

cross-cultural situations. These biases are: the assumption of "a universal human nature which presumably leads all normal people to respond in certain uniform ways in given situations"; an excessive belief in "reason (as) a controlling force in human behavior"; ethnocentrism; identification of scientific medicine with the practitioner's own social organization; ignoring the effect of the social environment upon the patient; and concentration upon the disease rather than the person.

Despite the primary emphasis on the Spanish-speaking group, the approach to the problems of medical care created by cultural differences and the point of view developed in this study should be of interest to all medical workers who deal with patients with a cultural pattern differing in important aspects from their own. Finally, it should be noted that Dr. Saunders has presented his material in a lucid style that is a pleasure to read.

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COHORT FERTILITY¹

IT would be true, I think, to say that over the past decade demographers have become increasingly dissatisfied with the measures of population replacement which they have had at their disposal. Of these measures the principal ones have been the gross and net reproduction rates as developed by Lotka and Kuczynski. The obvious superiority of these rates over the cruder measures in earlier use led to their being regarded as the "best" measures of fertility and reproductivity and it is only in recent years that a critical analysis of the limitations of these measures has been undertaken.

The conventional gross reproduction rate is calculated by summing over the child-bearing period the age-specific fertility rates current to the period under consideration. It measures the average number of female babies which will be born to a female living right through her child-bearing period who is

¹ Whelpton, Pascal K.: COHORT FERTILITY: NATIVE WOMEN IN THE UNITED STATES. Princeton, Princeton University Press, 1954, xxv + 492 pp., \$6.00.

subject continuously to the rates at which females of each age produce offspring in the period under consideration. Thus the gross reproduction rate for a certain period tells us the rate at which females will reproduce themselves if they are *constantly* subject to the *current fertility conditions* as expressed by the current age-specific fertility rates. The two major objections which can be levelled against the gross reproduction rate defined in this way are:

1. Age-specific fertility rates are not an adequate expression of the "fertility conditions" of a population.
2. The combination of the current fertility experience of females of different ages (i.e. of different generations) is not a meaningful operation.

As far as the first objection is concerned it can be readily appreciated that whether or not a woman will have a child within a given period depends not only on her age but also on her marital status, the number of children she has already borne and the interval since the birth of her last child. It follows that fertility rates specific for age, marital status, parity, and interval since last birth (or since marriage in the case of zero parity females) would more adequately represent fertility conditions than the simple age-specific fertility rates. Indeed if fertility conditions, defined in this refined way, are held constant over a period, the simple age-specific fertility rates (and hence the conventional gross reproduction rate) will almost certainly vary over the period. Thus a marriage boom will, by increasing the proportion of newly married females in the various age groups, raise age-specific fertility rates, even though the underlying fertility conditions have remained unchanged. It follows that if these continue to remain unchanged, the age-specific fertility rates must at a later date fall. Indeed under these circumstances, constancy of the age-specific fertility rates might well imply an impossibly large number of first births in the future. The rate at which females are having first births during the marriage boom could not continue, for if an abnormally large number of women are having their first births *now*, they cannot have first births in a few years time.

This objection to the conventional reproduction rates has been to some extent met by calculating reproduction rates on the basis of more refined definitions of fertility conditions. Thus rates have been calculated which take marital status into account and which have attempted to eliminate the influence of temporary fluctuations in the marriage rate. In the volume under review Professor Whelpton has produced reproduction rates controlled for parity as well as age, so that his fertility conditions are defined in terms of the rates at which females aged x and of parity n produce their $(n + 1)$ th offspring. These "parity adjusted" rates are discussed in more detail below.

The second objection to the conventional reproduction rates, is more fundamental. In modern societies, the rate at which births are produced, depends mainly on the rate at which people marry and the rate at which married people have offspring *over their married lives*. Since marriage can be postponed or advanced and since many married couples are able, to a considerable extent, to postpone and advance the having of their children, considerable fluctuations in births can take place from year to year without any change in people's attitudes to marriage or family building. It follows that current reproduction rates may bear little relation to the underlying attitudes towards child-bearing, and that reproduction should be measured over the lives of a given generation of females. This is precisely what Whelpton has attempted to do. His cohort fertility rates measure the reproductive performance of a generation of females. Thus the cohort gross reproduction rate for 1905 measures the actual performance over the next 40 or so years of women borne in 1905, whereas the current gross reproduction rate for 1905 measures what that performance would be of a group of women subject to the fertility conditions experienced by all the different cohorts living in 1905.

I have included the above discussion in order to emphasize the importance of Professor Whelpton's book in the methodology of population measurement. COHORT FERTILITY is ostensibly research into the fertility patterns of native-white women in the United States over the past 50 years or so. It contains a mass of detailed statistics and a very detailed appraisal of them. But it would be a pity if the real significance of the book

were lost in the mass of detail. In my opinion Whelpton has shown conclusively that studies of population replacement must be carried out on a generation basis and that the conventional reproduction rates based on current specific fertility rates—however adjusted or refined—have very limited meaningfulness. This has a number of implications. First, it becomes impossible to speak of the current fertility conditions of a particular year, because in any particular year women of child-bearing ages are only part way through their reproductive periods. We can record their child-bearing performances to date, but can only guess what their performances will be when they have completed their reproductive period. In this sense we can never be up-to-date. Secondly, in estimating future populations we should do this on a generation basis also, estimating the future performances of “incomplete” generations. Thirdly, the theory of the stable population and true rate of natural increase as developed by Lotka loses a great deal of its significance. Constant fertility conditions should now, presumably, be interpreted as a constant number of births per generation (i.e. a constant cohort gross reproduction rate). Such constancy is consistent with a variable timing of having children and hence with a variable mean length of a generation. It may also be pointed out here that a permanent decline in the age at which women have their families would result in some acceleration of population growth even if the size of their families remained unchanged.

The practical objective of Whelpton's book is to present statistical material which “can help to advance our understanding of the size of the changes in fertility which have taken place, the extent to which these changes represent short-time cycles or long-time trends, the course of fertility during future years, and the relation between changes in fertility and changes in economic conditions and other phenomena” (page 14). The basic tables presented for this purpose consist of the cumulative birth performance of given cohorts of women, classified by order of birth e.g. 1,000 surviving females born in 1900 will by age 30 have produced 1,803 births (700 first births, 490 second births, 291 third births etc.), and will by age 47 have produced 2,619 births (777 first births, 608 second births, 413

third births etc.). Such tables have never been presented before and their publication (together with the publication of supporting tables) for the United States is extremely valuable and permits of a more detailed analysis of fertility than has been hitherto possible. They are especially useful for examining the extent to which births are postponed or advanced.

Professor Whelpton's analysis throws considerable light on the behavior of fertility in the United States over the past 50 years and on its likely behavior in the future. The conventional gross reproduction rate has shown a steady decline into the 1920's, accelerated in the depression years of the '30's, and a remarkable recovery since about 1940. Has the downward trend in fertility evident since the latter part of the 19th century been reversed? Whelpton is rightly cautious, but his answer seems to be that the downward trend may have been halted, but could hardly be said to have been reversed. The gross reproduction rate of the cohort of 1875 was 1.74 (i.e. females born in 1875 actually produced on the average 1.74 female babies, mortality being ignored). It fell with extraordinary regularity to 1.11 for the cohort of 1909—the last virtually complete cohort available. On the basis of subsequent incomplete cohorts Whelpton judges that a figure of 1.10 will be reached by the cohort of 1910 or 1911 and a limited rise will occur for a time among subsequent cohorts. He also believes that the downward trend in the proportion of married couples having five or more children will continue but that the proportion having no child or one child will also fall and hence will have an offsetting effect. In spite of the fact that the conventional net reproduction rate was below unity throughout almost the whole of the '30's, no actual cohort has failed to reproduce itself. At the same time the baby boom of the '40's can be explained to a considerable extent by the catching up of postponed births and the advancing of future births. This latter phenomenon accounts for the drop in the number of births which Whelpton anticipates will take place in the next ten years. Three sets of projections are provided and although the range between those based on high and low fertility is very wide, they all indicate a fall in the number of births. The calculations involved in making these projections provide an ex-

cellent illustration of how cohort fertility tables should be used in making population projections.

Although the book is mainly concerned with cohort fertility, Whelpton includes a section giving calculations of current reproduction rates controlled for parity, marriage, and fecundity as well as age. In view of the powerful objections which can be raised against reproduction rates based on current data—objections which must for the most part be credited to Whelpton himself—I would not now attach the significance to these refined measures which I might formerly have done. The control in Whelpton's rates for marriage and fecundity is rather arbitrary and he points out that a more refined control for marriage is desirable. However I am puzzled that his refined gross reproduction rates for the years 1920–1949, are, with the exception of one year only, lower than the simple gross rates controlled for age alone. It cannot be due to bias in the allowances for marriage and fecundity, for this allowance works sometimes to increase and sometimes to decrease the refined measure. Whelpton draws attention to this characteristic of his refined measure, but does not attempt to explain it.

Professor Whelpton's book is of the first importance and its influence on the future development of demography will be very great. No one could read it without being impressed by its significance and awed by the detail of its analysis.

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RESEARCH METHODS IN THE BEHAVIORAL SCIENCES¹

THIS book represents the contributions of nineteen social scientists from the University of Michigan. In essence, the volume attempts to provide graduate students in the social sciences with a current picture of the level and content of methodology and research methods oriented specifically for the field of social psychology. The editors define the criterion for

¹ Festinger, Leon and Katz, Daniel (editors): *RESEARCH METHODS IN THE BEHAVIORAL SCIENCES*. The Dryden Press, New York, 1953, xi + 660 pp.