continuing process over time, subject to influence from psychological predispositions in the individual, change in the social environment, and the effects of previous fertility decisions.

In this paper, the authors examine a group of women who experienced two successive pregnancies, the first of which was unwanted and terminated by abortion. Some of the subsequent pregnancies were repeat abortions, while others resulted in births. Questionnaires obtained from the same women at the time of both events are used to examine: (a) whether the sequence of behaviors exhibited by one person is consistent with the theory that basic psychological traits play a major role in fertility decisions; (b) whether other social variables can satisfactorily account for the observed sequence of behavior; and (c) what social factors can further specify conditions under which particular psychological factors may be critical.

A Test of a Social Psychological Model for the Prediction of Fertility Behavior: Results of a Longitudinal Survey

Andrew R. Davidson, Department of Psychology NI-25, University of Washington, Seattle, WA 98105; and James J. Jaccard, Purdue University.

To test a model of fertility behavior, a stratified random sample of 244 married women residing in an urban area in the United States was studied over a two-year period. It was predicted that a woman's fertility behavior is a function of two components: (a) her beliefs about the consequences of having a child multiplied by the evaluation of those consequences ( $\Sigma B_i E_i$ ), and (b) her normative beliefs multiplied by her motivation to comply with those norms ( $\Sigma N_i M C_i$ ). In support of the model, a linear combination of  $\Sigma B_i E_i$  and  $\Sigma N_i M C_i$ , measured at the outset of the study, provided a significant multiple correlation with fertility behavior during the two-year period ( $R^2 = .349$ ,  $p < .01$ , with 83.2 percent of the cases correctly classified). When the predictor variables were adjusted to reflect a change of mind during the first 12 months of the study, there was a significant increase in prediction ( $R^2 = .392$ ,  $p < .01$ , with 85.2 percent of the cases correctly classified).

A Comparison of the Factors Influencing Husband/Wife Use of Contraceptives in Pakistan

Herbert M. Baum, Richard Katon Associates, One Central Plaza, Box 22, 11300 Rockville Pike, Rockville, MD 20852.

The decision to use contraceptives should represent a concensus arrived at by the couple. Most studies of contraceptive practice focus on either husbands or wives. This study focuses on both, with the aim of showing that the factors influencing use are different for husbands and wives.

Two models were formulated linking selected socioeconomic and demographic variables to use. The first omitted the prior decisions, opinion of family planning, and desire to use; while the second included them. The differences between the results for the two models were extreme for husbands, but minor for wives. Desire to use was an important part of the final husband model, but was not part of the final wife model. This could indicate a dominance by husbands in the realm of family planning.

The study found distinct sexual differences, which implies that neither spouse can be used as a proxy for the couple.

A Suggested Framework for Analysis of Urban-Rural Fertility Differentials with an Illustration of the Tanzanian Case

Sally E. Findley, Minnesota State Planning Agency, Room 101, Capitol Square Building, St. Paul, MN 55101; and Ann C. Orr, General Electric-TEMPO.

The authors offer a framework for analyzing how individual and urban or rural "place" factors interact to influence fertility decisions. The framework builds on the Davis-Blake model and additionally shows how place or community variables influence exposure to intercourse, conception, and birth, either with or without a conscious decision-making process. The framework emphasizes the way person and place related factors combine to determine a woman's perception of her life options before bearing any children, as well as how changes in these factors may affect subsequent childbearing decisions. The framework is briefly illustrated by the Tanzanian case. The analysis highlights urban-based considerations, such as education-wage differentials, which may influence the rural couple's decisions. A comparison of two rural groups shows that specific community variables, such as cultural attitudes, accessibility, general educational levels, and child mortality, mediate the influence of these urban-based phenomena.

DEMOGRAPHIC IMPACT OF DEVELOPMENT POLICIES IN DEVELOPING COUNTRIES

Organized and Chaired by  
Mary M. Kritz, Rockefeller Foundation

Some Issues Pertinent to the Assessment of Demographic Impacts of Development Policies

Anrudh K. Jain, The Population Council, One Dag Hammarskjold Plaza, New York, NY 10017.

First an attempt is made to formulate the objectives and examine the potential utility of initiating research efforts to establish causal linkages and to quantify effects of developmental inputs on changes in population components (fertility, mortality, and migration). In addition to generating and accumulating knowledge, the ultimate utility of such research efforts will be to create awareness and to generate interest among policymakers and planners in considering the potential demographic impact in selecting, designing, and implementing development policies, programs, and projects. One of the various ways to advance current knowledge is to select specific development programs and projects designed to affect non-demographic behavior and try to study their effects on demographic behavior as well. Various problems and issues anticipated in following this approach are identified and discussed, including problems in identification and selection of specific development projects, establishment of fertility change that can be attributed to developmental inputs, the need for developing surrogate indices to measure fertility change, and the time required before the approach affects the demographic behavior of couples.

In addition, efforts have to be made to utilize available knowledge in incorporating population issues in the planning process. To this end, it is suggested that for selected development sectors, the potential population impacts of existing policies selected during the past few years should be compared with the estimated population impacts of alternate options that could have been chosen, given the constraints of the particular situation. Active collaboration among researchers and planners in such examinations is essential for the utilization of the results in the planning process.

Development as a Means of Enhancing Fertility Reductions

Richard M. Cornelius, Office of Population, U.S. Agency for International Development, Department of State, Washington, DC 20523; and J. Joseph Speidel, U.S. Agency for International Development.

The ongoing debate among population professionals and policymakers regarding the interrelationships between development and fertility was in evidence at the 1974 World Population Conference at Bucharest. Some delegates advocated intensive development as the only effective means of reducing fertility, while others proclaimed that meaningful economic and social development is impossible unless population growth is first slowed by family planning programs.

The authors present a brief overview of recent research on the effects of selected development variables (including education of females, employment of females, and income redistribution) on fertility. They then explore the feasibility and efficacy of development as a means of inducing fertility reductions in less developed countries. They conclude that vigorous family planning programs provide the single most efficient measure available to reduce rapid population growth.

Employment Expansion, Age at Marriage, and Marital Fertility in the Philippines

Mark R. Rosenzweig, Economic Growth Center, 52 Hillhouse Avenue, Yale University, New Haven, CT 06520; and Bryan L. Boulier, Princeton University.

In this paper, the authors employ economic theories of marriage and household behavior to examine the determinants of age at marriage, marital fertility, female education, and assortative mating in the Philippines.

Functional forms are derived from the underlying biological relations among age, age at marriage, and fecundity, and estimation techniques are used which take into account the heterogeneity of women with respect to unobserved characteristics such as fecundity and intelligence. Important empirical findings are: (1) improvements in economic opportunities for men (relative to those for women) reduce female age at marriage; (2) increases in the schooling level for women raise their age at marriage; (3) women of given education who delay marriage (i.e., engage in more search) acquire husbands with greater earning power; (4) given search time, women with more schooling attract "better" mates; (5) use of inappropriate estimation techniques which ignore heterogeneity results in seriously biased estimates of important parameters; and (6) variations in family size in the Philippines appear to be due almost exclusively to variations in the age at marriage of women.

Development Policies and Demographic Change in Socialist Cuba

Barent Landstreet, Department of Sociology, Bethune College, York University, Toronto, Ontario, M3J 1P3, Canada; and Axel I. Mundigo, Ford Foundation.

The authors present an overview of the most significant changes in post-revolutionary Cuban population trends and policies. The post-1959 baby boom and subsequent decline in the birth rate to historically new low levels are reviewed, along with birth control and abortion policies. The lack of an official anti-natalist policy is partly explained by the government's commitment to policies which aim to reduce the dependency burden by incorporating previously unproductive sections of the population into productive labor via full male employment plus the promotion of female, voluntary, military, and student labor.

Rural revitalization policies have led to a relative balancing of rural and urban population growth, and Havana's growth rate has been kept to a level below that of the country as a whole. Recent emigration history is divided into time periods, and the magnitude and characteristics of the émigré flow are discussed. Health conditions apparently deteriorated immediately following the revolution, but the authors point out that this trend has now been reversed and that life expectancy is now greater in Cuba than elsewhere in Latin America.

MIGRANTS TO METROPOLITAN AREAS

Organized and Chaired by

C. Jack Tucker, Atlanta University

Racial Succession in Individual Housing Units

Larry H. Long, U.S. Bureau of the Census. Mailing address: 258 G Street, S.W., Washington, DC 20024; and Daphne Spain, University of New Orleans.

In the period 1967-1971, racial succession represented about 4.0 percent of all residential moves in the United States involving one household vacating a housing unit and being replaced by another household one year later. The probability that a housing unit experiencing a change in occupancy will also experience racial succession is higher in central cities than in suburbs and higher in suburbs than in nonmetropolitan areas. Blacks moving into housing units previously occupied by whites tend to cover short distances in their moves, are of higher socioeconomic status than other black movers, and typically consist of families where both husband and wife are present. The whites who are replaced by blacks tend to be older and of lower socioeconomic status than other white movers. The data come from year-to-year matches of housing units in successive Current Population Surveys taken by the U.S. Bureau of the Census.

Black Suburbs and White Cities? Recent Trends in Intrametropolitan Migration  
Kathryn P. Nelson, 105 Delmar Circle, Oak Ridge, TN 37830.

Several recent articles have identified white in-migration to transition central city neighborhoods and a study of Chicago foresees the development of a mostly white central city with black suburban ghettos by the year 2000. In this study, the author compares data from the 1974 and 1975 Annual Housing Survey with 1960 and 1970 Census of Population data for 11 large metropolitan areas in order to determine the pervasiveness and extent of such developments. The data reveal increased rates of black suburbanization but little evidence that white in-migration to central cities is increasing. Black migration patterns have shifted markedly since 1970 away from central cities and towards the suburbs. Although whites are "returning" to the central city in Los Angeles, elsewhere total white migration remains effectively directed away from central cities and towards suburbs and nonmetropolitan areas. Only for the youngest whites, age 20-24, do any indicators suggest higher levels of migration into central cities since 1970. Those blacks moving into suburbs appear to be younger and to have higher incomes than other blacks.

A Reconsideration of the Effects of Welfare Payment Level Differences upon Interstate Migration of Low-Income Population  
Gordon F. Sutton, Department of Sociology, University of Massachusetts, Amherst, MA 01003; Huey-tsyh Chen; University of Massachusetts at Amherst; and Douglas Downing, University of Massachusetts at Amherst.

A structural equation model describing the causal linkage between differentials in welfare payments among states and the direction and relative size of corresponding migration streams is introduced. Previous investigations of this subject, results of which have been inconclusive for a number of reasons, are reviewed. Based on this model, analyses of micro-data on interstate migration, 1965-1970, from census public use files for (a) welfare recipient family members and/or (b) low-income population are presented measuring the level of effects. Variables introduced in a regression analysis required to estimate the structural equation model of the migration streams include measures of population size and of differences between pairs of states as to level of urbanization, extent of industrialization, and average family income.

The Changing Impact of Migration on the Population Compositions of Origin and Destination Metropolitan Areas  
William H. Frey, Center for Demography and Ecology, Department of Sociology, 3224 Social Science Building, University of Wisconsin, 1180 Observatory Drive, Madison, WI 53706.

Increased migration to the sunbelt and the metropolitan-nonmetropolitan turnaround represent departures from long-standing redistribution trends. Although these patterns have been examined from a number of perspectives, their consequences for individual metropolitan areas have not yet been brought to light. In the present study, stream-disaggregated data for the late 1950s and late 1960s are employed to assess the impact of recent migration for the sizes and compositions of white populations in 31 large metropolitan areas.

It is found that most large northern SMSAs have been experiencing the "new" migration patterns since the late 1950s. They have incurred net out-movements of whites to both metropolitan and nonmetropolitan areas but, due to exchanges with nonmetropolitan areas, have managed to retain greater numbers of college graduates and professional workers. Although southern and western SMSAs have not yet sustained losses to their nonmetropolitan environs during this period, they did appear to gain substantially from the interregional metropolitan redistribution with respect to both their total and high status populations.

## POPULATION PROJECTION METHODS

Organized and Chaired by

Harry M. Rosenberg, U.S. National Center for Health Statistics

Population Projections and Regional Planning

Norfleet W. Rives, Jr., College of Urban Affairs, University of Delaware, Newark, DE 19711.

Population growth is centrally important to the process of regional development, but the role of population projection in regional planning has only recently begun to receive greater attention at the state and local levels. Regional planners have traditionally interpreted population projection to mean population prediction, and they have typically favored simple forecasting models which require relatively little time, expertise, money, and statistical information. This approach has adequately served a wide range of purposes, but the past several decades have witnessed a significant increase in the complexity of questions confronting state and local planners, and simple forecasting models no longer seem appropriate for all planning situations. The nature of regional planning warrants a further assessment of the role of population projection in planning activity.

In this paper, the author addresses three major dimensions of the problem: (1) the selection of projection methods, (2) the design of projection systems, and (3) the definition of projection assumptions.

Projecting Income Distribution in a Regional Economy

Daniel A. Seiver, National Bureau of Economic Research, 575 Technology Square, Cambridge, MA 02139.

Interest in income and its current and future distribution and maldistribution is on the rise throughout the world. In this paper the author seeks to project, in a simple fashion, the distribution of earnings in the state of Alaska. Building on a regional economic-demographic model of the state's economy and population, the author projects occupational demands, occupational supplies, occupational earnings, and the distribution of earnings for race and sex groups to the year 1990. It is shown that distributional consequences vary with the growth path of the economy. The assumptions underlying the projection technique and the calculation of the projection matrices are also discussed.

Notes on Projections of the Older Population

Beth J. Soldo, Center for Population Research, Georgetown University, Washington, DC 20057; Carol J. DeVita, Georgetown University; and Alfred M. Pitts, Duke University.

There are numerous references in the gerontological literature to the relative ease with which the absolute size and characteristics of the older population can be projected into the near future. Underlying this argument is the assumption that, having identified the birth cohorts that will comprise the older population in the next 15-20 years and having developed compositional profiles of these cohorts, it is simple enough to "forward survive" them under a constant or easily discernible regime of mortality rates. Efforts to project the older population in this manner, however, have yielded inadequate results.

Current research by the authors has been designed to improve the quality of projected estimates for utilization by planners and demographers. Although no innovative projection techniques are introduced, it is hypothesized that the mortality assumptions incorporated into earlier projections have accounted for many of the discrepancies between observed and projected populations. Emphasis is, therefore, placed on the dynamic properties of mortality differentials which affect both inter- and intra-cohort compositional changes. Application of this strategy will be applied to 10 birth cohorts projected from 1975 to 1990. Analysis of results will be forthcoming.

The Recent Acceleration of Female Employment Growth and Its Implications for Projections through 1990: Insights from a Cohort Model  
George Farkas, Department of Sociology, Yale University, New Haven, CT 06520.

In this paper, the author presents cohort models as an alternative to the more usual method of labor force projection via the extrapolation of annual age-specific rates. This is accomplished by updating a previously estimated, single-year-of-age cohort model. The updated model is used to provide three projections of the size and age structure of the female labor force through 1990. Two of these projections are based upon the extrapolation of a constant inter-cohort trend, while the third permits the magnitude of this trend to vary according to relative cohort size. A number of issues of model specification are explored, and areas of uncertainty are pointed out. These projections are compared with those of the Bureau of Labor Studies and of Michael Wachter, and, whereas the three sets of figures are not incompatible, the author concludes that, at least over the next 15 years, the female labor force may grow a good deal more rapidly than is currently anticipated.

CONTRIBUTED PAPERS: SUBSTANTIVE TOPICS  
Organized and Chaired by  
Conrad Taeuber, Georgetown University

Completeness of Registration of White Births for States, 1930: A Statistical Reconstruction

J. Gregory Robinson, Population Division, U.S. Bureau of the Census, Suitland, MD 20233.

Three national tests of the completeness of birth registration have been conducted in the United States for the years 1940, 1950, and 1964-1968. Estimates of birth registration completeness (both for the entire country and for states) before 1940 can be used to produce the best estimates of births for tracing the evolution of American fertility, for identifying historical differences between sections of the country, and ultimately, for measuring coverage of censuses since 1940. This paper describes a method for estimating the completeness of registration of white births for states in 1930 that would add another benchmark and extend the series of corrected births back in time.

Estimates of the completeness of registration of white births for 1930 are derived by comparing registered births in each state with estimates of the true numbers of births developed from 1930 census counts of the population under one year of age, corrected for under-enumeration and infant deaths. State estimates of under-enumeration at ages under one in 1930 are derived by extrapolating patterns of under-enumeration in the 1940 and 1950 censuses.

Applications of the estimates of birth registration completeness for 1930 to the measurement of census coverage for states, together with possible extensions of research to earlier years, are discussed.

Some Effects of Socialization and Role Hiatus on Parity Progression at Parities Two and Three

M. D. Evans, Department of Sociology, University of Chicago, 1126 East 59th Street, Chicago, IL 60637.

The author assesses some effects of socialization and role hiatus on additional fertility at parities two and three among 2,150 white women in intact marriages of more than nine years duration in 1970. At each parity, indicators of the standard of living in the wife's family of orientation, the fertility-enhancing Catholic backgrounds of both spouses, human capital formation, and role hiatus are examined in terms of their impacts on the probability of having at least one more birth. Data are from the 1970 National Fertility Study. The major results of regression analyses are that:

(1) husband's Catholic childhood, wife's farm childhood, wife's age at marriage, and the interval between marriage and the first birth all have important effects on progression at both parities; and (2) the sizes of the effects of these indicators are virtually identical at both parities.

Thoughts on Food: How Definitions Can Matter

Tomas Frejka, The Population Council, One Dag Hammarskjold Plaza, New York, NY 10017.

Scholars (including Malthus) frequently consider it unessential to define food, since the concept seems self-evident. However, different definitions of food can lead to differing or even to contradictory findings, some of which become the basis for public perceptions of national and international issues and the basis for policymaking. In social science research food definitions range between two extremes, "foodgrains only" and "total food" (including such items as vegetables, dairy products, meat, fish, fruit, sugar, oils, and beverages). Two data sets illustrate the case, one from India, one on the international food trade. Predictably, social class food consumption differentials are larger in non-grain foods than in foodgrains. Policies increasing income of the poorest would increase foodgrain consumption and generate more nutritious diets. The narrower definition pictures First World countries with a large and positive food trade balance, whereas with the broader definition Third World countries had a large positive food trade balance in the early 1970s.

Attitudes toward Women's Role and Abortion--1971 and 1975

Lois A. Monteiro, Division of Bio-Med, Box G, Brown University, Providence, RI 02912.

The author examines attitudes concerning the role of women and concerning abortion, as expressed in a longitudinal design household survey of the Rhode Island population in 1971 and 1975. The attitudes recorded show an unexpected stability over a period in which there has been increasing public awareness of abortion and women's issues.

With regard to women's role, the survey shows support for women working except when the woman has small children. There is little difference in attitudes between male and female respondents. Abortion attitudes show a high level of approval for "hard" reasons (health, 85 percent; rape, 76 percent; birth defect, 69 percent), but less than half the sample approve of abortion for "soft" reasons (low income, 40 percent; unmarried mother, 34 percent; child not wanted, 28 percent). Much of the analysis focuses on the relationship between women's role attitudes and abortion attitudes and shows that more liberal women's role attitudes are associated with more liberal abortion attitudes. However, such associations are not significant enough to affect the influence of religion and age on abortion attitudes.

Comparison of Recent Estimates of World Population Growth

Roger Kramer, Scuderi Building, Room 302, U.S. Bureau of the Census, Washington, DC 20233; and Samuel Baum, U.S. Bureau of the Census.

In recent years an increasing number of organizations, both governmental and private, have prepared estimates of world population growth. Such estimates range from 1.5 to 2.1 percent annually and lead to considerably different interpretations of the world demographic situation. Depending on which agency's growth rates one looks at, it would be concluded that the pace of the world population growth is rapidly decelerating, slowly decelerating, or even slowly accelerating.

It is the authors' purpose in this paper to compare these demographic estimates and to identify the areas of agreement as well as disagreement. The reasons for disagreement are also examined. Estimates of the following six agencies are included for discussion: U.S. Bureau of the Census, United Nations, U.S. Agency for International Development, Population Reference Bureau, Environmental Fund, and Worldwatch Institute.



Impact of Income Maintenance on Low Birth Weight: Evidence from the Gary Experiment

Barbara H. Kehler, Mathematica Policy Research, P.O. Box 2393, Princeton, NJ 08540; and Charles M. Wolin, Mathematica Policy Research.

Birth weight is an important index of infant health status: low birth weight (5.5 pounds or less) is associated with high rates of infant mortality and morbidity. Low birth weight also is associated with low income and low socioeconomic status. The question arises, therefore, whether income transfers can affect the incidence of low birth weight among the poor.

In this study, the impact of an expanded income support plan on the incidence of low birth weight is analyzed using data on 404 infants born to low-income women who participated in the Gary (Indiana) Income Maintenance Experiment. The findings suggest that such a plan can have a significant effect on the health of children of women who face high risk pregnancies. High risk is defined as being those women who are under 18 or over 34, who smoke or who have had children in quick succession. These results provide dramatic evidence of the broad benefits of welfare reform.

The Religious Factor and Migration: Mormon and Non-Mormon Migration in and out of Utah

Michael B. Toney, Utah State University. Mailing address: 1670 E. 1550 N, Logan, UT 84321; and Carol McKewen-Stinner, Pennsylvania State University.

In this paper, the authors describe the migration patterns of Mormon and non-Mormon residents of Utah and examine factors influencing these patterns. Although Mormons make up less than one percent of the U.S. population, they constitute 70 percent of Utah's population and appear to make up a majority of Utah's in-migrants. The percentage of non-Mormons intending to out-migrate from the state is much higher than the percentage of Mormons intending to leave. The historical emphasis of the Mormon Church on "the gathering doctrine" conflicts between Mormons and non-Mormons and the differential family and community integration are discussed as major contributors to these selective migration patterns.

METHODS AND MODELS IN POPULATION RESEARCH

Organized and Chaired by

Charles J. Mode, Drexel University

Experience in Practical Application of Component Population Projection Techniques That Explicitly Incorporate Contraception and Abortion

Dorothy L. Nortman, The Population Council, One Dag Hammarskjold Plaza, New York, NY 10017.

A variety of models has been evolved to meet the need of government planners and policymakers for reliable evaluation of family planning programs with respect to (1) the family planning acceptor requirement to reduce the birth rate to some predesignated level and (2) the demographic impact of programs in terms of births averted and/or points off the crude birth rate. These models range from simple rules of thumb to elaborate, micro-level, stochastic processes. Among the several computerized population projection techniques in which fertility is explicitly modified by contraception and induced abortion, the deterministic macro-models known under the acronym TABRAP/CONVERSE have received the widest application. In this paper, the author explores the practical problems and issues experienced in applying these models to real life situations and provides a brief review of their methodology.

An Algorithm for Estimating a Markov-Generated Increment-Decrement Life Table--Applications to Marital Status

Robert Schoen, Department of Sociology, University of Illinois, Urbana, IL 61801; and Kenneth C. Land, University of Illinois.

Single and multiple decrement life table models have long been grounded mathematically in Markov process theory. In the present paper, the authors describe how increment-decrement life table models (interconnected life tables that have entrants as well as exits) can also be represented in terms of Markov processes. Differentiations are made between three kinds of probabilities, which, while identical in single and multiple decrement life tables, are distinct in increment-decrement models. The first kind are the  $p$ -probabilities, defined in the same manner as conventional life table probabilities. The second kind are the  $\pi$ -probabilities, which indicate the probability that a person in a given state at a certain age will be in some specified state at another age, and which comprise the Markov transition probability matrix. The third kind are the  $\xi$ -probabilities, the probability that a person in a given state at a certain age will transfer to another state within a specified period.

Procedures for constructing increment-decrement life table models, for estimating the underlying forces, and for finding the transition probability matrices of the corresponding Markov processes are discussed, and calculation formulas given for the case of two interconnected increment-decrement life tables. The two-table model is then applied to the study of marital dissolution and remarriage, and the results are described.

Application of a Non-Markovian Stochastic Process to the Taichung Medical IUD Study

Gary S. Littman, Center for Population Studies, Harvard University, 9 Bow Street, Cambridge, MA 02138.

The author describes the principles of absorbing age-dependent semi-Markov processes and proceeds with a description of how multiple decrement life table techniques may be used to estimate the needed transition functions. An overview of the Taichung Medical IUD Study is given and the state space to be employed is discussed. Some path dependencies which appear in the data are pointed out and the unsuitability of a Markovian process to model the entire set of contraceptive-pregnancy histories as reported in this study is described. An alternative non-Markovian model is outlined and attention is focused on the portion of the model which takes individuals up to their first pregnancy during the study. Results are presented along with a method for verifying the applicability of the model. Finally, a computing algorithm to handle a key calculation which arises in the model is briefly discussed.

A Model of Intention-Use-Specific Fertility

Norman B. Ryder, Office of Population Research, Princeton University, 21 Prospect Avenue, Princeton, NJ 08540.

Using data from the 1965 and 1970 National Fertility Studies, the author presents a set of observations for each of eight quinquennial (real and synthetic) marriage cohorts, covering the experience of the 1940s, 1950s, and 1960s. These observations, which classify births and person-years of exposure by planning status, are used to derive nine indices of reproductive input (three ends, three means, and three conditions) as well as a set of conventional outputs (such as the mean number of unintended births). The outputs are then expressed as deterministic equations in terms of the inputs. This permits the study of the structure of fertility determination by examining the elasticity of each output with respect to each input. The model provides a parsimonious description of changes in fertility regulation and an instrument of possible utility for policy decisions.

RECENT DEVELOPMENTS IN AMERICAN FERTILITY  
Organized and Chaired by  
N. Krishnan Namboodiri, University of North Carolina

Future of American Fertility: Some Speculations

David Goldberg, Population Studies Center, University of Michigan, 1225 South University Avenue, Ann Arbor, MI 48104.

No abstract received.

The End of "Catholic" Fertility

Charles F. Westoff, Office of Population Research, Princeton University, 21 Prospect Avenue, Princeton, NJ 08540.

On the basis of data from the National Fertility Studies of 1965, 1970, and 1975 and from the Growth of American Family Studies of 1955 and 1960, the course of Catholic and non-Catholic fertility in recent U.S. history is reconstructed. Both cohort and period measures of marital fertility are reconstructed from birth histories covering the period 1951 to 1975. The divergence during the baby boom and the convergence during the subsequent years of fertility decline are documented. This convergence has occurred across social classes and among the more devout as well as the more nominal Catholics and is consistent with the secularization of Catholic contraceptive practice. Some speculations about the reasons for the convergence are offered.

Is Zero Preferred? American Attitudes toward Childlessness in the 1970s

Judith Blake, School of Public Health, University of California, Los Angeles, CA 90024.

This paper is based on special questions about childlessness that were commissioned in a Gallup survey of voting-age adults in February 1977. Using these materials, the author constructs a Likert-type scale of attitudes toward childlessness. Major socio-demographic, and some attitudinal, predictors of scale values are studied by means of Multiple Classification Analysis. The results indicate that the general public does not view childlessness as an advantaged condition. There is, however, a wide diversity of views concerning the disadvantages of non-parenthood. The analysis also considers the childlessness scale, plus selected additional attitudinal variables, as predictors of family size preferences.

Recent Changes in Contraceptive Practice among American Couples: Results from the 1976 NSFG

Kathleen Ford, U.S. National Center for Health Statistics, 3700 East-West Highway, Hyattsville, MD 20782.

The 1960s and the early 1970s witnessed increased use of highly effective contraceptive methods by married couples in the United States. In this paper, data are presented from the 1976 National Survey of Family Growth (NSFG) to provide current estimates of the distribution of methods used and an assessment of trends between 1973 and 1976. Major findings indicate an increase in the use of surgical sterilization in the white population and the continued dominance of the pill as the method preferred by all couples who have not resorted to surgical sterilization.

## TOPICS IN THE DEMOGRAPHY OF TROPICAL AFRICA

Organized and Chaired by

Sarah Clark Green, U.S. Agency for International Development

Breast-Feeding, Abstinence, and Family Planning among the Yoruba and Other Sub-Saharan Groups: Patterns and Policy Implications

Thomas E. Dow, Jr., Department of Sociology, State University of New York, Purchase, NY 10577.

Historical and contemporary patterns of breast-feeding, abstinence, and family planning among the Yoruba and other sub-Saharan groups are analyzed. On the basis of these patterns, it is concluded that family planning programs must accept the pro-natal spacing intentions of most African women if higher levels of approval and practice are to be obtained. Finally, it is argued that in taking this position, that is, in separating itself from direct responsibility for population control and economic development, family planning would be acting in a rational and defensible manner.

Education, Female Status and Fertility in Nigeria

Judith A. Harrington, Department of Population Planning, School of Public Health, University of Michigan, Ann Arbor, MI 48104.

No abstract received.

Voltaic Migration 1969 to 1973: Volume and Rates

Joel W. Gregory, Département de Démographie, C.P. 6128, Succursale "A", Université de Montréal, Montreal, Quebec, H3C 3J7, Canada; and André Lavoie, Université Nationale du Rwanda.

Some of the major quantitative results of the National Migration Survey in Upper Volta, conducted in 1974-1975, are presented. The data collection procedures and potential for underestimation and overestimation are studied in the first part of the paper. Next, origin and destination migration matrices (for the total population and by sex and age groups) for the 1969-1973 period are discussed; the overwhelming numerical importance of moves from rural areas in Upper Volta to the Ivory Coast is stressed. In the following section of the paper, migration rates are calculated, and the relatively high rates of in- and out-migration to urban areas, and particularly to Ouagadougou and Bobo-Dioulasso, the two largest cities, are noted. Finally, three major aspects of recent Voltaic migration are discussed: the continued importance of international emigration, the role of urban and rural origins and destinations within Upper Volta, and the substantial amount of return migration.

## CONTRIBUTED PAPERS: SUBSTANTIVE TOPICS

Organized by Conrad Taeuber, Georgetown University

Chaired by Vincent H. Whitney, University of Pennsylvania

Catholicism and Family Planning Attitudes in Brazil

Alene H. Gelbard, Department of Population Dynamics, School of Hygiene and Public Health, Johns Hopkins University, 615 North Wolfe Street, Baltimore, MD 21205.

The effects of Catholic teachings on family planning in Brazil, a country that is 90 percent Catholic, are poorly understood. While research findings have indicated that most Brazilian Catholics are not influenced by Church

teachings which forbid the use of contraceptives, they are ambiguous regarding Church influence on the family planning attitudes and behavior of those most active in the Church.

This paper is concerned with a study designed to resolve some of these ambiguities. In this study, measures of Catholic ideology are used in addition to attendance at mass, a traditional measure of Catholicism, and analyzed in relation to birth control and contraceptive attitudes in a multivariate analysis which also includes appropriate environmental factors.

The data are from a 1970 survey of religious attitudes and behavior and secular concerns of Catholics in Rio Grande do Sul. Following a report of the findings, the implications for Brazil's current population policy are briefly discussed.

#### Simultaneous Equation Models of Marital Dissolution and Fertility

Helen Koo, Research Triangle Institute, P.O. Box 12194, Research Triangle Park, NC 27709; and Barbara S. Janowitz, International Fertility Research Program.

In order to investigate the reciprocal causation between separation and fertility, the authors study two related simultaneous equation models. Model I hypothesizes that separation affects only the fertility occurring around the time of the dissolution and not childbearing occurring earlier in marriage. However, both earlier and more recent fertility may affect the probability of separation. Given that a marriage has remained intact for  $n$  years, both the decisions to have additional children and to separate during the subsequent  $i$  years are hypothesized to be dependent upon the number of children born during the first  $i$  years ( $C_n$ ). The probability of separation and fertility during interval  $i$  influence each other reciprocally.

Model II examines the possibility that the eventual dissolution of a marriage can influence the fertility of couples throughout the entire marriage. It specifies that separation during the interval  $i$  may have affected fertility during the first years of marriage, and vice versa.

Both models are estimated by two simultaneous equations using two-stage least squares. The models are estimated separately for two marriage cohorts, for successively later durations, using 1970 National Fertility Study data. Preliminary results are presented, and further work is discussed.

Fertility Desires and Child Mortality Experience: A Study of Guatemalan Women  
Anne R. Pebley, International Population Program, Uris Hall, Cornell University, Ithaca, NY 14853; Hernan Delgado, Institute of Nutrition of Central America and Panama; and Elena Brineman, Institute of Nutrition of Central America and Panama.

Using survey data collected by the Institute of Nutrition of Central America and Panama (INCAP) in rural and semi-urban Guatemalan communities, the authors examine the relationship between differential child mortality experience and the desire for an additional child among women of childbearing age. The model assumes that fertility decisions are made at each life cycle stage. Couples may either consciously make fertility decisions based on current mortality conditions, or their fertility desires may be subconsciously influenced by personal experience with child death. The sample is divided into groups based on the number of living children at the time of interview, and a separate discriminant function is derived for each group. The results indicate that child mortality experience appears to influence the fertility decisions only of those who already have five or more living children, and that this effect appears to be subconscious.

#### The Fertility Socialization of Young People: Unraveling the Mother's Role

Susan Gustavus Philliber, Center for Population and Family Health, Columbia University, 60 Haven Avenue, New York, NY 10032.

In this paper, the author explores relationships between mothers' fertility and family size preferences and their children's family size

expectations and preferences. Communication patterns between mothers and children on fertility topics are also considered. Data come from simultaneous but separate interviews of a stratified random sample of 164 Cincinnati mothers and 2 of their children between ages 10 and 18. Results indicate that children perceive the fertility of their mothers as greater than intended and as much greater than they would wish for themselves. Mothers are perceived as approving lower preferences for children. Siblings and best friends are viewed as having preferences similar to the children interviewed, suggesting that children perceive a generational difference in appropriate fertility. These relationships are examined by sibling order, race, sex of child, income of family, and by whether or not verbal communication has occurred between mother and child.

#### Contraceptive Risk-Taking by Young Canadian Women

D. Ian Pool, Department of Sociology, University of Waikato, Hamilton, New Zealand; and Janet Sceats Pool, Health and Welfare Canada.

Studies of young sexually active women in Canada indicate that knowledge of and access to contraception is generally adequate. Despite this knowledge and availability, however, there is a relatively high frequency of unwanted conceptions, which is attributed to a widespread lack of motivation to practice efficient contraception.

In the present paper, the authors attempt to demonstrate that this explanation is inaccurate, that collectively young women employ contraception regularly and efficiently, and that, for the overwhelming majority, this use commences either at first intercourse or soon thereafter. They hypothesize that there exists a small minority of chronic risk-takers, analogous to the "chronic movers" of migration research. This group contributes disproportionately to premarital conception.

The data are drawn from a 1974-1975 disproportionate stratified random sample of 902 full-time women university students in the Ottawa urban area.

#### Changes in the Impact of Age at First Marriage on Cohort Fertility in the United States

Michael Hout, Department of Sociology, 417 Liberal Arts Building, University of Arizona, Tucson, AZ 85721.

Cohorts that have completed their childbearing recently, bore more children than other cohorts born in the twentieth century. This rise in completed fertility has been attributed to the pattern of earlier marriage among the more recent cohorts. In this paper, the author shows that the early marriage hypothesis rests, in part, on the implicit assumption that the parameter relating age at first marriage to fertility is constant for all cohorts compared. This assumption is tested using Public Use Sample data on ever-married white women born in the United States between 1901 and 1935. Interactions between age at first marriage and cohort are statistically significant at first and second parity. Because of these parameter changes, changes in average age at first marriage account for 21 and 13 percent of the increases in first and second births, respectively. These findings emphasize the importance of structural change as a component of demographic trends.

#### Early Childhood Survivorship Related to Subsequent Pregnancy Spacing

Ingrid Swenson, International Fertility Research Program. Mailing address: 4604 Blanchard Drive, Durham, NC 27713.

Childhood mortality is significantly higher among children whose birth is followed by another pregnancy in less than 12 months compared with those whose birth is followed by another pregnancy in more than 12 months. This relationship is apparent when the second pregnancy of the interval results in a live or a non-live birth. These results suggest that a second closely spaced pregnancy adversely affects the older child even when the second pregnancy does not terminate as a live birth which competes for breast milk and other maternal attention. The period of competition from the second

closely spaced pregnancy does not appear to have a significant effect on the survivorship of the older child. However, children followed by a short interval and a live birth have a higher mortality than children followed by a short interval and a non-live birth.

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