

Upbringing and Advantage

Family Size and Achievement. JUDITH BLAKE. University of California Press, Berkeley, 1989. x, 415 pp., illus. \$40. Studies in Demography, vol. 3.

Does being reared in either a large or a small family have significant consequences for a person's life chances? Some have suggested that the answer depends on the state of sociodemographic development. It has been argued, for example, that in societies that have not experienced the "demographic transition" (the transition from high to low fertility rates), being born to a large family is an asset, whereas in post-transition societies children of larger families are subject to a number of socioeconomic disadvantages (see for example, J. C. Caldwell, *Theory of Fertility Decline*, Academic Press, 1982).

Family Size and Achievement represents an important contribution to understanding the socioeconomic influences on offspring of family size differentials in post-transition societies. It is a superb illustration of how survey data can be used to address an important set of issues regarding human development and the family. In sum, the book presents a careful, comprehensive, and reasoned analysis of available survey data on the relation of family size to educational attainment (years of completed schooling), cognitive ability, and a number of associated aspects of the schooling process. Blake's consideration of these issues is based primarily on data on past cohorts in U.S. society, but her work is intended to address the question in the context of the recent "sibsize revolution." In this context, Blake notes that children born since the end of the postwar baby boom are the first in American history to come primarily from small families—families of three or fewer children. This new family size regime, contends Blake, has major implications for the cognitive development and schooling experiences of cohorts growing up under it. Its consequences for individuals "will be strikingly positive," and "society as a whole stands to benefit as well" (p. 297).

Blake's gathering together of data pertinent to this issue is impressive. She presents data from the General Social Surveys (13 annual national surveys taken between 1972 and 1986), the 1962 and 1973 Occupational Changes in a Generation cross-sections

(from the Current Population Surveys), and three national fertility studies: the 1955 and 1960 Growth of American Families surveys and the 1970 National Fertility Survey. She also examines data from several surveys of young people, specifically cycles II and III of the Health Examination Surveys, which sampled children 6 through 11 in 1963–65 and children 12 through 17 in 1966–70, the University of Michigan's 1966 Youth in Transition survey of 10th-grade boys, and the 1980 High School and Beyond survey of some 60,000 high school sophomores and seniors sponsored by the National Center for Educational Statistics. It is hard to imagine any large-scale national database that Blake has left out, and in this sense her analysis is the most extensive and exhaustive treatment of this topic to date. The analysis uses appropriate and rigorous analytic tools, and the reporting of the results is straightforward and accessible to the non-social scientist.

Using these many and diverse sources of data, with appropriate statistical controls for other variables reflecting socioeconomic differences among families, Blake carefully documents that increases in number of siblings are associated with attainment of fewer milestones in the process of schooling and with completion of fewer years of schooling. And lest the reader conclude that the association of sibship size and schooling is primarily linked to greater ability of small families to afford post-secondary schooling for their children, she painstakingly demonstrates that the linkage appears even more strongly when years of graded schooling and the likelihood of graduating from high school are considered. Indeed, she shows that the higher the level of schooling considered, the smaller the association with number of siblings. This, she argues, is why some studies have found only weak or nonexistent support for the sibsize effect—they have studied populations, such as high school graduates or college students, that will have already been selected by number of siblings at an earlier stage in the schooling process.

A further reason the role of number of siblings has been understated in past research, Blake argues, is that its effect is often "absorbed" into the overall influence of family socioeconomic status. Because for some individuals early childbearing and family

size are determinants of schooling and occupational attainment, the "effects" of parental socioeconomic status are confounded with those of family size. Blake therefore considers a panoply of control variables in her statistical analyses, adjusting family size differences for parental background characteristics (father's occupational status, father's amount of schooling, whether or not the father was a farmer, and whether the parents' marriage was intact while the child was growing up). She also includes a person's age as an indicator of the period during which he or she was growing up. It is hard therefore to argue that the association she finds between sibship size and developmental outcomes is due to other exogenous factors not included, although I return to this point below.

In order to gauge the relative magnitude of the association of family size with achievement, Blake compares it with the effects of variables commonly considered important for amounts of schooling attained. Specifically, she notes that family size differentials approximate race or age in their effect on the amount of schooling attained. However, her data show that family size is less important than parental schooling, which has repeatedly been found to be the most important determinant of amount of children's schooling (pp. 52–53). Still, Blake argues, the importance of family size in the prediction of schooling outcomes, especially in the years of graded schooling, has been neglected. Despite the fact that the negative educational effects of large families can be mitigated by powerful external forces like the Catholic Church, inasmuch as it invested substantial resources in the education of the young, by the influences of the kin cohesion of certain ethnic groups, or by high parental socioeconomic status, the residual negative effects are too significant to ignore. After all, the Catholic Church assisted children from small as well as from large families, and the family size differentials tend to persist even where supportive forces mitigate their effect.

Blake's interpretation of these effects is decidedly supportive of a perspective that implicates families with large numbers of children in the production of educational disadvantages for their offspring. She argues that these effects are not due to unmeasured exogenous structural or cultural variables, but are due rather to the operation of family size on processes within the family. Specifically, she hypothesizes that family size works via the "dilution of parental resources," including time and attention as well as economic resources. Although she nowhere examines any direct evidence for this interpretation, it is the only one really favored by the book—the family size differentials are con-

tinually referred to as reflecting this "dilution." On the other hand, Blake does spend considerable space examining a number of related endogenous processes, presumably linked to the dilution hypothesis. In chapter 5 she reports a strong negative influence of family size on verbal scores of young persons, reflecting cognitive learning, which is responsive to parental attention and which predicts the amount of schooling attained. In chapter 7 she shows that young people from smaller families have higher educational aspirations in part because parental desires regarding children's amount of schooling, which are linked to family size, directly influence children's educational goals. Her other efforts to implicate dilution of parental resources as the mechanism by which family size effects operate are somewhat vitiated by negative findings. For example, she speculates (chapter 7) that family size might predict parental values regarding "intellectual curiosity" versus "obedience to parents," which might in turn affect schooling attainment. Her analysis indicates there are no family size differences in these variables, once parental socioeconomic characteristics are controlled. Generally speaking, Blake's attempts to find the endogenous aspects of family environments linked to family size differences, or some reflection thereof, are interesting and reveal imaginative uses of available data, but are essentially inconclusive.

Blake also examines the ordinal position of children as a factor affecting development and schooling attainment. She concludes, on the basis of past theory and research, as well as her own empirical analysis, that birth-order effects on cognitive skills are nonexistent once proper statistical controls are introduced for family size and socioeconomic level. In this context she gives considerable attention to Robert Zajonc's well-publicized claim (see for example *Science* 192, 227-236 [1976]) that the downward trend in Scholastic Aptitude Test scores over the 1960s and 1970s might be explained by increasing average birth-order in these cohorts. Using a more extended series of average birth-order and SAT score data, she finds little support for Zajonc's speculation, but she notes that the SAT decline tracks well with lagged increases in average completed fertility of women. However, she calls for the analysis of more appropriate individual-level data and cautions against overinterpreting such aggregate time-series.

Blake's results are highly consistent with substantial amounts of literature. However, her interpretations of the effects as reflecting the dilution of parental resources may be premature. Though she makes a strong case that the effects of family size do not repre-

sent unmeasured exogenous influences, I would note that such conclusions rest on a set of assumptions about the adequacy and completeness of measures of between-family differences in socioeconomic experience. Before one concludes that associations of family size with schooling processes reflect the influences of family size on endogenous factors, as the dilution hypothesis does, one should be able at a minimum to identify and measure those factors and statistically interpret their role in transmitting such effects.

Overall, Blake seems too ready to embrace the conclusion that large families are bad for children and only good things will come of the "sibsize" revolution. Whereas the possibility that there may be more than an occasional offset to the advantages of small families is not fully explored, Blake devotes considerable effort to refuting the idea that solitary children suffer personality deficits. A more balanced approach to the issue of family size might give greater attention to non-intellective criteria. Having a number of siblings may help develop other traits beneficial to self and society, such as ability to get along and cooperate with others, to share one's belongings, and to care for and help others. One would hope that the questions future generations will ask regarding the desired number of children and their ultimate "quality" will not be answered solely on the basis of criteria associated with amounts of schooling.

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Aquatic Studies

Breaking New Waters. A Century of Limnology at the University of Wisconsin. ANNAMARIE L. BECKEL. With a chapter by Frank Egerton. Wisconsin Academy of Sciences, Arts and Letters, Madison, 1987 (available from Center for Limnology, University of Wisconsin, Madison). xiv, 122 pp., illus. Paper, \$10. Special issue of *Transactions of the Wisconsin Academy*.

Few first-rate scientific groups remain first-rate for more than a decade. I was therefore anxious to read this little volume describing a group that has remained near the top of its discipline for a century and the three scientists who founded and directed it. Much of the history recorded in the volume was obtained first-hand, by interviews with people who were students or young scientists who worked with Edward A. Birge and Chancey Juday during the formative years of limnology at Wisconsin. This would not



"A. D. Hasler and Wolfgang Braemer, a German ethologist from the Max Planck Institut, studying sun-compass orientation in fish, about 1957. Fish were placed in the center of the tank and trained to enter only the northerly compartments. The shade, peace, and quiet of a chamber were the rewards. Electric shock was given if incorrect direction was taken." [From *Breaking New Waters*; Arthur Hasler]

have been possible for much longer, for many of those interviewed are now in their 70s and 80s.

The portrait of Birge shows one of the most remarkable men to practice science in this century. The first several decades of his life reveal nothing unusual as far as scientific work goes: a few papers published, a department chairmanship followed by a deanship and a university presidency. However, following this career, from which most scientists would retire fully satisfied, Birge embarked on an enterprise that was to leave a permanent mark on ecological science: the integrated, multidisciplinary study of lakes—not just a few lakes, but hundreds of them. At the age of 73, Birge established a research station in then-remote northern Wisconsin. In his 80s he was still participating in field programs beyond the physical capabilities of most 20-year-olds and publishing papers that were all-time classics. He received limnology's most prestigious award, the Naumann-Thienemann Medal, at 98. One is a little disappointed that the book is limited to reciting Birge's achievements, revealing few details of the life of this remarkable individual.

The personal side of Juday, the Robin of the Wisconsin dynamic duo, is even less developed. He is described as a workaholic whose curiosity and fascination with lakes rivaled Birge's. His personality seems to have complemented Birge's perfectly; while