

cal appeal of science for both medical professionals and the public and explores its diverse and changing meanings, whether manifested in clinical research, the use of the laboratory, the precision and complexity of feeding methods, or the approval of professionals, be it the seal of the American Medical Association or a quotation from a physician appearing in an baby food advertisement. This book is an important contribution to our understanding of the relationship between prescription and practice, a thoughtful integration of visual, oral, published, and manuscript materials. Apple has given us a chance to hear the voices of ordinary women and their physicians as they tried to determine what was best for baby, mother, and doctor.

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The Nestlé Affair

Infant Feeding. Anatomy of a Controversy, 1973–1984. JOHN DOBBING, Ed. Springer-Verlag, New York, 1988. xviii, 169 pp. \$30.

This book is basically the history of a worldwide controversy, involving the infant food industry, medical scientists, and certain activist movements. In this controversy, activist groups charged the infant-food industry with marketing their infant formula so aggressively and persuasively that mothers who could have breast-fed successfully chose to use formula instead. This practice was particularly serious in developing countries where illiterate mothers could not read the instructions for safe formula preparation, often overdiluted the expensive formula to make it last longer, and unknowingly fed their infants formula that had become contaminated because of unsafe water supplies and lack of cleanliness and refrigeration. The activists charged that these circumstances led to marked increases in infant malnutrition, gastroenteritis, diarrhea, and mortality.

These serious charges were made against companies that had until then been generally viewed as making legitimate and important contributions to child health. The Nestlé Company, perhaps because it was so long established and well respected and had the largest share of the market in developing countries, was most directly charged and soon became the target of a prolonged consumer boycott of its products in the United States, Europe, and Asia. Throughout the controversy Nestlé has maintained that its products provide better nutrition than traditional substitutes for breast milk

and are intended only for infants who are unable to breast-feed for various reasons or whose feeding must be supplemented.

John Dobbing is a medical practitioner and scientist who has been an insider to the controversy in several ways. His research focus has been on the effect of undernutrition on infant brain growth and development; he has had contact in Uganda with Derrick Jelliffe, a leader of the activists, and with the Nestlé Company; and he participated in the meetings called by the World Health Organization and UNICEF to resolve the controversy. His first aim in this book is to provide readers of all backgrounds with a detailed and objective description of the controversy, so they will be able to judge for themselves. He begins by emphasizing that all participants in the controversy agree on the clear advantages of breast-feeding, provided it is possible. He uses a reasoned approach, showing sensitivity to both sides, yet critiquing the logic or methods used by either side when this seems deserved. A recurrent theme is that Nestlé, out of an increasing sense of corporate responsibility, changed its marketing policies in many ways, first in response to the activists' charges and then in an effort to implement the World Health Organization Code established in 1981, but that these efforts went largely unappreciated by the activists.

Dobbing's second aim is to delineate the process used to resolve this controversy, thereby providing, if not a model to follow, at least an example to study. To achieve these aims he enlisted the assistance of Maggie McComas, an American business writer and public affairs analyst interested in consumer movements, and Gabriel Veraldi, a French writer and investigative journalist interested in the relationship between industry and society. Both these authors had independently studied the controversy.

Infant Feeding begins with the activists' charges, presented by Veraldi and followed by Dobbing's medical and scientific commentary about them. A strength of the book is Dobbing's discussion of pertinent research methodology and insights important for interpretation of relevant research findings. For example, in addition to manufactured formula, many culturally based breast-milk substitutes exist; usually they provide inadequate nutrition and are susceptible to contamination, and often they are given in bottles. Yet bottle-feeding is generally used as a synonym for formula feeding, and studies comparing bottle-feeding and breast-feeding rarely describe the contents of the bottle. As another example, it must be realized that breast-fed infants who do poorly are often changed to formula, whereas for-

mula-fed infants who do poorly are rarely changed to breast-feeding. This selective dropout leaves breast-fed infants healthier as a group and adds sickly infants to those who are bottle-fed, yet this phenomenon is poorly controlled in comparisons of outcome for breast-fed and bottle-fed infants.

A weakness of Dobbing's commentary is the absence of a cohesive discussion of other factors known to be related to incidence and duration of breast-feeding. The reason given is that the causes are so multifactorial, interdependent, and complex that meaningful analyses cannot be done. However, this topic is relevant to the charges underlying the controversy and merits at least an overview presentation. Although several factors such as women working outside the home are mentioned now and then, one factor never mentioned is that increasing urbanization brings increasing hospital birth and frequently mother-infant separation after birth, with infants taken to central nurseries for most of their care. Because close mother-infant contact and frequent breast-feeding are known to increase prolactin levels, thereby promoting lactation, such separation may compromise breast-feeding to some extent, rendering mothers more susceptible to an inadequate milk supply and more likely to use infant formula, especially if they have received formula samples.

One potential source of error is the impression given by Dobbing that the incidence of breast-feeding has begun to increase in several Western countries. At least in England and the United States, this is not the case. The incidence of breast-feeding (with or without supplementation) in the United States decreased from 58% in 1985 to 54.3% in 1988, according to data from Ross Laboratories National Mothers Survey. Continued breast-feeding at 6 months decreased from 22% to 19.2%. Decreases have occurred in England as well.

The next five chapters, by McComas, detail the growing controversy, including its origins; the developing focus on Nestlé rather than all the companies involved; Nestlé's suit for libel; the U.S.-based boycott; political action led by Senator Edward Kennedy; international discussion under the aegis of WHO and UNICEF; and the adoption of an unprecedented international code, the WHO International Code of Marketing of Breast Milk Substitutes. Rather than a binding regulation, this Code took the form of a flexible recommendation that facilitated implementation but made enforcement difficult because it was subject to wide variations in interpretation. This causes problems, for example, in defining which infants need formula feeding or at least supplementation.

The next and final three chapters are by

Veraldi, who first describes increasing allegations by the activists that Nestlé and others were violating the Code and then describes the establishment of an independent Infant Formula Audit Commission by Nestlé. The Commission is headed by former Secretary of State Edmund Muskie and has distinguished members with impeccable credentials; it advises Nestlé on proper implementation of the Code and investigates complaints of violations. The Commission's initial success and support from the United Methodist Church, which conducted a thorough evaluation and became convinced of Nestlé's sincerity, led to resolution of the boycott in 1984.

Dobbing's second aim is accomplished well, making *Infant Feeding* a useful book for those who wish to study the process of conflict resolution in general, as well as those concerned with the Nestlé controversy. His first aim, to represent a complete and balanced view, has been accomplished to some extent. Even those well oriented to the controversy, on either side, will gain new and valuable insights, some of which have a modulating effect. Questions remain, how-

ever, and this reviewer is left with the wish to learn more.

It is ironic that *Infant Feeding* was published just as the controversy began to escalate again. By June 1988, the activists had ceased to file their complaints with the Muskie Commission, which had apparently lost credibility with them. Also, Action for Corporate Responsibility/IBFAN, Minneapolis, threatened to resume the boycott unless Nestlé and American Home Products (Wyeth) presented plans to end their programs of distributing free formula to hospitals. No plans were presented, and the boycott was begun against both companies in October 1988. Given this escalation, *Infant Feeding* will provide a relatively balanced background from which to evaluate what is yet to come. At the very least the reader is encouraged to read the excellent foreword by Frank Falkner and the preface and epilogue; many who do so will be intrigued enough to read the entire book.

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Adoption Studies Continued

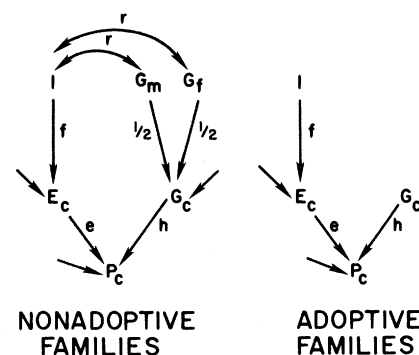
Nature and Nurture during Infancy and Early Childhood. ROBERT PLOMIN, JOHN C. DEFRIES, and DAVID W. FULKER. Cambridge University Press, New York, 1988. xiv, 345 pp., illus. \$44.50.

In 1934, Iowa's Bureau of Child Welfare established a policy mandating psychological assessment of children prior to their adoption. The policy led to a classic study of children's mental development, a longitudinal follow-up of children "from the lower social, economic, and educational levels . . . placed in average and superior foster homes" at young ages (1). Although their compilation was conceptualized as "a service project" rather than as planned research, the Iowa adoption data have been celebrated in developmental psychology for the insights they provided into the plasticity of mental growth, into developmental changes in age-to-age stability of mental test scores, and into the association of children's cognitive abilities with educational characteristics of their biological and adoptive parents. Four decades later, amid renewed appreciation of the power of adoption methods for developmental psychology, plans were formulated to initiate a contemporary longitudinal study of adopted infants. The result, the Colorado Adoption Project (CAP), here

receives a second, interim report; an earlier book (2) traced development of the CAP children through age 2; now they are followed through age 4.

The Iowa studies tracked average test scores of 100 adopted children from infancy into adolescence, concluding that intellectual abilities of the adoptees were consistently higher "than would have been predicted from the intellectual, educational, or socioeconomic level of the true parents" (3). More was made of the average IQ differences between the adopted children and their biological mothers than of developmental increases in resemblance between children and mothers (IQ correlations between adopted children and their biological mothers were zero at age 26 months, 0.28 at 51 months, and 0.44 at 13 years), and the authors made "no attempt to determine relative contributions . . . from genetic or environmental influences" (3). Not so in the Colorado research here described. The CAP was explicitly designed to "disentangle the causes of familial resemblance" (p. 41) and to make explicit, multiple estimates of changing influences of shared genes and shared experience on behavioral development. The effort is ambitious, the design creative, the results significant. Both biological and adoptive parents of adopted chil-

dren, as well as both adoptive and nonadoptive sibling pairs, are tested, and the aim of the effort is parameter estimation of both genetic and environmental sources of behavioral variance. An early chapter in the book contrasts research directed to group differences (focusing on means) with research directed to individual differences (focusing on variance), and, after decrying research neglect of individual differences, the authors advance quantitative genetics as a basis for a general theory of individual development. They devote another chapter to an elegant, highly readable introduction to path-analytic modeling of family data, and results of path models fitted to the CAP data form the major empirical contribution of this book. The database includes 203 adopted and 195 matched nonadopted children at 3 years of age, slightly more at ages 1 and 2, and slightly fewer at age 4, along with biological mothers, the adoptive parents of adoptees, and both parents of nonadoptees; 67 adoptive and 82 nonadoptive siblings were tested at 1 year, with diminishing numbers at ages 2, 3, and 4. The parents completed a 3-hour test battery assessing cognitive abilities, personality, interests, and life-style habits; children were assessed with standardized scales of mental and motor development at ages 1 and 2, and with the Stanford-Binet Intelligence Scale at ages 3 and 4, and personality and temperamental development was evaluated from parental ratings and videotapes. Testing



"Model of genetic mediation of environment-development correlations in nonadoptive families and adoptive families" as elaborated by Plomin, Lochlin, and DeFries (1985). "In nonadoptive families, correlations between environmental measures and measures of children's development can be mediated genetically as well as environmentally; in adoptive families, the correlation arises only for environmental reasons. More precisely, the child's phenotype P_c is assumed to be causally determined by its genotype G_c and by its environment E_c via genetic and environmental paths h and e ; the residual arrow impinging on P_c allows for measurement error. The environmental measure I is assumed to be correlated to an extent r with mothers' and fathers' (unmeasured) genotypes G_m and G_f ." [From *Nature and Nurture during Infancy and Early Childhood*]